

Communication Apprehension and Participation in Videoconferenced Meetings

John A. Campbell

Information Systems and Management Science
Faculty of Commerce and Management
Griffith University
Logan Campus
Nathan 4111
Australia
j.campbell@mailbox.gu.edu.au

Abstract

Communication technologies are becoming increasingly important in organizational communication. However, many users indicate that they are apprehensive about using these new mediums for routine communication. This study draws on media choice theory to assess the impact of communication apprehension and participation on perceptions of task characteristics and media traits. The findings show that user aversion to videoconferencing has a significant impact on perceptions of task and media. A significant interaction was also detected between user apprehension and participation relating to perceptions of communication richness. It was found that perceptions of communication richness vary considerably for the high apprehension group depending on whether they have had recent exposure to the medium.

Keywords

organizational communication, user apprehension, media selection, videoconferencing, task traits, media characteristics

ISRL Categories

AA01, AD04, DC, DD02, HA1101

INTRODUCTION

Many people are not comfortable with their level of competence with new communication technologies. (Scott and Rockwell 1997). A popular view is that these people are apprehensive about using communication technologies because they have little understanding of the technologies or how to use them effectively (Booth-Butterfield and Cattone 1991, Martinsons and Chong 1999). This uneasiness is an important consideration concerning the effective use of organizational communication technologies, as apprehensive individuals will avoid feared technology when given the choice (Okebukola *et al.* 1992). Despite this, user apprehension is one factor generally overlooked when assessing the effectiveness of new communication technologies.

Communication apprehension is a fear or anxiety about actual or anticipated communication with other people, and is an individual trait related to the psychological constructs of shyness and reticence (McCoskey 1984). Communication apprehensive individuals usually adopt avoidance and withdrawal behaviour and therefore are less likely to engage in oral communication (Scott and Rockwell 1997). Hence, communication apprehension should

cause aversion toward communication technologies that make oral communication more convenient such as in audio and videoconferencing. However, unlike the users of other oral communication technologies, videoconferencing participants are more acutely aware of their self-image and of the potential for the system to disseminate an unfavorable image to others (Storck and Sproull 1995, Webster and Hackley 1997). This is of particular concern as the managerial use of videoconferencing is increasing rapidly as organizations become more global in focus and less hierarchical in structure (Kydd and Ferry 1994, Hart *et al.* 1995).

This research investigates the simple and main effects of communication apprehension and participation on user perceptions of task and media characteristics in a videoconferencing context. Because of the exploratory nature of the study, no pre-specified associations between any of the study variables are proposed. The following section identifies and describes the variables relevant to the study.

THEORETICAL BACKGROUND

User Apprehension and Participation

User aversion to new technologies is often viewed as a systems analysis and design issue that is best addressed at the implementation stage where users are desensitized to new technologies and applications by participation in practice sessions and formal training (Lucas 1978, Lee and Bohlen 1997). This perspective assumes that the anxiety and apprehension are removed once users gain sufficient experience using the technology. This view is supported by empirical evidence concerning user acceptance of microcomputer technologies (Igbaria 1993). However, with communication apprehension, there is evidence that experience alone does not totally alleviate all concerns as individuals may also be averse to the communication task as well as, or in addition to, the communication technology (Weil *et al.* 1990, Rosen *et al.* 1993). The literature reports that these anxious users tend to be less self-confident, display poor cognitive processes, and are perceived by other participants as inattentive and poor communicators (Allen and Bourhis 1996).

User apprehension towards communication technology may significantly reduce individual and organizational effectiveness. This aversion could create dysfunctional communication patterns with significant performance costs for organizations and detrimental career implications for individuals (Okebukola *et al.* 1992, Scott and Rockwell 1997). Managers also need to be aware of the difficulties caused by user discomfort as user apprehension plays a critical role in the success of new technologies. Unfortunately, the literature focuses on the causes of anxiety rather than its effect on communication and performance so little is known about the actual impacts.

User apprehension and discomfort connected with participation in videoconferenced meetings is an important aspect of privacy theories (Storck and Sproull 1995, Webster 1998). The literature suggests that user apprehension and anxiety about using a technology is partly caused by the heightened level of self-awareness felt by many users and can lead to less confident communicators (Stone and Stone 1990). Users consistently report a strong concern for dignity and the respect of their peers when using communication technologies. Unlike other information technology applications that provide some degree of privacy and anonymity, participation in videoconferenced meetings can make some people self-conscious about their on-screen appearance and performance. This self-consciousness is often very noticeable and is an impediment for many users.

