Social Presence in Virtual World Surveys

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Abstract

Social presence varies from low, to moderate, to high in self-administered, telephone and face to face surveys. New communication technologies add another layer of survey modes that can be understood along the same spectrum of social presence. Virtual worlds like Second Life are rapidly becoming popular environments for testing theories of social and economic behavior. Researchers who use Second Life as a data collection platform must consider the extent to which existing social theories hold in virtual environments. This study tests the hypothesis that indicators of interviewers' social presence observed in real world survey environments persist in virtual environments with avatar interviewers and respondents. Preliminary results provide support for the hypothesis.

Keywords--- **survey research, virtual worlds, Second Life**

1. Introduction

Survey modes vary by communication technology (paper, telephone, computer, internet, etc.) and by presentation (visual, auditory, mixed) but also by the extent of social presence in the interview setting from none (self administered survey) to highly present (in-person). A persistent question in survey research is the extent to which social presence in the interview setting is desired.

1.1 Social Presence and Survey Modes

The amount of social presence in a survey can have biasing effects on study results. For example, some respondents may report less honest answers to sensitive questions when an interviewer is present [1], [2]. The use of telephone interviewing gives way to less candid reporting of sensitive information as well, because respondents are speaking directly to another person [3], [4]. Respondents may also be influenced by the visual appearance of the interviewer. An interviewer's race, gender or perceived attractiveness has been found to not only influence the respondent's trust, but also the respondent's belief of what is a desirable response [5].

Though all of this research encourages moving towards a self-administered surveying universe, there are advantages to using interviewers in survey research that can not be ignored. Interviewers are not only helpful in persuading people to participate in surveys and keep them motivated to continue, but they are also useful for probing respondents for accurate reporting and clarifying questions respondents may ask unpredictably. Respondents have been known to be more participatory and involved in the survey when an interviewer is involved than when there is no interviewer [5]. The use of interviewers can also reduce item non-response compared to self-administered surveys. Interviewers can also hide answer options such as "Don't Know" and "Refuse", whereas self-administered surveys have those options ready for the respondent to choose [6].

Survey modes vary along a spectrum of social presence. Low social presence surveys include self-administered mail surveys and web surveys. Extremely low social presence surveys are mail and web surveys with text only. Somewhat higher social presence can be found in web surveys with pictures of individuals or with reactive communication technologies. High social presence surveys include face-to-face surveys, where the interviewer conveys presence through tone of voice, along with facial expressions, eye movement, body language and other visual cues. Telephone surveys have moderate social presence.

Developments in communication technologies add additional layers of survey modes to apply to the social presence spectrum. Telephone surveys can be administered by interactive voice response (IVR), maintaining the voice interaction that allows some social presence, but decreasing the personality behind the voice. Face to face interviews can be enhanced with components where the respondent listens to or watches an audio or video recording and enters answers privately into a computer. Web surveys may include avatars or other interviewer agents to encourage and provide feedback on respondents' answers.

For the most part, new modes of survey research are attempting to combine the benefits of both interviewer and self-administered surveying, minus all of the disadvantages. That is, emergent survey technologies are applied in the hopes of providing enough social distance to encourage respondents to report honestly and without fear of judgment,

but with enough social presence to guarantee respondent engagement and attentiveness.

The "computers as social actors" or CASA paradigm states that people react to computers as social actors providing a social presence, not as inorganic machines [7]. Some research has found that, when using interactive voice recordings (IVRs) respondents sometimes even stereotyped the "interviewer" based on the sex of the recorded voice [8].

On the other hand, a series of experiments conducted in surveys, rather than in a lab environment, did not reveal strong support for the CASA paradigm [5]. Their results did not show the effects of interviewer presence on sensitive questions as the CASA paradigm would suggest using ACASI, virtual interviewers (via video), IVR and images on a web survey.

This research suggests that there may be some personal presence perceived by respondents through a virtual interviewer interaction, but not with the magnitude of a real interviewer and not enough to hinder truthful responses to sensitive questions. Using interviewers in a virtual setting, as opposed to face-to-face, telephone or self-administered modes, may lead researchers to be able to obtain sensitive information accurately while still keeping the benefits of an interviewer's presence. As technology advances and as we learn more about interviewing with voices, videos and other types of "distanced interviewers", survey research moves closer to the age of researching in virtual worlds.

1.2 Surveys in Virtual Worlds

A virtual world is an "electronic environment that visually mimics complex physical spaces, where people can interact with each other and virtual objects, and where people are represented by animated characters," [9]. Virtual worlds enhance interpersonal communication across distances beyond what telephone and text communication have to offer. Virtual reality places respondents in a common environment. Respondents in virtual meetings are able to examine the same digital object—for example, a medical assessment or procedure or a design project—and discuss it and interact with it despite their physical distance [10].

Virtual world users experience a quasirealistic 3D graphical environment, and can walk, talk, fly, live, work, and play in the virtual environment. Some online virtual worlds, such as World of Warcraft, are actual games. Others are multiuse environments for socialization and gaming.

