December 2004

The Measurement of Perceived Social Usefulness

Bonnie Glassberg
Miami University

Varun Grover
Clemson University

James Teng
University of Texas at Arlington

Follow this and additional works at: http://aisel.aisnet.org/amcis2004

The Measurement of Perceived Social Usefulness

Bonnie C Glassberg, Ph.D.
Miami University, Oxford, OH
glassbbc@muohio.edu

Varun Grover, Ph.D.
Clemson University
vgrover@clemson.edu

James T. C. Teng, Ph.D.
University of Texas at Arlington
jtteng@uta.edu

ABSTRACT

IS research into technology acceptance has concentrated on the use of technologies for enhancing work performance. Web technologies, however, can be used as the means to gain access to new knowledge, engage in entertainment activities and get involved in communities of interest. Firms have begun to recognize human needs for socialization and are adding forums and chat rooms to their websites. These social interactions provide opportunities for participating in events, learning new ideas and establishing or enhancing one's social identity. For these reasons, a new construct is needed to study the motivation to use technology for intrinsically satisfying social activities. This research describes, operationalizes and rigorously validates a new construct, termed Perceived Social Usefulness, following Churchill's paradigm for scale development. This measure can aid researchers in the quest for richer explanations of consumer behavior involving technologies not strictly intended for the accomplishment of work.

Keywords

Construct, scale development, measurement, social usefulness, survey, technology acceptance

INTRODUCTION

More individuals than ever before are surfing the Internet to fulfill a variety of social, personal and business needs. While the Internet shines as a way to enhance economic benefits for many firms, the real value of the internet will come from providing people with the ability to interact with one another, from satisfying their multiple social needs as well as their commercial needs (Armstrong and Hagel, 1996). Early in its development, scientists used the Internet to collaborate and share data. This created a strong sense of community which is evident today. Armstrong and Hagel (1996) advise that competing on the Web will require considerable efforts at building customer loyalty. This includes providing social entertainment activities, not just current information and transaction capabilities. Recent studies on Web usage indicate that a whopping 90% of respondents are using email, one third are playing games and a quarter of them indicate they have used chat rooms (SIQSS, 2000). People get in involved in surfing and chatting not just from their homes. On the week before Valentines Day, 2.7 million people at work spent time visiting and ordering gifts, cards and flowers (Neilson/Net Ratings, 2004). Another 3.8 million employees went to a personals site during the same week, hoping to find that special someone. Recognizing this trend, web-based businesses, such as Amazon, have added message boards, rating services and chat facilities to their sites. Some studies also indicate that socialization patterns are shifting (SIQSS, 2000). The longer a person has been on the Web, for example, the more hours they use it. The more hours they are online, the less time they in spend in personal contact with friends and family or attending events outside the home. It is not a surprise therefore that people would use the Internet for socializing, but it is remarkable that few measures exist to study this phenomenon. This research describes, operationalizes and rigorously validates a new construct, termed Perceived Social Usefulness, that can be used to understand social use of technology. Literature from psychology, quality of life studies and information systems provide the theoretical support for the new construct. Statistical analysis from two pilot tests (n=178, n=192) are presented and the results of the final test (n=202) of the survey instrument including reliability, validity and measurement modeling are discussed. Suggestions for potential uses of the measure and future research plans are discussed.

LITERATURE REVIEW

There are many theories that suggest individuals have inherent drives to engage in social activities. Discussed first are theories of *Individual Needs and Human Behavior*. Then *Quality of Life* literature will be presented to identify the types of life goals that individuals seek to achieve above and beyond the needs for daily subsistence. Studies from media are presented to identify factors which may influence the way consumers *view* the Web environment Finally, research on technology acceptance, which utilize Perceived Useful as one of its main constructs, is covered.

