Running head: VOLUNTEERISM IN INTERNET DERIVED SAMPLES

Antecedents of Compliance Rates in Internet-derived Samples and Their Representativeness

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Abstract

Internet-based, questionnaire type studies typically compare their results to subject pool derived samples. The characteristics of Internet samples make comparisons with mail-based sampling more appropriate. Compliance rates are important for both, because of the self-selection biases that can arise when rates are low. Compliance rates in this study decreased for individuals who had never participated in this type of survey before, urban and suburban (as opposed to rural) dwellers, and as a function of page number. Sex, connection speed (perceived and actual), knowledge of survey length, and reward did not affect compliance rates.

Antecedents of Compliance Rates in Internet-derived Samples and Their Representativeness

The early history of the Internet, as the stomping ground of post-adolescent, technogeek males, made it an unsuitable place for samples representative of the general population. Its explosive growth, reaching an estimated 625 million users worldwide by the end of 2001 (Petska, 2001), has gone a long way to change that. The use of the Internet has become more equal in gender, and the average educational level and socio-economic status of users is rapidly converging with that of the general population. The continued deflation of computer prices should continue that trend.

The intent of this study is to, in part, burst the bubble of optimism surrounding the assumed validity of Internet-based research, to push for a more traditionally rigorous use of experimental methodology, and to advance some solutions to the methodological shortcomings of the previous research based on the particularities of the Internet. Through the use of lowest common denominator technologies, this study will attempt to give evidence for two competing assertions: first, that Internet samples are fairly representative of the population as a whole in terms of certain demographics, such as sex, and personality variables, such as socially desirable responding; second, that the use of Internet samples must be accompanied with the caveat that a large degree of self-selection bias could conceivably affect data collection.

The compliance rates of research participants over the course of an Internet-based questionnaire are not known compared with other methods. In other words, Internet samples are good, but associated problems should not be dismissed. This area

will be explored by examining how both demographic and situational variables can be used to predict how far research participants progress through a series of questionnaires.

The main problem with using the Internet for data collection is the same as with any non-captive sample: participation is totally voluntary, and, therefore, may sacrifice some external validity. Research has shown that volunteers have greater intellectual ability, need for social approval, interest, and motivation, and are less authoritarian than the population as a whole (Rosenthal, 1965). When compared with non-volunteers, volunteers are better educated (Robins, 1963), more sociable and arousal-seeking (Shubert, 1964), less conventional (London, Cooper, & Johnson, 1962; Shubert, 1964), younger (Newman, 1956). With standard tasks, such as helping to pick up dropped items, volunteers are more likely to be female; with unusual tasks, such as changing a tire, volunteers are more likely to be male (Ora, 1966).

In most cases, the strict use of volunteers makes data collection a difficult and long process. In the case of the Internet, however, more than one percent of the population of the planet are potential research participants. Because the Internet population is growing faster than the world's population proportionally, Internet data collection creates a prime opportunity to study relatively large samples of individuals with high levels of volunteer behavior in an environment that evokes prosocial behavior.

Thus, the population of Internet users, as it becomes more representative of the general population, should eventually become a pool of psychology experiment research participants as good or better than what is currently used in institutes of higher

education. The Internet is certainly a faster method of data collection than standard paper and pencil tests, and almost certainly provides a wider demographic pool.

Several studies have surfaced that support the contention that Internet derived samples and lab-based samples are similar in terms of results (Bartram, 1994; Buchanan & Smith, 1999; Drasgow & Olson-Buchanan, 1999; King & Miles, 1995; Pasveer & Ellard, 1998). Smith and Leigh (1997) found demographic similarities between Internet users and Introductory Psychology students on all but age and sex variables. Krantz, Ballard, and Scher (1997) found similar female attractiveness ratings for web and laboratory samples.

Other studies outline the differences between the two sample sources. Bonnenburg and Gosling (1998), while noting that similar patterns were found for both Internet and college samples, concluded that Internet users were found to be more extroverted, agreeable, conscientious, and open to experience, as measured by Saucier's (1994) scale. Whitener and Klein (1995) reported differences in interaction effects when comparing web and lab samples on need for achievement, self-esteem, locus of control, and social desirability, although means and variances were similar. The authors suggest that mode of administration, social environment, and social desirability are also important factors. Carlsmith and Chabot (1997), however, failed to find support for the former two characteristics.

Of particular interest to this study is the problem of subject mortality, i.e. the compliance rates of participants to complete studies of more than one page in length.

