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The use of the Internet to activate latent ties in scholarly communities

by Paul Genoni, Helen Merrick, and Michele Willson

Abstract

This paper presents the results of a survey on the use of the Internet by university-based scholars to contact unknown peers. These contacts are considered as examples of the activation of "latent ties" which are said to exist within communities with associated interests. The research indicates that the Internet facilitates the activation of these ties and that the degree to which it is used for this purpose is associated with academic rank.

Contents

Introduction

Since the widespread academic adoption of the Internet during the 1990s there has been ongoing speculation and investigation regarding the manner in which scholarly practice has been transformed. There have been a number of fruitful areas of research, including the use of the Internet for teaching purposes; the rise and impact of digital libraries; the efficacy of e-research, and the emergence of the information commons. In many cases the purpose of the research has been to understand the extent to which forms of scholarly practice have changed from the "traditional" to the "new" and to assess the likely impacts of such changes.

The driver of the research reported here is a study into the extent of the changes to informal scholarly communication practice and the nature of the virtual scholarly community. Research into informal scholarly communication has long accepted the existence of an "invisible college" as an important manifestation of the need for scholars to identify and communicate with individuals and groups of researchers with similar

interests. An integral part of informal scholarly communication has been the capacity for researchers to identify and contact others working in related fields. Indeed, the building of relationships between researchers has been crucial to the founding of research partnerships and teams; to the creation of a wider community encompassing researchers with affiliated interests, and to the personal development of new researchers.

In recent years the formation of the invisible colleges of associated researchers would appear to have been significantly impacted by the emergence of the Internet. The research reported in this paper measures the outcomes of an investigation into one aspect of the informal scholarly communication process — the point at which one researcher/scholar initiates contact with another in order to commence a research related dialogue. These contacts may be seen as the first steps towards initiating more substantive interactions with others within a scholarly community or sub-community of peers. In terms of social network theory, such contacts constitute the establishment of a "weak tie", with the potential to develop into more persistent and stable networks maintained by "strong ties" between individuals.

Strong, weak, and latent ties

The concepts of weak and strong ties have been developed as a means of describing the interpersonal relations, or ties, within a network. In coining the terms Mark Granovetter described the strength of a tie between individuals as being "a (probably linear) combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie" (1973, p. 1361). Granovetter concluded that whereas a preponderance of weak ties has previously been seen as indicative of alienation, it is possible to appreciate the important role they play in promoting integration and community building. In particular he describes weak ties as being "indispensable to individuals' opportunities" (1973, p. 1378). Weak ties enable the sharing of diverse information since they offer the opportunity of connection with a more heterogeneous range of individuals than is possible with strong ties.

In the wake of Granovetter's work, further research has attested to the importance of weak ties, particularly within work place settings and occupational communities. In part this later research has been linked to the uptake of computer-mediated communication (CMC), and in particular the Internet. These technologies have transformed the opportunity for individuals to create and maintain weak ties, often in the absence of any face-to-face contact.

Pickering and King (1995) considered the role of weak ties in occupational groups. They gave particular attention to academic communities as an example of groups which "are very loosely coupled ... with the invisible colleges of academics enmeshed in weak tie networks of shared research pursuits" (1995, p. 482). They highlighted the various mechanisms by which these geographically dispersed academic communities traditionally maintain their weak tie links, and suggest that they are an occupational group which is ideally suited to the use of interorganizational computer-mediated communication (ICMC) for the purpose of establishing and maintaining the weak ties that are necessary for community development and well being.

Research conducted by Constant *et al* (1996) provided support for the contention that weak ties provide an important substitute when strong ties fail to produce desired

information. Their research was conducted within the context of an internationally distributed organization, and involved broadcast messages requesting technical advice. They concluded that the weak tie links thus created were "useful to the degree that they put people in touch with those offering superior resources; they were not useful nor did they have a greater likelihood of solving the information seeker's problem when they were simply greater in number" (1996, p. 130). The implication of this finding is that weak ties used for information gathering are likely to be most useful when they are activated with individuals possessing particular knowledge or skills, such as senior members of an established community.

