

The experience of connectivity: results from a survey of Australian Internet users

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DRAFT PAPER NOT FOR DIRECT QUOTE WITHOUT CONTACTING AUTHOR

Introduction

The research presented in this paper investigates the overall experience of connectivity for Australian Internet users, based on a survey conducted in 2007 (n=117). Connectivity is defined here to mean having and using an Internet connection at home. The experience of connectivity means the way people utilise the Internet to achieve a variety of outcomes in their everyday lives. This experience includes both the importance people place on connectivity for successful achievement of outcomes and also the range of outcomes which it influences. In essence, this research investigates a single behaviour – ‘using the Internet’ in terms of the meaning of connectivity which people generate through that behaviour. This research construes Internet use, not from the perspective of the functions, features or applications which might or might not be used (a net-centric view), but from the standpoint of the Internet user’s everyday life. It correlates the behaviour of Internet use with outcomes and expectations which are not themselves inherently concerned with the Internet. To put it another way, the research explores users’ individual and collective experiences of being a node in a complex network of human-machine interactions that now infuses more and more of our everyday lives, drawing from Molz’s argument that network behaviour involves “electronic connections with embodied routines and emotional attachments” (2008: 328).

This research not only provides an example of a different way of undertaking empirical research into the behaviour of Internet users, but also adds materially to the relatively limited data available on Australians and the Internet. There is very limited information concerning the mindset and understanding of Australians of their overall experience of Internet connectivity. Recent Australian Internet use surveys (such as ACMA, 2008; Ewing and Thomas, 2008) have focused primarily on what users are doing online, without inquiring into the meaning and significance of the overall state of connectivity; while useful, these surveys and the data they produce speak more to the superficial sense of what people do online, rather than providing the basis for any attempt to understand empirically the nature, consequence and meaning of being online as a critical component in everyday life. Moreover, aside from these surveys, there is very little work being done in Australia currently which provides the basis for this kind of analysis. There is no equivalent of the Pew Internet Life Project and limited independent academic research is conducted on the basis of surveys. The data on Australians and Internet use tends to be highly specific to particular investigations, in which the Internet features primarily as a means to assess some deeper concern (e.g. Vromon, 2007 on political participation).

Background

Connectivity is a prominent concept in much research and analysis of the growth, significance and extent of the Internet and related technologies. It is used in two ways, generally speaking. First, connectivity is thought to be a relatively simple matter of being able to access the Internet in some manner. Public policy, economic development and governmental writing about the Internet is particularly concerned with connectivity in this way, either because it is a simple and measurable way of assessing 'improvements' based on access to networked ICTs, or because of unexplored assumptions that access technologically determines social and economic benefits, or perhaps both. It bears all the hallmarks of the instrumentalist faith in the power of technological change to necessarily mean social improvement, as critical commentary on both the importance of the 'digital divide' and on the weaknesses of its normative formation (access bridges the divide) reveals. However, even more sophisticated thinkers still focus primarily on improving simplistic equations of connectivity and access by emphasising government responsibilities to also improve individual users (literate users are more able to access the Internet), or their own practices (information is what is most important to receive through access to the Internet). Of course, this work is important, but it is silent on the question of what connectivity might mean from the perspective of users, in their everyday lives. It also can only measure 'connectivity' in raw terms: numbers of users, speeds, and so on. Such work is rarely, if ever, concerned with *how* connectivity might be experienced. Second, connectivity can also be understood as 'connectedness' in the sense of the social networks which might emerge or be sustained or expanded because of the Internet. Connectivity here is largely a matter of the social relationships. Drawing on a rich and extensive tradition of social network analysis that well and truly predates the Internet, and becoming more significant as we understand the interweaving of the Internet within and through everyday life, studies of and understandings of connectivity as 'connectedness' to people are very valuable. They do, however, tend to focus on *one* possible use of the Internet (to maintain networks of human interaction), to the exclusion of others; and, of course, the experience of connectivity in such work is about human, social connectivity mediated *by* the Internet rather than a focus on Internet connectivity in and of itself.

The work on connectivity in the domains of both public policy (whether celebratory or critical) and social network analysis shares a common, and key, theme: that the Internet is not anymore (if ever it was) truly separate from the everyday lives of its users. While much early research and thinking about the Internet tended to focus on the experience of *cyberspace*, outside of or beyond, the everyday, this tendency has largely evaporated even though people using the Internet remain influenced in various ways by the alterity of cyberspace triumphantly proclaimed through the early years of the 1990s. The spaces of everyday life are what matter now; but they have not subsumed the Internet's remaining spatiality within them, and instead, the space of everyday life expand, become more complex, and differently visible and accessible because of the Internet. Thus, in considering the value and role of the Internet in society, we should at how people articulate virtual and real spaces such that one becomes the other in real virtuality. This articulation is achieved by being connected (in all senses of the word) and thus *connectivity* becomes a useful focus for investigation – not the specific linkages of, say, blogging, chatting, webcamming, googling, or any other of the 'do-ings' on the Internet, but something far more fundamental: the experience of connectivity which can tell us something about the degree and nature of the articulations of real and virtual.