While at least one study reported dropout rates over a small number of pages (Brennan, Rae, & Parackal, 1999), this study attempts to examine the problem more methodologically over a greater number of pages. In addition, as is not usually the case, this study attempts to examine mortality rates in a more inclusive sample than is usually observed.

In many studies, more advanced Internet technologies are used for the purpose of tracking responses in order to match data across pages for each individual. As Brennan, Rae, & Parackal (1999) point out, the use of such technologies excludes individuals with older browsers, or makes matching data across pages difficult. This study, in response to that problem, uses the most common denominator technologies for the purpose of data collection, html and server-side programming.

The question, then, is not only how wide a net an Internet-based survey can cast without excluding individuals on technological grounds, but also how it can avoid sampling bias. Some studies obtained their samples through direct invitation through e-mail (Brennan, Rae, & Parackal, 1999; Stanton, 1998; Weible & Wallace, 1998), which, at face value, seems like a reasonable way to attract large numbers of subjects quickly. However, this method, i.e., experimenter selection of subjects, obviates random sampling of participants. If an experimenter is looking for particular participants then e-mailing invitations would allow for a large enough sample of these individuals to be gathered in an expedient manner. On the other hand, if the experimenter is not looking for a specific sample, where should he or she send the invitation? There are no random sample mailing lists.

Another problem with this method is that is recipient often react quite negatively to unsolicited e-mail (spam) (Cho & LaRose, 1999). It is hard to believe that the best sampling will come from a group that is contacted in a way that causes negative affect in at least part of the group. It is not hard to believe that someone will complain to a university that allows this activity, nor is it hard to believe that at least a few of the participants will be unhappy enough to purposefully give false responses. In a worst case scenario, the unsolicited invitation could incite a more experienced computer user to hack their way into the file structure of the site and do something malicious such as deleting or altering the site, or deleting the survey responses so far.

A better way to get research participants to a site might be to put an invitation in the most public place available, such as on the AOL homepage. Unfortunately, this method would probably be prohibitive in cost to all but the most well-funded studies. Another solution could be to submit the research site to the major search engines and get a link to the site listed in as many places as possible, the most effective being on sites that are relevant to the content. While this method may create a certain amount of selection bias it could be, perhaps, the most effective and least costly method of getting serious participants to the online experiment.

This method of participant acquisition would also allow this study to record demographic data, such as the participants' perceived download speed and personal experience with the Internet. These data could then be correlated with subject mortality rates as have not been done in the past, and would allow experimenters to know what degree of technical sophistication would be best for their sites. In addition,

experimenters would be able to learn how to tailor their surveys to their targeted participants. In a study, for example, that used the java programming language to run a web-based, time-critical graphic animation, usable data was obtained from only ten percent of the site visitors (Hecht, Oesker, Kaiser, Civilek, & Stecker, 1999).

This study also examines the relationship of participant compliance rates to (a) participant knowledge of the costs associated with participation (no studies have manipulated this variable to determine its effects on Internet survey completion rates.), and (b) the manipulation of a reward. Both of these are easily manipulatable and operationally definable situational variables when it comes to the Internet.

The work of Latane and Darley (1968, 1970) gives support to the idea that personality variables are of lesser importance than situational variables when it comes to predicting prosocial behavior. The Internet creates a particular type of helping situation. According to the taxonomy of helping situations proposed by Smithson, Amato, and Pearce (1983), the Internet creates a helping situation that is planned, as opposed to spontaneous (the participant is looking for the website in most cases); non-serious (it is hard to convey a sense of urgency using HTML); and, the participant has to give nothing more than time.

Solely having a picture of the situation in aid-eliciting environments is obviously inadequate for explaining the behavior. Batson (1987) has outlined three types of theories to explain altruism. The first group of theories centers on motivation to avoid punishment and seek reward. The second group deals with arousal reduction as a motivation for altruism, which can still be considered egoistic in nature. The last group

explains helping behavior as a reaction to empathy for a distressed individual.

Batson (1987) describes all these theories as having five key processes or constructs. The first event that must happen is that the individual must be perceive that someone is in need. Batson (1991) states that three factors must be present for this perception to take place: (1) the distressed must be visibly lacking on some dimension of well-being; (2) those dimensions must be viewed as relevant to the helper, and (3) the helper must be focused on the distressed. Batson recognizes that while these factors are necessary, they are not sufficient for the determination of need. Cognitive and situational factors are also necessary. The degree of perceived need is a function of the number of dimensions that have gaps between potential and current states of well-being, the gap size on those dimensions, and whether the helper believes those dimensions are salient to the distressed at that time (Schaps, 1972).

