

Internet Users' Prior Psychological and Social Difficulties

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ABSTRACT

This study addressed the hypothesis that frequent Internet use produces social and psychological difficulties. An Internet-administered survey was given to a sample of Internet users. Comparisons were made between this sample and general population norms on a selection of social and psychological variables. Internet users showed a more detrimental mean rating on 11 of 13 of the variables (two measures of social contact were more positive among the user sample). However, for those variables for which time of onset was available ($n = 7$), the disorder had begun 5–22 years before Internet use. These findings are not in accord with the theory that Internet use causes disorder or social difficulty, and suggest the possibility that the Internet may provide a particular benefit for certain individuals who have already displayed these personal and social difficulties.

INTRODUCTION

THE SOARING POPULARITY of home computing and use of the Internet has resulted in some trepidation concerning the impact of the resulting change in life-style on people's well-being. Media reports often posit the potential for negative effects of extended Internet use. Headlines, such as "Technology comes with a price: stress and depression,"¹ "Is the Net good for us?,"² and "More Net use is more depressing"³ are typical. This view has been supported by two scientific studies. First, Kraut and his colleagues found higher levels of depression and loneliness among people who had used the Internet for at least two years.⁴ Interestingly, this held true even for relatively light users. Second, Nie and Erbring, in a study of over 4,000 individuals, found that regular users tended to lose contact with their social environment.⁵ That is, these Internet users appeared to have traded time with family and friends for increased time on line. The results of both of these studies received extensive media coverage. In

line with their findings, commentators have argued that without intimate social relationships, it should not be surprising that problems of distrust, loneliness, and depression will result. Stoll has sardonically wondered about the sensibility of trying to revitalize community by sitting alone, typing at networked computers, and making virtual friends,⁶ and Locke has suggested that electronic communication strips away personal attributes and "entrenches users in their individual fortresses."⁷

The above said, several studies in the literature suggest the potential for increased social contact from Internet use. Many people report that the Internet allowed them to be connected with people like themselves,⁸ and that socio-personal benefits are often the key impetus for the formation of on-line networks.⁹ Support groups may have also found a new home on the Internet due to its ability to provide anonymity and because it allows highly specialized topics to be widely discussed.¹⁰ Such "connections" may be especially important for stigmatized persons who feel misunderstood within

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their own traditional social networks, thereby creating a need for such individuals to access electronic social support, albeit without face-to-face contact.¹¹ Individuals often report that the Internet helped them to ease personal life-concerns.^{12,13} In Canada, the Information Highway Advisory Council speculated on this possibility and in 1997 advised that we need to go a step further and attempt to understand the implications of the transformations in the way in which we will relate to each other in the future.¹⁴

The sum of this, then, does not point to a conclusion that Internet use necessarily leads to social and psychological difficulties. As a consequence, this study was designed to assess the prevalence of a number of significant psychological and social difficulties in a sample of Internet users and to determine the chronology of the onset of disorder in relation to the time of serious engagement with the Internet.

MATERIALS AND METHODS

Instrument construction

The literature is not clear on the meaning of social and psychological difficulty. Thus, we assembled

an Internet-administered questionnaire that tapped an array of factors that were thought to adequately cover this general concept. The item sources were the Diagnostic Interview Schedule (DIS), the Canadian National Population Health Survey (NPHS), and the social isolation sub-scale of the Dean Alienation Scale. A list of the variables selected for use is contained in Table 1.