Postill (2008) provides a clue as to the direction that future research should take. At a time when there are many Internet users, in many locations, we must discard older approaches which focused on either the special or distinguishing features of users (compared to the majority who did not), or which emphasised a world of cyberspatial difference. Similarly, Floridi (2007) suggests that we are approaching or have passed a threshold where it is no longer relevant to consider what is virtual or real: people are now connected by information and interaction, whether or not that connection is explicitly activated via the Internet. Such underpinnings are not common to most current survey-based research. Some researchers fail to grasp sufficiently that while actions performed on or offline differ, they more or less remain part of the same general lifeworld of the people concerned. The complexity of the network mediation of human relations is apparent, for example, in 'online dating', combining structured and unstructured information exchanges *without* first being physically co-present, so as to form a social connection that is sufficient to promise or sustain face-to-face meeting. Yet research (Hardey, 2008) shows that when engaging in online dating, the possibility of meeting influences, in various ways, the exchanges leading to it such that it is hard to understand this activity as being either online or offline. The same can be said for many computer-mediated interactions and behaviours: they are deeply human engagements pursued variously at different times and in different ways but all part of one underlying endeavour. For this reason research which attempts to compare Internet-mediated and unmediated life seems to be based on a potentially fatal assumption: that the two domains of interactivity disconnected. Thus, for example, Stoneman's (2008) analysis of the effects of the Internet on family life – while interesting and revealing – does also reveal a bias towards viewing the Internet as something 'outside' everyday life which may positively or negatively change that life, rather than seeing the Internet as part of those every day rhythms. Similarly, Acar (2008) analyses the differences between real life and online networking, as if the two never intersect. An important influence which often drives research in this directions comes from the traditions of media research, especially uses and gratifications research, with its desire to determine how 'the media' – from outside the family home – changes the rhythms and dynamics of family life. Moreover, media-oriented research further emphasises the separateness of the Internet in its formulation of questions and approaches because it also seeks to analyse the way one media form substitutes for, or is competing with, other media (see for example Kink and Hess, 2008; see also Kinnally, 2008). Equally, too many times researchers presume that the Internet is a tool and are primarily interested in how that tool is used, without really considering the underlying purposes and contexts of that use (see Dholakia, 2006 for example).

Where work does involve a deeper appreciation of connectivity as something more than just 'doing' things online, it tends to focus on the digital divide. The technical basis of connectivity and its socio-economic dimensions is well explored in Viseu et al. (2006) and Devins, Darlow and Webber (2008); Lee (2005) provides valuable additional commentary as to the problems of instrumental analyses of connectivity. There has also been considerable work done on the differences that broadband access makes to the way in which people use the Internet, though with conflicting findings (e.g., Kwak et al., 2004 and Anderson, 2008), but again, this work is primarily interested in a relatively simple understanding of the Internet, focusing on what is done, differently, between one or other connection type. There has also been valuable research into the increasingly important role of the Internet in creating, maintaining and extending social connectedness. Gennaro and Dutton (2007) report the use of the Internet for friendships among single people in Britain; Tufeckni (2008) reports the

value of social networking; Hlebec et al. (2008) provides a summary of several important research projects about online social support; Haythornthwaite (2005) provides the critical foundation for studies which analyse connectivity in terms of human and social connectedness. This work is now being extended to analyse the role of social media (content creating and sharing) in producing social connectedness (Hargittai and Walejko, 2008).

While this work has been valuable, it does not fully explore the extent and significance of connectivity, because it is driven by more specific concerns. Only the work of Jung (2001; 2008) provides a clue as to the means and importance of analysing and exploring connectivity. In developing and use what Jung terms the Internet Connectedness Index, this research has, over several years, emphasised the central concern with connectivity as a thing in itself, but one that is not primarily technological, but socio-technological in character. Jung's approach is, however, still largely influenced by the interest in whether or not people fall on one or other side of the presumed digital divide between haves and have-nots. It also uses a media dependency approach that, to some extent, continue to account for the Internet as one of several media forms rather than as something which has media characteristics, but which cannot be accounted for solely from a media perspective. However, Jung's work was vital for this research in emphasising the value of using "goal scope" (Jung et al., 2001: 516) as a means for understanding the experience of connectivity. A similar approach is apparent in Kinnally et al.'s recent work on online downloading – but, again, this research overemphasises the understanding of the Internet as media, utilising 'media gratifications' to account for the outcomes of Internet use. This research attempts to expand the goal focus to account for all key outcomes which connectivity might help people achieve.

This research takes as its starting point that studies of specific Internet activities and functions will, largely, fail to capture the most interesting and important aspects of the experience of connectivity because they do not relate connectivity to the lifeworld of those they survey (see for a recent and sophisticated argument, Robinson, 2009). Floridi has argued that we are approaching or perhaps have even passed the point where we can conceptually use the "threshold" between real and virtual to analyse the Internet; he proposes that now, or soon, humans become "connected informational organisms". Few if any of the people surveyed in this research would self-identify as Floridian 'inforgs'; moreover it is unclear how we can judge the degree to which the transformation has occurred – not conceptually – but an empirical level, case by case, and with consideration of the varieties of connectivity which might collectively add up to an overall state where the real and virtual merge. Thus, while Floridi's insight is most important, its connection with empirical research is hard to see, unless we attempt to analyse the degree of connectedness, rather than measuring the uses to which the Internet is put.

Ultimately, the Experience of Connectivity survey attempts to resolve three primary problems with the majority of approaches to collecting empirical evidence about Internet use. First, many surveys ask for responses about an ever-expanding list of activities online and, in doing so, inevitably fail to capture all possible elements and often produce multi-dimensional domains for analysis because some elements overlap with others or are not equivalent categories, or – in the interests of reducing survey length – do not actually cover all possible varieties of activity (see ACMA, 2008 for example). Second, most surveys are very

concerned with the frequency of activities; yet, increasingly, Internet use involves multi-tasking (Keynon, 2008) and is not understood by those participating in it as quantifiable in units of time. Third, most surveys presume a comparison between offline and online life (as evidenced by the interest in quantifying frequency) which might reflect the fact that people do indeed sometimes engage in life without computer mediated and sometimes do, but which does not capture the underlying *potential* of the Internet to be used by those connected to it across every aspects of life, at any time. This survey explores the gap between this potential and actual behaviour by avoiding the pursuit of excessive granularity in functions and frequencies, and concentrating instead on the generalities of the experience of connectivity.

