

e-Social Science as an Experience Technology: Distance From, and Attitudes Toward, e-Research

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Abstract. e-Social Science initiatives have been launched around the world, but little is known about their visibility and take-up across the disciplines. This paper reports on the findings of a Web-based survey designed to determine whether or not a sizeable proportion of social scientists are aware of e-research initiatives and identify the characteristics of early adopters of e-social science practices and technologies. The respondents to the survey reflected those interested in e-social science, providing some evidence of where early adoption is likely to occur, and the factors related to support for these initiatives. Early adoption and interest in e-research practices represent a wide range of methodological traditions, but those most interested in e-research tend to be among a cohort of more recent graduates of doctoral programs. Also, while there is a generally positive orientation towards the potential of e-social science among those interested in its development, many remain spectators or disengaged from new e-research practices, and, therefore, relatively uncertain of its value to the social sciences. Greater certainty and support of e-research is driven largely by proximity to e-research. This finding suggests that efforts should be increased to engage more social scientists in e-research, such as through demonstrations, training, or other ways of providing hands-on involvement. Doctoral and early career training might be the most promising targets for early efforts to engage more social scientists in e-research.

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Advances in information and communication technologies (ICTs), from the Web to the Grid, are enabling scientists and other researchers, from law and social sciences to the humanities, to transform the ways in which they do their work. These changes, in turn, have an impact on what researchers discover, with whom they collaborate, how they share their work, what methods are used to report their findings, and what know-how they require. As significant as these innovations are likely to be, there is a perception within the e-Research community that social scientists are not generally supportive of e-Research, and lack an awareness of initiatives and innovations in this area. For example, one international project, entitled Accelerating Transition to Virtual Research Organization in Social Science (AVROSS), has been formed to 'understand the reasons behind low levels of support'.¹ In fact, some proponents of e-social science are reluctant to promote e-social science more actively, given concern that many social scientists would resist technological change as threatening to existing practices and technologies that often form the basis of their present stature in the field.

To empirically explore whether these concerns have merit, we designed an approach to gauging awareness of e-Research within the social science community, and exploring the range and determinants of attitudes toward e-research.² This led us to conduct a Web-based survey that employed mailing lists, listservs, and Web sites to obtain responses from 526 individuals from the research community in the UK and worldwide.

Theoretical Expectations

An emerging perspective among academics involved in e-research is that support for e-social science could be driven largely by methodological practices. Specifically, e-research might be most directly applicable to quantitative research, and therefore find more support among quantitative social scientists, such as survey researchers, rather than qualitative researchers. That is, there is a developing, redistributive politics of e-social science, which explains attitudes toward initiatives. Those who stand to benefit most, will be more supportive.

An alternative expectation is linked to one's distance from a technology or practice. Donald MacKenzie's (1999) notion of a 'certainty trough' provides a theoretical perspective on the likelihood that proximity to e-research would be a strong factor shaping opinions about its potential. The certainty trough posits a curvilinear relationship between distance and certainty, with uncertainty being most prominent among those most and least distant from a technological innovation.

A variant on the certainty trough is the concept of an 'experience technology' in which greater proximity to a technology, such as experience with use, leads to greater certainty and trust (Dutton and Shepherd 2005, 2006). This is not in opposition to the idea of a certainty trough, but suggests that uncertainty only rises among those very proximate to an innovation, such as those on the cutting edge of innovation, who are most aware of the uncertainties. However, for most users, greater experience with use fosters more certainty.

We found that those most distant from e-research were less certain about the e-social sciences. However, those more proximate to e-research were not only more likely to have a higher level of certainty, but also a more positive view of e-social science. Rather than support a certainty trough, however, the pattern of findings lent support to e-research as an 'experience technology' in line with other research on trust in the Internet in everyday life (Dutton and Shepherd 2005, 2006).

Methods

In order to explore awareness of, and attitudes toward, e-research, we designed a Web-based survey instrument, fielded in early 2008. The online survey sought to describe the ways in which social scientists use software tools to enable research, and to measure attitudes and awareness of developments in e-Research. Among the topics covered by the survey are the use of e-research tools, such as the take-up of specific e-research tools in the social sciences, enabling us to determine the extent to which researchers are engaging in e-research, and how this shapes their attitudes. This paper reports the results of this survey that are concerned with the relationship between methodological practice and proximity to support for e-Research.

