User satisfaction and user experiences with Access Grid as a medium for social science research

[Words: 4,144]

Nigel G Fielding

Jane L Fielding

*Department of Sociology, University of Surrey, Guildford, GU2 7XH, UK
01483 686967*

*Corresponding author. Email: n.fielding@surrey.ac.uk

Notes on contributors

Nigel Fielding is Professor of Sociology and Associate Dean of Arts and Human Sciences at the University of Surrey. He co-directs the CAQDAS Networking Project, which provides training and support in the use of computers in qualitative data analysis. His research interests are in new technologies for social research, and mixed method research design. In research methodology his books include a study of methodological integration (Linking Data, 1986, Sage; with Jane Fielding), an influential book on qualitative software (Using computers in qualitative research, 1991, Sage; editor and contributor), and the Sage Handbook of Online Research Methods (2008; editor and contributor).

Jane Fielding is a Senior Lecturer in Quantitative Methods. She is interested in research methods, particularly the use of computers in quantitative and qualitative data analysis, and is currently studying the application of geographic information systems techniques to an investigation of environmental inequality. She published *Understanding Social Statistics*, (Sage 2006 with Nigel Gilbert).

User satisfaction and user experiences with Access Grid as a medium for social science research: a research note

[4,144]

Access Grid is a state-of-the-art video teleconferencing system that operates over computer networks such as the Internet. In the research sphere it has principally been used to conduct meetings of natural scientists in large international collaborations, such as physicists collaborating over the Large Hadron Collider. Social scientists have recently begun exploring the use of Access Grid to conduct 'virtual fieldwork' where researchers carry out interviews or moderate group discussions involving participants at remote sites. There have also been experiments in using AG to deliver social research methods training and to facilitate meetings between social researchers and government researchers who are collaborating on research projects. This article provides a quantitative analysis of the experiences of a sample of participants in such AG sessions. It finds a high degree of satisfaction with the technical affordances of the medium, and identifies differences in perspective according to whether a session is research-oriented or has a 'real world' purpose.

Keywords: ACCESS GRID; SOCIAL RESEARCH TECHNOLOGIES;
COMMUNICATION IN VIDEO-TELECONFERENCING ENVIRONMENTS

Introduction

Access Grid is a networked video teleconferencing application that enables images and sound to be exchanged in real time between computers (see Figure 1). Multiple cameras, projectors and microphones relay participants' images and utterances to other AG sites (each site is called an Access Grid Node or 'AGN'). There is no technical limit on how many sites can be linked. Limits on participant numbers at each site depend on room size and node configuration.

Visual output is projected onto a wall or screen. Users can vary image display size. Images from a given site will often show the whole room, the current speaker (from different angles), and a computer-generated document like a PowerPoint slide. As well as images, AGNs can dynamically display any material that can be shown on a computer screen. AGNs provide audiovisual signals without the lag of video-teleconferencing, and because participants can be displayed life size or larger, paralinguistic cues are more visible than with video-teleconferencing.

[Figure 1 about here]

Access Grid technology and social research

One of the first academic applications of Access Grid was for virtual meetings of dispersed scientists and engineers working collaboratively on large projects, such as the Large Hadron Collider. In the business world the use of AG as a meeting medium also predominates. In 2005 Nigel Fielding began work on evaluating AG as a medium for social science fieldwork (reported in Fielding & Macintyre, 2006) and, latterly, as a medium for the delivery of postgraduate methods training. This work has gathered recordings of AG sessions for one-to-one interviews involving social science and computer science students, group interviews involving social science and computer science students, group interviews involving criminal trial judges in the US and UK, a business meeting of staff of the Environment Agency, and the delivery of qualitative software training sessions, all involving remote participants communicating via Access Grid technology.

Sample of the present study

For all individual interviews, and most group discussions, opportunity and snowball samples of students from five UK Universities (and a small number of academic staff) were used. University students are easily-accessed and, at present, most AGNs are in universities. The business meeting involved team members of an Environment Agency –funded research project and their EA project managers. The training sessions involved members of the academic and research community where participants responded to an e-mail invitation to participate (see Fielding and Macintyre (2006) and Fielding (2007) for further details). In addition, a project conducted by a Linguistics researcher involving simulated police interrogations with real police officers and interpreters, and non-English speaking students playing suspects and witnesses, was made available to us. The project employed our AG

equipment, and made use of the debriefing questions we employed in our own AG fieldwork¹. See Table 1 for a breakdown of the sample and the purposes of the AG meetings in the sample.