Haythornthwaite (2002) noted that whereas previous research had emphasised the use of CMC for maintaining and reinforcing strong ties, in fact the real benefit may be in the realm of weak ties, "such as inclusion and empowerment of peripheral participants" (2002, p. 387), and "providing access to a wider set of contacts" (2002, p. 388). Weak ties are used for the "primarily instrumental" exchange of information and resources (2005, p. 128) that certainly characterize academic networks. Haythornthwaite also introduced another possible tie configuration: latent ties. Latent ties are described as "a tie for which a connection is available technically but that has not yet been activated by social interaction" (2002, p. 389). Latent ties exist as possibilities within organizational, institutional, and disciplinary structures. Extrapolating from Haythornthwaite's description, a latent tie could therefore be said to include individuals working within the same occupational or professional group, who may be aware of each by name or reputation, but who have not had previous personal contact.

The concept of weak and latent ties has also been applied to an investigation of the use of e-mail to seek professional assistance by academic reference librarians (Flynn, 2005). Flynn reported that "Most believed that e-mail has made them more likely to directly contact weak ties (85 percent) and latent ties (75 percent)" (2005, p. 91), while 30.5 percent of respondents indicated that they would "regularly" or "occasionally" use email to contact a latent tie. Flynn also concluded, however, that "even a slight preexisting acquaintance makes a difference when seeking assistance via e-mail" (2005, p. 94), indicating that weak ties are an important consideration in any information seeking endeavor.

CMC and the virtual scholarly community

Recent research has also been undertaken into the use of CMC by academic and research communities; assessing its utility for the purpose of informal scholarly communication and the expansion of scholarly communities. A research project in Brazil and the United Kingdom found that the use of the Internet widened the boundaries of scholarly communities (Costa and Meadows, 1999). It found that 86.9 percent of economists and 77.8 percent of sociologists reported an expectation of "increase(d) informal communication" in a networked environment, and that 60.6 percent of economists and 56.1 percent of sociologists indicated that they expected CMC to "lead to new scholarly communities" (1999, p. 258). Costa and Meadows concluded that the key factor is "greater interactivity", resulting in "not only increased information exchange with known contacts, but also the making of new contacts" (1999, p. 261).

Walsh *et al* (2000) measured the e-mail activity of scientists and its impact on their "professional tasks" and "research tasks". They noted that there were some significant differences between subject groups within the sciences in terms of their use of e-mail

and other forms of CMC. However, when reporting on the degree of "positive change" induced by the use of CMC across twelve variables, the most positively affected was that of "Contact with scholars/professionals at other institutions", with 85.2 percent of respondents reporting a positive change. The researchers concluded that "E-mail's main function in scientific communities is to facilitate scientific communication, providing the glue for the virtual college" (2000, p. 1304). To apply network analysis terms then, the possibilities of latent ties being converted into weak or even strong ties are increased with the use of CMC.

Koku *et al* (2001) also examined the use of e-mail and its potential to overcome barriers of distance in forging scholarly relations. Although it was determined that e-mail can facilitate long distance informal communication, the strongest predictors of e-mail communication continued to be those associated with more traditional forms of informal communications, including friendship, geographic proximity and established face-to-face contact.

In order to investigate the impact of CMC on patterns of scientific work and research, Walsh and Bayma (1996) conducted interviews with 67 scientists from four disciplines. This study included an examination of the role of CMC in providing opportunities to younger scientists. Their conclusions indicated that "the lower social context clues and the informal nature of e-mail reduce the constraints on lower level individuals contacting higher level individuals"; and that "e-mail may facilitate the creation of new ties between remote collaborators and give lower status scientists the ability to query their more eminent colleagues" (1996, p. 357).

Methodology

Latent, weak and strong ties are useful concepts to describe the form and function of interpersonal communication. As such, these concepts have been applied here to enable the discussion of the survey findings below. This is not to embrace the terms and approaches uncritically or holistically, simply to see them as a useful framework through which to examine informal scholarly communication practices.This investigation is focused on the Internet and its use by academics in their scholarly communication practices.