Survey design and method

The survey was specifically designed to focus on the experience of Internet connectivity at home, including all possible uses (personal, study and work), and by the person completing the survey (and not the household or other members) over a relatively long period of time. This focus was made explicit in the wording of each item, providing users with clear cognitive cues to guide responses. The key items elicited responses to the broad questions: ‘What does the Internet help you to do?’, ‘With whom do you use the Internet?’ and ‘What if you didn’t have access to the Internet?’ Extensive demographic information was also obtained. While the survey also included items relating to activities and attitudes towards broadband that are not reported here.

What then were the key design considerations for these items? Item One asked respondents to consider twelve broad outcomes which they might seek to achieve in their everyday lives and to assign to each of them a measure of the importance of connectivity (very important; important; somewhat important, or not important) in achieving those outcomes:

“Using the Internet helps me to...:

- stay in touch with people I know
- find and interact with people with similar interests
- make a statement about who I am
- create an alternative world for myself
- acquire directly things that I want and need
- improve my knowledge
- make good decisions
- balance competing requirements for work, study and personal life
- help other people
- share information and ideas with others online
- belong to a group of similar people
- be part of a wider world than my local area”

In seeking respondents’ views of the importance of connectivity, the survey deliberately left open the question of how *exactly* each individual might use the Internet in pursuit of that end. For example, while we might normatively imagine that, to achieve the outcome of improved knowledge, an individual would search for and read information online, it is also the case that improved knowledge might come from chatting with other people, studying via the Internet, listening to streaming audio documentaries and so on. The survey carefully avoiding any

attempt to link the 12 outcomes with specific kinds of Internet activity (respondents were cued to ‘consider all of the ways’ they used the Internet), permitting each individual respondent to interpret and respond to the items in their own way. Whatever the inconsistencies in response at that level, the survey as a whole thereby consistently and rigorously focuses only on ‘Internet use’ which therefore enables conclusions to be drawn about ‘connectivity’ as singular experience. In other words, the survey was designed to investigate ‘being connected’ rather than what activities were performed via that connection.

The survey was also designed to inquire into the relationship between the experience of connectivity and the kinds of broadly understood social networks that people might form and participate in via the Internet. Since the exact nature of these networks was not the focus of the research, the survey simply elicited from respondents a basic judgment as to which of three ‘network’ categories they belonged:

“When I use the Internet at home I am doing things that usually involve:

many other people, whom I may or may not know well;
a small number of people, many of whom I know well;
only myself and /or people that I am living with at home.”

This item provided an important alternative form of demographic information, based not on the inherent qualities or situation of individual respondents, but on their sense of the social connectedness which they enacted through the Internet. It also provides some valuable confirmations of common-sense assumptions about the experience of connectivity for more or less networked individuals.

The third item, ‘What if you did not have Internet access?’ asked users to assign a numerical rating from 1 (least affected) to 6 (most affected) to six activities which would be affected if they did not have access at home for a month:

Communicating with people
Expressing myself
Acquiring products, information, and/or services I need
Organising my life
Sharing what I think and do with others
Being part of a group or groups that matter to me

This item was included primarily to check on the consistency with which users responded to both the presence and absence of the Internet, enabling a more comprehensive judgment of the overall experience of connectivity.

Survey method

The survey was conducted via the web in late 2007, after receiving clearance from the author’s Human Research Ethics Committee. Two Australian Internet service providers (ISPs) agreed to distribute information about the survey and promote its completion via their monthly email newsletters to clients and their websites. The survey was run at different times for each ISP, for a two-week period in each case. The scholarly origins and research purpose

of the survey were made clear to potential respondents to distinguish it from marketing and business research also conducted from time to time by the ISPs. Respondents were encouraged to complete the survey via an incentive, being the chance to win one of five \$100 credits from their next ISP bill. For confidentiality purposes, results from each of the two ISPs were combined into a single data file and no conclusions are drawn that differentiate one group from the other. No attempt was made to secure a representative sample of Australian Internet users and the respondents who completed the survey form a convenience sample.

There were 1358 attempts to complete the survey. From this number, 186 attempts were excluded from further data analysis since they contained either no data or so few responses to items as to suggest they were either errors, or possibly attempts to complete the survey multiple times to increase the small chance of obtaining the incentive. Therefore, at the completion of the survey, 1172 valid attempts at the survey had been made. Due to the length of the survey, there were a declining number of fully valid responses through to the end of the survey, but most of the 1172 valid attempts completed most or all of the items and the large sample size meant that significant conclusions can be drawn from the survey as a whole. Data were analysed primarily using simple statistical tools. The demographic information in the survey indicates that, generally speaking, the survey sample is not directly representative of all Australian Internet users at that time. The survey was more heavily weighted towards males (67% : 50.2%), broadband users (74%: 52%), employed users (81% : 74%), and 55+ users (30% : 20%); there was slight underrepresentation of 18-24 year olds (10% : 15%). (ABS, 2008)

Findings, Analysis and Discussion

The overall experience of connectivity

The experience of connectivity can first of all be described by considering the relative *unimportance* of the Internet for users in achieving the 12 outcomes which are at the heart of Item 1.¹ For very few users, 'improve my knowledge' (2%) and 'stay in touch with people I know' (4.5%) were unimportant. 10% of respondents thought 'make good decisions' and 'acquire directly things that I want and need' were unimportant. Around a quarter of respondents judged that 'help other people' (26.5%), 'share information and ideas with others online' (27.1%), and 'be part of a wider world than my local area' (28.7%) were unimportant. Over a third of respondents did not find 'balance competing requirements' important (38%). Perhaps more surprisingly, given the way that the Internet is construed in public discourse, 43.9% did not rate 'find and interact with people with similar interests' as important; and just over 50% did not use the Internet to assist with 'belong[ing] to a group of similar people'. Two behaviours were extensively considered to be unimportant: more than three-quarters of respondents did not rate 'make a statement about who I am' (75.9%) and 'create an alternative world for myself' (78.3%) as outcomes with which the Internet helped them.