Method of the present study

For the present quantitative analysis, and previous qualitative analyses (XXXX (2007, 2008, 2010), the AG interaction was captured on video camera(s) and verbatim transcripts were made of the audio data. Transcription and the synchronisation of video data using time stamps was facilitated using Transana 2.41² software (see Silver and Lewins (2009) for a review of this software and Woods and Dempster (2011) for an account of the program's latest functionality). Transana is especially useful in the analysis of multi-stream video where up to four video inputs can be synchronised with multiple transcripts, thus allowing analysis from various different camera angles in different locations, linked not only to the verbatim transcript, but also to a time-stamped analytic account of the interaction, a document we called the proxemic transcript.

We have thus assembled a corpus of AG recordings, transcribed them verbatim, and have latterly moved to quantitative analysis of aspects of user experiences. Whatever its purpose, each session has involved a debriefing in which participants are asked to comment on the experience of AG-mediated communication. With slight variations in question wording, response has been elicited on a standard set of a dozen main topics. The corpus of data is based on a sample that currently stands at 56 participants. This is not a large number in terms of norms for quantitative data analysis but we believe it to be the largest sample of documented AG user experiences currently available. We have restricted the statistical techniques used here to those that we regard as appropriate to sample size.

¹ We are very grateful to Dr Sabine Braun, Department of Linguistic and Translation Studies, University of Surrey, for sharing this dataset

² <http://www.transana.org/>

In order to undertake the quantitative analysis presented in this Note, a topic list was derived from the questions posed to participants in each debriefing session. Some questions were susceptible to simple yes/no/DK responses, and response to these was confined to this basic response, with counts from these data being presented here. Other questions requested reasons for the yes/no/DK response. In this case, a list was made of reasons by reading all of the relevant debriefing data. Using the list as a coding frame, all of the relevant debriefing data was then read again, and a tally was made of the number of times each reason was cited. Respondents could offer multiple reasons but the tally recorded only one citation per reason no matter how many times a given respondent cited a given reason. In addition, as a qualitative element of the analysis, statements of reasons that were distinctive in some way, or emphatic, or offered a telling example, were noted as short verbatim extracts or summarised.

This article thus presents findings relating to various aspects of AG user experiences. Our analysis finds noteworthy differences between the experiences of users participating in fieldwork sessions and users participating in AG sessions for a ‘real world’ purpose. While our previous work in this field has been concerned to develop a conceptualisation of AG-mediated communication and interaction, and has capitalised on the richness of qualitative data to do this, the largely quantitative data presented here are complementary to that conceptualisation – sharing the range and depth of the elements of the conceptualisation (to the extent that our sample size permits). We have thus chosen to frame the present account as a Note, and the analysis presented here is serviceable rather than extensive. We would hope that as use of AG for social research increases (along with associated but less sophisticated video conferencing technologies, such as Video Skype), our ‘serviceable’ analysis will serve as a suggestive set of elements of user satisfaction that can be applied to other research applications of AG and video conferencing technologies.

[Table 1 about here]

Observations from the use of Access Grid Technology

General satisfaction with the AG medium was high. Those who were not satisfied with the overall AG experience were a small minority, see Figure 2. A considerable majority were satisfied with audio quality, with the remainder expressing mixed feelings and no one dissatisfied. Half were happy with video quality, with most of the remainder having mixed feelings (a large proportion of those dissatisfied with video quality were from the simulated interrogation study; these groups routinely had high quality closed circuit digital video available to them for remote interrogation purposes).

[Figure 2 about here]

The top two points in overall satisfaction were favourable comparison to other similar media, and a feeling that AG created the illusion of co-presence. This illusion of co-presence and the comparison with face to face interaction, especially with video-conferencing communication, has been an issue in the literature. Previous research with medical professionals (Ferran and Watts, 2008) found that participants in video-conferencing sessions were more influenced by the likeability of the presenter than the arguments being presented. This was attributed to the greater cognitive load, such as that in processing lags in audio and video streams, involved in video-conferencing. This increased cognitive load, in turn is thought to reduce the mental capacity to attend to more systematic processing in favour of the more heuristic cues. It is believed that the more advanced technologies of AG communication reduce this cognitive workload, notably the absence of lag in AG-mediated communication, thus creating a more natural communication setting. Some 14 respondents commented that the AG medium was better than standard video teleconferencing, or using a webcam, or programs like Video Skype, Video MSN, or the ‘Webinar’ web-based system. These

respondents highlighted the lack of the lag associated with standard video conferencing and the sense of immediacy resulting from life-size images and high quality audio. Being able to pick up ‘body language’ was seen as an advantage over telephone conferencing. Appreciation of being able to pick up body language was prominent amongst student respondents and judges but less so amongst police officers and interpreters participating in mock interrogations, who, as noted, regularly work with a single but much larger screen with better image quality. Several participants commented that the medium encouraged focused discussion, and others felt that, where participants were previously unknown to each other, it removed stress on participants compared to face to face interaction.