Abraham Maslow's *Hierarchy of Needs Theory* (1954) suggests that individuals are motivated to perform certain behaviors in response to needs that arise. These needs appear as individuals grow older, or in response to one's economic or situational environment. Lower order needs (physiological, safety and belongingness) emerge from an individual first, and must be satisfied before that individual begins to address higher order needs (esteem and self-actualization). Belongingness Needs consider that individuals express the desire for love, affection and acceptance. Clayton Alderfer (1969) also maintained that humans have strong desires to interact with other people and he calls these Relatedness needs. According to his ERG theory (Existence, Relatedness, Growth), the need for interaction is a strong motivator of behavior. The *Need for Affiliation*, (Schachter, 1959) motivates people to form friendships, to nurture, empathize and help others. It can be described as the desire for companionship, for reassurance and approval from others. Individuals with a high need for affiliation would be most likely to enjoy environments which provide a lot of human interaction.

From a social perspective, Quality of Life (QOL) was first addressed by looking at the standard of living in different societies. Affluent and economically developed societies were seen to offer the potential for a better life, including availability of material and health resources (Shostrom, 1963). People from other cultures (Porter, 1961), not used to economic wealth, envision success in terms of access to higher levels of consumption. It is the availability of choices, and settings conducive to learning, rather than the actual exercise of those options that makes people happy (Ger, 1997). Other QOL studies looked at the quality of one's personal relationships or one's place in the social fabric of society: Personal Orientation (Porter, 1961); Satisfaction with Life (Ger, 1997; Porter, 1961; Cantril, 1965; Shostrom, 1963); Purpose in Life (Shostrum, 1963); Having a happy family life (Crumbaugh & Maholick, 1968); QOL within a society (Leak, Millard, Perry, & Williams, 1985); and States of Alienation (Dean, 1961; Efraty and Sirgy, 1995)

Media Studies suggest that the World Wide Web provides a unique and involving experience. This phenomenon has been called "telepresence" (Steuer 1992) or "social presence" (Daft and Lengel, 1986),meaning the extent to which media possesses or cues that incorporate a sense of social interaction. Media richness" (Daft and Lengel, 1986) is also used to describe communication channels, but it refers to the capacity of a medium to change understanding. Rich media would be expected to provide for immediate feedback, multiple cues, personalization and language variety. In a similar vein, Fortin (1997) and Hoffman and Novak (1996) identified the interactivity of a medium as an important construct in understanding mass communication.

The three major models are discussed in the technology acceptance literature: Theory of Reasoned Action (TRA), the Theory of Planned Behavior (TPB), and the Technology Acceptance Model (TAM). TRA attempts to explain how beliefs are translated into intentions, which ultimately affect actual behavior (Ajzen and Fishbein, 1970). TPB (Ajzen, 1991) suggests that a person's intent to perform a certain behavior is based on three determinants: (1) their attitude toward performing the behavior, (2) any perceived social pressure towards performing it and (3) their perception that they have the ability and resources needed to perform the behavior (perceived behavioral control). Intention to perform the behavior can then be used to predict actual performance. TAM (Davis, 1985) has been widely used in organizational settings to predict the likelihood of acceptance of a wide range of systems, software packages and personal computers. Its focus was to primarily predict usage of IT in organizations. TAM posits that individuals develop attitudes toward technology based on: (1) the perceived usefulness of the technology on the job and (2) a subjective appraisal of the degree to which the technology is easy to use. Characteristics of the system or external variables are expected to influence both Perceived Usefulness and Perceived Ease of Use. Perceived Usefulness can have a direct effect on behavioral intent (BI) and BI has been shown to have a significant impact on usage. The new construct discussed in this paper is similar in nature to the Perceived Usefulness construct in TAM, although the TAM construct specifically looks at the usefulness of technology to enhance job performance.

In sum, these studies suggest that Web technology is fulfilling a social role for a lot of Web participants, one that would normally be fulfilled by the geographical community in which one resides. Closeness, companionship and a sense of

community are some of the social needs people have, and many are already using the Web to fulfill these needs. The interactive environment also lets people experiment with or build upon their social identity. For these reasons, a new construct is needed to study the motivation to use Web technology for purely social activities. The new construct, termed Perceived Social Usefulness, will thus be defined as the "degree to which an individual believes that using a particular technology would enhance his or her social identity."

