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When to Survey? Influences of a 24-hour Internet Abstinence on Self-evaluations of Internet Overuse Assessed using Internet Addiction Test (IAT)

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Abstract

As Internet use becomes increasingly common and pervasive in our daily life, there is growing concern about Internet overuse and how to assess its severity via self-report surveys. However, being constantly connected without prolonged breaks may lead to a prejudiced self-perception on Internet overuse as an accurate assessment often relies on contrasts between lives with and without the Internet. The present study investigates how a 24-hr Internet abstinence influences self-reported Internet overuse assessed using Internet Addiction Test (IAT). Fifty-seven students were recruited from a US university to complete two IAT surveys: a pre-weekend IAT before the Internet abstinence on Saturday and a post-weekend IAT after the weekend. Results showed 93% of the participants reported different IAT scores before and after the abstinence, with changes in both directions and a range of absolute differences from 0 to 20 points. In spite of the similar averages, the distribution of the pre-weekend IAT scores was more dispersed and positively skewed than the post-weekend scores. Further analyses showed people scoring at the higher end in the pre-weekend IAT dropped more points and reported more questions with negative changes in the post-weekend IAT, suggesting overestimation of Internet overuse before the abstinence. Furthermore, items in IAT reacted differently to the abstinence; responses to questions on time management issues and withdrawal-like symptoms related to Internet overuse were more likely to be influenced. The study suggests that self-evaluation on Internet overuse are influenced by recent experience with prolonged offline life, and that future studies should consider administration of the IAT survey after an extended period of Internet abstinence as it ensures a more realistic and accurate self-evaluation.

Keywords: Internet abstinence; Internet addiction test; IAT score

Introduction

The advent of the Internet Age has provided our society with novel ways of communication and access to information. Lately, the use of the Internet becomes more common and influential with advancements in mobile technology and Internet bandwidth. Despite the countless benefits it brings to our society, the omnipresent Internet has created serious social and personal problems ranging from privacy theft [1], cyberbullying [2] to Internet overuse.

Despite the inconsistent use of terms such as Internet addiction [3], problematic Internet use [4] and iDisorder [5], Internet overuse at its core refers to excessive Internet use with functional impairment of one's daily life. The recognition and classification of Internet overuse in the existing framework of mental disorders is controversial, with contentious debate over its identification as a discrete disorder entity or a manifestation of other underlying disorders such as depression and personality disorder [6]. Nevertheless, several survey measures have been proposed since 1990s to assess individual severity of Internet overuse [7]. The most commonly used questionnaire is Young's Internet Addiction Test (IAT), which has been validated with strong internal consistency and good test-retest reliability [8-11].

First used in late 1990s, the IAT was adapted from the diagnostic criteria for pathological gambling [3]. The questionnaire consists of 20 items, with each response measured on a six-point Likert scale ("does not apply" to "always"; 0 through 5 points) [12]. The higher the total score is, the more inferred problems and impairment are caused by Internet overuse. Items in the IAT reflect different aspects of Internet overuse including time management issues related to overindulgence, withdrawal-like symptoms such as craving, defensive reactions towards others and reality substitution with online virtual interaction [9,11].

Despite of its popular use, there are inconsistent ways of data analyses when the IAT is used. For example, previous studies disagreed on the cut-off schemes of severity index identified by its score [8,11,13,14]. Although not mentioned often in the literature, a lack of unified instructions on how the IAT should be administered may lead to inaccurate assessments and inconsistencies across studies.

In the present study, we are investigating whether an "abstinence-before-survey" method is necessary when assessing Internet overuse using the IAT. Most previous studies failed to address this issue and generally administered the IAT survey to their participants without requiring any type of Internet abstinence beforehand. Unlike abused psychoactive drugs such as alcohol and heroin as well as behavioral addictions such as pathological gambling, access to the Internet is relatively easy and unrestricted. Frequent use of the Internet for both working and personal purposes has become extremely common in many circumstances such as college and modern workplace. The routine interaction with the Internet without prolonged breaks may lead to a judgment with prejudice on personal severity of Internet overuse, reflected as overestimation or underestimation of one's IAT scores. An extended period of Internet abstinence, however, offers the participants an opportunity to contrast lives with and without the Internet, ensuring a more realistic thus accurate self-evaluation of Internet overuse.