The survey was pre-tested in November 2007. From January to March 2008, the revised survey was distributed using two mechanisms.³ The first was a targeted mailing to a set of mailing lists obtained from the UK's National Centre for e-Social Science (NCeSS) (N = 615) and the Oxford Internet Institute (OII) contact database (N = 1,761). Individuals on

these mailing lists were sent personalized invitations to the survey, with a follow-up request sent approximately two weeks after the initial request only to those subjects who had not yet completed the survey (Table I).

The second distribution mechanism was a separate, generic version of the same survey that allowed anyone to complete the survey. This generic version was distributed to a number of targeted mailing lists, including the ESRC National Centre for Research Methods newsletter, the NCeSS weekly and monthly newsletters, the Cybersociety Live mailing list, the Association of Internet Researchers (AoIR) mailing list, and the American Sociological Association Communication and Information Technologies (CITASA) listserv. Recipients were also asked to forward this request to other appropriate lists. The survey received a total of 526 complete responses (Table I). There were also some additional respondents, who did not complete the survey, but 85% of people who began the survey completed at least 70% of the instrument, and these are all included in the total sample of 526. Most drop-offs were after the initial introduction, probably by those uninterested in e-Research, given the overall pattern of our findings.

Table I. Characteristics of the e-Social Science Survey Sample.

Sample Characteristics				
Source	N Sent	N Responded	Response Rate	% of sample
NCeSS List	615	141	22.9%	26.8%
OII List	1761	180	10.2%	34.2%
Open mailings	n/a	205	n/a	39.0%
Total		526		100.0%

The respondents to the survey were those most interested in e-research. For example, the NCeSS mailing list, which mainly includes individuals who have expressed an interest in following this centre and subject area, yielded a higher response rate than the OII list, which is made up of individuals with a more general interest in the societal implications of the Internet. Across the sample, when asked: ‘How would you describe your interest in e-Social Science initiatives?’; only 7 percent said they were ‘not interested at all’. This underscores the difficulty in assessing the attitudes and habits of the truly disengaged, without field interviews, as their disengagement is likely to translate into an unwillingness to complete related surveys.

In addition to being skewed towards those interested in e-social science, the sample was also predominately composed of respondents from the UK (47%), social scientists (55%), and academics who received their highest degree after 2001 (43%). The geography and disciplinary mix of responses is understandable from the survey being fielded by a UK social science unit, based on UK mailing lists. However, the relative prominence of those with recent degrees suggests a cohort of early researchers might have more interest in e-social science.

Findings

There is a general perception that the social science community lacks a sufficient level of awareness of e-social science, and that this had a braking effect on the take-up of advances in information and communication technologies as tools for social research. Are levels of

awareness, and support, related to patterns of up-take, methodological approaches, and disciplines, or to the researcher’s proximity or distance from e-research?

We sought to gauge awareness and support for e-social science through a series of questions that focused on three areas: 1) perceived impacts on the quality of research, 2) the usability of e-research tools, and 3) funding. These attitudes form the basis of indices of support and uncertainty. After describing basic attitudes toward e-research, we will describe the indexes we created to examine the relationships between fields, proximity and attitudes toward e-research.

Attitudes Toward e-Research

Table II displays the responses to four items concerning impacts on research. Generally, there is a positive attitude on the role of e-research in that respondents tend to believe that e-Research does not undermine the quality of social science research, and enhances both their personal and their team’s productivity (Table II). The greatest level of agreement (58.7%) is with the claim that ‘Many new scientific questions will require the use of e-Research tools. However, large proportions of the respondents indicate that they are uncertain about these impacts, saying they ‘don’t know’ or have ‘no opinion’.