METHODOLOGY

Prior research on technology acceptance suggests that survey methodology is appropriate when focusing on the individual as the unit of analysis. Researchers should follow a prescribed set of steps in the development and testing of survey instruments in order to ensure that the results are (1) reliable and valid in representing the domain of interest and (2) are not artifacts of the measurement instrument (Sethi and King, 1991; Straub, 1989; Churchill (1992). The first step is to conduct a thorough literature review to specify the domain of each construct. The second step is item creation, where existing scales are identified and then evaluated. New items may be generated where there is a gap in the literature. (Moore and Benbasat, 1991 recommend that the scale first be reviewed by a panel of judges. The instrument is then pilot tested on a representative sample of the target population using conditions similar to those anticipated during actual data collection. Then, each new measure is purified to identify items which may exhibit measurement error or not share in the core of the construct. Reliability and validity testing are performed to ensure that all areas of the domain of interest are covered and the items truly measure what they are supposed to measure.

The population of interest for this research and the qualifications they should possess will now be described. The ideal candidates for this study should fulfill all these requirements: be computer literate, have minimum exposure to a Windows environment and, have current access to a computer with Web capability. College students strongly represent the target population of interest for these activities as they are likely to be away from family or childhood friends during the school year. The use of the Internet for entertainment and chatting purposes is also on the rise for this age group.

Specify the Domain of the Construct

A general literature search was conducted using the following resources: refereed journals, books, dissertations, conference proceedings, online publications. Based on this information the construct, Perceived Social usefulness (SUSF) covers several theme areas as shown in Table 1. Identity changes and role playing allow an individual to pretend to be someone else, practice being someone they would like to be, or just gain feedback in order to enhance their communication ability. Sharing ideas and gaining feedback are ways one tests out and develops new social relationships.

Concept	Previous Research in this Area
Sharing ideas Provides feedback	Bandura 1982; Steuer 1992; Martocchio & Dulebohn 1994; Fortin 1997; Constant, Sproull & Keisler 1996
Part of the "in" crowd. Be whoever I want to be Feel important.	Kraut, Scherlis, Mukhopadhyay, Manning, & Kiesler 1996; Ger 1997
Join the Extended community. Be virtually anywhere	Armstrong & Hagel 1995, 1996;
New experiences	Kettinger and Grover, 1997
Enhances communication	Lee 1994; Daft & Lengel 1986
Closeness to others Reduces loneliness	Maslow 1962: Sirgy et al. 1995 Steuer 1999; Steuer 1992; Efraty & Sirgy 1995
Enhances image with peers	Moore and Benbasat, 1991

Table 1: Summary of Social Usefulness Concepts

Generation of Items

Pertinent scales were reviewed for their coverage of content material and psychometric properties. In this case, where scales do not exist, a pool of items must be generated to cover the domain of the construct. Researchers (Moore and Benbasat, 1991) have also recommended that scales be pre-tested. This process is designed to gauge the understandability and appropriateness of the questions asked, and clarify the content of the items. To capture the richness of the SUSF construct, a set of twelve items was first generated. A 7-point Likert measurement was applied to the scale with endpoints ranging from "strongly disagree" to "strongly agree". To help with the item improvement process, a panel of judges consisting of two MIS faculty members and four doctoral candidates evaluated the questionnaire. They provided feedback regarding the instrumentation, readability, and formatting. Additionally, five undergraduate students were asked to complete the instrument with the researcher present and the initial set of items was further refined. The set of 12 items that resulted from this process can be seen in Table 2.

Using the web prevents me from feeling lonely.
Using the web brings me closer to other people.
Using the web gives me the feedback I need..
Using the web improves my ability to communicate with people.
Using the Internet prepares me to join the global community.
Using the web gives me the opportunity to enhance my image with my peers.
Using the web lets me be whoever I want to be.
Using the web makes me feel important.
Using the web lets me experience new places and meet new people.
My communication on the web is enhanced because people can't see me.
Using the web gives me the opportunity to share my ideas with others.
Using the web keeps me from being left behind the crowd.

Table 2: SUSF Items used for Pilot Test 1

Purification of the Scale

Next, the additional steps to purify the instrument are described and the results presented. There are two pilot tests and a final data sample.