The DIS is a survey instrument that garners information which is used to identify psychiatric disorders according to the 3rd edition of the *Diagnostic and Statistical Manual*.¹⁵ It can be administered by trained lay interviewers and has a companion computer program that is used to calculate diagnoses from the symptoms reported by the respondent. Reliability and validity have been reported to be satisfactory, with high kappa values for inter-rater agreement.^{16,17} The data set used to represent a control group (psychiatric/psychological variables) in the present study was drawn from the responses to the 3,956 DIS-based interviews that comprised the second wave of the Edmonton Area study.¹⁸ Respondents were household residents in Edmonton, Canada, aged 18 years and over. Households were systematically selected from an electronic list of addresses and a response grid was used to select

TABLE 1. DESCRIPTION OF STUDY VARIABLES

	<i>Source</i>	<i>Description</i>
Psychological/psychiatric		
Depression	DIS	DSM-III diagnosis. Two weeks of sadness plus 4 other symptoms.
Anxiety	DIS	DSM-III diagnosis. "Ever experienced serious anxiety when most would not be afraid (3 spells within 3 weeks)."
Nervousness	DIS	1-Item Yes/No. "Ever considered self to be a nervous person."
Any phobia	DIS	DSM-III diagnosis of either agoraphobia, social phobia, or simple phobia.
Hopelessness	DIS	1-Item Yes/No. "Ever felt that life was hopeless."
Self-esteem	NPHS	6-Item scale pertaining to self-worth.
Unhappiness	NPHS	1-Item, 5-point dimension ranging from "happy & interested in life" to "life is not worthwhile".
Social variables		
Social support	NPHS	4-Item Scale tapping access to support, advice, and caring.
Membership	NPHS	1-Item Yes/No. "Membership in any voluntary organization (e.g. school, church, ethnic assoc.)."
Participation	NPHS	1-Item, 5-point dimension on frequency of participation, ranging from never to weekly.
Helping others	NPHS	1-Item Yes/No. "Helped to care for a relative or friend during previous month."
Childhood trauma	NPHS	7-item scale. Includes parental problems (divorce, substance abuse, unemployment), abuse, intense fear, hospitalization, & being barred from home.
Social isolation	DEAN	9-item, 5-point scale on loneliness and quality of relationships

individual residents to ensure optimal age and sex distributions.¹⁹

The NPHS collects economic, social, demographic, occupational, and environmental information pertaining to the health of Canadians every two years, with slight differences in the questions used. It is a comprehensive survey that targets a sample of households in all provinces and territories, but excludes populations on Indian reserves, Canadian Forces bases, and some remote areas of Ontario and Quebec. An adult member was selected from each household in the sample to become the longitudinal panel respondent. Some items from each of the first two waves (1994 and 1996) were selected for the present study.²⁰ Data collected from residents of the province of Alberta (the locale of the present investigation) were extracted to serve as controls for the present study sample (social variables). This produced comparison samples of 1,164 Albertans from 1994, and 12,751 from the larger 1996 survey.

The social isolation scale was located via an Internet search and was adopted because of its apparent face validity and reported construct validity. It was extracted from the Dean Alienation Scale,²¹ and comprises nine items, each of which are rated on a five-point gradient ranging from "strongly disagree" to "strongly agree" (scoring range = 0 to 4, maximum score = 36). Unfortunately, very few published articles were located that contained data that could serve as norms for this test. Robinson reported the mean from the original sample ($n = 524$) to be 12.7 (males = 11.8, females = 15.1),²² although this was not reported in Dean's paper.²¹ Unfortunately, sample standard deviations were not provided. Howley, Harmon and Leopold reported data from 802 rural senior high-school students from West Virginia in the U.S.A. These students, who might be thought to be isolated, at least in terms of their rural residential status, showed a much higher mean score of 20.3 ($SD = 4.71$).²³ In spite of the difficulties with this scale, it was retained (using the existing normative data) because of the relevance of its content and documented validity (i.e. associations with related concepts).^{21,24} Interpretation of the results that involve it should nonetheless be made with caution.

Respondents were asked to note the age of onset for most of the psychological/psychiatric problems. This was not deemed to be feasible for the self-esteem and unhappiness items, nor for the social factors. Note that the onset for "Anxiety" was taken to be the age when the first spell of anxiety appeared, regardless of whether this met the criterion of three spells within a 3-week period.