Turning to the assignment of importance, almost exactly the same order of importance emerges as for unimportance. In terms of the mean score provided by all positive responses to

1 In the following analysis, responses 'no importance' and 'no opinion' are combined. In all but one case, less than 1% of respondents indicated no opinion. The only exception was 'balance competing requirements' where some 5% of respondents indicated no opinion; if these are excluded, then the percentage of unimportance shifts to around 25%.

each element (where 3 indicates very important and 1 indicates somewhat important), the following rank order emerges:

Outcome	Mean
...improve my knowledge	2.40
...stay in touch with people I know	2.34
...acquire directly things that I want and need	2.08
...make good decisions	2.08
...be part of a wider world than my local area	1.91
...balance competing requirements for work, study and personal life	1.90
...share information and ideas with others online	1.77
...belong to a group of similar people	1.61
...find and interact with people with similar interests	1.61
...help other people	1.60
...create an alternative world for myself	1.49
...make a statement about who I am	1.40

(T-test $p < .01$ in all cases)

Clearly, then, the experience of connectivity is very much influenced by the way that the Internet enables people, principally, to improve knowledge, stay in touch, acquire things and make decisions. In all four cases, the mean score places these items somewhere between important and very important. The lowest ‘somewhat important’ frequency (10.5%) was registered against ‘improve my knowledge’; the highest ‘very important’ frequency attached to ‘stay in touch’. In both cases, more people assigned higher importance than the next-available category. Notably, however, for both ‘acquire things’ and ‘making decisions’, the highest response was ‘important’. In most other cases, ‘somewhat important’ was the most populated response. One notable difference appears when considering the rank orders of the outcomes for which the Internet is judged unimportant or important. ‘Help other people’ is the 5th least unimportant outcome, but slips to be the 10th most important outcome. In all other cases, whatever is less unimportant is generally more important, or close enough as to be insignificantly different.

Because of the manner in which Internet activities, regardless of the outcome, all involve similar kinds of sub-behaviours, it is not surprising that there are no strong patterns of correlation. Almost all of the 12 elements correlate positively with one another to a limited degree ($< .500$) ($p < .05$), with ‘improve knowledge’ and ‘make good decisions’ being the strongest correlation (.469); notably, sharing information correlates at over .350 with helping, belonging and being part of a wider world. Being part of a wider world correlates with belonging to a group (.398). None of these results are especially surprising and lend weight to the contention that, to the extent these outcomes may or may not be helped by connectivity, all of them – even in the manner by which some choose *not* to consider them important – contribute to understanding the experience of connectivity as a singular human endeavour.

The components of the experience of connectivity

Respondents’ views on all twelve outcomes contribute materially to their overall experience of connectivity, as demonstrated. However, do these twelve outcomes group together in any way that might provide clues as to varieties of that overall experience? Using a factor

analysis, the survey found that there are three components to the overall list of outcomes, each of which distinctively demonstrates how connectivity is experienced by users.

The factor analysis was conducted via a principal component analysis, using an equamax rotation method with Kaiser Normalisation; 95% of cases were randomly selected to avoid observational bias. As the following table shows, sampling was adequate and the results are significant.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.791
Bartlett's Test of Sphericity	Approx. Chi-Square	321.069
	df	66
	Sig.	.000

The results achieved were:

Rotated Component Matrix

	Component		
	1	2	3
stay in touch with people I know	.475	.207	.002
find and interact with people	.554	-.074	.335
make a statement about who I am	.151	.141	.818
create an alternative world	.159	.066	.775
acquire directly things	.041	.565	.335
improve my knowledge	.210	.764	-.044
make good decisions	.130	.783	-.021
balance competing requirements	.037	.604	.205
help other people	.549	.371	.051
share information with others	.773	.073	.098
belong to a group of similar people	.664	.002	.330
be part of a wider world	.568	.245	.307

These three components can be understood as follows. Component One of the experience involves high-loading values for sharing information and belonging to groups of similar people, along with slightly lower values (still $>.500$) for several other factors such as helping, finding others and belonging to a wider world; staying in touch (.475) is also included here. Component Two show high-loading values for a closely related cluster of outcomes: improving knowledge, acquiring things, making good decisions and balancing requirements; note the low values for all other factors but also the link apparent between knowledge improvement and decision making. Component Three shows the close relationship between making a statement about the world and creating an alternative world, both $>.750$. Note the negative values in this component for improving knowledge and making good decisions.

In overall terms, the factor analysis shows that in most cases individual outcomes group together more or less exclusively of one another. These components can be interpreted to mean that there are three broad themes to the experience of connectivity. First, people experience connectivity as a process of *collaboration, communication and combination* (component 1); connectivity can also be seen as *knowledge in action* (component 2); finally,

connectivity can be experienced as *self-presentation and exploration* (component 3). Any one individual may be involved in one, two or all three of these ways of utilising the Internet to live their lives; but each one is, on the basis of this survey, a different kind of experience. Critically, while almost all respondents engaged in online activities that fitted with either the first or second component, most (61%) did not see the Internet as important for self-presentation and exploration. Yet, by considering the mean scores for outcomes associated with the other components, we see that these components are not mutually exclusive: people who ascribed some importance to self-presentation and exploration were more likely to find the Internet important for the other two kinds of experiences.