Pilot Test 1

Human subjects identified for the preliminary testing were a convenience sample of 178 lower level undergraduate students enrolled in introductory MIS courses, at a major state university in the South. To ensure that the scale would be clearly focused and understood by the widest possible audience, the progression of scale development started with undergraduates and moved up the educational ladder with successive data collections. Lower level undergraduates vary widely in their skills, knowledge and experience, and this variance helped in being able to clarify the wording, content and general layout of the survey instrument.

Using the web prevents me from feeling lonely.	LONELY
Using the web brings me closer to other people.	CLOSER
Using the web gives me the feedback I need from others.	FEEDBK
Using the web improves my ability to communicate with people.	COMM
Using the web prepares me to join the global community.	JOIN
Using the web gives me the opportunity to enhance my image with my peers.	IMAGE
Using the web lets me be myself.*	BEME
Using the web makes me feel important. *	FEEL

* These items later dropped before final study..

Table 3: SUSF Items used for Pilot Test 2

Cronbach Alpha for SUSF Scale (standardized) = .8813			
Scale Item	**Corrected Item-Total Correlation**	**Squared Multiple Correlation**	**Alpha if Item Deleted**
FEEDBK	.7086	.5560	.8594
IMAGE	.7053	.5491	.8597
CLOSER	.6898	.5665	.8613
BEME	.6259	.4565	.8680
COMM	.6208	.4566	.8692
JOIN	.6164	.4397	.8691
FEEL	.6034	.6034	.8703
LONELY	.6021	.4632	.8706

Table 4: Coefficient Alpha for SUSF

Pilot Test 2

One hundred and ninety-two upper level undergraduates enrolled in introductory MIS classes, at a major research university in the Northeast, were utilized for the second pilot test of the instrument. Sixty-four percent of the subjects were male and 36% were female. An initial pass of the SUSF scale to assess reliability, indicated that all items exhibited reasonable item-to-total correlation ($>.60$). Further analysis using measurement modeling (the first step of structural equation modeling) showed that two items continued to be unstable as indicators for this domain ("lets me be myself" and "makes me feel important"). A review of the literature suggests that these two items may be more highly linked to creative endeavors and self-efficacy concerns, respectively, rather than to improving one's social identity. These were not used for the final survey instrument. Through a rigorous purification process (feedback obtained from the panel, first and second pilot test), the number of items was reduced to a more parsimonious set of 6 items having a standardized reliability of .8453 See Table 5).

Cronbach Alpha for Scale (standardized) = .8453			
Scale Item	**Corrected Item-Total Correlation**	**Squared Multiple Correlation**	**Alpha if Item Deleted**
SFEEDBK	.7043	.5378	.8042
SCLOSER	.6673	.4941	.8121
SCOMM	.6583	.5178	.8143
SIMAGE	.6643	.4533	.8144
SJOIN	.6192	.4586	.8215
SLONELY	.4531	.2702	.8508

Table 5: Scale Reliability for SUSF

FINAL TEST OF THE INSTRUMENT

In all, a total of 202 usable responses were obtained form subjects enrolled at part-time MBA programs from three research-oriented universities on the east coast completed the survey. Before pooling the data from the three groups, an analysis of variance (ANOVA) was conducted for mean differences, as recommended by Neter, Wasserman and Kutner (1990). The Scheffe Method of multiple comparison was used as the group sizes were not equal. Means were compared for respondents on three items: age, sex and education level. The results indicated that none of the three groups was significantly different from the others on these criteria. Accordingly, the data was pooled for final statistical analysis resulting in a sample size of 202.

The final sample of subjects, as anticipated, was considerably older (average age of 31) as compared to that used in the pilot testing (Pilot 1 = 20.6 years, Pilot 2 = 22 .0 years). These subjects also were predominately male (72.3%) and employed (90.1%) either full-time or part-time. Subjects had an average of over eight years of full-time and close to two years of part-time work experience. On a scale of 1 to 7, they rate themselves above average in their computer experience (5.41) and knowledge about the Web (5.06).

First, reliability and internal consistency for this set of measures was assessed. Item-to-total correlations ranged from .4531 to .7043. SLONELY detracted from this group of indicators at .4531. The statistical analysis indicated that dropping this item would increase the reliability of the scale slightly. The low value as compared to other items suggests that this item does not correlate well within the domain even though literature supports the notion that individuals are joining communities at a record pace to keep in contact with family and friends.