Table II. Attitudes towards e-Research – Quality and New Tools, N = 526

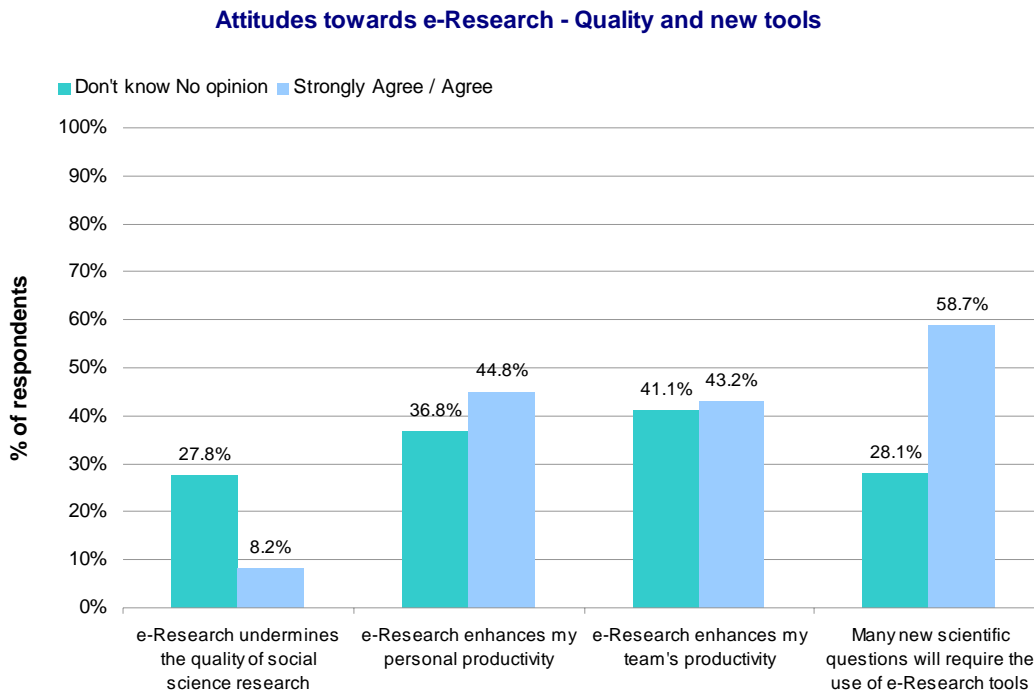


Table III indicates that there is a similar pattern of responses concerning the usability of e-Research tools. Most respondents believe that these tools are ‘already useful’ (59.9%). Less than one-fourth (20.8%) believe e-Research is ‘more hype than reality’. While very few (19.5%) believe these tools are ‘easy to use’, three-fourths (76.7%) believe that more training is needed in e-Research. Also related to usability, nearly three-fourths believe that e-Research raises ‘new ethical issues’ (Table III). As with quality, many respondents are uncertain about the usability of these tools, with fully 43% not knowing if they are easy to use (Table III).

Likewise, there is a generally positive view towards the funding of e-Research, as shown in Table IV. Given that responses to this survey are biased toward those interested in e-Research, it perhaps not surprising that only one in five respondents believe e-Research is adequately funded, and more funds should be targeted to ‘developing e-Research infrastructure’ (51.9%) and ‘supporting e-Research project proposals’ (52.4%). Nevertheless, here again, there is a high level of uncertainty, with over half of respondents not knowing whether or not e-Research is adequately funded (Table IV).

