

Time Well Spent?

The Influence of the Internet on Subjective well-being

This study investigates the relationship between internet usage and subjective well-being, and particularly the role of online friendships in moderating this relationship. Results show time spent online is associated with lower subjective well-being in some cases, whilst the quality and quantity of online friendships appears to have no effect.

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Introduction

Two out of every three American adults use the Internet (Pew Internet & American Life Project, 2005), as do almost as high a proportion of adults in the UK (National Statistics, 2006). Like the telephone the Internet makes it possible for people to communicate no matter how geographically distant they are. However the Internet also provides a shared space in which people may make contact with each other for the first time. This shared space provides new opportunities for relationships, platonic and romantic, to develop (Parks & Floyd 1996).

Whilst the Internet may resemble the telephone in allowing us to communicate with others, it also resembles the television in that it provides an endless amount of information that can be passively consumed. The search engine Google claims to index over 25 billion pages, over 4 billion of these being in English.¹ Whilst the telephone increases social participation (Fischer 1992), time spent watching TV is associated with less social involvement (Brody 1990). Whether the Internet increases or decreases social involvement has important implications for whether or not we should be encouraging its use.

¹ Though Google no longer publicly announce how many pages they index an estimate can be obtained by looking at the number of results for the query “* *”.

Existing research on the effect of internet use on subjective well-being has given mixed results. Kraut et al. (1998) performed a panel design study on a group of families who were given free internet access in exchange for participating. They found that greater Internet usage was associated with a decrease in subjective well-being as measured by depression and loneliness scales. They proposed this was because any relationships established through the internet were relatively weak compared to those maintained in person. Greater internet usage was thus associated with spending more time maintaining weak relationships and less maintaining strong ones. As strong relationships are associated with better social and psychological effects (Krackhardt 1994) this resulted in reduced subjective well-being. This is consistent with the claims of Stoll (1995) that the internet is isolating people from existing social relationships. It is also supported by further work by Cummings, Butler and Kraut (2002) which found online relationships to be less valuable than offline ones

In contrast to these findings a follow up study by Kraut et al. (2002) on the same group of participants two years later found that there was no relationship between change in loneliness and depression relative to the start of the study and level of internet usage. Further correlational research also suggests that the internet does not cause increases in loneliness. Katz et al (2001) found that people who spend more time online typically had a greater level of community involvement, and knew just as much about their neighbours as those who used the internet less. DiMaggio et al. (2001) found that internet users typically had larger social networks than non-users and Gross et al. (2002) found that amongst Californian teenagers even regular

internet users still spent most of their time in traditional social activities.

Whilst these are correlational studies their findings still seem incompatible with a view of the internet as increasing loneliness.

There are a number of possible explanations for these conflicting findings. The simplest of this is to attribute the differences to sampling errors. As each of the studies cited used a different sample group, none of which were representative of internet users as a whole, it is possible that the effects of the internet differed between these groups. However this still leaves open the important question of what was the significant difference between the groups; what are the significant moderating variables in the relationship between internet use and subjective well-being.

This hypothesis is also incompatible with the differing results found by Kraut and colleagues given they found a change of effect in a single sample. The hypothesis proposed by Kraut et al. (2002) is that the nature of the internet has changed – it has become more hospitable since the early research was performed. This seems plausible as most of the research documenting negative internet effects pre-dates that showing positive or null effects.

However it is still a rather unsatisfactory explanation as it does not shed light on what it is about the internet that has changed, and thus what could be done to make the internet even more hospitable.

A third hypothesis, compatible with that of Kraut and colleagues is that the way people use the internet has changed. Kraut et al. (1998) proposed the internet reduced subjective well-being because it substituted weak

relationships for strong ones. A possible explanation for why the internet no longer reduces subjective well-being could thus be that people increasingly do develop strong relationships online.