Respondent selection

Subscribers of two Alberta, Canada Internet service providers, the Edmonton FreeNet and the Calgary Community Net, were invited to participate in this survey. Edmonton FreeNet included a recruitment message in their June 2000 newsletter and advertised it in their "What's New" section on their web site, which included a link to the survey. Calgary Community Net placed a graphic link on their home page which stated "New Survey, Click Here". Calgary Community-Net Chinese Canadian Special Interest Group also offered to draw attention to the survey via a graphic link to the survey. Both graphic links were placed for a 2-week period during June 2000. The service provider links took potential respondents to an information page that provided an explanation of the survey. Prior to commencing the survey, the respondents who chose to participate were required to confirm that they wished to complete the survey and were aged 18 years or older. Respondents were also given the option of exiting the study at any point via a direct link on every page of the survey. Responses from those who completed the survey (i.e., who clicked the "submit survey" button) were e-mailed to the researcher.

Analysis

To correct for the influence of age and sex differences across samples, the data for the Internet and comparison samples were adjusted to the 1999 population distribution for the City of Edmonton. Thus, adjusted means and prevalences were used rather than the observed values. Analysis involved simple comparisons of means for continuous variables and prevalences for dichotomous variables. Statistical significance was determined using Z-scores in the former case and a Chi-square test in the latter. To correct for the compounding effects of the kind of multiple comparisons used here, alpha levels were calculated according to experimentwise error rates²⁵ in lieu of the individual comparison basis that would be used in most situations.

This study was approved by the Health Research Ethics Board of the University of Alberta.

RESULTS

One hundred and thirty-one individuals completed the Internet survey. Fifteen were Calgary Community Net subscribers and the remainder were members of the Edmonton Free Net. More males (64.2%) than females (35.8%) chose to respond. Age

was well distributed, with 30.6% falling within the age range of 18–34 years, 44.2% in the 35–54-year range, and 25.2% were 55 years or over. The oldest respondent was aged 76 years.

Table 2 shows the values for the Internet sample and the general population (control) estimates for each of the variables under study (adjusted to the local population distribution for age and sex). For dichotomous variables, such as depression, the prevalence for each group is shown, along with the associated Chi-square statistic. Means for the two groups, with the accompanying Z-scores of the difference (equivalent to t-tests at this sample size), are shown for variables with continuous data (such as childhood trauma). Standard errors for the dichotomous variables and standard deviations for the continuous measures are shown in parentheses.

The Internet sample differed significantly from the general population on all but one variable (simple phobias). When considering only the psychological/psychiatric variables, the Internet sample showed higher levels of pathology/disturbance throughout that were often dramatic. This would appear to support the views on the deleterious effects of Internet use that were cited above. How-

ever, Internet users were more likely to have been faced with traumatic experiences during childhood, and were less likely to be in receipt of social support as adults, suggesting that some of the reasons for their difficulties may have arisen outside of the Internet. This notion is supported by the finding that for all variables where time of onset was available, the existence of the condition in question had been established well before the respondents had commenced meaningful Internet use. Furthermore, on some of our measures, Internet users show higher levels of social engagement than those in the comparison samples. They show higher levels of club membership (although participation rate is lower) and a much higher rate of helping others (perhaps via the Net). Nonetheless, we see a greater level of social isolation on the Dean²¹ scale (a caveat here being some concern about the shortage of suitable norms for this latter variable). It is interesting that recently Kraut and his colleagues, in a 3-year follow-up of their original sample (noted above), found that the apparent negative effects of Internet use had dissipated and some social benefits had been exhibited, particularly for those individuals with the greatest social resources.²⁶