Table III. Attitudes towards e-Research – Usability, N = 526

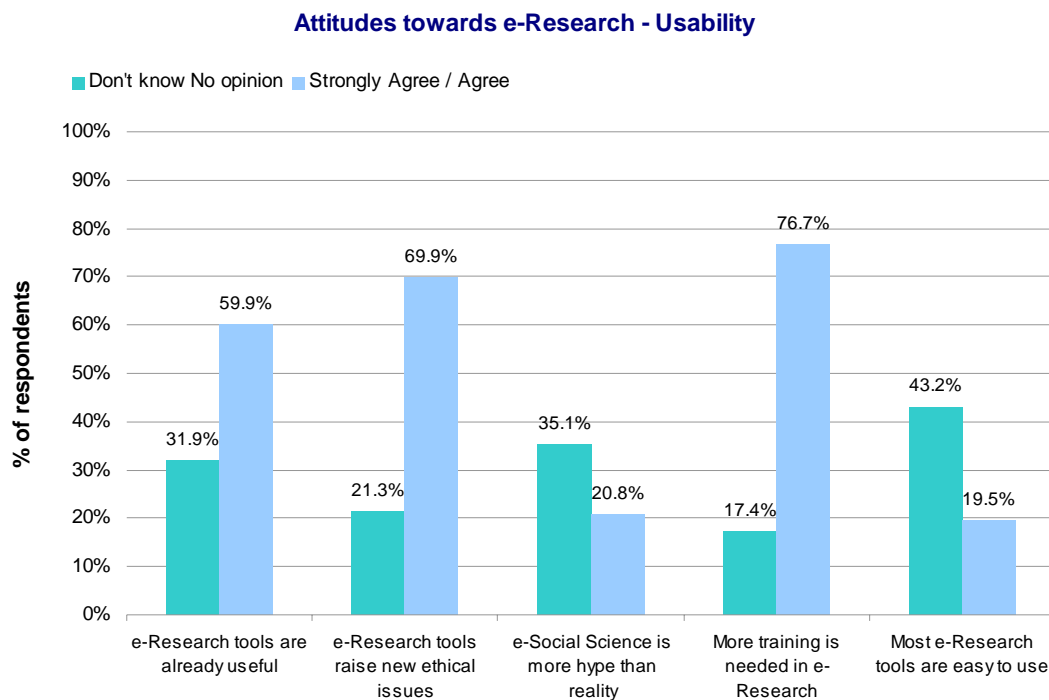
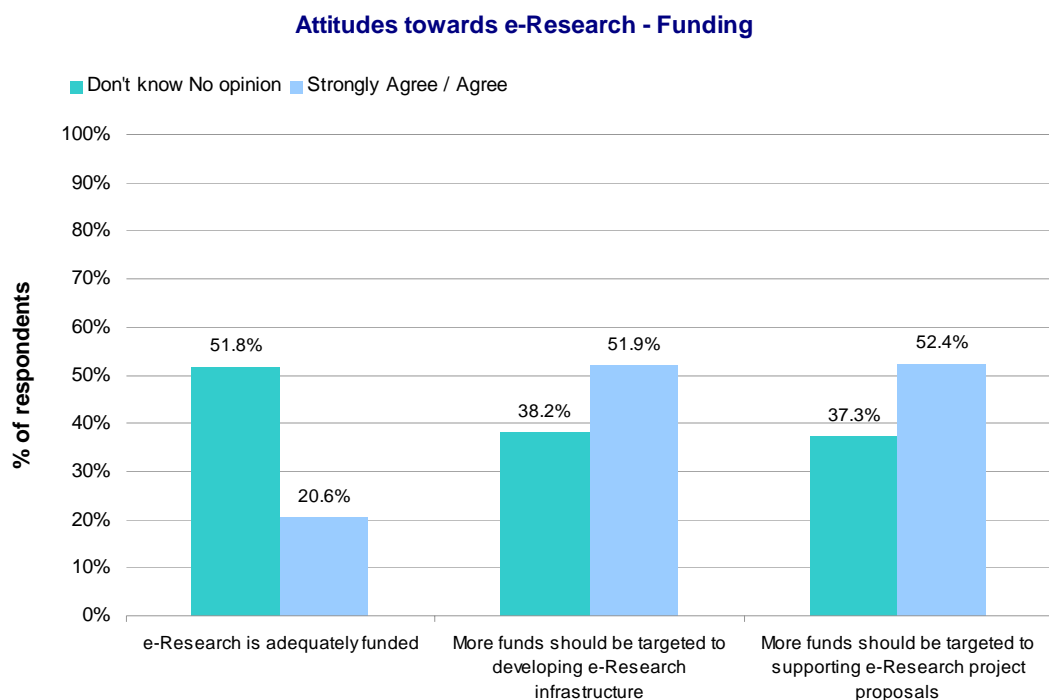


Table IV. Attitudes toward e-Research – Funding, N = 526



This general pattern of support, with high levels of uncertainty, is reinforced by a self-categorization of respondents. Respondents were asked: ‘With respect to e-social science, would you say you are a critic, sceptic, observer, enthusiast, or advocate or promoter?’ Only 7.6% of respondents said they were a critic or sceptic, which we have called ‘opponents’, while about one-third (33.3%) are promoters, saying they were an enthusiast or advocate-promoter. However, the largest proportion (43.2%) said they were an observer, which we’ve called the ‘spectators’. In short, we have found among those with an interest in e-Research, a large proportion of spectators, and a smaller proportion of promoters, with a very marginal number of opponents.