Task and Media Characteristics

Videoconferenced meetings differ from face-to-face meetings in (1) the level of conflict and misunderstanding; (2) the structure of meetings; (3) task focus - the number of interruptions and distractions during meetings; (4) problem complexity and the degree and frequency of group interaction; (5) sociability - the degree of social presence supported by the medium and (6) communication richness - how easily participants are able to develop a shared understanding and consensus (Campbell 1997). Each of these factors reflects a different aspect of the media and task trait theories associated with the media selection literature (Carlson and Davis 1998). Meeting conflict, structure, task focus and problem complexity reflect different task characteristics while sociability and communication richness reflect different media traits. These factors are discussed in more detail in the following sub-sections.

Task Characteristics

Conflict is concerned with the incidence of misunderstandings, interjections and conflict between group members. There is considerable evidence in the literature that groups using electronic communication systems have more difficulty in achieving consensus than face-to-face groups (Dennis *et al.* 1988, McGrath and Hollingshead 1993). Videoconferencing does not have the capacity to support meetings involving arbitration between conflicting viewpoints (McGrath 1984). This has been confirmed in empirical studies that have examined the suitability of videoconferencing for different communication activities (Kydd and Ferry 1994, Campbell 1998).

Meeting structure is concerned with the degree of structure enforced on meetings by the technology. It is believed that electronic meeting systems enhance participation by providing structure, allowing some processes to be performed in parallel, and preventing conflict and the domination of the group by a few individuals (Konsynski *et al.* 1992, McLeod 1992, Benbasat and Lim 1993). The structure imposed by videoconferencing technology also encourages better planning and preparation by participants (Campbell 1997).

Task focus is concerned with the number of interruptions and distractions experienced during videoconferenced meetings. While videoconferencing constrains interaction between participants and enforces structure, the same constraint also encourages greater task focus which can lead to higher quality outcomes and higher user satisfaction (Svenning and Ruchinskas 1984). During videoconferenced meetings there is an increase in meeting formality which reduces group tolerance of outside distractions and interruptions.

Problem complexity is concerned with the level of complexity that can be supported by videoconferencing including the depth and frequency of group interaction. Problem complexity relates to the level and depth of interaction required to solve the task at hand (McKeen and Smith 1996). The problem complexity aspects concerning videoconferencing relate to the scope and scale of the meetings, the number and diversity of meeting participants, meeting frequency, and the size of meeting agendas. As problem complexity increases, the inflexibility of videoconferencing systems causes meetings to become more difficult to manage.

Media Traits

Sociability is concerned with the informal interaction between participants and is of central focus in the theories of media richness (Daft and Lengel 1984, 1986) and social presence (Short *et al.* 1976). The social presence and media richness theories have provided important models that have been used to predict media choice and usage behaviours. Both perspectives

recognize that sociability is an important factor in communication and that different communication media support different levels of social presence. The social presence provided by a communication medium is determined by user perceptions about the socio-emotional similarity of that medium to face-to-face conversation. There is a general consensus within the literature that as bandwidth narrows, the communications channel becomes less suitable for complex social interactions and interpersonal communication (Rice and Williams 1984). In videoconferencing, compared with face-to-face meeting environments, the feeling of contact or social presence is lessened and communication is likely to be described as less friendly, impersonal, business-like and task oriented (Williams 1978, Rogers 1986).

Communication richness is concerned with the ability to overcome misunderstandings and individual differences within videoconferenced meetings and to converge towards a shared understanding. Communication richness refers to the communication enactment processes that allow participants to develop the coherent and shared meaning necessary to complete the task at hand (Markus 1994, Lee 1994). Communication systems capable of supporting only lean information will inhibit the free flow of communication, reduce meeting effectiveness, and discourage participation. In videoconferenced meetings, the flow of information exchanges between participants is often slower and less spontaneous than in traditional meetings (Svenning and Ruchinskas 1984, Gowan and Downs 1994). Participants have consistently indicated that the cognitive workload is higher for videoconferenced meetings than for face-to-face meetings (O'Connaill *et al.* 1993).