TABLE 2. SUMMARY OF AGE- AND SEX-ADJUSTED SCORES AND TIME OF ONSET FOR INTERNET USERS AND CONTROLS

Measure of well-being	Internet users Vs. comparison sample				Onset prior to internet use?	
	Outcome measure	Internet users	Control	Statistic	Yes/no	Mean years
<i>Psychological variables</i>						
1. Depression	Prevalence	23.6%	13.6%	X ² = 10.54*	Yes	5.0
2. Anxiety (3x)	Prevalence	26.4%	3.3%	X ² = 171.93***	Yes	15.8
3. Nervousness	Prevalence	34.8%	20.3%	X ² = 15.98***	Yes	22.0
4. Any phobia	Prevalence	44.3%	27.5%	X ² = 14.16**		
Agoraphobia	Prevalence	24.8%	8.7%	X ² = 37.87***	Yes	10.8
Social phobia	Prevalence	33.2%	5.2%	X ² = 168.1***	Yes	19.8
Simple phobia	Prevalence	15.2%	23.4%	X ² = 4.71	Yes	21.2
5. Hopelessness	Prevalence	50.3%	25.5%	X ² = 39.22***	Yes	12.9
6. Self-esteem (low)	Mean	17.9 (1.19)	19.9 (0.95)	Z = 18.24***	N/A	—
7. Unhappiness	Mean	1.7 (0.28)	1.3 (0.18)	Z = 15.33***	N/A	—
<i>Social variables</i>						
8. Social support	Mean	3.4 (0.29)	3.8 (0.22)	Z = 14.90***	N/A	—
9. Membership	Prevalence	72.3%	33.5%	X ² = 76.54***	N/A	—
10. Participation	Mean	2.3 (0.26)	2.8 (0.14)	Z = 20.95***	N/A	—
11. Helping others	Prevalence	54.1%	29.3%	X ² = 35.83***	N/A	—
12. Childhood trauma	Mean	1.6 (0.46)	1.1 (0.39)	Z = 13.60***	Yes	—
13. Social Isolation	Mean	16.4 (3.31)	13.5(3.33)	Z = 8.96***	N/A	—

Experimentwise error rates: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

DISCUSSION

The notion, then, that Internet use has pervasive harmful psychological and/or interpersonal effects is not supported by the results of our study. First, while our findings confirmed the suggestion of others^{4,5} that Internet users show elevated scores on a number of measures of social and psychological disturbance, the data clearly indicate that such disturbance preceded commencement of serious Internet involvement. Furthermore, Internet users show elevated levels on some forms of positive social interaction (participation, helping others). Thus, Internet use cannot be thought to be a cause of the psychosocial difficulties that were observed.

An interesting parallel to this has been reported in an important study by Depue and Monroe.²⁷ These investigators noted, in response to the rising interest in life events scales in the 1970s,^{28,29} that although it was true that psychiatric symptoms were associated with high life-events scores (suggesting high stress), this was true only for those individuals who had previously shown such symptoms. Thus, the most that could be said was that stressors might awaken already existing tendencies. A similar mechanism may be in operation among Internet users. A hypothesis worth pursuing, then, is that earlier on in life, the particular needs and interests of many individuals had predisposed them to certain aspects of Internet use, and that time on-line proved to be an overall benefit. It is quite conceivable that socially awkward individuals, who nonetheless crave social interaction, would gravitate to a medium that allows for myriad social interactions of varying degrees of intimacy, but with the safety accorded by the controllable anonymity of electronic contact.

A concern with our data is the possibility that those who chose to respond do not represent Internet users in general. A likely influence here is the level of personal difficulty that we have attempted to study here, with those exhibiting personal difficulty being more likely to complete the survey. Thus, the very high levels of disturbance that were found may be an overestimate. An additional limitation of our study is the use of control data obtained from sample populations that were not studied concurrently. However, neither of these limitations takes away from the conclusion that Internet users come to the Internet with pre-existing difficulties. At present, then, there is no evidence that Internet use is a cause of social and psychological ills, and, in fact it may, on balance, be just the opposite—a positive influence for many who would have done less well without it.

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