The next step was to perform measurement modeling to see if these items adequately represent the Perceived Social Usefulness construct. Amos, a structural equation-modeling package supported by SPSS, was used for this analysis. The initial goodness of fit indicators (GFI = .922, AGFI = .818) were at acceptable levels. The Root Mean Square Residuals (RMSR) at .169 was rather high. The smaller the RMSR is, the better. A RMSR of zero indicates a perfect fit. The P-value (.000) was not within the expected limits ($\geq$.05) and should have been higher. The adjusted Chi-Square statistic, derived by dividing the Chi-square amount by the degrees of freedom, suggested the model was a poor fit at 5.229. In general, the lower the adjusted Chi-Square value, the better the fit of the model. Typically, this statistic will range from 1 to 5, with 1 being the desired statistic.
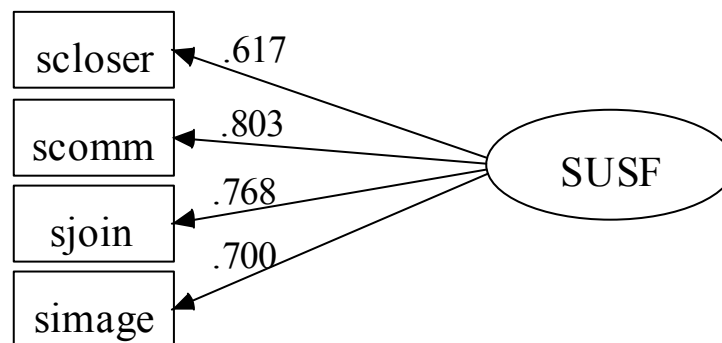

Figure 1: SUSF Measurement Model Results

A further review of the results of measurement modeling indicated that SLONELY displayed a high variance and had the lowest loading factor of any item in the scale (.457). This item showed a high correlation with both SCOMM and SCLOSER. It makes sense that people seek closeness with others if they are lonely and tend to increase the use of communication medium to fulfill these social needs. As the loneliness factor was preserved adequately by the other two items, dropping SLONELY did not affect the coverage of the social domain significantly. In addition, modification indices revealed that two items, SCLOSER and SFEEDBK, were highly correlated. Both items also displayed high residual error indicating a lack of consistency in these measures. A review of the literature suggested that feedback can help in the learning process and gives a person the feeling they are involved in a two-way exchange. This item, however, had clinical connotations while the SCLOSER item more pertinently described the affective motivation for social use. Feedback, therefore, might be just as important for personal growth as for social usefulness. The SLONELY and SFEEDBK indicators were eliminated and a four-indicator model was estimated. Results from the reduced set of items resulted in a much improved fit (see Figure 1) for this measurement model (Adjusted ChiSq = 1.042, GFI = .995, AGFI = .974, RMR = .046 and p-value = .35). The Adjusted ChiSq value dropped to an excellent 1.04, and the residuals also dropped considerably to .046. The P-value of .35 indicated that the items in the second measurement model cover the domain well.

Overall, the Composite Factor Reliability for this 4-item scale was .8149, well exceeding the recommended level of .70 (Segars, 1997). The Average Variance Extracted is also strong at .5263, where >.50 is the desired level. These results suggest that these four items adequately represent the Social Usefulness construct.

DISCUSSION AND LIMITATIONS

This research has provided a new tool for our understanding of social factors which motivate users to accept multifunctional technologies into their daily lives. Such an endeavor is worthwhile, but is not without its limitations. Certainly there may be other facets of this construct that are not conceptualized here. A second limitation is the selection of the sample frame for this study. The ideal sample frame included individuals who were computer literate, had previous exposure to the technology, and had access to it. While MBAs were not necessarily representative of the population as a whole, these subjects were not only likely to have access to Web technology at school, but also were also more able to afford the purchase of a home computer. . Researchers are cautioned, however, as to the generalizability of the findings. These subjects merely represent one limited segment of society. Future studies should endeavor to include new population groups, including teenagers, non-working adults and senior citizens. Subjects who are novices to computers or who have not been exposed to Web technology can be contrasted with those who consider themselves more Web savvy. This study also did not attempt to control for the extent of computer experience or extent of Web knowledge.