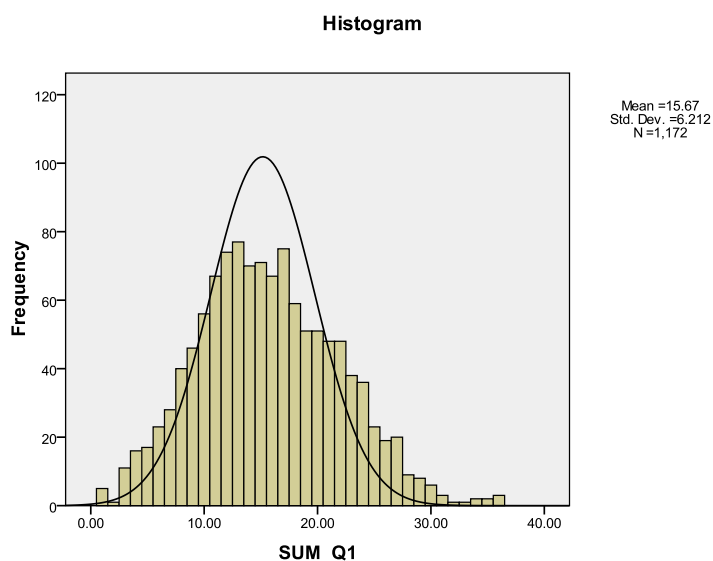
The index of connectivity

Each individual respondent provided a variable answer as to the importance of the individual outcomes. While there were 12 individual outcomes, a Rasch analysis (excluding from the count items to which respondents indicated there was no importance), shows the 12 outcomes form a uni-dimensional domain. Thus, for the overall single behaviour of using the Internet to achieve life outcomes, a single score can be produced that represents the overall degree to which connectivity is important for that individual.² In this manner, all 1172 respondents can be arrayed on a single scale – the index of connectivity – permitting detailed comparisons between different sub-groups of respondents.

There are two aspects to this score generated by aggregating responses to all 12 distinct items. First the score demonstrates the *extent* of the individual's experience of connectivity theoretically ranging from none (for no respondents) to all twelve (74 respondents). Second, the score demonstrates the *significance* of the individual's experience of connectivity. The greater the extent and significance, the higher the score. The variation between scores shows measurable differences in the experience of connectivity between respondents. Theoretically, a person could score 36 which could be interpreted as meaning this person is so totally connected that their everyday life is entirely dependent on their connectivity: connectivity as a distinct experience would, for such a person, disappear. Similarly a person who scored zero would on this scale have an Internet connection but value it not at all for any aspect of life measured by the outcomes used in the survey. Connectivity would not, for such a person, be experienced at all, except in the negative.

Overall statistics for respondents demonstrate that all fall between these two hypothetical extremes, generating a mean score of 15.670.

2 In this analysis, rather than using the norm of 0,1,2 scoring, the original scoring of 1,2,3 was retained to provide correlation between the mean scores for items and those of individuals.



Overall response to Item 1

N	Valid	1172
	Missing	0
Mean		15.6698
Std. Error of Mean		.18146
Median		15.0000
Mode		13.00
Std. Deviation		6.21224

The extent of the experience of connectivity correlated closely with the significance of that experience, measured by the mean score for each group of respondents:

Items	respondents	mean for these respondents
12	74 (6%)	25.068
11	130 (11%)	22.469
10	159 (13.6%)	19.855
9	178 (15.2%)	17.393
8	153 (13.1%)	14.967
7	160 (13.7%)	13.744
6	129 (11.0%)	11.163
5	101 (8.6%)	09.050
4	041 (3.5%)	07.098
3	28 (2.4%)	05.179
2	11 (<1%)	03.909
1	08 (<1%)	01.750

What were the demographic correlations which might shed light on the kind of people who score more highly on the index of connectivity? Firstly, there were no statistically significant correlations between gender and whether or not respondents were working. Nor did the specific mix of Internet use at home (work, study or personal use) correlate. However, higher mean scores on the index of connectivity were found for the following dichotomous categories:

Demographic characteristic	Sig.	Mean	Diff.
People studying	p < 0.01	17.02	1.64
People studying full-time, not part-time	p < 0.01	18.83	2.86
People working full-time, not part-time	p < 0.03	16.75	1.52
People with broadband	p < 0.01	16.04	1.64
People without children	p < 0.01	16.04	1.38
People who are single	p < 0.05	16.44	1.21

The survey also gathered information from respondents about their perceived expertise in using the Internet. 269 (23%) of respondents identified themselves as expert; 491 (41.9%) as above-average; and 291 (24.8%) as average. The remainder considered themselves either as still learning or beginners. Higher mean scores for connectivity were recorded at significant levels for each of the most populated categories:

Demographic characteristic	Sig.	Mean	Diff.
Expert users (compared to others)	p < 0.01	18.10	3.28
Above-average or expert (compared to others)	p < 0.05	16.83	3.85
Average to expert (compared to others)	p < 0.01	15.78	3.16

The survey provided evidence that the length of time of Internet use also influenced the extent and importance of the experience of Internet connectivity. While there were no significant differences for the most experienced users (prior to 1996) or the most recent (after 2001), there was a consistent difference between the mean scores for users by year of first use of the Internet (p < 0.01):

Year 1 st use	n	Mean for this group	Mean of others	Difference
1995 and before	529	16.11	15.15	0.96
1996 and before	642	16.02	15.04	0.98
1997 and before	744	15.98	14.85	1.13
1998 and before	862	15.84	14.78	1.06
1999 and before	946	15.79	14.54	1.25
2000 and before	1010	15.73	14.37	1.36

Similarly, the mean score declined for all users the shorter time they had access to broadband, with the exception that very early Internet adopters had a slightly lower mean:

Year 1 st broadband	n	Mean for this group	Mean of others	Difference
before 2001	112	16.75	15.54	1.21
2001	199	17.10	15.34	1.76
2002	295	16.88	15.2	1.68
2003	414	16.65	15.04	1.61
2004	556	16.54	14.70	1.84
2005	694	16.23	14.60	1.63
2006	791	16.10	14.35	1.75