The top three criticisms for those with mixed or negative feelings were about anchoring interaction in eye contact with remote participants, a preoccupation with what one respondent called ‘a Star Trekkish’ environment, and being distracted by seeing a screen with one’s own image (however, this can be addressed by simply closing this screen). Several respondents had felt that their body language needed to be exaggerated to convey points over distance but realised during the session that this was unnecessary.

[Figure 3 about here]

Looking at those who found the technology distracting (figure 3), one interesting feature is that in highly interactive situations, like business meetings or teaching sessions, some found it hard to know how to interrupt, in other words, how to take the floor. Eight participants reported feeling this way. We think this relates to the eye contact point. Good technical set-up and preparation can address this problem. Indeed, the reason cited by five participants for being distracted was image break up and a further six complained of a stiff neck due to the main screen in two sessions being projected at the top of the projection wall. It is not just good practice but essential to put technicians at the different AG sites in contact before a session to ensure good camera and microphone positioning and network connectivity

(once this is done technician help is not needed in AG sessions themselves as the equipment is easy to operate). Moreover, six of the eight participants who were preoccupied with the technology reported that this receded within a few minutes. As one put it, ‘once you’re in the guts of the interview you don’t notice any more’ (for further discussion of this point based on an earlier, qualitative analysis of the debriefing data, see XXXXX 2010). Five participants nevertheless felt that the technology inhibited the achievement of rapport, with uncertainty about whether remote interactants had eye contact with oneself also being cited by five participants.

[Figure 4 about here]

Figure 4 suggests that the co-presence idea comes with pros and cons. Moreover, in this display of most often-cited reactions to feeling the illusion of co-presence, two are flatly contradictory – some think that this could be a good medium for research on sensitive topics, others think the opposite. One interesting observation by those who saw AG as a good medium for sensitive research topics was that the medium was empowering for disabled people, anorexics, and others with body image issues who could just be shown in head and shoulders profile. The category of those who did not think AG was suited to sensitive work included all the police officers and criminal trial interpreters. They all said that AG would be acceptable for interrogations relating to low and medium seriousness crime but not crimes like rape or murder, and that it would be better for routine court-related work (like Plea and Direction Hearings) rather than the main trial. This is in fact consistent with present practice in the UK Ministry of Justice’s experiments with ‘virtual courts’.

Four participants felt that the ‘Star Trekkish kit’ could be made less unsettling by having a brief familiarisation session, and five others made the same suggestion but without the hyperbole. We should note here that all of our participants received a pre-session pack via e-mail with a several page document explaining AG (including photos of AG suites), an

explanation of the substantive purpose of the session, and an indication that there would be a debriefing about the experience.

The largest single category of response regarding co-presence was that it was good to have images that were life size because it prompted engagement; nine respondents gave this reason. Five participants cited the advantage of not having to travel to conduct or participate in fieldwork, with most noting that it made international comparative fieldwork realistically possible. Four participants felt that where participants were already known to each other the medium encouraged a more business-like approach than in face-to-face meetings. Seven participants said that the multi-mode facility (participant display, document or whiteboard display) was particularly useful. All of these respondents had participated in a teaching session or the business meeting.

[Figure 5 about here]

We asked whether respondents would in future prefer a face to face interview, meeting, or teaching session, or whether they would prefer AG. We very much expected face-to-face to be the preferred option. The data in Figure 5 tell us the opposite. A major factor was the avoidance of having to travel to participate in a research or teaching session, cited by 17 participants. Note that this question was not asked of the simulated interrogation sample.

Of those who preferred a face to face session, five cited camera shyness/awareness (with two saying that it was an issue for them that what one said was more obviously linked to one), but seven cited problems in seeing the whole of the other participants' bodies (their hands, eyes and 'posture', the latter concern being that they were curious whether another participant was writing notes). Six had been uncertain about what was happening at the remote site; this related to interruptions by people who entered the suite in-session and were off-camera. Two felt it was easier to lie or be evasive, or indeed to simply walk out of the

session, but seven felt that the AG removed stress when discussing sensitive topics or giving evidence in court or participating in a job interview, and six thought that the life size images promoted engagement.

