



Recognizing internet addiction: Prevalence and relationship to academic achievement in adolescents enrolled in urban and rural Greek high schools

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ABSTRACT

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This study aims: a) to estimate the prevalence of internet addiction among adolescents of urban and rural areas in Greece, b) to examine whether the Internet Addiction Test cut-off point is applicable to them and c) to investigate the phenomenon's association with academic achievement. Participants were 2090 adolescents (mean age 16, 1036 males, 1050 females). Young's (1998) Internet Addiction Test and her Diagnostic Questionnaire were applied. School records' grades were retrieved. A 3.1% prevalence revealed, while boys $F(1, 1642) = 6.207, p < .05$, urban residents $F(1, 1642) = 5.53, p > .05$ and academic track high school students $F(1, 1642) = 5.30, p < .05$ were at higher risk. An Internet Addiction Test score of 51 points (sample's mean = 27.69, SD = 17.38) was proposed as the optimal cut-off point combining high sensitivity (98%) and specificity (91%). Finally, findings illustrated the syndrome's relation to worse academic achievement $F(1, 1725) = 0.93, p > .05$.

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The present research aims to describe the prevalence of internet addiction in rural and urban Greek high schools, in order to address widely disparate prevalence rates documented in previous Greek studies. Moreover, we tried to determine whether the diagnostic cut-off point of the Internet Addiction Test (IAT) applies to a Greek sample and to identify relations with gender, urban/rural status and academic achievement.

Given the importance of the internet in contemporary life, those who are unfamiliar are often considered as digitally illiterate (Huerta & Sandoval-Almazán, 2007). However, significant numbers of individuals tend to overuse the medium (Block, 2008). This phenomenon has caused controversies, which refer to the name and the diagnostic category that should describe it. Various terms have been proposed, such as "Problematic Internet Use" (Davis, Flett, & Besser, 2002), "Cyberspace Addiction" (Hur, 2006) and "Internet Addiction" (Young, 1998), while three diagnostic categories, Addictions (Young, 1998), Impulse Control Disorders (Shapira et al., 2003) and Impulsive–Compulsive Disorders (Block, 2008) are claimed to overlap with it.

In this study, we adopt the definition of Internet Addiction Disorder (IAD) and instruments proposed by Young (1998). Moreover, we use the Young Diagnostic Questionnaire (YDQ) to examine the cut-off point of IAT. Our impetus was the lack of consensus regarding IAD prevalence among Greek adolescents. A research of 315 Athens' high school students (mean age 15) using the IAT resulted to a zero % prevalence (Tripodaki et al., 2008). In contrast, a study of 2200 adolescents from Thessaly (age 13–18), using the YDQ found an 8.2% rate (Siomos, Dafouli, Braimiotis, Mouzas, & Angelopoulos, 2008). Another study of 1221 adolescents (age 14–19) from Kos, using the YDQ gave an 11% rate (Floros, Fisoun, & Siomos, 2010).

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The above researches used either the YDQ or the IAT, while the study conducted with the latter, interpreted the results with US cut-offs (Tripodaki et al., 2008). None of these studies focused on adolescents from the extended Athens area, where close to half of Greece's population along with the majority of internet users resides (National Statistic Authority, 2011; Society of Information Observatory, 2011). Specifically, internet use reports suggest that 46% (41% broadband) of Greek households have an internet connection (European Union mean 70%), while males of urban areas, age 16–24, are the most frequent users (Society of Information Observatory, 2011).

To address these issues we study adolescents from the Athens metro area as well as a smaller sample from a rural area, assessing IAD both with the IAT and the YDQ. Additionally, we examine whether the 79 IAT cut-off point used internationally (Center for Internet Addiction, 2012) is applicable for this sample. Neither theories-instruments are universal nor psychopathology is experienced in the same way (Church & Lonner, 1998). An "emic-etic" approach integration would suggest that the construct of IAD and its questionnaire IAT should be adjusted within the cultural context that are implemented (Church & Lonner, 1998). As score variance could reflect differences in arousal or restraint rather than true symptoms (Triandis, 1996), "scalar equivalence" is needed (Church & Lonner, 1998). This would depict the extent to which IAT scores express the same IAD intensity and magnitude across cultures.

