

Internet addiction in relation to cognitive style in university students

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The primary aim of this study was to observe the influence of cognitive style on the extent to which individuals get addicted to the internet. It also aimed to investigate the effect of cognitive style on the choice of discipline post school. For the said purpose, 115 university students (Mean age = 23.26 years) belonging to science, commerce and humanities disciplines were contacted. Cognitive styles and internet addiction were measured by the Rational-Experiential Inventory (Pacini & Epstein, 1999) and the Internet Addiction Test (Young, 1996) respectively. Correlational analyses yielded a positive but non-significant correlation between experientiality and internet addiction and a significant negative correlation between rationality and internet addiction. Subsequent one way analysis of variance suggested significant differences between internet addiction in science and humanities students. However, non-significant differences were found between the cognitive styles of science, commerce and humanities students. The present findings provide evidence for the efficacy of cognitive behavior therapy as the preferred line of treatment for internet addiction. Moreover, they illustrate the possible link between cognitive styles and academic choices which may be validated in subsequent studies.

Keywords: rationality, experientiality, internet addiction

Rapid growth and expansion of the internet has purveyed better opportunities for communication, information and social networking. Some people use it to seek information, to aid research, and for interpersonal communication; while some others use it to indulge in excessive gaming, gambling, pornography, and chatting for long hours. Of late, there have been rising concerns all over the world for what Goldberg (1996) has called internet addiction. It may be defined as an inability to control Internet use. Although disproportionate internet use is not officially recognized as a disorder by the psychiatric community, an overwhelming majority of people show what appear to be signs of addiction to the virtual world. Internet addiction has been found to lead to serious impairment in psychological and social functioning (Young, 1996) as well as cause increased feelings of loneliness over time (Yao & Zhong, 2014).

Addictive use of the Internet is a new phenomenon which many mental health professionals are unaware of and therefore unprepared to treat. Internet addiction is usually characterized by psychomotor agitation, anxiety, craving (Ferraro, Caci, & D'Amico, 2007), preoccupation, loss of control, withdrawal, impairment of function, reduced decision-making ability (Ko, Yen, & Chen, 2005) depression, hostility, substance experience (Ko, Yen, & Chen, 2006), and constant online surfing despite negative effects on social and psychological welfare (Shaw & Black, 2008; Tao et al., 2010).

The existing literature shows clear connections between internet addiction and impulsivity and aggressive behavior (Lee, Choi, Shin, Lee, Jung, & Kwon, 2012), disordered eating and body image avoidance (Rodgers, Melioli, Laconi, Bui, & Chabrol, 2013), depression, anxiety, stress, and loneliness (Akin & Iskender, 2011). However, an insignificant amount of research so far has attempted to relate internet addiction with cognitive style.

Cognitive style refers to characteristic ways in which individuals conceptually organize the environment (Goldstein & Blackman

,1978). In other words, cognitive style is an information transformation process whereby objective stimuli are interpreted into meaningful schema (as cited in Lucas-Stannard, 2003, p.3). A large number of researchers have proposed that there are two fundamentally different ways of processing information. These two modes of thinking are variously referred to as heuristic versus analytic (Tversky & Kahneman, 1983), implicit versus explicit (Reber, 1993), non-verbal versus verbal (Paivio, 1986), and many more besides. Epstein and his colleagues (1996) have tried to integrate these various approaches into a single theory, the cognitive-experiential self theory. Cognitive-experiential self-theory (CEST) is a broadly integrative theory of personality that is compatible with a variety of other theories, including psychodynamic theories, learning theories, phenomenological self-theories, and modern cognitive scientific views on information processing. According to this theory, people use two parallel but interacting cognitive systems, a preconscious experiential system and a conscious rational system.

Epstein, Pacini, Denes-Raj, and Heier (1996) describe the two independent systems in the following way:

The rational system operates primarily at the conscious level and is intentional, analytical, primarily verbal and relatively affect free. The experiential system is assumed to be automatic, preconscious, holistic, associationistic, primarily non-verbal and intimately associated with affect (P. 391)

In any specific situation, behavior is determined jointly by the two systems. The extent to which one dominates depends upon the precise situation involved, prior experience, and the extent of emotional involvement.

Most importantly from the present perspective, there are assumed to be individual differences in the extent to which people rely on each system, with some people being more inclined to the rational approaches, others to experiential. This is essentially the reason it is claimed that these are different cognitive styles.

The experiential system adapts by learning from experience rather than by logical inference. It operates in a manner that is preconscious, automatic, rapid, effortless, holistic, concrete, and associative and minimally demanding of cognitive resources.