Based on these responses, we constructed two indices. The first was based on the level of support for e-Research as indicated by the number of positive responses to each of the items in Tables II-IV, except the items on ethics and the adequacy of funding, since these two items could represent support or concern with e-Research. This scale was then used to divide the respondents into those with low, moderate and high levels of support for e-Research. The second was based on the level of uncertainty, counting the number of don’t know or no opinion responses for all items in Tables II-IV, and splitting the respondents into thirds, based on whether they were relatively certain, marginal, or uncertain about e-Research.

Factors Shaping Attitudes Toward e-Research

Are attitudes being shaped by disciplinary and methodological approaches, defining a politics of e-Research, or by proximity to e-Research, as suggested by the certainty trough? To develop a summary indicator of research approaches, we conducted a cluster analysis anchored in a set of items that spanned methods (qualitative or quantitative research), skill sets (coder or user), and collaborative styles (sole researcher or one of a team). We found four types of researchers: 1) the Lone e-Researchers, who are often the sole investigator, often or always coding or designing applications, and employing a mix of quantitative and qualitative techniques; 2) the Team Players, who usually work as members of a team, develop and use e-research, and use a mix of quantitative and qualitative methods; 3) the Qualls, who are primarily users of e-Research, for qualitative research, most often as a sole investigator; and 4) the Quants, usually work as members of a team, often coding or designing their own applications, and relying more on quantitative and qualitative research (Table V). Among our respondents, the cluster analysis identified nearly a third (29.1%) of the respondents as Qualls, followed by Team Players (26.2%), Lone e-Researchers (23%), and finally, the Quants (12%).

Table V. A Factor Analysis of Approaches to Research, N = 526

	Cluster Centers			
	Cluster			
	Lone e-Researcher	Team Player	Qualls	Quants
User of research methods	0.47	0.34	0.74	0.18
Both a user and developer	0.45	0.66	0.22	0.55
Methodologist, developing or studying methods	0.08	0.00	0.03	0.27
Quantitative	0.19	0.07	0.09	0.57
Some mix of Quantitative and Qualitative	0.66	0.86	0.18	0.04
Qualitative	0.15	0.07	0.72	0.39
Never or Rarely Code or Design applications by myself	0.00	0.83	1.00	0.05
Often or Always Code or Design applications by myself	1.00	0.17	0.00	0.95
Sole investigator on all or most my projects	0.45	0.06	0.53	0.00
Sole investigator on about half	0.42	0.07	0.23	0.00
One of a team on most or all my projects	0.13	0.87	0.23	1.00

First, we found that disciplinary and methodological practices do not have a strong relationship with who uses and who does not use advanced ICTs in the research process. For example, interest in e-Research across our sample was relatively similar across a range of methods. For instance, 59% of both qualitative researchers and survey researchers were ‘interested’ or ‘very interested’ in e-Research. The methodological and collaborative approaches of researchers (Table V) help to illuminate patterns of e-research practice, but they do not account for differences in attitudes towards the diffusion of e-Research across the sciences and humanities. For example, one of the only statistically significant links between types of researchers and attitudes was that Qualls were somewhat less likely to believe that ‘new scientific questions will require the use of e-Research tools’ (48.6% of Qualls believed this was the case, compared to 65% of the Quants).

Secondly, we looked at proximity to e-Research by first developing a scale of proximity. This was constructed by creating an additive index, where respondents were given a score of 1 if they had registered to be on the NCeSS listserv, one point was added if they participated in an Access Grid meeting, and two points if they helped organize one, since the Access Grid is one e-Research tool. We also asked: ‘A number of social and computer scientists are involved in developing advanced Internet and Grid technologies to support social science research. This is sometimes called ‘e-social science. Are you aware of developments in this field?’ One point was added to their score if they said they have ‘followed’ e-social science ‘closely’, and two were added if they said ‘yes, I am personally involved in such developments’. This yielded a scale from 0-5, which was then grouped into three categories, based on their level of proximity: distant, marginal, and proximate.