Among others, cultural differences captured by "Individualism–Collectivism" involve in which behaviors are considered socially functional (Triandis, 1996). The interpersonal restraint associated with IAD (Yang & Tung, 2007) is perceived differently according to levels of individualism–collectivism. Collectivists emphasize relational impairment whereas individualists the individual's wellbeing. In contrast IAT enquires more about the latter, example item is as follows "How often do you find yourself anticipating when you will go online again?". Moreover, as collectivists are less tolerant to inequality (Triandis, 1996, p. 409), they may respond choosing scores closer to the mean.

Furthermore, individualistic countries show a higher rate of internet adoption (Erumban & De Jong, 2006). As anything innovative may be threatening to the norm, collectivistic countries often have a lower level of internet use (Erumban & De Jong, 2006). Finally, individualism may be related with addictions (Triandis et al., 1986), because of a greater tendency to hedonism (Triandis, 1996), that often triggers them (Stephenson, Maggi, Lefever, & Morojele, 1995). Alexander (2000) proposes that dislocation and alienation from the self and others, interwoven both with addictions and individualism, may explain this association. As Greece is ranked almost in the middle of the collectivism–individualism continuum (Hofstede, 2001; Triandis et al., 1986), both the definition of IAD and its questionnaires should be carefully applied, especially in critical developmental periods as adolescence.

High levels of internet use (Society of Information Observatory, 2011) and impairments of internet abuse make adolescence a fertile period to study IAD. Worse adaptation with respect to developmental tasks, such as academic achievement (Frangos, Frangos, & Kiohos, 2010) and peer relations (Yang & Tung, 2007), as well as more psychological symptoms (Casale & Fioravanti, 2011) have been linked with IAD. Such problems often indicate poor adaptation in adult life (Masten, Burt, & Coatsworth, 2006). Therefore, studying IAD group differences in adolescence may have significant implications both for the individual and for society.

Our guiding framework to study such differences was Douglas' conceptual model regarding internet abuse (Douglas et al., 2008). She suggests that push factors, either contextual or individual-level, contribute together with pull factors, concerning the electronic environment, to the presence of IAD, which in turn affects negatively adaptation. Specifically, we aim to study group differences considering gender, place of residence (urban vs rural) and type of school (academic vs vocational) as push factors differentiating the IAD risk. Moreover, we study the association of IAD with lower academic achievement.

The significance of the present study lies in that it addresses questions, that to the best of our knowledge have not been examined in normative samples before, combining: a) the use of both the YDQ and the IAT, b) focusing in a culture that is in the middle of the "individualistic–collectivistic" continuum c) comparing adolescents from urban and rural areas enrolled in two types of schools. Nevertheless, such comparisons have been conducted regarding other addiction forms (Berten, Cardoen, Brondeel, & Vettenburg, 2012; Van Houtte, 2006; Van Houtte & Stevens, 2008). Our focus on differences in IAD risk allows the identification of both prevention and intervention priorities in health policy.

Group differences in internet use and abuse

Men have been shown to be more experienced and receiving more encouragement from their social context to use computers and the web (Busch, 1995; Weiser, 2000). These findings have also been confirmed in Greek studies (Aslanidou & Menexes, 2008; Papastergiou & Solomonidou, 2005).

Moreover, male users seem more likely to present IAD (Chou, Condron, & Belland, 2005; Morahan-Martin & Schumacher, 2000; Siomos et al., 2008; Widjyanto & Griffiths, 2006; Yang & Tung, 2007). The higher web familiarity of males and their preference for online games and pornographic sites may place them at higher risk (Tsai et al., 2009).

The findings are contradictory regarding the relationship between place of residence and addictions in general. Some studies support that youth living in urban areas are at higher risk than those living in rural areas (Peen et al., 2007). In contrast, other studies show the opposite (Aronson, Feinberg, & Kozlowski, 2009; Hanson et al., 2009). In Greece, there is evidence supporting that Athens area experiences greater internet use expansion (Society of Information Observatory, 2011). Additionally, more individuals from urban than rural areas are referred to clinical centers treating IAD (Chroni, Tsoukala, & Stavropoulos, 2011). Socio-educational and socio-economic deprivation may possibly explain these kinds of findings (De Voe, Krois, & Stenger, 2009; Eberhardt et al., 2001). Analytically, limited access to recreational opportunities and other

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