In contrast to the experiential system, the rational system is an inferential system that operates according to a person's understanding of the rules of reasoning and of evidence, which are mainly culturally transmitted. It operates in a manner that is conscious, analytical, effortful, relatively slow, affect free and highly demanding of cognitive resources.

Cognitive style has been studied in association with excessive internet use in a relatively small number of researches. One of these studies directly tested the effect of personality and cognitive style on three measures of internet use. However, the results did not support the use of cognitive style as an antecedent variable (McElroy, Hendrickson, Townsend, & DeMarie, 2007). The present study attempted to see how cognitive style relates to internet addiction in students from three disciplines, namely, Science, Commerce and Humanities.

The present study

Who doesn't like to spend long hours socializing, commenting, liking, posting pictures on social networking sites, searching for random data on various search engines, or simply surfing the net. However, excessive and indiscriminate internet use, or internet addiction, that causes impairment and distress in our lives is surely a matter of concern. But what factors determine who gets addicted to the virtual world? Is it will-power and self-control? Or is it to do with the way we process information relating to the virtual world; or the way we process information in general? In other words, is it our style of thinking that determines or influences the extent to which we get addicted to the internet? No existing literature talks about this issue. There may be numerous factors underlying internet addiction. In this study, we considered one of them, cognitive style, defined as the characteristic ways in which individuals process information and extract meaning out of it. This study assumes a possible role of cognition in determining the extent of addiction. Another question this study addresses relates to the style of thinking individuals have and the academic choices they make after finishing school. Theoretically speaking, it makes sense to expect rational individuals to be leaning toward the sciences and intuitive individuals to be more willing to choose humanities.

Until now, there have not been many studies that have spoken about the impact of cognitive style on internet addiction and choice of discipline. The present study aimed at building on existing literature about the same. It was performed to determine the degree to which individuals with rational or experiential thinking style demonstrated addiction to the internet and to examine the relationship between cognitive style and choice of discipline.

Based on a thorough review of the literature, the following objectives and hypotheses were formulated.

Objectives of the study

- To assess internet addiction in Humanities, Commerce and Science students.
- To assess the cognitive styles of Humanities, Commerce and Science students.
- To investigate the relationship between cognitive style and internet addiction among Science, Commerce & Humanities students.

Method

Participants

Participants, selected through convenience sampling, consisted of

115 students (78 females; 37 males) from various colleges in the National Capital Region (NCR), India. Participation was not restricted based on gender and ethnicity. Participation was restricted based on age as participants were between 20 and 25 years of age (Mean age= 23.26 years; SD= 2.26), the sample consisted of more female than male participants (Female=67.8%; Male= 32.2%).

Instruments

Cognitive Style: The present study utilized the REI to assess self-reported rational and experiential processing preferences and abilities. This measure consists of four subscales, which are named, Rational Ability, Rational Engagement, Experiential Ability, and Experiential Engagement. Rational Ability refers to confidence in one's ability to think logically and analytically (e.g., "I am much better at figuring things out logically than most people"). Rational Engagement refers to reliance on and enjoyment of thinking in an analytical, logical manner (e.g., "I enjoy thinking in abstract terms"). Experiential Ability refers to confidence in one's intuitive impressions and feelings (e.g., "I trust my initial feelings about people"). Experiential Engagement refers to reliance on and enjoyment of feelings and intuitions in making decisions (e.g., "I tend to use my heart as a guide for my actions") (Pacini & Epstein, 1999). The REI rational subscale and the REI experiential subscale each consist of twenty items: 10 assessing preferences for utilizing each modality (Rational Engagement and Experiential Engagement) and 10 assessing ability to process in each modality (Rational Ability and Experiential Ability), which are rated on a five-point scale ranging from completely false to completely true (Pacini & Epstein, 1999 p. 976). High scores indicate a greater preference for and/or ability to utilize that modality of thinking. The REI boasts of good psychometric properties, the reliabilities being .90 and .87 for rationality and experientiality subscales respectively. It also displays good construct, convergent and discriminant validity.

Internet Addiction: The present study utilized the Internet Addiction Test (IAT; Young, 1998) for measuring the degree of internet addiction. It is a 20-item, 5-point likert scale ranging from rarely to always, that measures the severity of self reported compulsive use of the internet. It has been shown to have good face validity.

Procedure

115 young adults were recruited from various institutes and universities in the National Capital Region (Gautam Buddha University, Army Institute of Management and Technology, Amity University, Delhi University, Delhi College of Engineering, Ambedkar University, and Shiv Nadar University), using convenience sampling procedure. Both males and females (both graduates and post graduates) were included in the sample. They were briefed about the research agenda and asked to fill out the consent form and duly sign it, post which their email ids were collected.