Unless the researcher specifically includes why completing his or her survey is personally important, a participant would not know the researcher's need. In most cases, a link to a survey resides almost solely on a page of links to that and other surveys. The only information available to the participant may be the name of the survey and a very short description. This would appear to argue against an egoistic explanation for the completion of Internet surveys, unless the expected reward was the satisfaction of assuaged curiosity. In that case, it might be expected that an individual would probably not be likely to fill out many surveys, because after filling out a few, or even part of one, that need has been satisfied.

The second stage of Batson's (1987) modeling of the theories of helping behavior

is the internal response to the perception of the situation. This response can be either cognitive, as a perception of a reward/punishment situation, or affective, as a response to personal distress or empathy for the distressed, depending on whether the theory being used is egoistic or altruistic in nature. In situations where the experimenter is offering a reward for participation, it is easier to see how helping can be perceived as a reward situation. When a reward is not explicit, it may come in a more subtle way, such as the reinforcement of a self-perception of goodness (Bandura, 1977) or compliance with personal norms (Zuckerman, 1975).

It is harder to support explanations for helping behavior in Internet-based surveys on the basis of feelings of empathy or personal distress reduction efforts. The lack of personal contact, except perhaps as represented by a few paragraphs of text, would make the situation unlikely to produce the strength of affect necessary to spur action. On the other hand, the lack of information may cause an individual to assume that, because the experimenter is doing psychological research and the participant is exploring psychological sites, there are some similarities between the two parties, thus perhaps inducing feelings of empathy (Pilliavin, 1981).

According to Batson (1987), the internal response of the individual, i.e., the motivation to get the reward, reduce the personal distress, or reduce the distress of the individual in need, leads to the next stage, which is a hedonic calculation of the various alternatives for action. The main alternatives for a resolution of distress are to help, view someone else helping, or escape the situation (Batson, 1991).

It is this stage that is perhaps the most important in determining helping behavior

in Internet studies. Because on the Internet the request for assistance from the experimenter is usually minimal, often to the point that the request is merely an attempt to induce curiosity, the participant must decide the costs of further involvement. Unlike traditional surveys, which may be given to the participant all at once, an Internet survey, if long, would normally be divided into separate components for the purpose of a faster download. Speed of download, which will vary according to modem speed, is a factor when the participant determines the cost of continued involvement. Perception of speed is also a cost factor. If a participant's home Internet connection is considered to be generally fast for a home computer, but is slower than his or her connection at work, the perception that the survey, if taken at home, will take too long to complete, is a cost factor the participant may consider.

As Batson (1991) pointed out, the cost calculations are based on the most salient attributes of the situation, i.e., in the case of a survey, either paper or Internet, time. The situational elements that are most salient to time spent on the Internet are connection speed, perception of the connection speed, and the amount of time already spent on the survey, which would be measured by how far the participant has progressed on the survey.

Another difference between Internet and traditional situations is the ease of discontinuing an Internet survey. One click of the mouse can completely eliminate the involvement of the participant. In a traditional situation, the participant has to get up and walk out, often under the gaze of the experimenter him or herself. The cost of that action is greater than discontinuing on the Internet.

The last stage of the theories of helping behavior that Batson (1987) describes is the actual behavior. As was mentioned before, the main options for resolution of the situation are to help, to let someone else help, or to escape the situation. If none of these options is perceived to be effective in terms of costs and benefits, then the individual may do nothing (Batson, 1991). In that case, the internal affective state should dissipate over time.

In addition to the above theories regarding individual decisions implicit in helping, this study also takes into consideration several other helping predictor variables including age (Green & Schneider, 1974), sex and race (Wispe & Freshley, 1971), urban vs. rural background (Weiner, 1976), and belief in a just world (Lerner, 1975).

Sex differences in helping situations are a well-studied area. In general, the literature suggests that sex differences in helping behavior are related to a qualitative difference in the type of helping situation (Smithson, Amato, & Pearce, 1983). The majority of studies imply that males offer more assistance to others in situations where active, anonymous, emergency aid is required. Situations include picking up a hitchhiker (Pomazal & Clore, 1973), making a call to a garage (Gaertner & Bickman, 1971), helping an epileptic (Darley & Latané, 1968; Schwartz & Clausen, 1970), and helping someone with a stuck shopping cart (Harris & Bays, 1973), and other similar situations (Bryan & Test, 1967; Page, 1977; Piliavin, Rodin, & Piliavin, 1969; Shotland & Huston, 1979).

On the other hand, a small number of studies suggest that women are more likely to help in situations that are planned, personal, formal, and require less active

intervention (Smithson, Amato, & Pearce, 1983). Females were more likely to give assistance in situations such as giving to charity (Nadler, Romek, & Shapiro-Friedman, 1979), helping a young child with a difficult task (O'Bryant and Brophy, 1976), and yielding to a dependent party (Schopler & Bateson, 1965).