METHOD

The objective of this study is to assess the relationship between user apprehension and participation, and with perceptions about the characteristics of task and media. The success of videoconferencing systems are firmly linked to the attitude of users, and the emphasis on user perceptions in this study recognizes the sovereignty of user attitudes in determining system usage (Davis 1989, Adams *et al.* 1992). It is the attitude of users that provides the strongest indicator of system effectiveness and success (Zmud 1979, Webster and Trevino 1995, Guimaraes and Dallow 1999).

Although public videoconferencing facilities are generally accessible and relatively inexpensive to hire, the impact of the technology on organizational communication is most evident where in-house facilities exist. Therefore, the survey was conducted using a sample of the in-house videoconferencing system users in the Brisbane office of an Australian government department. The reliability and validity of the survey questions was established through pre-testing on a sample comprising four managers and four academics all specializing in information systems.

Task and media traits were measured using a thirty-item instrument developed by Campbell (1997). Participation was measured by referring to actual system usage. Unlike many other information technology applications, participation in videoconferenced meetings is a conscious act that can be easily recalled with great accuracy. The simple measure used here was the number of videoconferenced meetings each user participated in during the four weeks preceding the survey.

User apprehension was measured with a modified version of an instrument developed by Reinsch *et al.* (1990). The original instrument was designed to measure apprehension towards telephone usage but was easily adjusted to reflect a videoconferencing context.

Analysis

The survey instrument was distributed to the 125 office staff who had experience with the in-house videoconferencing facilities. Eighty completed survey forms were returned, providing a 64 per cent response rate. All data were assessed for violations of the assumptions of multivariate analysis. Because of unacceptable skewness in the usage data (a skewness statistic greater than 3 standard errors), each survey response for this variable was re-coded to create a dichotomous variable reflecting whether the individual had participated in *any* videoconferencing session during the four weeks preceding the survey.

The relationships between the variables were initially explored through correlation analysis. The study employed a 2x2 factorial design to investigate how perceptions of task and media were affected, including interaction effects, by communication apprehension and participation. The apprehension scores were re-coded as a dichotomous variable using the median value to discriminate between the high and low apprehension respondents. The acceptance level for all tests was set at $p \leq .05$.

RESULTS

Correlations and factor reliabilities of all variables are displayed in Table 1. There are significant negative correlations between user apprehension and meeting structure, problem complexity, sociability and communication richness. However, there were no significant correlations between participation and any of the study variables.

Table 1. Correlations and reliabilities for the study variables

Variables	1	2	3	4	5	6	7	8
1. User apprehension	(.96)							
2. Participation	.16	(NA)						
3. Conflict	-.02	.20	(.67)					
4. Meeting Structure	-.24	-.11	.04	(.78)				
5. Task focus	-.21	-.07	.40	.35	(.85)			
6. Problem complexity	-.24	-.14	.23	.48	.51	(.73)		
7. Sociability	-.33	.12	.50	.20	.43	.42	(.88)	
8. Communication richness	-.55	.05	.23	.50	.40	.56	.63	(.91)

Notes: All correlation coefficients with absolute values $> .22$ are significant at $p < .05$ or lower

Cronbach's alpha for each study variable is displayed in parenthesis

NA means not applicable

The results of the MANOVA tests are shown in Table 2. The results indicate that there is a multivariate main effect attributable to communication apprehension but not to participation. Univariate analyses were also performed between each of the categorical variables (apprehension and participation) and the task and media trait variables. For communication apprehension, perceptions of the high and low groups differed in their perceptions of problem complexity, task focus, sociability and communication richness. Not surprisingly, low apprehensive users viewed these aspects of videoconferenced meetings more favorably than their more apprehensive colleagues did. Interestingly, univariate tests between the level of participation and the task and media variables revealed that the more recent participants felt that videoconferenced meetings involved a higher level of conflict than face-to-face meetings.

Table 2. MANOVA tests of simple and main effects for apprehension and participation with univariate *F*-ratios of task and media characteristics

Dependent Variables	Apprehension <i>F</i> _(6,71) =5.34**	Participation <i>F</i> _(6,71) =1.43	Apprehension x Participation <i>F</i> _(6,71) =2.47*
Conflict	.14	6.31*	.12
Meeting structure	3.42	.01	0
Task focus	8.52**	.55	0
Problem complexity	5.41*	.15	2.48
Sociability	6.67*	2.47	1.14
Communication richness	27.46**	1.43	9.40**

Notes: *N* = 80 for the combined groups, 38 for Low Apprehension, 42 for High Apprehension

* *p* < .05

** *p* < .01

The results also revealed a significant interaction between participation and communication apprehension. Univariate analysis revealed that recent participation in videoconferenced meetings influences perceptions about communication richness. The communication richness values for different levels of participation and apprehension are presented in Figure 1. The graph indicates that the groups are differentially affected by the two conditions. Regular use by high apprehension individuals results in more positive perceptions about the richness of the videoconferencing medium. While, in contrast, low apprehension individuals without recent exposure to using the technology appear to over-rate the richness of the medium.