An interesting observation that was specific to participants in teaching sessions was that they wanted more camera coverage and clearer images so they could see how other participants were reacting to what was being presented by the lecturer. The idea was that in co-present teaching, students scan each others' expressions before deciding whether to ask a question; if others seemed to 'get it' as regards the point the lecturer was making they would ask their question privately after class. The point particularly applied to being able to scan the expressions of those in the same suite as themselves and may therefore be about the cognitive burden of maintaining attention to the remote lecturer (and Powerpoint screen) while trying to see how classmates were reacting. The lecturer herself reported feeling that the sessions had been less 'interactive' than equivalent co-present sessions, although she also felt it was something that would change with experience.

[Figure 6 about here]

Figure 6 suggests that people using AG for a real world purpose like a business meeting or police interrogation are more likely to be satisfied with the medium than the student sample participating in research interviews. This sub-sample comprised either social science students or computer science students. We surmise that they may be sensitised to evaluating different modes and media due to the focus of their academic disciplines and thus sustain attention to these considerations whereas the 'real world people' need to focus on what they see as the main purpose of the proceedings.

[Figure 7 about here]

Figure 7 shows the top reasons cited by those in the research and real world groups who were dissatisfied with the AG medium. While several factors diminished the AG

experience for the research group, the real world group felt the only limiting factor in a comparison with meeting face to face was a lack of training or familiarisation.

The preference for not having to travel expressed by several participants was further explored in the sub samples (note that the police/interpreters sample were not asked this question). Figure 8 below shows that there were interesting differences between the two groups regarding how much time they were prepared to travel in order to attend an AG meeting. More than two thirds of those with a “real world” purpose for the meeting were prepared to travel up to 60 minutes to attend an AG meeting, compared to only a quarter of the research participants. The remainder of the research participants did not know how far they were willing to travel.

We would speculate that perhaps this consideration depends on a balance of costs and benefits. For the real world participants they would gain time and money and a lower carbon footprint by travelling shorter distances to attend meetings or training sessions and they judged these benefits to outweigh the loss of face-to-face interaction.

A further factor here is the provision of a modest incentive to participate in the research. All participants in these AG sessions (except the EA business meeting members) were offered book tokens, retail store tokens or Tesco vouchers as incentives to participate. Perhaps for the research participants it was the tokens that attracted their participation and the issue of travel time to attend did not figure in their decision as to whether to participate, because they anticipated that this was likely to be a one-off experience.

[Figure 8 about here]

This issue of incentive to participate was further explored in Figure 9 where it was surprising to find that over half of the real world participants were attracted by the new technology compared to only a quarter of the research participants. In addition, nearly a half

of the research participants expressed the view that neither the topic of discussion nor the technology was a factor in their participation. The latter position may perhaps reinforce the speculation above that the incentive payment was an attractive factor. For the interview and group discussion sub-sample, the topic of the main part of the interview (which preceded the debriefing) was issues relating to bearing witness in a criminal trial. The group discussion sub-sample also included two judges, one a State Circuit judge in the USA and the other a presiding judge at an English crown court. The two judges were particularly enthusiastic about AG. This is interesting in the context of the current Home Office experiments with ‘virtual courts’.

[Figure 9 about here]

In previous work evaluating AG interaction (e.g., XXXXX 2008), we have developed a concept of ‘engagement’ as a means by which to evaluate AG-mediated interaction and communication. This concept led us to focus on some basic interactional and communication features and to address gains and deficits when comparing AG-mediated and conventional fieldwork. This qualitatively-based work led us to the conclusion that participants were generally able to develop a working rapport sufficient to participate effectively in research fieldwork via AG. This was not done without instances of difficulty, but we would observe that the same applies to any fieldwork. Fieldwork is never an effortless achievement. The present quantitative analysis has both pursued some of the facets of ‘engagement’ with more precision and provided a clearer sense of patterns in participants’ subjective experience of the AG medium. Some of these patterns are surprising; we certainly would not have expected such a generally positive assessment of the medium by participants when we first embarked on fieldwork via AG, a view anticipated by Patrick (2001).