Methods

Participants were recruited for AFK (away-from keyboard) Weekend Project at Binghamton University in 2013. The event was advertised via campus flyers and listserv postings. Each participant was given a chance to win one of two $50 Amazon.com gift cards in a lottery. This study was conducted in accordance with guidelines for the use of humans as research participants, and was approved by the Human Subjects Research Review Committee at Binghamton University. All participants were adults (≥18 years) and enrolled

voluntarily. A written informed consent was given based on a clear understanding and appreciation of the procedure and implications of the project prior to their participation.

Survey and procedure

Primary self-report measures of this study consisted of a pre-weekend IAT on Friday and a post-weekend IAT on the following Monday. Information on Internet usage behavior were also obtained from the participants in the form of survey, including time spent online per day and frequency of participation in twenty-six online activities (listed in Supplement). Other measures were collected but are to be used and reported elsewhere, including a delay discounting task test, a log kept by each participant over the weekend, and their DNA samples.

After completing the pre-weekend IAT on Friday, the participants were asked to abstain from using the Internet (via computers and mobile devices) for 24 hours the next day (Saturday). On Sunday (starting at 12 AM), the participants were allowed to resume regular Internet use. On Monday, the participants returned to complete the post-weekend IAT.

Data analysis

The main goal of data analysis was to investigate whether and how individual scores were influenced by the 24-hr Internet abstinence. Pre-weekend and post-weekend IAT scores for each participant were calculated by a sum of their responses to the 20 items. Internal consistency of the measure was tested by calculating Cronbach's alpha for both IAT surveys. On the individual level, comparison were made between one's pre- and post-weekend IAT scores, including direction of the change (positive, negative or neutral) and the absolute difference by points. Number of questions with positively or negatively changed responses between the two IAT surveys were recorded for each participant. Bivariate correlations between the pre-weekend IAT score and numbers of questions with positive or negative changes, time spent online per day and numbers of daily online activities were analyzed using Pearson product-moment correlation. On the population level, distributions of the two sets of IAT scores were characterized by maximum and minimum scores, median and skewness. Dependent t-test was used to compare the means between the pre- and post-weekend IAT scores.

The secondary goal of data analysis was to investigate how each question of the IAT was influenced by the 24-hr Internet abstinence. Percentages of the participants with changed responses (positive or negative) to each question after the abstinence were recorded and compared. The influence were also compared between four categories of IAT items including "excessive use", "craving and anticipation", "defensive reaction" and "reality substitution" (Table 1).