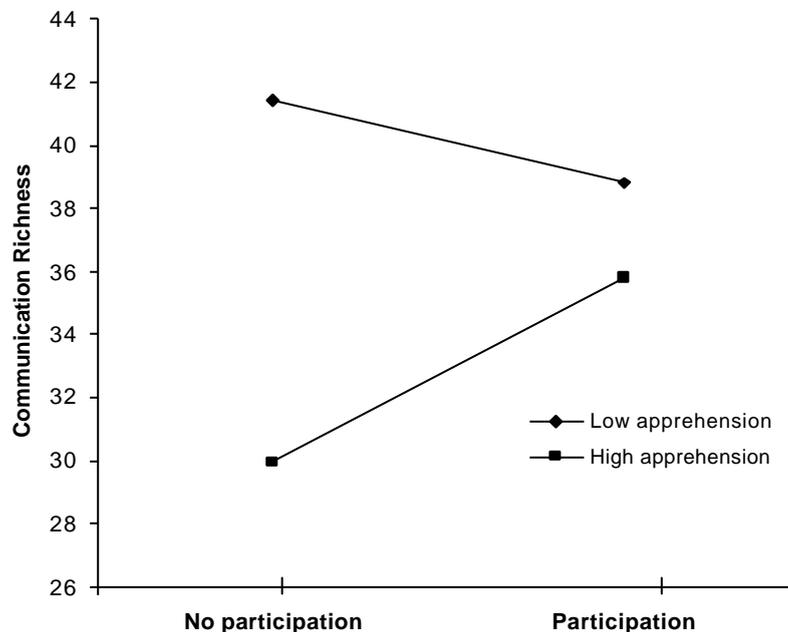


Figure 1. Mean communication richness scores for apprehension types (low and high apprehension) on level of participation during the four weeks preceding the survey

DISCUSSION

This study has explored the impact of communication apprehension and participation on user perceptions of task and media characteristics in a videoconferencing context. The findings indicate that the media richness and social presence aspects of media choice theory are important considerations for videoconferencing users. User aversion and discomfort in videoconferenced meetings has the potential to reduce not only user satisfaction, but also perceptions of meeting processes and performance. This study provides valuable insight into the importance of medium experience and user apprehension in organizational communication.

The findings of this study have significant consequences for practitioners and researchers in the field of organizational communication. System developers often over-emphasize the advantages of using information technology while underestimating the importance of creating systems that are easy to use and capable of supporting communication richness. In the implementation of videoconferencing systems, careful consideration must be given to developing implementation strategies that boost self-confidence and reduce user apprehension and anxiety about using the technology. These strategies must incorporate approaches beyond training programs offering only hands-on experience, and should include counseling and other constructive techniques for overcoming personal anxiety and improving communication effectiveness.

This study used data from a single site within one organization thus significantly reducing the external validity of the findings. Despite this shortcoming, the research context did provide significant benefits. First, use of the in-house videoconferencing facility was long established in the organization and the employees had no vested interests in the success or otherwise of the technology. Second, as the study focused on one site only, the findings should not have been confounded by the existence of different social perspectives on the medium (Carlson and Davis 1998). Third, field research into the effects of videoconferencing technology is scarce. This analysis provides a valuable insight into the role of videoconferencing technology in organizational communication.

A number of measures were used in this study to measure the variables of interest. While the reliabilities of most measures were within acceptable limits, some items would benefit from further development. Future research should also address ways in which videoconferencing technology can be made more compatible with the structure, culture and the overall objectives of the host organization and its users. Greater consideration should also be given to gaining a better understanding of the interaction between technological and human factors, and whether attitudes toward videoconferencing are uniformly developed across organizational boundaries and within other organizational contexts.