Preliminary observational research in the virtual world Second Life has shown that social norms from interpersonal communication apply, suggesting that social presence does exist in the virtual community. Yee et al. collected gender, distance, eye gaze, and talking behaviors in world and observed that male-male dyads maintain larger interpersonal distance than female-female dyads, that males maintain less eye contact with each other, and that decreases in interpersonal distance (i.e., moving closer) are associated with an increase in eye avoidance [11], All of these observations replicate behaviors between and within genders in real life. However earlier research by posited that virtual social environments foster "transformed social interaction"—that is, a set of behaviors that diverge from in-person interactive behaviors as users become more experienced in virtual worlds [12].

Although few results from Second Life surveys have been published, surveys are common in Second Life. Surveys are conducted in Second Life through links to Web surveys, "survey bots" (programs that administer questionnaires), and through e-mail invitation to members of Web panels recruited through Second Life avatars.

A 2006 survey of 246 Second Life users recruited through in-person avatar intercept methods in-world with a 90% completion rate, revealed that Second Life users:

- are more affluent than the general population,
- spend 30+ hours on average each week in Second Life,
- maintain their same gender for their avatars, • have a university degree, and
- work in information technology or creative professions [13].

In separate research, use of a virtual currency, Linden dollars in Second Life, resulted in a response rate four times the industry average for market research Web surveys: 29%. Researchers observed that using the virtual currency potentially weeds out professional Web survey respondents who are persuaded to complete surveys based on dollar incentives. There is doubt about the quality and accuracy of Web surveys when professional survey response is rampant. Answers obtained by respondents who were given virtual currency were of better quality as well: they were longer and more deliberative [14].

Second Life easily lends itself to researchers as a data collection environment. Residents are primarily in the world for socialization, and are willing to answer survey questions especially to receive Linden dollar incentives. Much as web surveys exploded in popularity as a mode as the internet expanded in accessibility, Second Life or another virtual world like it is likely to do the same thing as it grows. The virtual world environment offers the opportunity for researchers to test hypotheses about social and economic behavior with significantly lest costs than real world lab tests [9]. The low costs of data collection will drive the usage of the mode. This necessitates attention to how data are collected and whether or not virtual survey modes are reliable and valid.

2. Study Design

The purpose of this study was to compare indicators of social presence across two survey data collection modes in Second Life. Two surveys were conducted with avatars in

Second Life. The first used a kiosk to test self-administered data collection. The second employed an avatar-interviewer to interact with respondents in mimicking a face to face interview.

2.1 Survey 1: Self-Administered Interviewing

A convenience sample of respondents was recruited through word of mouth methods to visit the RTI facility to complete a brief interview. If a respondent was interested in participating in the RTI survey, he/she would click on the SLURL in our posting. Respondents were directed to the kiosk, pictured below, where an object administered the survey.

Figure 1: RTI Survey Kiosk in Second Life

The survey was administered in individual SL "notecards", blue boxes which popped up on screen, one per question. The user clicked on the appropriate button in the notecard, much like in a web survey, to answer each question. There were 404 avatar respondents to the self-administered survey.

2.2 Survey 2: In-Avatar Interviewing

Using the same word of mouth recruitment methods, a second convenience sample of respondents was selected to complete the in-avatar (virtual face-to-face) interview. Interested avatars were invited to contact an interviewer via Instant Message (IM) in Second Life. In this study, eligibility was restricted to only United States residents. Eligible respondents were invited to enter a secure private room in our Second Life facility. There they met with an interviewer, who conducted a brief survey via text chat. Each interview took about 10 minutes. Sixty respondents completed the in-avatar interview.

2.3 Hypothesis

We hypothesized that social presence is replicated in virtual survey modes as in real life survey modes. That is, in-avatar interviews will exhibit greater social presence than a self-administered interview. We expected respondents to the in-avatar survey to react to survey questions differently than those completing the kiosk survey based on the presence of the interviewer. The interviewer could control the pace of the survey and develop rapport with the respondent. This would result in an engaged respondent who took the survey task seriously and did not simply "breeze through" the interview, also known as satisficing. Further, we expected the respondents to the in-avatar survey to be more compliant with the survey results and have a lower rate of item nonresponse compared to the kiosk survey respondents.

3. Results

We first compared the rate of "straightlining," or providing the same response option to multiple consecutive questions which would indicate probably satisficing behavior. Looking at just the first four questions of the survey, there was no evidence that respondents in the in-avatar survey demonstrated straightlining behavior—no respondents provided the same response option for all four questions. For the kiosk survey, 37 of 404 respondents (9.2%) provided the same response option to the first four questions of the survey. As further evidence of straightlining, 22 (5.5%) provided the same response option for the first eight questions of the survey.

Another indicator of satisficing, or shortcutting, is interview administration time. In the in-avatar survey, the interviewer controlled the pace of the survey and none of the 20-question surveys were completed in fewer than 30 seconds. While the kiosk survey had only 18 questions, it was unlikely that a respondent could reasonably read, think through, and answer all questions in 30 seconds. However, 75 respondents (18.6%) did in fact complete the kiosk interview in 30 seconds; 20% of these respondents also demonstrated straightlining behavior. This suggests that respondents to the kiosk survey were not as engaged in the task as those responding to an avatar interviewer.