Whilst it has been argued that internet communities are only an illusion (Stoll 1995) others claim that genuine relationships are possible online (Rheingold 1993). For example Kerr (1982) quotes an internet user who asserts people he knows online “are as much a presence in my life as if they were right in the room”. There is a significant body of research suggesting that the quality and quantity of our social relationships has a profound effect on our subjective well-being (see Baumeister & Leary 1995 for a review). In particular Cohen & Wills (1985) found that more social contact makes people happier. A change in the level of social interaction online between the participants of the different surveys would thus explain the conflicting findings, particularly if we assume that the level of online social interactions by participants in the studies of Kraut and colleagues increased in the second period.

Method

Participants

Participants were visitors to a range of online web forums over a period of 4 days. In total 132 participants completed at least part of the survey.

Participants' ages ranged from 15 to 72 with 50% of the participants aged between 19 and 28 ($M = 26$, $SD = 10.4$). There were participants from 15 different countries, though there were only four countries with more than one participant (Ireland $n=65$, United States $n=37$, Canada $n=5$, New Zealand $n=2$). Surprisingly there was only one participant from the UK.

Measures

The survey questionnaire was primarily composed of a number of existing measures. Subjective well-being was assessed using measures of loneliness and depression. For loneliness the UCLA loneliness 10 item scale was chosen (Russell 1996). This measure asks how often participants has certain feelings relating to depression (e.g. "How often do you feel you lack companionship?", "How often do you feel close to people?"). Participants responded on a four point scale ranging from "Never" to "Always".

For depression the CES-D depression scale 10 item version was used (Radloff 1977; Andersen et al 1994). This asks how often in the previous week participants felt particular positive and negative emotions (e.g. "During the past week I was happy", "During the past week my sleep was restless"). Again responses were made on a four point scale from "Rarely or none of the time" to "All of the time". Rierdan (1999) has commented that the CES-D may not in fact be a measure of depression, but does not dispute that it is appropriate to use it as a measure of subjective well-being so it is still suitable for our purposes.

In addition measures of neuroticism and extroversion were included (Buchanan 2001) as these personality traits have been found to be linked to well-being (Hotard et al 1989). Participants were asked how accurately a number of statements described them (e.g. "I make friends easily", "I feel comfortable with myself"). Participants responded on a five point scale ranging from "Very Inaccurate" to "Very Accurate".

Questions on frequency and duration of internet usage, and how long participants have been regular internet users were adapted from the Pew Internet Tracker (Pew Internet & American Life Project, 2005). Questions on frequency of real life social interaction were selected from the European Social Survey questionnaire (European Social Survey, 2004).

In addition a number of new measures were included, following from unstructured interviews over Internet Relay Chat. These questions asked the participants to select the online communications tools they use from a list and to indicate whether they maintain an online profile about themselves.

Participants were also asked about the closeness of their online friendships (“How close do you feel to your best online friends?”, “How concerned would you be if one of the people you know best through the internet suddenly stopped communicating”).

Participants were asked how many close friends they had, both online and offline. Finally two demographic questions were included, asking the participants' country of origin and year of birth. Where possible the forum through which the participant reached the site was recorded.

Procedure

Responses were collected directly through the internet using a web based questionnaire. This made it feasible to collect responses from participants over a far larger geographical region. However with such a method it is impossible to standardise the environment in which the questionnaire is completed (Nosek, Banaji, & Greenwald 2002). In a particularly acute example of this one participant in the study commented on a forum that he had filled in the questionnaire with a glass of wine in hand.

In spite of this evidence suggests data collected directly online is at least as reliable as data collected in interviews or in a designated location. In particular Chang & Krosnick (2002) report that internet research typically shows lower measurement error, social desirability bias and survey satisfying effects than telephone interviews.

No personal data was collected in conjunction with participants' results. In particular results were not linked to particular internet addresses. This meant it was not possible to check for multiple submissions by a single user by checking for a common IP address as suggested by Birnbaum (2004). However an analysis of web server logs indicate no IP address filled out the survey more than once, so this is not a problem.