They were then sent online versions of measures of cognitive style (Rational-Experiential Inventory) and internet addiction (Internet Addiction Test) via email. They were assured that the information obtained from them will be kept confidential and will be used only for the purpose of research. They were also told that if they were interested in knowing their own results or the findings of the research as a whole, they were most welcome to contact the researchers through email/ phone.

Results

The sample consisted of 115 individuals presented in Table 1. The variation observed in the sample in terms of Age was 20-25 years, Gender- 37 (32.2%) male and 78 (67.8%) female and Discipline- 46 (40%) science, 19 (16.5%) commerce and 50 (43.5%) humanities students

Table 1: Demographic Characteristics of the Sample

Variable	n	Percentage
Age (20-25 years)	115	
Gender		
Male	37	32.2%
Female	78	67.8%
Discipline		
Science	46	40.0%
Commerce	19	16.5%
Humanities	50	43.5%

Table 2: Means, Standard Deviations, and F value of Science, Commerce and Humanities students on Cognitive Style and Internet Addiction

Measures	Science	Commerce	Humanities	F
	Mean SD	Mean SD	Mean SD	
Rationality	76.97a	74.42a	73.52a	1.10
Cognitive style	10.02	9.01	10.29	
Experientiality	61.86a	68.21 a	65.12a	1.91
Cognitive style	12.30	11.27	11.14	
Internet	38.15a	32.15ab	29.64b	3.05*
Addiction	17.7	18.85	16.49	

* $p \leq 0.05$ (Common superscript represent there is no differences between them)

As is evident in Table 2, the F value = 3.049 ($p = 0.05$, 2,112) has come out to be significant. This implies that, for the present sample, there exists a statistically significant difference between Science, Commerce and Humanities students as far as Internet Addiction is concerned. Post hoc analysis revealed that the level of internet addiction in Science and Humanities students differs significantly ($p = .043$) while it doesn't differ between humanities and commerce and science and commerce students.

One way analysis of variance, both rationality by discipline and experientiality by discipline yielded insignificant results as is evident in Table 2, i.e. the three groups did not differ significantly on cognitive style.

Table 3: Correlations between Rationality, Experientiality and Internet Addiction

Variable	Rationality le Cognitive style	Experientiality Cognitive style	Internet Addiction
Rationality	---	-.079	-.235*
Experientiality		---	.110
Internet Addiction			---

* $p < .05$

In Table 3, it is clearly evident that rationality correlated negatively with internet addiction ($r = -0.235$; $p < 0.05$). This correlation was also found to be significant. On the other hand, experientiality correlated

positively with internet addiction, however, the relationship was not found to be significant ($r = 0.110$; $p > 0.05$).

Discussion

Studies involving internet addiction and cognitive style so far have conceptualized cognitive styles in a way different from the present study. For example, in a study by Senormanci (2014), cognitive styles were conceptualized as dysfunctional attitudes and Dysfunctional Attitudes Scale Form A was used to measure the same in university students. In another study on cognitive styles and internet addiction, cognitive styles were represented by constructs such as field Dependence - Independence and field Constructed - Flexible Control (Alzoubi, 2008). Thus, cognitive styles studied with internet addiction have never been conceptualized as rational-analytical and intuitive-experiential, as is emphasized in the present study. Moreover, cognitive styles and internet addiction have never been studied with reference to Science, Commerce and Humanities students.

The present research attempted to study the link between experientiality- rationality and internet addiction among young adults belonging to science, commerce and humanities disciplines. The very first objective was to see whether students from the three disciplines namely, science, commerce and humanities, differed in the degree to which they get addicted to the internet. One way analysis of variance revealed significant differences between students from the three disciplines. The results of post hoc analysis confirmed that the means of internet addiction for Humanities students significantly differed from the means for Science students. In simple words, this means that Humanities and Science students don't get equally addicted to the internet. This could be attributed to the essential distinction between the two disciplines. Science requires logical and analytical thinking while humanities call for greater awareness of the social and psychological phenomena. Another reason could be the disparity between the time individuals are able to devote to online surfing and social networking as a result of the work load they have due to their respective academic disciplines. However, these are only speculations as the sample under consideration was small and require further support. Longitudinal studies are required to validate these likelihoods.

The second objective of the current study was to see if any significant differences existed among the three groups with respect to cognitive styles. One way analysis of variance revealed no significant difference between them with respect to both rationality and experientiality. However, it remains fairly apparent that these findings need further statistical analyses in order to be creditable.