The survey reported in this paper was undertaken at Curtin University of Technology in Perth, Western Australia, in September and October 2004. The survey population was all current academic staff and postgraduate research students (Masters and PhD) of the University. Possible respondents were contacted by using email distribution lists intended to reach all of the members of these two groups. E-mail recipients were directed to a website if they wished to complete the survey. Given the nature of this method of distribution it is not possible to know how many staff or postgraduates received notification of the survey. Curtin University currently has approximately 1300 academic staff and 1600 postgraduate students.

Recipients of the survey were informed that the research was being conducted into "the ways in which academics and postgraduates employ the Internet to establish and foster scholarly community". The survey consisted of 44 questions including demographic questions. A report of responses to other aspects of the survey is available from Genoni, Merrick and Willson (2005).

Completed surveys were received from 246 respondents; 107 (44.5 percent) from staff,

and 139 (56.5 percent) from postgraduates. Respondents identifying themselves as staff were asked to indicate their academic rank according to the levels used at Curtin University and widely elsewhere in Australia. It was hypothesized that there may be differences in the use of the Internet for contact by and with unknown scholars depending on academic rank, on the basis that a scholar's seniority is loosely equated with their eminence and profile within the broader scholarly community. This is a slightly different, though related focus, to the one offered by Walsh and Bayma (1996) above.

Table 1: Academic rank of staff respondents

Academic Rank	Total
Associate Lecturer	15
Lecturer	34
Senior Lecturer	24
Associate Professor	20
Professor	14
Total	107

Of the respondents, 135 (54.9 percent) were female and 109 (44.7 percent) male, with two cases missing. Respondents were drawn from all Divisions of the University, with 86 (39.6 percent) identifying themselves as belonging to the Humanities; 84 (34.1 percent) from the Sciences, 47 (21.7 percent) from the Social Sciences, and 29 failing to report a disciplinary affiliation.

The survey consisted of two parts. Part A collected demographic information and asked respondents about their current use of the Internet for scholarly communication purposes. Part B was to be completed by only those respondents who had participated in scholarly communication prior to the introduction of the Internet, in order that they could make assessments of the impact of the Internet on their scholarly communication practice.

Survey results

Survey results: Part A
Respondents were asked to indicate the frequency with which they used the Internet to activate latent ties by contacting scholars or research students they did not know.

Table 2: Do you use the Internet to initiate contact with scholars and research students unknown to you?

	Frequently	Occasionally	Never	Total
Postgraduate	18 (13.0)	68 (49.3)	52 (37.7)	138*
Associate Lecturer	4 (26.7)	11 (73.3)	0 (0.0)	15
Lecturer	8 (24.2)	17 (51.5)	8 (24.2)	33**
Senior Lecturer	5 (20.8)	15 (62.5)	4 (16.7)	24
Associate	5 (25.0)	15 (70.0)	1 (5.0)	20

Professor				
Professor	6 (42.9)	6 (42.9)	2 (14.3)	14
Total	46 (18.9)	131 (53.7)	67 (27.5)	244

* 1 case missing ** 1 case missing

The results indicate that many respondents do use the Internet to activate a latent tie, with 72.6 percent reporting at least occasional use for this purpose.

These results, in so far as they correlate academic rank with the likelihood of activating a latent tie, are however, inconclusive. They do record a greater number of Professorial staff using the Internet "frequently" for this purpose (42.9 percent as compared to 23.6 for other staff levels combined), but the results for staff levels below Professor are reasonably consistent.

All staff at the University are encouraged to be "research active", and may have varying need to integrate themselves into scholarly communities at different stages of their careers. Associate Lecturers and Lecturers would frequently be in their early post-doctoral careers and attempting to establish their profile and reputation. This may entail initiating contacts with identified researchers in established scholarly networks or communities. Staff of the rank Senior Lecturer and above would be expected to be part of established scholarly communities, but as they are frequently the most active researchers would often be engaged in establishing new research opportunities by activating latent ties with wider networks of scholars.

The results do indicate that Postgraduate research students are less likely to use the Internet for the purpose of initiating contact than their staff colleagues, with nearly 40 percent reporting that they "never" engage in the activity, and only 15 percent doing so "frequently". It can be speculated that the reason for this lies in their general lack of confidence in initiating contact with other, often more established scholars; or because they are engaged in a fundamentally personal research project, and do not yet feel the need to engage with a wider scholarly community. That is, although postgraduates have both technological and professional access to the organizational and institutional contexts that establish latent ties in academic communities, they are positioned differently than other academics in relation to such ties.