Participants were located through a cluster sampling method. Random words were selected from a dictionary and combined with phrases that identify certain popular types of forum software (Jelsoft vBulletin, phpBB, Invision Power Board & Wolfram Burning Board). These were then entered into a search engine to locate online forums on random topics. In line with the suggestions of King (1996) the names of the forums chosen have not been included.

Of the 30 forums selected with this method 5 were discarded as they were no longer operating, 4 were discarded because they covered topics related to psychological health or specifically targeted at children. One board was discarded because no way could be found to contact the owner.

The owners of the remaining 20 forums were asked for permission to use their forums to advertise the questionnaire. Ten of these owners gave permission. Three forum owners replied requesting not to be included, and the remaining

seven did not reply. On those forums giving permission a single new thread was started briefly describing the topic being researched and giving a link to the survey.

Because the recruitment method did not involve contacting particular individuals it is difficult to accurately judge response rates. One way to measure this is to measure the proportion of visitors to the survey web page who completed the survey. Server logs report 212 unique visitors to the page thus a 61% response rate.

However some people may have seen the advertisement for the questionnaire and not visited the site. In total the forum posts advertising the survey were viewed 759 times giving a response rate of 17%. However this probably overestimates the number of real views as the author viewed the post on each forum several times to check for any replies, and many people probably viewed the thread with the advertisement in more than once.

This is rather low but there is evidence to suggest a low response rate is not as problematic as is often assumed. In particular Keeler et al. (2000) found in one case that increasing response rate to 61% from 36% for a survey did not change any of the substantive findings.

Results

A surprisingly high proportion of the participants in the survey were from Ireland (n = 65, 49%). This appears to be because one of the forums randomly selected was based in Ireland and this forum had many more visitors than of the others selected. In total at least 50% of responses (n=66) came from this forum. Participants from this forum differed significantly from other respondents in that they were younger (M = 23, SD = 5.7 vs M= 30, SD =

13.3, $p < 0.001$) and more depressed ($M = 10.7$, $SD = 6.0$ vs $M = 7.3$, $SD = 5.3$, $p < 0.001$). To avoid potential skewing of the results it will be noted when results for users of this forum (hereafter referred to as MagicForums, this is not its real name) differ from results for other participants.

Aggregate scores on the loneliness scale ($M = 21.4$, $SD = 6.2$) had a high internal consistency (Cronbach's $\alpha = .90$) and were broadly comparable with those that have been found in teachers ($M = 19.2$, $SD = 5.11$), students ($M = 40$, $SD = 9.5$)², and nurses ($M = 40.1$, $SD = 9.52$, Russell 1996). Aggregate scores on the depression scale ($M = 9.3$, $SD = 5.9$) were also highly consistent (Cronbach's $\alpha = 0.84$).

Most of the participants (61.3%) spent 3 or more hours each day using the internet, with 25% spending 6 or more hours a day doing so. This almost certainly represents a bias in response rate, with those spending more time online being more likely to respond to the survey. A half (50.1%) of the participants use four or more different communication channels online the most popular being email ($n = 116$) and writing on forums ($n = 115$).

A significant proportion (40%) of participants reported having no close friends online, with a third (35%) having between one and three. In contrast only 5% of participants reported no having close offline friends and the most common response (38%) was two or three close offline friends.

As expected extroversion and neuroticism both significantly correlate with depression and loneliness (extroversion-loneliness $r = -.494$, extroversion-depression $r = -.295$, neuroticism-loneliness $r = .639$, neuroticism-depression

² Mean values are twice as big for Students as Nurses as research on these groups was carried out using a version of the scale with twice as many items.

($r = .757$, all $p < 0.001$). There is also a significant effect for age with older participants being less lonely ($r = -.358$, $p < 0.001$) and less depressed ($r = -.346$, $p < 0.001$).