In our assessment the data that was forthcoming from the substantive stage of the interviews and group discussions was commensurate with what we would expect to derive

from fieldwork delivered via conventional face-to-face interviews and group discussions. Similarly, the testimony of the participants in the Environment Agency business meeting, the simulated interrogations, and the software training sessions was that these sessions had largely delivered what they would have expected to have achieved in their conventional face-to-face equivalent. A benefit of AG is that by producing a complete audiovisual record of the proceedings, where there are lapses in communication their effects can be explored in detail, both in the course of analytic work and if interpretations are queried by other researchers. Initial apprehension of an unfamiliar setting seemed to result in participants' displaying very attentive behaviour, often fixating on the screen images. That this appeared to relate to the format and content of the discussion as well as the technology was apparent in our general observation of a distinct change of demeanour in the second half of sessions, the debriefing. An attentive, upright posture, with body orientation direct to the display wall, was often apparent during the first part of the session. In the debriefing, posture relaxed, demeanour was informal, and verbal responses more conversational. Such transitions are widely-remarked in the methodological literature on conventional fieldwork (XXX 2008).

Most participants were only initially affected by camera-awareness. A minority were conscious of self-image throughout, but we also noted that the small number seriously affected were nevertheless not inhibited from saying so in debriefing. Such concerns can be addressed by offering reassurance and encouragement, reiterating the right to restrict viewing of recordings, and practical measures like unobtrusive camera positioning.

It remains an important qualification that the participants in our sample are not 'ordinary members of the public'. Students, judges, police interrogators and criminal trial interpreters are educated and highly articulate groups. We fully acknowledge these features, which make the sample distinctive. However, the AG fieldwork, and the present evaluation, suggests that people are flexible and adaptable, and such qualities are not confined to the

educated and highly articulate. People can cope well with new technology provided they are afforded ways of relating it to a format with which they are familiar. The interview and group discussion format is such a commonplace of our culture – either by direct experience or by viewing such interactions on television and listening to them on the radio – as to provide most ordinary culture-members with a grounding in the implicit rules that organise interaction in such formats. This is to the great advantage not only of any fieldworker seeking research information using these techniques but of fieldworkers whose efforts are mediated by a new technology such as Access Grid.

References

- Ferran, C. and Watts, S.(2008) Videoconferencing in the Field: A Heuristic Processing Model *MANAGEMENT SCIENCE* 54: 1565-1578, DOI: 10.1287/mnsc.1080.0879.
- Fielding, N. and Macintyre, M. (2006) Access Grid Nodes in Field Research. *Sociological Research Online*, 11. doi:10.5153/sro.1570. Retrieved from <http://www.socresonline.org.uk/11/2/fielding.html>.
- XXXXX. (2007). New Technologies, New Applications: Using Access Grid Nodes in Field Research and Training: Full Research Report.ESRC End of Award Report, RES-149-25-1005. Swindon: ESRC
- XXXXX. (2008) Grid Computing and Qualitative Social Science. *Social Science Computer Review*, 26, 301-316. doi:10.1177/0894439307310822
- XXXXX. (2010) Virtual Fieldwork using Access Grid. *Field Methods*, 22, 195-216. doi:10.1177/1525822X10374277
- Silver, C. And Lewins,A. (2009) Transana review. QUIC Working Papers Number 6. Retrieved from <http://www.surrey.ac.uk/sociology/research/researchcentres/caqdas/resources/workingpapers/> Date accessed: 27 /4/11.
- Patrick, E., J (2001). Barriers to Collaboration: User-Centred Research and the Access Grid, *Motorola Labs Research Report*.
- Woods, D., and Dempster, P. (2011) Tales From the Bleeding Edge: The Qualitative Analysis of Complex Video Data Using Transana. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, North America, 12, jan. 2011. Available at: <http://www.qualitative-research.net/index.php/fqs/article/view/1516/3119>. Date accessed: 27 /4/ 2011.

Figure 1 Access Grid session

Table 1 Sample of respondents and purpose of AG interaction

Debrief Sample	No. of participants	Purpose of AG interaction	Totals
Individual AG interviews	9	Research	27
UK & US Judges	2	Research	
Group interviews	16	Research	
Qualitative software training sessions	14	Real World	29
Business meeting	4	Real World	
Police interrogations: interpreters	8	Real World	
Police interrogations: police officers	3	Real World	
	56		56

Figure 2: General satisfaction with AG interaction

Figure 3 Whether the AG Technology was distracting

Figure 4 Comparison with physical co-presence

Figure 5 Preference for AG or interview in person

Figure 6 General satisfaction with AG and whether technology distracting: comparing “research” and “real world” purpose of AG sessions

Figure 7 Comparison with physical co-presence: comparing “research” and “real world” purpose of AG sessions.

Figure 8 Distance prepared to travel: comparing “research” and “real world” purpose of AG sessions.

Figure 9. Incentives to participate: comparing “research” and “real world” purpose of AG sessions.