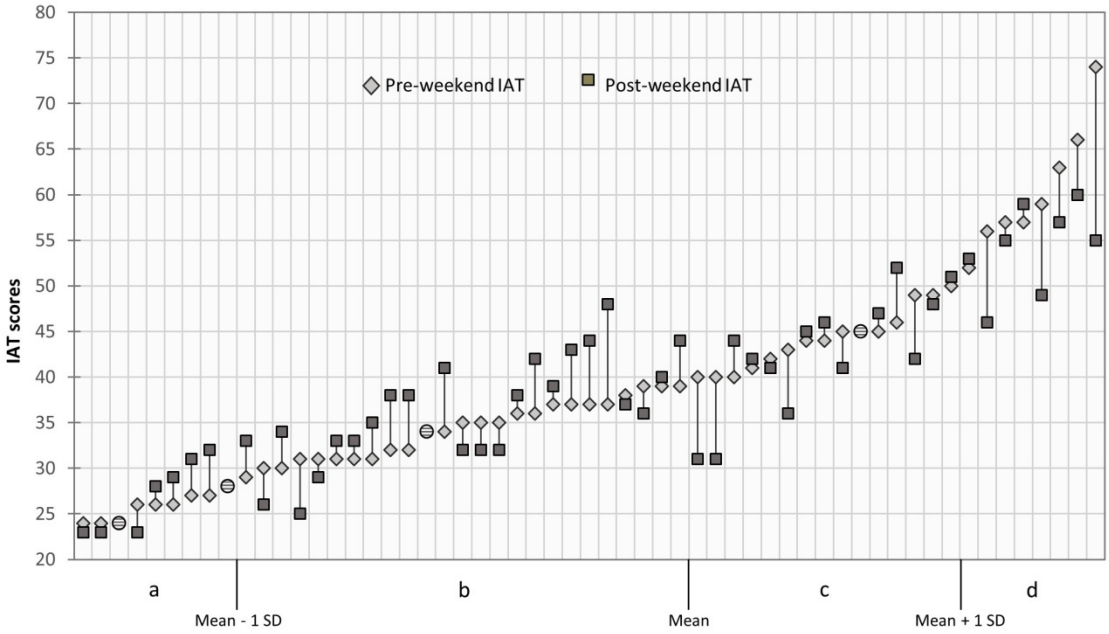
"Excessive use"	"Craving and anticipation"	"Defensive reactions"	"Reality Substitution"
Overindulgence and time management issues including troubles in reducing time spent online and their negative life consequences. **Q1.** How often do you find that you stay or play longer online than you intended? □□□□□□□□□□□□ **Q2.** How often do you neglect household chores to spend more time on-line? **Q6.** How often do your grades or school work suffer because of the amount of time you spend online? **Q7.** How often do you check your e-mail before something else that you need to do? **Q8.** How often does your academic performance or productivity suffer because of the Internet? **Q14.** How often do you lose sleep due to late-night log-ins? **Q16.** How often do you find yourself saying "just a few more minutes" when online? **Q17.** How often do you try to cut down the amount of time you spend on-line and fail?	Withdrawal-like symptoms when offline, including negative mood change, urgeto reconnect and anticipation of fulfillment associated with Internet use. □□□□□□□□□□□□ **Q10.** How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet? **Q11**. How often do you find yourself anticipating when you will go online again? **Q12.** How often do you fear that life without the Internet would be boring, empty, and joyless? **Q15.** How often do you feel preoccupied with the Internet when offline, or fantasize about being online? **Q20.** How often do you feel depressed, moody or nervous when you are offline, which goes away once you are back online?	Situations that triggers certain defense mechanisms such as aggression and denial when one's Internet use is inquired or disturbed by others. □□□□□□□□□□□□ **Q5.** How often do others in your life complain to you about the amount of time you spend online? **Q9.** How often do you become defensive or secretive when anyone asks you what you do online? **Q13.** How often do you snap, yell, or act annoyed if someone bothers you while you are online? **Q18**. How often do you try to hide how long you've been online?	Uses of the Internet to substitute real-life relationships or activities with virtual ones. □□□□□□□□□□□□ **Q3.** How often do you prefer the excitement of the Internet to intimacy with your partner? **Q4.** How often do you form new relationships with fellow online users? **Q19.** How often do you choose to spend more time online over going out with others?

Table 1: Four categories of IAT items based on symptomatic manifestations of Internet overuse.

Results

Fifty-seven participants with an average age of 22.1 (SD=4.2) completed both the pre-weekend and post-weekend IAT surveys. Among them, 40 (70.2%) were undergraduate students while 17 (29.8%) were graduate students; 37 (64.9%) were females while 20 were males (35.1%). Cronbach's alpha for the pre- and post-weekend IAT were 0.879 and 0.867, indicating good internal consistency of the measure.

The majority of the participants reported different scores before and after the Internet abstinence: 24 (42.1%) participants scored lower and 29 (50.9%) participants scored higher in the post-weekend IAT; only 4 (7.0%) participants reported the same scores in both IAT. The average of absolute differences between the two IAT scores was 5.6 points (SD=4.6). The numbers of participants who had an absolute difference of at least of 10 points and at least 5 points were 4 (7.0%) and 20 (35.1%) respectively. Figure 1 shows comparisons of individual IAT scores, sorted by the pre-weekend IAT score and partitioned by distance to the mean. The average number of questions with changed responses after the abstinence was 7.5 (SD=3.7), including averages of 3.8 (SD=2.6) positive and 3.7 (SD=2.9) negative changes.