There is a trend for more time online to correspond to higher levels of loneliness ($r = .143$, $p < 0.15$). This result is significant when results from MagicForums are excluded ($r = .417$, $p < 0.01$). The results for MagicForums show a relationship in the opposite direction, though this finding is not significant.

Offline sociability was operationalised as aggregate of standardised measures of absolute sociability ("how often do you meet socially with friends, relatives or work colleagues?"), relative sociability ("Compared to other people of your age, how often would you say you take part in social activities?"), and number of close offline friends (Cronbach's $\alpha = .70$). This was found to be significantly negatively correlated with loneliness ($r = -.433$, $p < 0.001$) and this result was significant when controlled for extroversion ($r = -.237$, $p < 0.01$).

Quality of internet social life was operationalised as the aggregation of standardised measures of closeness ("How close do you feel to your best online friends?", "How concerned would you be if one of the people you know best through the internet suddenly stopped communicating"), and number of close online friends (Cronbach's $\alpha = .80$). Quality of internet social life found to increase with the amount of time spent online ($r = .265$, $p < 0.01$). It was completely independent from offline sociability. There were no significant relationships between Quality of internet social life and either depression or loneliness.

Discussion

The Internet and Subjective well-being

The purpose of this study was to investigate in more detail Kraut et al's (1998) finding that internet usage leads to a reduction in subjective well-being. There is some support for this as there was a significant positive relationship between internet usage and loneliness amongst users of forums other than MagicForums. However this finding is not in line with Kraut et al's (2002) claims that the internet has changed and become hospitable, were this the case we would no longer expect to find a loneliness correlation.

The participants in this study all use the internet to communicate with others. All read Internet forums on a semi-regular basis to have found the study and almost all (90%) post to them. The participants in this study do not just use the internet as an alternative to television, their usage better fits the telephone model, so they are a group we would expect to suffer less negative effects of the internet than average.

Significant time has passed since Kraut and colleagues' studies and it could be claimed that the internet has since changed to become less hospitable again however there seems little evidence to back up such a claim. A theory of the internet as oscillating between hospitable and inhospitable between surveys seems rather unsatisfying and risks being unfalsifiable. It also does not fit with the results from the study, users of MagicForums did not find the internet made them more lonely.

Whilst there is evidence that the length of time participants had been using the net was correlated with how lonely they are – thus predicting a decrease in loneliness as the net is used for longer this is primarily a spurious

correlation caused by age, and thus we cannot explain the difference between the early and late Kraut studies by claiming they had simply used the internet for longer. Whilst participants did of course age over the course of the study this effect was small and is not a suitable explanation as Kraut found the internet had negative effects on subjective well-being regardless of age.

We also cannot say that whether the internet makes you lonely depends on the quality and quantity of friends you have online – quality of internet relationships and both measures of subjective well-being were found to be unrelated. Whilst this is a null result and thus we cannot say for sure there is no relationship we can say the relationship is not sufficient to explain the variation seen in the effect of the internet.

Given the data does not seem consistent with any of the proposed hypotheses we need a new model to account for the discrepancy seen. One possibility is to question whether different findings really are contradictory. It could be possible that whilst internet users have greater community involvement (Katz et al. 2001) they are also more lonely. Loneliness is often conceived as a discrepancy between actual and desired relationships (Perlman & Peplau 1998). It is possible that whilst the internet contributes to improving actual relationships it also significantly increases the quality and quantity of desired relationships, leading to the paradoxical result that it increases social interaction whilst also increasing loneliness.

This hypothesis could be tested by measuring the actual and desired relationship levels of individuals as a function of how much time they spend online. Causality again is difficult to establish as it is possible individuals with greater desire for social interaction use the internet more to find new friends,

so ideally a panel design should be used. Such designs are becoming increasingly difficult to do as the number of people who do not use the internet already decreases. An alternative would be to pay participants to stop using the internet for a particular period and see what influence this has.