REFERENCES

- Adams, D.A., Nelson, R.R. and Todd, P.A. (1992) Perceived Usefulness, Ease of Use, and Usage of Information Technology: A Replication, *MIS Quarterly*, 16, 227-247.
- Allen, M. and Bourhis, J. (1996) The Relationship of Communication Apprehension to Communication Behaviour: A Meta-Analysis, *Communication Quarterly*, 44, 214-226.
- Allen, M., Hunter, J.E. and Donohue, W.A. (1989) Meta-Analysis of Self Report Data on the Effectiveness of Public Speaking Anxiety Treatment Techniques, *Communication Education*, 38, 54-76.
- Benbasat, I. and Lim, L. (1993) "The Effects of Group Task, Context, and Technology Variables on the Usefulness of Group Support Systems: A Meta-Analysis, *Small Group Research*, 24, 30-462.
- Booth-Butterfield, S. and Cattone, R.R. (1991) Ethical Issues in the Treatment of Communication Apprehension and Avoidance, *Communication Education*, 40, 172-179.
- Campbell, J. (1997) The Impact of Videoconferenced Meetings on The Pattern and Structure of Organizational Communication, *Singapore Management Review*, 19, 77-93.
- Campbell, J.A. (1998) Participation in Videoconferenced Meetings: User Disposition and Meeting Context, *Information and Management*, 34, 329-338.
- Carlson, P.J. and Davis, G.B. (1998) An Investigation of Media Selection Among Directors and Managers: From "Self" to "Other" Orientation, *MIS Quarterly*, 22, 335-362.
- Daft, R.L. and Lengel, R.H. (1984) "Information Richness: A New Approach to Managerial Information Processing and Organizational Design" in B. Straw and L.L. Cummings (eds.), *Research in Organizational Behaviour*, 6, JAI, Greenwich, 191-233.
- Daft, R.L. and Lengel, R.H. (1986) A Proposed Integration Among Organizational Information Requirements, Media Richness, and Structural Design, *Management Science*, 32, 554-571.
- Davis, F.D. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, *MIS Quarterly*, 13, 319-340
- Dennis, A., George, J.F., Jessup, L.M., Nunamaker, A. and Vogel, D. (1988) Information Technology to Support Electronic Meetings, *MIS Quarterly*, 12, 591-618.
- Gowan, J.A. Jr. and Downs, J.M. (1994) Video Conferencing Human-Machine Interface, *Information and Management*, 27, 341-356.
- Guimaraes, T. and Dallow, P.K. (1999) Empirically Testing the Benefits, Problems, and Success Factors for Telecommuting Programmes, *European Journal of Information Systems*, 8, 40-54.
- Hart, P., Svenning, L. and Ruchinskas, J. (1995) From Face-To-Face Meeting to Video Teleconferencing: Potential Shifts in the Meeting Genre, *Management Communication Quarterly*, 8, 395-423.

- Igbaria, M. (1993) User Acceptance of Microcomputer Technology: An Empirical Test, *Omega*, 21, 73-90.
- Konsynski, B.R., Stohr, E.A. and McGee, J.V. (1992) *Information Systems and Decision Processes*, IEEE Computer Society Press, Los Alamitos, California.
- Kydd, C.T. and Ferry, D.L. (1994) Managerial use of Videoconferencing, *Information and Management*, 27, 369-375.
- Lee, A.S. (1994) Electronic Mail as a Medium for Rich Communication: An Empirical Investigation Using Hermeneutic Interpretation, *MIS Quarterly*, 18, 143-157.
- Lee, D.R. and Bohlen, G.A. (1997) "Influence Strategies of Project Managers in the Information-Technology Industry", *Engineering Management Journal*, 9, pp.7-14.
- Lucas, H.C. (1978) Empirical Evidence for a Descriptive Model of Implementation, *MIS Quarterly*, 2, 27-41.
- Markus, M.L. (1994) Electronic Mail as the medium of Managerial Choice, *Organization Science*, 5, 502-527.
- Martinsons, M.G. and Chong, P.K.C. (1999) The Influence of Human Factors and Specialist Involvement on Information Systems Success, *Human Relations*, 52, 123-152.
- McCoskey, J.C. (1984) "The Communication Apprehension Perspective" in J.A. Daly and J.C. McCoskey (eds.) *Avoiding Communication: Shyness, Reticence, and Communication Apprehension*, Sage Publications, Beverly Hills, California, 13-38.
- McLeod, P. (1992) An Assessment of the Experimental Literature on Electronic Support for Group Work: Results of a Meta-Analysis, *Human-Computer Interaction*, 7, 257-280.
- McGrath, J.E. (1984) *Groups: Interaction and Performance*, Prentice Hall, Englewood Cliffs.
- McGrath, J.E. and Hollingshead, A.B. (1993) "Putting The Group Back in Group Support Systems: Some Theoretical Issues About Dynamic Processes in Groups with Technological Enhancements" in L.M. Jessup and J.S. Valacich (eds.) *Group Support Systems New Perspectives*, Macmillan Publishing Company, New York, pp. 78-95.
- McKeen, J.D. and Smith, H.A. (1996) *Management Challenges in IS: Successful Strategies and Appropriate Action*, Wiley & Sons, Chichester.
- O'Connaill, B., Whittaker, S. and Wilbur, S. (1993) Conversations Over Video-Conferences: An Evaluation of the Spoken Aspects of Video-Mediated Communication, *Human-Computer Interaction*, 8, 389-428.
- Okebukola, P.A., Sumampouw, W. and Jegede, O.J. (1992) The Experience Factor in Computer Anxiety and Interest, *Journal of Educational Technology Systems*, 20, 221-229.
- Reinsch, N.L. Jr., Steele, C.M., Lewis, P.V., Stano, M. and Beswick, R.W. (1990) Measuring Telephone Apprehension, *Management Communication Quarterly*, 4, 198-221.
- Rice, R.E. and Shook, D. (1990) Relationships of Job Categories and Organizational Levels to Use of Communication Channels, including Electronic Mail: A Meta-Analysis and Extension, *Journal of Management Studies*, 27, 195-229.