Respondents were also asked to indicate the frequency with which scholars or research students they did not know contacted them via the Internet. It was hypothesised that staff of more senior academic rank would be contacted more frequently than their junior colleagues.

Table 3: Is the Internet used by scholars and research students you do not know to contact you?

	Frequently	Occasionally	Never	Total
Postgraduate	20 (15.0)	58 (43.6)	55 (41.4)	133*
Associate Lecturer	2 (13.3)	12 (80.0)	1 (6.7)	15
Lecturer	5 (15.6)	21 (65.6)	6 (18.8)	32**
Senior Lecturer	7 (29.2)	16 (66.7)	1 (4.2)	24
Associate Professor	8 (40.0)	12 (60.0)	0 (0.0)	20
Professor	7 (50)	6 (42.9)	1 (7.1)	14
Total	49 (20.6)	125 (52.5)	64 (26.9)	238

* 6 cases missing **2 cases missing

The results indicate the relationship between academic rank and the frequency of contact by unknown scholars in order to activate a latent tie. Each of the five academic ranks from Associate Lecturer (13.3 percent) through to Professor (50 percent) recorded an increase in the number of such contacts that were received "frequently". Combined staff of level Senior Lecturer and above reported that 37.9 percent "frequently" received unsolicited contact, while the Associate Lecturer and Lecturer ranks reported a combined 14.9 percent for frequent contact. On the basis of these results it can be concluded that academic rank does correlate with the amount of unsolicited contact scholars receive. In other words, latent ties were more likely to be activated by those whose position in academic communities / networks was more established and presumably maintained by a greater level of pre-existing weak and strong ties.

Postgraduate students reported an occurrence of frequent contact that resembled that of the two junior academic staff levels, but they also recorded a substantially higher response (41.4 percent) indicating that they were "never" contacted in this way by scholars or research students they did not know.

Survey results: Part B

Part B of the survey was to be completed only by "those respondents who have experience of scholarly communication before the introduction of the Internet". The survey was designed in this way in order to invite comparison between traditional forms of scholarly communication and those that are enabled by CMC, with the intention of assessing whether scholars are more or less likely to activate latent ties since having access to the Internet. The numbers responding to the Part B questions ranged from 160 to 164. As would be expected, most of the "drop off" in respondents (i.e. those with no experience of scholarly communication prior to the Internet) was amongst Postgraduates.

Respondents to Part B were asked to indicate whether the Internet had affected the likelihood of them contacting a previously unknown scholar.

Table 4: Has the Internet changed the likelihood of you initiating contact with a scholar or research student personally unknown to you?

	More likely	No change	Less likely	Total
Postgraduate	53 (62.4)	25 (29.4)	7 (8.2)	85
Associate Lecturer	4 (80.0)	1 (20.0)	0 (0.0)	5
Lecturer	17 (81.0)	3 (14.3)	1 (4.8)	21
Senior Lecturer	18 (90.0)	1 (5.0)	1 (5.0)	20
Associate Professor	15 (88.2)	2 (11.8)	0 (0.0)	17
Professor	11 (78.6)	2 (14.3)	1 (7.1)	14
Total	118 (72.8)	34 (21.0)	10 (6.2)	162

Every category of respondent indicated that they were now more likely to initiate contact than they were prior to access to the Internet. This is in line with expectations, and is likely to reflect two aspects of the Internet. Firstly, individual scholars are now more "visible" due to online publishing; discipline based discussion lists and bulletin boards, and the widespread use of institutional and personal websites (see Table 7

below). Secondly, the ease of use, low cost, and generally less formal nature of CMC has reduced the time, resources and personal "emotional" investment required to initiate such contacts.

There was no significant variation by academic level for staff responding to this question, with 84.4 percent of combined staff reporting they were now "more likely" to initiate contact; 11.7 percent reporting "no change, and 3.9 percent reporting they were "less likely". The results for Postgraduate students again indicated some variation from those for staff. Postgraduates recorded both the lowest result for "more likely" (62.4 percent) and the highest result for "less likely" (8.2 percent).