This study also examined the relation of rationality and experientiality, separately with internet addiction. Correlational analyses revealed a significant and strong negative correlation between rationality and internet addiction. In other words, individuals high on rationality were less likely to be addicted to the internet. This could be attributed to the fact that rational individuals are more likely to exert greater control over their impulses and keep themselves from getting lured into the vicious web of the virtual world. LaRose and Eastin (2002) found associations between excessive online buying, a form of internet addiction, and deficient self-regulation. They conceptualized unregulated buying behaviors as the result of deficient self-regulation using mechanisms proposed in social cognitive theory. They found that deficient self-regulation of online buying was positively related to online shopping activity.

On the other hand, the correlation between experientiality and internet addiction, though positive, was not statistically significant. It is possible that variables other than experientiality play a role in determining who gets addicted to the internet; and that experientiality is one of the many determinants of internet addiction. However, this speculation needs further investigation since current literature doesn't provide evidence for its credibility.

Conclusion

This study attempted to observe the association between rational-experiential cognitive styles and internet addiction among students from Science, Commerce and Humanities disciplines. In addition, it also investigated the possible differences in the degree of internet addiction in students from the three disciplines.

To achieve the said objectives, data was collected via self-report measures of each of the two variables and subjected to relevant statistical tests. The analyses revealed significant negative correlation between rationality and internet addiction and non-significant positive correlation between experientiality and internet addiction. Additionally, internet addiction was found to differ significantly between science and humanities students.

In sum, the current research set out to find associations among certain cognitive human aspects and one form of a behavioral addiction and ended up with a modest amount of noteworthy results, from which meaningful conclusions were drawn, thereby adding a fairly decent bit to the existing literature.

Strengths and limitations of the study

This study has its strengths as well as its limitations. The fact that this research attempted to study the association between two variables (cognitive style and internet addiction) with respect to various disciplines (science, commerce, humanities), something that has never been studied before, is clearly its strength. However, every study has limitations and so, this one does too. There are several factors that may have served as limitations for this study. To start with, the use of a convenience sample may have influenced study results. The inclusion and exclusion criteria employed for the selection of the sample may have resulted in a part of the study population being left out thus resulting in misrepresentation of the population under study in the sample. Another limitation to this study is that a cross-sectional design was employed. The results provide a picture of how variables relate but do not inform how the relationship between cognitive style and internet addiction changes overtime. A small sample size may be another limitation of this study. In addition to that, generalizability of the results to the general population may be restricted because of the demographic characteristics of the sample. All participants in this study were recruited from various colleges of the National Capital Region. Additionally, this study was limited by the exclusive use of self-report questionnaires for data collection. Although self report data have been frequently used when studying cognitive styles and internet addiction, it must be emphasized that cognitive style is a purely subjective human quality, and hence, should be studied from a more qualitative perspective than a quantitative one, employing methods such as personal interviews, focus group discussions, case studies etc.

Implications and future directions

With regard to the present study, there are a variety of applications that may be extended to counseling, psychotherapeutic and the

educational settings. The fact that individuals who scored high on rationality scored low on internet addiction lends itself to some direct implications for psychotherapy and counseling. Since rationality is negatively associated with internet addiction, mental health professionals may employ cognitive behavioral therapy as the treatment of choice for individuals with internet addiction disorder (Young, 2007). Once they come to confront and subsequently understand the perils of dysfunctional or pathological internet use, they are likely to be intrinsically motivated to get themselves de-addicted from the internet.

Another important implication of the present study's findings could be in the arena of vocational guidance. As the present study suggested that rational individuals are likely to be more inclined towards the sciences while experiential individuals are more interested in humanities, vocational guidance counselors may exploit this link in the course of their assessment of the counsellee's interest, aptitude, personality type and other characteristics. In addition to assessing these parameters, counselors may assess their cognitive styles as well. They may then corroborate data from several assessments and finally list the most suitable vocations for the counsellee.

Future studies can improve upon the present study's limitations and find more valid relationships between the study variables. An intriguing possibility is that a student's choice of discipline might be influenced by whether s/he has a predominantly rational or intuitive cognitive style. The present study provides evidence for the suggestion that science and engineering should be more attractive to someone with a rational thinking style while humanities would be more suited to an experiential thinking style. Clearly, these findings seem to be worthy of further investigation. Longitudinal studies that examine changes in relationships among variables over time would help to gain a better understanding of the way these relationships hold in real life. Finally, future studies involving a bigger and representative sample belonging to a diverse demographic background would yield more authentic results.

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