- Rice, R.E. and Williams, F. (1984) "Theories Old and New: The Study of New Media" in R.E. Rice (ed.) *The New Media: Communication, Research and Technology*, Sage Publications, Beverly Hills, California, 55-80.
- Rogers, E.M. (1986) *Communication Technology: The New Media In Society*, The Free Press, New York.
- Rosen, L.D., Sears, D.C. and Weil, M.M. (1993) Treating Technophobia: A Longitudinal Evaluation of the computerphobia reduction program, *Computer in Human Behaviour*, 9, 27-50.
- Scott, C.R. and Rockwell, S.C. (1997) The Effect of Communication, Writing, and Technology Apprehension on Likelihood to Use New Communication Technologies, *Communication Education*, 46, 44-62.
- Short, J., Williams E. and Christie, B. (1976) *The Social Psychology of Telecommunications*, John Wiley, London.
- Stone, E.F. and Stone, D.L. (1990) "Privacy in Organizations: Theoretical Issues, Research Findings, and Protection Mechanisms", in G.R. Ferris (ed.) *Research in Personnel and Human Resources Management*, 8, JAI Press, Greenwich, 349-411.
- Storck, J. and Sproull, L. (1995) Through a Glass Darkly: What Do People Learn in Videoconferences, *Human Communication Research*, 22, 197-219.
- Svenning, L.L. and Ruchinskas J.E. (1984) "Organizational Teleconferencing" in R.E. Rice (ed.) *The New Media: Communication, Research, and Technology*, Sage Publications, Beverly Hills, California, 217-248.
- Webster, J. and Trevino, L.K. (1995) Rational and Social Theories as Complimentary Explanations of Communication Media, *Academy of Management Journal*, 38, 1544-1572.
- Webster, J. (1998) Desktop Videoconferencing: Experiences of Complete Users, Wary Users, and Non-Users, *MIS Quarterly*, 22, 257-286.
- Webster, J. and Hackley, P. (1995) Teaching Effectiveness in Technology-Mediated Distance Learning, *Academy of Management Journal*, 40, 1282-1309.
- Weil, M.M., Rosen, L.D. and Wugalter, S.E. (1990) The Etiology of Computerphobia, *Computers in Human Behaviour*, 6, 361-379.
- Williams, E. (1978) Teleconferencing: Social and Psychological Factors, *Journal of Communication*, 28, 125-131.
- Zmud, R.W. (1979) Individual Differences and MIS Success: A Review of the Empirical Literature, *Management Science*, 25, 966-979.

COPYRIGHT

John A. Campbell © 1999. The author assigns to ACIS and educational and non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The author also grants a non-exclusive licence to ACIS to publish this document in full in the Conference Papers and Proceedings. Those documents may be published on the World Wide Web, CD-ROM, in printed form, and on mirror sites on the World Wide Web. Any other usage is prohibited without the express permission of the author.