Part B respondents were also asked to indicate changes in the likelihood of them being contacted by unknown scholars.

Table 5: Has the Internet changed the likelihood of you being contacted by scholars or research students unknown to you?

	More likely	No change	Less likely	Total
Postgraduate	49 (57.6)	26 (30.6)	10 (11.8)	85
Associate Lecturer	2 (50.0)	2 (50.0)	0 (0.0)	4
Lecturer	16 (76.2)	5 (23.8)	0 (0.0)	21
Senior Lecturer	18 (90.0)	1 (5.0)	1 (5.0)	20
Associate Professor	16 (94.1)	1 (5.9)	0 (0.0)	17
Professor	13 (92.9)	0 (0.0)	1 (7.1)	14
Total	114 (70.8)	35 (21.7)	12 (7.5)	161

These results indicated that all categories of respondents believe they are now more likely to receive unsolicited contact from unknown scholars. Again, this result is as anticipated, and for similar reasons as discussed above in relation to Table 4

The results strongly suggest that senior staff are more likely than junior staff to believe that their amount of unsolicited contact by other researchers has increased since the advent of the Internet. Combined, 92.2 percent of staff of the rank Senior Lecturer and above reported they were "more likely" to be contacted, compared with 72 percent of Lecturers and Senior Lecturers. The explanation for this is likely to be because the Internet visibility of senior researchers is higher than for their junior colleagues. It can also be speculated that the informal nature of e-mail has played a part, in that a communication environment with reduced status cues is more likely to entice junior researchers to activate latent ties with senior scholars.

Following from the preceding question respondents were asked to indicate whether they were now more or less likely to respond to unsolicited contacts than had been the case prior to having Internet access. In order for a latent tie to be transformed into a weak tie requires not only an initial contact between individuals but also a response to that contact. There have been a number of indications that e-mail contact is particularly effective at eliciting replies due to the ease of responding, but contrary claims have pointed out that e-mail may carry less "weight" with recipients than more traditional communication such as a letter (Hill and Monk, 2000)

Table 6: What is the likelihood of you responding to these contacts in comparison

with those you received prior to the Internet?

	More likely	No change	Less likely	Total
Postgraduate	51 (60.7)	28 (33.3)	5 (6.0)	84
Associate Lecturer	2 (50.0)	2 (50.0)	0 (0.0)	4
Lecturer	11 (52.4)	9 (42.9)	1 (4.8)	21
Senior Lecturer	12 (60.0)	7 (35.0)	1 (5.0)	20
Associate Professor	10 (58.8)	7 (41.2)	0 (0.0)	17
Professor	7 (50.0)	4 (28.6)	3 (21.4)	14
Total	93 (58.1)	57 (35.6)	10 (6.3)	160

The results reported in Table 6 indicate that there was an increased likelihood (in excess of 50 percent for each category and 58.1 percent combined) that individuals would respond to a contact from an unknown scholar. There was no significant variation between categories in terms of the likelihood that they would be "more likely" to respond.

It has been suggested above that part of the reason for the increased levels of informal scholarly communication and the activating of latent ties has been the ease with which the Internet allows scholars to be identified and located. In order to test this hypothesis, respondents were asked to indicate whether they believed that the Internet had made it easier for them to locate other scholars.

Table 7: Has the Internet has made it easier to find other scholars and peers?

	Agree	Neutral	Disagree	Total
Postgraduate	68 (76.4)	18 (20.2)	3 (3.4)	89
Associate Lecturer	3 (75.0)	1 (25.0)	0 (0.0)	4
Lecturer	17 (85.0)	3 (15.0)	0 (0.0)	20
Senior Lecturer	20 (100.0)	0 (0.0)	0 (0.0)	20
Associate Professor	15 (88.2)	2 (8.3)	0 (0.0)	17
Professor	13 (92.9)	0 (0.0)	1 (7.1)	14
Total	136 (82.9)	24 (14.6)	4 (2.4)	164

Identifying and locating possible contacts is an important part of building scholarly communities and a necessary precursor to activating a latent tie. All categories of respondents provided substantial support for the proposition that other scholars were more easily located than prior to Internet access.