The survey produced less clear results concerning age. Using the standard age groupings for Australian statistics (18-24; 25-34; 35-44; 45-54; 55-64; 65+), the only consistent statistically significant differences were found for the 18-24 year old grouping (n=116, 10%) which, compared to all others, scored higher on the index of connectivity (p < 0.01):

(I) Age	(J) Age	Mean Difference (I-J)
18-24 years of age	25-34 years of age	3.34523 [*]
	35-44 years of age	3.97840 [*]
	45-54 years of age	5.95472 [*]
	55-64 years of age	5.16230 [*]
	65 or older	4.67038 [*]

While not all results are statistically significant, the data suggest that the experience of connectivity was most important and extensive for those aged below 35; least important and extensive for people aged between 45 and 64, but became somewhat more so for those aged over 65.

Demographic differences also enrich our understanding of the experience of connectivity. For most of the demographic categories, the results were (p < 0.05; in most cases < 0.01):

Outcome	Variations in mean by demographic
stay in touch with people I know	women 0.322 not working 0.156 no children 0.127 above-average / expert 0.113
find and interact with people ...	no children 0.148 18-24 0.239
make a statement about who I am	no children 0.288
create an alternative world for myself	18-24 0.434
acquire directly things ...	single 0.142 no children 0.162 broadband 0.166 above-average / expert 0.238 18-24 .281
improve my knowledge	studying 0.177 broadband 0.275 use before 1996 0.142 above-average / expert 0.271 18-24 0.187
make good decisions	broadband 0.183 use before 1996 0.116 above-average / expert 0.271 18-24 0.196
balance competing requirements...	studying 0.368 above-average / expert 0.226
help other people	above-average / expert 0.115
share information and ideas ...	single 0.181 above-average / expert 0.276 18-24 0.351

belong to a group of similar people	not working 0.234 single 0.127 no children 0.169 above-average / expert 0.262
be part of a wider world ...	women 0.167 not working 0.215 single 0.124 above-average / expert 0.208 18-24 0.189

Crucially, for people aged 18-24, 7 outcomes were significantly more important, with create an alternative world for myself (.434); share information and ideas (.351) being particularly noteworthy. Internet competence correlated with higher mean scores for 9 of 12 outcomes. Notably, the outcomes which are least important, and which form a distinct component – make a statement; and create an alternative world – are the least likely to show significant differences.

Connectivity and social relationships

In Item 2, respondents nominated one of three broad patterns of Internet use, based on the kind of interpersonal relations that their Internet activities involved. The responses were:

When I use the Internet I am performing activities that usually involve	Frequency	Valid Percent
many other people on the Internet, whom I may or may not know well	288	25.0
a small number of people on the Internet, most of whom who I know well	536	46.5
only myself and/or people that I am living with at home	329	28.5
Total (19 missing)	1153	100.0

On the basis of this grouping, the following significant differences in the mean scores on the index of connectivity were found ($p < 0.01$ in all cases)

(I) When I use the Internet I am performing activities that usually involve:	(J) When I use the Internet I am performing activities that usually involve:	Mean Difference (I-J)
many other people may be known well	a small number /most known well	2.47279
	only myself / people living with at home	6.27112
a small number /most known well	many other people may be known well	-2.47279
	only myself / people living with at home	3.79833
only myself / people living with at home	many other people may be known well	-6.27112
	a small number /most known well	-3.79833

The degree and character of users' online social networking also provides a way of analysing the 12 specific outcomes. There were significant differences between those whose experience of the Internet involves either broad or small online social networking and those whose experience was more and self-centred for the following six outcomes, all of which

were shown to form a single component of the experience of connectivity; the other two components do not show significant differences.

Outcome	many	small	home
stay in touch with people I know	-.146		-.431
find and interact with people with similar interests		-.225	-.557
help other people	*	*	-0.242
share information and ideas with others online		-.226	-.498
belong to a group of similar people		-.275	-.522
be part of a wider world than my local area	*	*	-.308
* = no significant difference			

Notably, between the two groups involving online social connections, the only category in which the small/known respondents valued connectivity more highly was for ‘staying in touch with people I know’.

These differences demonstrate that, for people whose do not have an online social network, their overall lower scores on the index of connectivity are explained primarily by the lack of value attached to the outcomes which involve extensive online networking. The lower overall mean score for those in smaller, known social networks is explained by the comparative lack of importance attached to outcomes around finding, belonging and sharing that are intuitively more important to broader and looser online social networkers. Thus the experience of connectivity can be understood as being part of the wider life circumstances of individuals varying according to their social connectedness. The tendency to form a looser social network involving Internet interactions with a variety of people is closely correlated to the extent and significance of connectivity. Of course, neither can be said to cause the other: they operate in concert, reinforcing each other.

The loss of connectivity

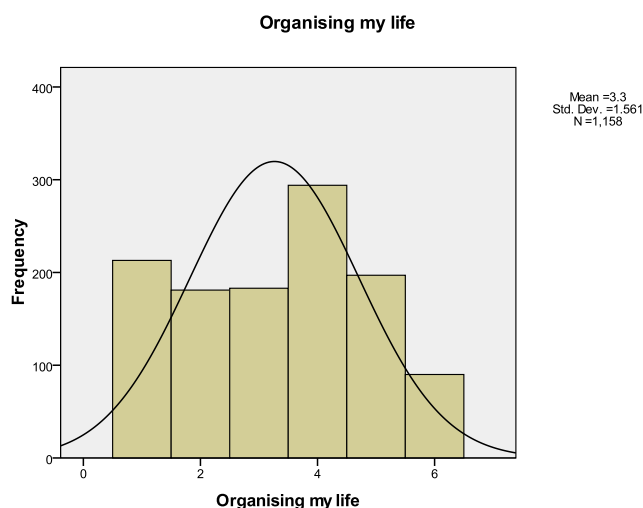
Survey respondents were also asked to provide a rating of the degree to which they would be affected by the loss of connectivity. This item provides a useful complement to the main focus on the positive experience of connectivity.³