IMPLICATIONS FOR RESEARCH

IS researchers have learned much from other reference disciplines and this trend should continue. This study adapted theories and constructs from social psychology, quality of life and media to build a theoretically based construct suitable for studying multi-functional, computer-mediated technologies. Virtual communities of interest and knowledge intensive sites are being formed and serve to supplement and enrich the quality of people's lives. As researchers, it is important to focus on why these new technologies are being selected. Individual use can change over time, so a person may start out using the Web for educational purposes and then, later on, begin using it for socializing. Socialization may require the assimilation of a new technology, such as Instant Messaging or IRC. Interesting research questions arise from these observations. Do different people view the same technology the same way? What types of motivations lead to the most satisfaction to new users? Do perceptions of Usefulness change over time?

The SUSF scale designed for this study needs to be validated further by other researchers and with new sample populations. It can be tested separately or in conjunction with other technology acceptance constructs when an appropriate target audience or technology is identified. For example, if a telephony technology is chosen for study, the social usefulness scale may be of premier importance. If a researcher wishes to study the reasons seniors use Web technology, this instrument can be employed to provide new knowledge in this area. Businesses may be able to identify and target certain groups based on their needs profiles. .

Overall, this research has attempted to define and validate a scale to measure Perceived Social Usefulness, filling a void in the IS literature stream on technology acceptance. The methods used to here capture and analyze the data were outlined following recommendations by well-known researchers practicing scale development. Two full pilot tests and a final data collection study were used to purify the instrument and establish both reliability and construct validity. While Davis (1985) characterized Perceived Usefulness as extrinsic, work-related motivation, the Perceived Social Usefulness scale looks at intrinsically satisfying social behavior as motivation. In addition, the Perceived Usefulness construct implicitly considers social values and norms, while this scale provides the opportunity to capture these perceptions explicitly. Finally, the new scales should aid researchers in their quest for richer explanations of software use.

REFERENCES
1. Alderfer, C.P. (1969) An Empirical Test of a New Theory of Human Needs. *Organizational Behavior and Human Performance* 4, 2, 142-175.
2. Armstrong, A. and John Hagel, I (1995) Real Profits from Virtual Communities. *The McKinsey Quarterly* 3, 126-141.
3. Armstrong, R. and Hagel, J. (1996) The Real Value of On-Line Communities. *Harvard Business Review* May-June, 134-141.
4. Bandura, A. (1992)Self-Efficacy Mechanism in Human Agency. *American Psychologist* 37, 2, 122-147.
5. Cantril, H. (1965) *The Pattern of Human Concerns*, Rutgers University Press, New Brunswick, NJ.
6. Churchill, G.A. (1992) *Marketing Research*, The Dryden Press, Hinsdale, IL.
7. Constant, D., Sproull, L. and Keisler, S. (1996) The Kindness of Strangers: The Usefulness of Electronic Weak Ties for Technical Advice. *Organization Science* 7, 2, 119-135.

8. Crumbaugh, J.C. and Maholick, L.T. (1968) Cross-validation of Purpose-in-Life Test Based on Frankl's Concepts. *Journal of Individual Psychology* 24, 74-81.

9. Daft, R.L. and Lengel, R.H. (1986) Organizational Information Requirements, Media Richness and Structural Design., Management Science, 32, 5, 554-571.

10. Davis, F.D. (1985) A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results. Ph.D. Thesis, Massachusetts Institute of Technology.

11. Dean, D.G. (1961) Alienation: Its Meaning and Measurement. *American Sociological Review* 26, 753-758.

12. Efraty, D. and Sirgy, M.J. (1995) Occupational Prestige and Bureacratization Effects on the Spillover between Job Satisfaction and Life Satisfaction: Reconceptualization. In *New Dimensions in Marketing/Quality-of-Life Research*, M. J. Sirgy and A. C. Samli (Ed.), Quorum Books, Westport, CT, 253-265.