Partitions		a	b	c	d
n		9	25	15	8
Percentage of					
	+ changes	44%	64%	47%	25%
	- changes	33%	32%	47%	75%
Average of					
	changes in points	1.0	2.0	-1.4	-6.25
	absolute differences	2.1	4.0	3.7	7
Average number of questions					
	with + changes	2.2	4.4	3.8	3.5
	with - changes	1.3	2.7	4.7	7.6

Figure 1: Comparision of individual IAT scores before and after the 24-hr internet abstinence. Participants were sorted by pre-weekend IAT score and partitioned into four subsets (a, b, c and d) based on its distance to the mean.

	n	Mean	SD	Minimum	Maximum	Median	Skewness (SE)
Pre-weekend IAT	57	39.2	11.2	24	74	37	1.00 (0.32)
Post-weekend IAT		39.0	9.6	23	60	38	0.28 (0.32)

Table 2: Descriptive statistics for pre- and post-weekend IAT scores.

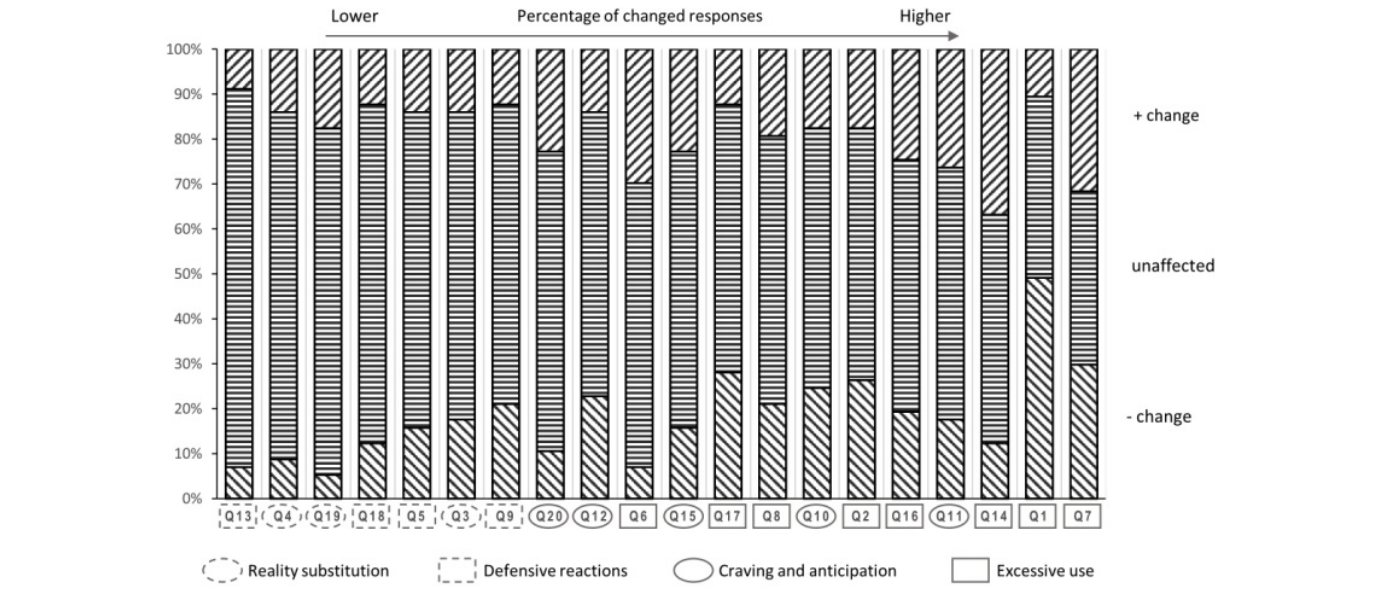


Figure 2: Influence of the 24-hr Internet abstinence on each IAT item sorted by percentage of changed (+ charge and - charge) responses.