		Communicate...	Express...	Acquire...	Organise...	Share...	Belong...
N	Valid	1167	1151	1162	1158	1157	1160
	Missing	5	21	10	14	15	12
Mean		4.78	2.04	4.71	3.30	2.84	2.62
Std. Error of Mean		.045	.038	.044	.046	.039	.046
Median		5.00	2.00	5.00	4.00	3.00	2.00

3 Analysis of this item is made difficult by the fact that the majority of respondents (61%) rated items uniquely (from 1 to 6); the remainder assigned either more or less of a particular rating score. While the scores change depending on whether the total response or the majority are analysed, the results are broadly consistent.

		Communicate...	Express...	Acquire...	Organise...	Share...	Belong...
N	Valid	1167	1151	1162	1158	1157	1160
	Missing	5	21	10	14	15	12
Mean		4.78	2.04	4.71	3.30	2.84	2.62
Std. Error of Mean		.045	.038	.044	.046	.039	.046
Median		5.00	2.00	5.00	4.00	3.00	2.00
Std. Deviation		1.529	1.282	1.490	1.561	1.330	1.560

Given the importance of staying in touch in the experience of connectivity, it is not surprising that the highest ranked item here is ‘communicating with other people’; similarly, the strength accorded to improving knowledge and acquiring things is consistent with the significant emphasis on missing ‘acquiring...’. Organising provides a useful indication of the variety of responses which produces a mid-ranked mean:



Of equal interest is the way that different social network groups provide significantly different responses:

What would be missed?	Type of social network	Compared with...	Mean Diff.	Sig.
Communicating	many other people	myself / people at home	.662	0
	small number of people	myself / people at home	.884	0
Expressing	many other people	small number of people	.240	0.031
	many other people	myself / people at home	.306	0.009
Acquiring	many other people	myself / people at home	-.526	0
	small number of people	myself / people at home	-.432	0
Sharing	many other people	small number of people	.279	0.01
	many other people	myself / people at home	.807	0

	small number of people	myself / people at home	.529	0
Belonging	many other people	small number of people	.613	0
	many other people	myself / people at home	1.437	0
	small number of people	many other people	-.613	0
	small number of people	myself / people at home	.824	0

The data reveal that people in online social networks of either character are more likely to miss communicating, belonging, sharing, expressing; people with a home or self focus are more likely than other respondents to miss acquiring things and information. Organising is the only 'absence' which is not missed significantly by any of the groups. Communicating was more likely to be missed within the online social networking groups by those in smaller and better known networks; belonging was significantly more likely to be missed by those in broader networks. A factor analysis confirmed that acquiring and organising form one component of what might be missed; all other items group together.

Connectivity and axes of engagement

The scores of each user on the index of Internet connectivity, in aggregate, describe the extent and significance of their experiences of using the Internet at home. However, because of the design of the 12 outcomes from which this aggregate score was produced, it is also possible to explore how the overall experience maps against three axes of engagement: a collaborative axis (more or less directed towards *self* or *others*); a directional axis (more or less directed towards *here* at home or *there* elsewhere); and a transactional axis (more or less directed towards *giving* to the Internet or *taking* from the Internet). This procedure involves identifying, for each axis, the six outcomes associated with each notional end point and then assigning the percentage of the total score for each individual that is made up from their responses to each sub-group of 6 outcomes. For example, if the score for one individual is 21 and 14 from 21 is from group A and 7 from group B, then the scoring ratio of A:B is 66% : 33%. What this analysis demonstrates is the weight given to one or other group for each individual and thus, collectively, for the sample as a whole.

Collaborative axis

While all the outcomes involve a mixture of collaborating with others and satisfying or expressing the self, the 12 outcomes tend to fall into two groups, one more oriented to collaboration with others in the first instance; and one more oriented towards the self and its satisfaction and expression. None of the results are *solely* associated with collaborative or individual activity, but reveal the tendency within the experience of connectivity *towards* collaboration or not.

Collaboration grouping (directed towards others)

- stay in touch with people I know
- find and interact with people with similar interests
- help other people
- share information and ideas with others online
- belong to a group of similar people
- be part of a wider world than my local area

Self grouping (directed towards the self)

- make a statement about who I am
- create an alternative world for myself
- acquire directly things that I want and need
- improve my knowledge
- make good decisions
- balance competing requirements for work, study and personal life

Overall, 52.02% of the sum of all scores reflects activity that is oriented towards the self; 47.98% reflects activity oriented towards collaboration with others. 500 (43%) respondents assigned other-directed activity as more important (with a mean differentiation from self of 25.6%); 111 (9%) assigned it equal importance; 561 (47%) saw self-oriented activity as more important (mean differentiation of 21.5%).

Directional axis

Similarly, while all the outcomes involve a mixture of activities which can be interpreted as directed towards the home where the Internet user is located, and towards somewhere other than home, the 12 outcomes tend to fall into two groups, one more oriented to 'here' in the first instance; and one more oriented towards 'there'. None of the results are *solely* associated with each location, but reveal the tendency within the experience of connectivity directed here or there.

Here grouping (directed towards home location)

- stay in touch with people I know
- make a statement about who I am
- acquire directly things that I want and need
- improve my knowledge
- make good decisions
- balance competing requirements for work, study and personal life

There grouping (directed beyond the home)

- find and interact with people with similar interests
- create an alternative world for myself
- help other people
- share information and ideas with others online
- belong to a group of similar people
- be part of a wider world than my local area

Overall, 66.91% of the sum of all scores reflects activity that is oriented towards the 'here'; 33.09% reflects activity oriented towards 'there'. 965 (82%) respondents assigned here-directed activity as more important (with a mean differentiation from there of 41.6%); 64 (5%) assigned it equal importance; 143 (12%) saw there-oriented activity as more important (mean differentiation of 14.3%).