However whilst this hypothesis brings several conflicting findings into line it still cannot directly account for why users of MagicForums perceive a different effect of the internet from the users of other forums. It suggests this difference is brought about either because different internet usage has a different effect on quality of relationships, or because different internet usage has differing effects on the desired quality of relationships. Before this question can be answered we need to gain a better understanding of what sort of internet use increases loneliness and what sort of use has no effect (or potentially decreases it).

One possible approach to answer this question is to record in detail over a period of time how a large sample of users use the internet, recording for example how much time they spend using email and what sort of websites they visit. If this was done in conjunction with a set of pre and post questionnaires. on subjective well-being a factor analytic technique might allow particular behaviours that contribute towards loneliness to be identified. However many users would be reluctant to experience this level of invasion of privacy so would require a large incentive to participate.

Online Friendships

The survey results also provide some insight into the nature of online friendships. Online friendships appear to be qualitatively different to those we establish in person. In particular people appear to make friends more easily

through computer mediated channels (Lea & Spears, 1995). In fact the results here suggest that it is so easy that the number of internet friends one can establish are unrelated to extroversion, merely to how long one spends online. However though internet friendships are easily formed they also seem fairly unimportant at least in terms of loneliness and depression.

In asserting the importance of relationships Baumeister & Leary (1995) made the argument that to be beneficial to use relationships must have both an element of intimacy and mutual affect, and a reasonable level of contact. Being in love with someone far away is unsatisfying, as is spending any amount of time with someone we are not friends with. This raises the question of whether internet friendships are unsatisfactory because they do not involve intimacy, they do not involve contact, or both.

There is some evidence that internet friendships offer at least a degree of intimacy. Parks & Floyd (1996) found people rated the quality of their online friendships almost as highly as that of those they have in person. There are many anecdotal accounts of how well people feel they know friends online, for example Bruckman (1992) found one participant in his study claimed his internet friendships were "much deeper and have better quality" than those offline.

One way we could more rigorously assess intimacy would be to compare online relationships between people participants know from real life but now only communicate with via the internet, and those they know only online. As contact is the same in both cases (online only) we might expect differences in the relationship to be a function of intimacy.

There appears to be little evidence about whether the internet provides contact, though Cummings et al. (2002) found people get less benefit from email than from other communication activities. To test whether the internet provides contact we could ask participants to only communicate with one of their friends through the internet for a certain period and compare how their perception of the relationship with that participant has changed, using another friend as a control.

Methodological considerations for future research

The methodology used in this study could be improved in a number of ways. Most importantly the study would have benefited from a more representative sample. The sample could be improved by using more forums to advertise (there are many many available), however the more people contacted directly without solicitation the more risk there is of “polluting the pool”. Another alternative would be to only choose forums with a certain number of users to prevent a big contrast between respondent counts from the bigger and smaller forums. Unfortunately this risks introducing a systematic bias into the research.

The study would also have benefited from a higher response rate, not only to increase the sample size but also to decrease the likelihood of a systematic error due to which participants choose to take part. This could be done by giving the participants an incentive to take part, for example a competition or something free to download.

The results of the study might also have been improved by a change in balance of the questions asked. Loneliness and Depression were strongly correlated ($r = .566$) so perhaps could have been combined into a shorter

single scale to leave more room for questions about relationships. Having said this many of the interactions which were significant for loneliness were not significant for depression and visa-verse.

Conclusion

The results of this survey support claims that higher levels of internet usage are associated with lower levels of subjective well-being. However this only appears to be the case for some internet users, and results did not support any existing theories of what might moderate this effect.

Internet friendships were found to be qualitatively different to those held offline, though further research is needed to establish precisely why this is so. In particular online friendships do not provide the same benefit to subjective well-being as offline friendships. The results do not support claims that everyone should stop using the internet or severely reduce the time they spend online, but they suggest that it is important to continue to maintain in person relationships regardless of how many friends one has on the Internet.

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