Regarding item nonresponse, there were only two questions in the entire in-avatar interviewer for which one respondent failed to supply a response. In the kiosk survey, rates of item nonresponse among all questions ranged from 0.3% to 1.5%. This suggests that several possibilities: respondents were more willing or comfortable providing answers in the in-avatar survey, the presence of the interviewer allowed the respondent to seek clarification on confusing questions, and/or the presence of the interviewer positively impacted respondents' level of compliance with the survey task. It should be noted that respondents to the in-avatar survey were provided a higher incentive for

completion compared to the kiosk survey respondents; this is a possible confounding factor, but we believe the presence of the interviewer was a more significant difference between the two surveys.

Finally, the last question in each survey asked respondents to indicate whether they would be willing to let us retain their avatar name: "We would like to keep your avatar name on record in case there are other research opportunities. May we keep your avatar name?" In the in-avatar survey, 96.7% of respondents consented while only 75.8% from the kiosk survey consented. This suggests that respondents either felt more comfortable with the in-avatar survey experience and would be open to repeating it, or were more compliant in the presence of an interviewer. Again, the incentive difference could have been a confounding factor here.

4. Conclusions

Our hypothesis test shows indications of increased social presence along the dimensions of more attentiveness (less straightlining and less satisficing) and higher data quality (fewer "Don't Know" and "Refuse" answers) on the part of the respondents and improved data quality in the in-avatar interview. These results are not an ideal test, because the surveys, though similar, were not identical the incentive amount varied in the two surveys. (Additional analyses are planned with these data, including an analysis and validation of inconsistent answers between respondents to both surveys.) However, particularly the straightlining behavior and the item nonresponse results suggest that the increased social presence of the in-avatar survey does contribute to better survey data. More testing should be conducted, but these results are an indicator that the avatar-interviewer's presence may be required to ensure quality of data collected in virtual worlds.

5. References List

[1] Tourangeau, R., & Smith, T. W. (1996). Asking sensitive questions: The impact of data collection mode, question format and question context. *Public Opinion Quarterly, 60,* p. 275–304.

[2] Turner, C. F., Forsyth, B. H., O'Reilly, J. M., Cooley, P. C., Smith, T. K., Rogers, S. M., & Miller, H. G. (1998). Automated self-interviewing and the survey measurement of sensitive behaviors. In M. P. Couper, R. P. Baker, J. Bethlehem, C. Z. F. Clark, J. Martin, W. L. Nichols II, and J. M. O'Reilly (Eds.), *Computer Assisted Survey Information collection.* New York: Wiley and Sons, p. 455-474.

[3] de Leeuw, E. and Van der Zouwen, J. (1988). Data Quality in Telephone and Face-toface Surveys: A Comparative Meta-analysis. In R. Groves, P. Biemer, L. Lyberg, J. Massey, W. Nicholls, II,, and J. Waksberg (eds) *Telephone Survey Methodology.* New York:John Wiley.

[4] Tourangeau, Roger, and T. Yan. 2007. "Sensitive questions in surveys." *Psychological Bulletin*, 133(5):859-883.

[5] Couper, M.P. 2008. Technology and the Survey Interview/Questionnaire. In *Envisioning the Survey Interview of the Future*, Edited by Frederick G. Conrad and Michael F. Schober. Hoboken, NJ: John Wiley & Sons, Inc.

[6] Dillman, D. A. (2000). *Mail and Internet surveys: The tailored design method.* 2nd ed. New York, NY: John Wiley & Sons.

[7] Reeves, B. and C. Nass (2006) *The Media Equation*. Cambridge: Cambridge University Press.

[8] Nass, C., Y. Moon and N. Green (1997) Are machines gender neutral? Gender-stereotypic responses to computers with voices. *Journal of Applied Social Psychology*, 27 (10) 864-876.

[9] Bainbridge, W. S. (2007). The scientific research potential of virtual worlds. *Science, 317*(5837), p. 472

[10] Hindmarsh, J., Heath, C., & Fraser, M. (2006). (Im)materiality, virtual reality and interaction: Grounding the 'virtual' in studies of technology in action. *Sociological Review, 54*(4), 795-817.

[11] Yee, N., Bailenson, J. N., Urbanek, M., Chang, F., & Merget, D. (2007). The unbearable likeness of being digital: the persistence of nonverbal social norms in online virtual environments. *Cyberpsychol.Behav., 10*(1), 115-121.

[12] Bailenson, J. N., & Yee, N. (2006). A longitudinal study of task performance, head movements, subjective report, simulator sickness, and transformed social interaction in collaborative virtual environments. *Presence: Teleoperators & Virtual Environments, 15*(6), 699-716.

[13] de Nood, D. & Attema, J. (2006, December). Second life, the second life of virtual reality. The Hague: Electronic Highway Platform. Accessed August 5, 2008. http://www.epn.net/interrealiteit/EPN-REPORT-The_Second_Life_of_VR.pdf

[14] Neff, J., & Klaassen, A. (2007). Web research could gain clout via virtual currency. *Advertising Age, 78*(50), 4-34.