13. Fortin, D.R. (1997) The Impact of Interactivity on Advertising Effectiveness in the New Media. Ph.D. Thesis, University of Rhode Island.

14. Ger, G. (1991)Human Development and Human Consumption: Well-being Beyond the "Good Life". *Journal of Public Policy & Marketing* 16, 1, 110-125.

15. Hoffman, D.L. and Novak, T.P. (1996) Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundations. *Journal of Marketing* 60, 3, 50-68.

16. Kettinger, W.J. and Grover, V. (1997) The Use of Computer-Mediated Communication in and Interorganizational Context. *Decision Sciences* 28, 3, 513-555.

17. Kraut, R., Scherlis, W., Mukhopadhyay, T., Manning, J. and Kiesler, S. (1996) The HomeNet Field Trial of Residential Internet Services. *Communications of the ACM* 39. 12, 55-63.

18. Leak, G.K., Millard, R.J., Perry, N.W. and Williams, D.E. (1985) An Investigation of the Nomological Network of Social Interest. *Journal of Research in Personality* 19, 2, 197-207.

19. Lee, A.S. (1994) Electronic Mail as a Medium for Rich Communication: An Empirical Investigation Using Hermeneutic Interpretation. *MIS Quarterly*, 10, 143-157.

20. Martocchio, J.J. and Dulebohn, J. (1994) Performance Feedback Effects in Training: The Role of Perceived Controllability. *Personnel Psychology* 47, 357-373.

21. Maslow, H.A. (1954) *Motivation and Personality*, Harper, New York.

22. Moore, G.C. and Benbasat, I. (1991) Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research* 2, 3, 192-222.

23. Nielsen//NetRatings, February 2004, http://www.nielsen-netratings.com/

24. Neter, J., Wasserman, W. and Kutner, M.H. (1990) *Applied Linear Statistical Models: Regression, Analysis of Variance, and Experimental Designs*, Irwin, Boston, MA.

25. Porter, W.L. (1961) A Study of Perceived Need Satisfactio in Bottom and Middle Management Job. *Journal of Applied Psychology* 45, 1-10.

26. Schachter, S. (1959) *The Psychology of Affiliation*, Stanford University Press, Stanford, CA.

27. Segars, A.H. (1997) Assessing the Unidimensionality of Measurement: a Paradigm and Illustration Within the Context of Information Systems Research. *Omega, International Journal of Management Science* 25, 1, 107-121.

28. Sethi, V. and King, W.R. (1991) Construct Measurement in Information Systems Research: An Illustration in Strategic Systems. *Decision Sciences* 22, 3, 455-472.

29. Shostrom, E.L. (1963) *Personal Orientation Inventory*, ITS, San Diego, CA.

30. Sirgy, M.J., Cole, D., Kosenko, R., Meadow, H.L., Rahtz, D., Cicic, M., Jin, G.X., Yarsuvat, D., Blenkorn, D.L. and Nagpal, N. (1995) Developing A Life Satisfaction Measure Based on Need Hierarchy Theory. In *New Dimensions in Marketing/Quality-of-Life Research.* M. J. Sirgy and A. C. Samli (Ed.), Quorum Books, Westport, CT.

31. Steuer, J. (1992) Defining Virtual Reality: Dimensions Determining Telepresence. *Journal of Communication* 42, 4, 73-93.

32. Straub, D.W. (1989) Validating Instruments in MIS Research. *MIS Quarterly* 13,2, 147-169.

33. SIQSS, February 16, 2000, The Stanford Institute for the Quantitative Study of Society , Stanford University, and interSurvey Inc., http://www.stanford.edu/group/siqss/

34. Webster, J. (1989) Playfulness and computer at work. Ph.D. Thesis, New York University, 1989.

35. Webster, J. and Martocchio, J. J. (1992) Microcomputer Playfulness: Development of a Measure with Workplace Implications. *MIS Quarterly* 16, 2, 201-226.

36. Zaichkowsky, J. L. (1985) Measuring the Involvement Construct. *Journal of Consumer Research* 12, 3, 341-352.

37. Zaichkowsky, J.L. (1994) The Personal Involvement Inventory: Reduction, Revision and Application to Advertising. *Journal of Advertising* 23, 4, 59-70.