Proximity is associated with support for e-Research as well as with levels of uncertainty, providing support for a variant of the certainty trough, that is, the notion of an experience technology. As Table VI shows, those most distant from e-Research are most likely to express the lowest level of support, while marginal and proximate proximity are related to higher levels of support. Thus, we are able to conclude that there is a tendency for those more proximate to be more supportive (Table VI). There is little difference in these data between the marginal and proximate categories with regard to levels of support, which may indicate that a major challenge for those wishing to extend the influence of e-Research lies in reducing the disengagement of those most distant from e-Research. Since the marginally close researchers already express similar levels of support to the most proximate researchers, it is possible that existing efforts will continue to draw both groups into support for e-Research practices at a similar rate. More distance researchers, however, may require additional effort and new approaches if they are to become more engaged in the e-Research domain.

Table VI. Proximity and Support for e-Research, N = 526

		Support by Proximity (**)			
		Proximity			Total
		Distant	Marginal	Proximate	
Support	Low support	47.5	19.2	23.5	34.6
	Moderate Support	29.4	36.4	32.4	32.2
	High Support	23.1	44.4	44.1	33.3
Total		100.0	100.0	100.0	100.0

Proximity is related also to greater certainty about e-social science (Table VII). Those most distant from e-Research are most likely to be uncertain, while those most proximate are the most certain about its implications and use (Table VII).

Table VII. Proximity and Uncertainty, N = 526

		Uncertainty by Proximity (**)			Total
		Proximity			
		Distant	Marginal	Proximate	
Uncertainty	Certain	23.1	48.3	66.2	37.8
	Marginal	28.2	32.9	23.5	29.0
	Uncertain	48.7	18.8	10.3	33.2
Total		100.0	100.0	100.0	100.0

Moreover, uncertainty is associated with being disengaged from e-social science. Both opponents and proponents of e-Research are more likely to have a higher level of certainty than are either spectators or the disengaged (Table VIII).

Table VII. Proximity and Perspectives on e-Social Science, N = 526

		Uncertainty by Perspective (**)				Total
		Perspective				
		Opponents	Spectators	Promoters	Disengaged	
Proportion of sample		7.6	43.2	33.3	9.9	
Uncertainty	Certain	40.5	19.7	68.1	8.7	37.9
	Marginal	27.0	33.7	23.5	30.4	29.1
	Uncertain	32.4	46.6	8.4	60.9	33.0
Total		100.0	100.0	100.0	100.0	100.0

Summary and Conclusion

This paper reports on an exploratory project, based on a self-selected set of respondents to a Web-based survey, rather than a random probability sample. Nevertheless, the findings are indicative of characteristics that define interest in e-research among the social science and related research communities.

Given the response to this survey, interest in e-social science seems to be greatest among more recent graduates, suggesting that the younger cohorts of researchers are the most likely to be open to new technologies and practices. Within this context, we sought to determine whether methodological practices or proximity to e-social science shaped attitudes toward e-Research, as suggested by conceptions of a certainty trough, and an experience technology. The findings suggest that methodological practices may be over-estimated, since researchers from a wide range of disciplinary and methodological perspectives were interested in e-social science. However, proximity mattered. Those most proximate, and engaged in e-research, were both more supportive of e-social science, and more certain in their beliefs. Overall, the patterns of findings support the concept of an ‘experience technology’.

These findings could help shape initiatives aimed at supporting the diffusion of e-social sciences. More exposure to initiatives in e-social science, based on these findings, is likely to reduce uncertainty and increase levels of support, beyond any increased resistance that

greater awareness might kindle. Training programmes, demonstrator projects, and more accessible information about e-social science, particularly targeted to post-graduates and young researchers could be effective.

However, more systematic research should be conducted to confirm the findings of this exploratory project. In contrast to a Web-based survey, open to particular mailing lists and users of various Web sites, it would be important to draw a systematic sample of social scientists within particular national contexts.

Acknowledgments

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Notes

1. See: <http://www.norc.org/projects/avross.htm> and Barjak et al (2007).
2. This work is one aspect of an e-Infrastructure Project of the National Centre for e-Social Science (NCeSS) conducted by the Oxford e-Social Science (OeSS) node at the University of Oxford, supported by a grant from the UK's Economic and Social Research Council (RES-149-25-1022).
3. The final survey instrument and more detailed results of the survey are available online at: <http://www.oii.ox.ac.uk/microsites/oess/survey/>.