Correlation analyses showed that the two sets of IAT scores were positively correlated, r=0.879, p<0.001. The pre-weekend IAT score was positively correlated with the number of responses with negative changes (r=0.708, p<0.001), but not with the number of responses with positive changes (r=0.083, p=0.537). Analyses also revealed moderate positive correlations between the pre-weekend IAT score and time spent online per day (r=0.486, p<0.001), and number of daily online activities (r=0.428, p<0.01).

The average scores of the pre- and post-weekend IAT were 39.2 (SD=11.2) and 39.0 (SD=9.6) respectively. Dependent t-test showed no significant differences between the two averages, t(56)=0.298, p=0.767. Table 2 summarizes the descriptive statistics for the pre- and post-weekend IAT scores.

Figure 2 shows how responses to each question in the IAT changed after the 24-hr Internet abstinence. A range of 15.8% to 61.4% of the participants reported different responses to a question before and after the abstinence. When analyzed by the category of questions, averages of 46.9%, 38.9%, 25.9% and 25.7% of the participants changed their responses to a question in the "excessive use", "craving and anticipation", "defensive reaction" and "reality substitution" categories respectively.

Discussion

The main purpose of this study is to investigate the influence of a 24-hr Internet abstinence on individual IAT scores. Fifty-seven participants, recruited for AFK Weekend Project at Binghamton University in 2013, completed two IAT surveys: one before a 24-hr Internet abstinence on Saturday and the other one after the weekend. The hypothesis is that the 24-hr Internet abstinence helps to ensure a more realistic self-evaluation on Internet overuse as it offers the participants an opportunity to contrast lives and feelings with and without the Internet.

Our results showed that the majority of participants (93%) reported different IAT scores before and after the 24-hr Internet abstinence. The abstinence had varying influences on participants' scores, resulting in changes in both directions and a wide range of absolute differences from zero to 20. Although there was no significant difference in average scores before and after the abstinence, the distribution of the pre-weekend IAT scores was more dispersed and skewed towards the higher end, suggesting that the 24-hr abstinence has a stabilizing effect on high IAT scores. This is consistent with other findings that the pre-weekend IAT score was positively correlated with the number of responses with negative changes, and that people scoring in the highest partition of pre-weekend IAT dropped the most points on average in the post-weekend IAT. Meanwhile there were indications that those

who scored relatively low (< mean) underestimated their severity level before the abstinence, but the adjustment they made in the post-weekend IAT was of smaller magnitude compared to those who overestimated.

Although it is beyond the scope of this paper to verify any explanations for the decrease of the highest IAT scores after the Internet abstinence, it is worth noting that those with higher pre-weekend IAT scores spent more time online per day and used the Internet for more types of activities on a daily basis. In other words, larger portions of their waking hours and daily activities were accompanied and assisted by the Internet, which possibly lead to a false feeling of Internet dependency. The 24-hr Internet abstinence might have helped them to realize situations when access to the Internet was merely optional, reflected as the decreased scores in the post-weekend IAT. Yet this change in self-evaluation would be less likely for those spending minimum hours on a limited number of online activities. Furthermore, less time spent online also implies a higher likelihood of experiencing prolonged offline life regularly, making those scoring lower in the pre-weekend IAT more resilient to the abstinence.

The questions in the IAT also showed varying degrees of sensitivity to the 24-hr Internet abstinence. Responses to the questions in the "excessive use" and "craving and anticipation" categories were more likely to be influenced by the abstinence than those in the "defensive reaction" and "reality substitution" categories.

As the Internet becomes increasingly pervasive and mobile, many people especially college students are constantly connected. Withdrawal-like symptoms experienced during the 24-hr abstinence availed as a direct source of corrected responses to questions in the "craving and anticipation" category. Meanwhile, self-perception on time management issues in the "excessive use" category often requires a contrast of lives with and without the Internet. For example, without the contrast, a realistic response to the question "how often do you neglect household chores to spend more time online" would be less likely for someone who is too lazy to vacuum under any circumstances or for someone who is always too busy online to notice any dust in the house. As a result, the participants either overestimated or underestimated the functional impairment caused by Internet overuse in the pre-weekend IAT and amended their assessment after the 24-hr Internet abstinence. Yet for the "defensive reaction" and "reality substitution" categories, recent experience of being disconnected has less influence on their responses. For example, the question "how often do you form new relationships with fellow online users" inquires a description of one's Internet behavior, which is less dependent on recent experience of disconnected life.