Transactional axis

Finally, while all the outcomes involve a mixture of activities which can be interpreted as involving either giving to or taking from the Internet, the 12 outcomes tend to fall into two groups, one more oriented towards acquisitive transactions in the first instance; and one more oriented towards distributive transactions. None of the results are *solely* associated with each location, but reveal the tendency within the experience of connectivity directed towards creating opportunities for others (giving) or exploiting opportunities from others (taking).

Give grouping (create opportunities for others)

- stay in touch with people I know
- make a statement about who I am
- create an alternative world for myself
- help other people
- share information and ideas with others online
- belong to a group of similar people

Take grouping (exploit opportunities for oneself)

- find and interact with people with similar interests
- acquire directly things that I want and need
- improve my knowledge
- make good decisions
- balance competing requirements for work, study and personal life
- be part of a wider world than my local area

Overall, 61.81% of the sum of all scores reflects activity that is oriented towards taking; 38.19% reflects activity oriented towards giving. 983 (84%) respondents assigned taking-directed activity as more important (with a mean differentiation from there of 31.0%); 80 (7%) assigned it equal importance; 109 (9%) saw giving-oriented activity as more important (mean differentiation of 21.7%).

Conclusions

Several insights into the overall experience of connectivity emerge from this research. First, the experience of connectivity is shown to be associated far more strongly with some outcomes than others, demonstrating how the Internet is more or less valuable across a spectrum of activities which are all theoretically made easier by the Internet, but which are not in practice equally valued. Second, the close correlation of some outcomes with others demonstrates three underlying components to the experience of connectivity; regardless of the extent to which one or all components are important, each of the three serves to explain how connectivity is understood by users. Third, the survey provides an index of connectivity, with each respondent's score measuring the individual significance of connectivity for them in achieving valued outcomes in their lives. This score allows consideration of the correlations between each individual's sense of connectivity and variables such as gender, age and so on. Fourth, the survey involves consideration of the relationship between the experience of connectivity and the kind of social network which is enabled for respondents by the Internet. Fifth, the survey presents confirmatory findings about the experience of connectivity by showing what would most be missed by respondents if they did not have the Internet. The final insight emerges when the 12 outcomes are regrouped to explore three axes

of engagement within connectivity: each axis can be described in terms of the variation in importance attached to it by respondents.

Four key points emerge in conclusion. First, the experience of connectivity can be summed up as involving one or more of the following themes: collaboration, communication and combination; knowledge in action; and self-presentation and exploration. The most extensively connected users, who are most likely to use the Internet with many people, regardless of how well known they are, are differentiated mostly by the value they place on the third aspect. These users are, however, in a significant minority. Most Internet users experience connectivity in ways that are very much concerned with gathering and using information, and in communicative and collaborative relations with other users. Second, despite the current fascination with shared and co-created content (Deuze, 2007; Bruns and Bahnisch, 2009), there is a significant tendency for connectivity to be experienced more in terms of what can be taken from the Internet, rather than given to it; the expression of self – while critical to a small number of users – remains a low priority for most. That said, the fact that so many people, over many years, have understood the Internet in terms of collaborative communications suggests that the difference Web 2.0 makes is rather less in terms of a new phase of Internet development, but a restatement of some of the Internet's most basic and attractive affordances (an argument explored in Allen, 2009) which have always been central to the experience of connectivity. Third, there is a strong relationship between experience and sophistication in Internet use and the degree to which people exploit connectivity; yet there is also a strong relationship between younger users and high connectivity. Finally, the research demonstrates conclusively that an individual's experience of connectivity is deeply entwined with the kind of social networking behaviour they activate via the Internet: but it is not possible to say which might cause the other. Rather, being connected in human terms is, still, a vital component of experiencing oneself as a node in an informational network.

Limitations and further research

The limitations of the research presented here are, firstly, that the sample – while large – was not entirely representative of Australian Internet users; in particular, given that significant differences in the experience of connectivity are associated with access to broadband, computer expertise and time using the Internet, the fact that the survey polled a relatively small number of people in some categories means some caution must be exercised in extrapolating from the data. Second, the analysis presented in relation to axes of engagement is based on descriptive statistical analysis of scores on the index of connectivity and on a relatively arbitrary and dichotomous judgment as to the tendency within each outcome. Third, the survey may be too focused on 'home Internet use' (traditionally used to discriminate between personal use and work or educational use) which may imply a fixed connection in one place. Recent and significant shifts in Internet use towards mobile devices in numerous locations would possibly limit the applicability of key findings to that small sub-set of Internet users who are ubiquitously connected.

However, despite these limitations, the research shows a clear direction for further study and analysis. First of all, and most importantly, additional and more diverse surveys need to be conducted to both test the unidimensionality of the 12 outcomes which produce the index of connectivity scores for each individual respondent. Additional surveys conducted at regular intervals, with representative samples, would provide the opportunity to

compare the growth in the importance and extent of connectivity in people's lives. Second, additional survey items that more directly explore the axes of engagement which are suggested by the analysis above. Such research is particularly important at a time when Internet activity is increasingly discussed in terms of social media, sharing and self-expression. Third, further work needs to be conducted on constructing meaningful measures of the variety and intensity of specific Internet behaviours that can be correlated with the scores on the index of connectivity to discern whether there are certain ways of using the Internet which more closely align with achieving one goal or another, or whether indeed the experience of connectivity scale is entirely independent of underlying behaviours.

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