It has been claimed that one of the benefits of CMC over traditional communication is that it promotes informality in a way that reduces or masks status differences between individuals. It could therefore be hypothesised that junior scholars who may be intimidated by the prospect of contacting a senior scholar if using more traditional communication may be prepared to do so using CMC. Respondents were therefore asked if they believed the advent of the Internet had made it easier to approach senior

scholars.

Table 8: Has the Internet has made it easier to approach senior scholars?

	Agree	Neutral	Disagree	Total
Postgraduate	56 (62.9)	30 (33.7)	3 (3.4)	89
Associate Lecturer	3 (75.0)	1 (25.0)	0 (0.0)	4
Lecturer	15 (75.0)	5 (25.0)	0 (0.0)	20
Senior Lecturer	17 (85.0)	2 (10.0)	1 (5.0)	20
Associate Professor	13 (76.5)	3 (17.6)	1 (5.9)	17
Professor	10 (71.4)	3 (21.4)	1 (7.1)	14
Total	114 (69.5)	44 (26.8)	6 (3.7)	164

Strong support for the proposition that the Internet had made it easier to approach senior scholars was forthcoming from each category of respondents, with 69.5 percent combined. While no significant variation was found between staff categories, the Postgraduate respondents again reported that they were comparatively less inclined to use the Internet to activate latent ties. Again it can be speculated that this is the result of the insecurity resulting from their junior status within (or at the margins of) the established scholarly community. Nevertheless, Postgraduate support for the proposition was still strong at 62.9 percent (compared to 77.3 percent for staff categories combined), indicating that they also identify the Internet as having made it easier to initiate contact with senior scholars than had been the case with traditional forms of communication.

Discussion and Conclusions

The survey questions and responses reported above attempted to assess the extent to which latent ties existing between scholars can be more readily activated by the use of CMC than was the case prior to the advent of the Internet. The data collected strongly suggests that the Internet has made it easier for researchers to locate, make contact with, and respond to contact from, scholars who were previously unknown to them.

The research outcomes also indicate that the extent to which individuals receive unsolicited contact from unknown scholars is related to their academic status, with the more senior scholars likely to attract more of such contacts (Table 3). It is also suggested by the results that the increase in unsolicited contact since the advent of the Internet has increased to a greater extent for senior academics (Table 5), although in some cases this may have led to a level of resistance to responding (Table 6). Despite the differences measured by academic level in response to some questions, it is nonetheless clear that the use of the Internet to activate latent ties is widespread and common to both junior and senior staff.

The data is therefore supportive of a conclusion that CMC has been a powerful tool for activating ties that might otherwise have remained latent. By extrapolation, it can also be concluded that the formation of scholarly communities has been significantly impacted by CMC. It is likely, based on the data, that this has been particularly the case with the introduction of new or junior researchers to more senior colleagues. Although the data is quantitative, it also has qualitative implications if it is assumed that the

activating of latent ties has beneficial outcomes for research networks and communities.

The data with regard to Postgraduate researchers indicates that they are less favoured by the availability of the Internet in so far as the activation of latent ties is concerned, but that they do nonetheless use CMC for this purpose. The key issue in this regard may be the "degree of latency" involved in the as-yet-inactivated ties. That is, a junior member of academic staff with a completed PhD, a university teaching position, and a fledgling research profile, is further progressed in terms of their integration into a research community than is a postgraduate student. This is not only a matter of profile, but also a matter of acquiring the knowledge, confidence and wherewithal necessary in order to overcome their latency and make contact with other scholars in their community.

This research project has raised a number of questions that remain unanswered. The possibility of recognizing and activating latent ties has certainly been enhanced by CMC, but whether the possibility of maintaining multiple weak ties is also enhanced or desirable is not addressed. Nor is the extent to which the weak ties that are created by the use of CMC are more or less likely to develop into strong ties than was the case prior to the Internet. The issue of degrees of latency is an interesting area worthy of investigation in terms of recognizing that "technical ability" to activate latent ties is more complex than simply technological capacity. And given that the Internet massively enhances the technical possibilities for latent ties, to what extent has CMC facilitated the social and professional interactions necessary to activate latent ties?

Such questions indicate the need to further explore the relations, ties and practices which characterize the online invisible college, and the ways we theorize social networks and virtual scholarly communities. FM

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