There are two potential limitations of our study. First, because the participants were from a college population, generalizing the findings to other populations may be unwarranted. Given that college students are one of the most studied populations on Internet overuse, findings of our study are highly relevant to the existing literature. Second, because of a lack of control group who would have completed two IAT surveys without the separation by a 24-hr Internet abstinence, there is a possibility that the changes in IAT scores were a result of the repeated survey method rather than the addition of abstinence. Considering the strong correlation between the two sets of IAT scores - a typical indicator for high test-retest reliability, it is unlikely the repeated survey method would compromise our findings greatly.

The present study offers two important implications for future research. First, future studies should consider administration of the IAT survey after an extended period of Internet abstinence because it helps the participants to make more realistic and rational evaluations of the severity of Internet overuse. Studies targeting potential risk populations and populations with constant access to the Internet may benefit the most from the "abstinence-before-survey" method as it helps to avoid fallacious inflations of high IAT scores. Second, designers of future measures for Internet overuse should care about the varying degrees of sensitivity of the questions to Internet abstinence. Although a measure containing only resilient questions eliminates the need for abstinence, it may also fail to encompass specific aspects of Internet overuse such as time management issues and withdrawal-like symptoms.

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References

1. Cecere G, Le Guel F, Soulié N (2015) Perceived Internet privacy concerns on social networks in Europe. Technological Forecasting and Social Change 96: 277–287.
2. Tokunaga RS (2010) Following you home from school: A critical review and synthesis of research on cyberbullying victimization. Computers in Human Behavior, 26: 277–287.
3. Young KS (1998) Internet Addiction: The Emergence of a New Clinical Disorder. Cyber Psychology & Behavior 1: 237–244.
4. Shapira NA, Lessig MC, Goldsmith TD, Szabo ST, Lazoritz M, et al. (2003) Problematic internet use: proposed classification and diagnostic criteria. Depression and Anxiety 17: 207-216.
5. Anthony K (2013) iDisorder: understanding our obsession with technology and overcoming its hold on us. British Journal of Guidance & Counselling 41: 609-611.
6. Pies R (2009) Should DSM-V Designate "Internet Addiction" a Mental Disorder? Psychiatry (Edgmont) 6: 31-37.
7. Byun S, Ruffini C, Mills JE, Douglas AC, Niang M, et al. (2009) Internet addiction: metasynthesis of 1996-2006 quantitative research. Cyber Psychology & Behavior 12: 203-207.
8. Jelenchick LA, Becker T, Moreno MA (2012) Assessing the psychometric properties of the Internet Addiction Test (IAT) in US college students. Psychiatry Research 196: 296-301.
9. Lee K, Lee HK, Gyeong H, Yu B, Song YM, et al. (2013) Reliability and Validity of the Korean Version of the Internet Addiction Test among College Students. Journal of Korean Medical Science 28: 763.
10. Fernández-Villa T, Molina AJ, García-Martín M, Llorca J, Delgado-Rodríguez M, et al. (2015) Validation and psychometric

analysis of the Internet Addiction Test in Spanish among college students. BMC Public Health 15: 953.

11. Widyanto L, McMurran M (2004) The psychometric properties of the internet addiction test. Cyber Psychology & Behavior 7: 443-450.
12. Young KS (1998) Caught in the Net: How to Recognize the Signs of Internet Addiction--and a Winning Strategy for Recovery (1st edn.) New York: John Wiley & Sons.
13. Lam LT, Peng Z, Mai J, Jing J (2009) Factors associated with Internet addiction among adolescents. Cyber Psychology & Behavior 12: 551-555.
14. Christakis DA, Moreno MM, Jelenchick L, Myaing MT, Zhou C (2011) Problematic Internet Usage in US College Students: A Pilot Study. BMC Medicine 9: 77.