Based on these differences, one may hypothesize that women would be more likely to complete an Internet questionnaire, because it is a situation where little activity is involved, personal information is usually asked for, it is not an emergency, and, because the participant is probably searching for related materials, the situation is more planned than not.

In addition to the situational and demographic variables listed above, there is one other factor that is pervasely used on the Internet to attract traffic to a web site and to increase voluntary relinquishment of personal information. That factor is free stuff. Quite a few major sites (Yahoo.com, Infoseek.com) give away their wares just for the price of looking at the page. Other companies give away services just for giving some personal information for the purposes of targeted advertising. Given that these techniques attract users, informational rewards (the Internet is an informational medium) seem to be an effective reward on the Internet.

The effect of these incentives to attract web surfers could be the creation of an expectation of future rewards and a decrease in effort put forward by research participants for non-rewarded activity. However, Singer, Van Hoewyk, and Maher, (1998) found this not to be the case. They found that rewarded participants were more likely to respond to surveys in the future even if they were not rewarded for it, and they were more

likely to have positive attitudes toward survey research in general.

The effect of incentives on traditional survey response rates seem quite positive as well. Several studies have found that a modest incentive, such as one dollar, has a significant effect on response rates for mail-based surveys (Easton, Price, Telljohann, & Boehm, 1997; Everett, Price, Bedell, & Telljohann, 1997; Summers, & Price, 1997). The promise of a reward for completing an Internet survey should have at least the same positive effect. The study of the effect of incentives, along with the other demographic elements discussed above, could give further insights into the factors that researchers should take into account when conducting Internet-based surveys.

Hypotheses:

The first three hypotheses are related to the idea that, as the perceived cost of participation increases, participation will decrease.

1A. The number of viewed and completed pages will decrease over the number of pages presented.

2A. Research participants with slower connections to the Internet will complete fewer pages of the survey.

2B. Research participants who perceive the survey download time to be greater that average will complete fewer pages of the survey.

2C. Research participants informed of the length of the survey will complete fewer pages than participants not given that information.

2D. Female participants will complete more pages than male participants.

Hypotheses 2E through 2G are based on the research mentioned above and are

meant to establish that factors irrelevant to the testing medium are similar in both the Internet and traditional testing environments.

2E. Research participants with a previous history of participation will complete more pages than those with no history.

2F. Research participants from rural settings will complete more pages that participants from urban settings.

2G. Research participants, given an incentive at the beginning of the survey, will complete more pages than participants not offered the incentive.

Method

The experiment consisted of an Internet-based survey presenting a battery of established scales, after a brief survey of situational and demographic questions. As each page was finished, the results were loaded into a database on the computer that hosts the web site itself. The data was downloaded for analysis periodically, along with the server logs. Server Logs give information such as how many times a page was accessed, when it was accessed, as well as other information relating to web site activity.

The survey was created using Microsoft FrontPage 2000, a program allowing the creation of html pages using a WYSIWYG (What You See Is What You Get) interface. What is visible on the creator's screen is what will be viewed (within a reasonable range) by visitors when it is posted to the Internet. FrontPage 2000 also creates interactive forms for the Internet without the usual CGI programming necessary for interactivity. The program does require that software extensions be installed on the

server that the form is on. Many web site hosting services have these extensions already installed.

The site itself consisted of 13 pages: an introductory page, demographic question page, 10 questionnaire pages, and a debriefing page. Each questionnaire page consisted of twenty questions drawn from the questionnaires discussed below. In cases where twenty questions were not available from an uninterrupted questionnaire, filler questions were used to make twenty. At the bottom of each page were three buttons. The first button was labeled “reset”, which wiped out all of the responses that were given for that page already. The next button was labeled “next page”, which sent the data from that page to a designated storage place. Then the next page of questions was sent to the browser window of the research participant. The third button was labeled, “quit”, which allowed the subject to end the experiment. Pressing this button sent the research participant to a page containing debriefing information. The same page was also given to subjects who finished the last questionnaire page.

The first, or home, page consisted of the introduction of the survey to the individual and was comprised of a privacy statement to assure participants of their anonymity (see Appendix A for a discussion of privacy, consent, and debriefing). The next page asked a few demographic and situational questions. These included sex, age, race, location of residence (urban vs. rural, state, country), modem speed, perceived modem speed, whether they had completed a survey in the past, and how long the participant had been using the Internet.

It is on that second page that the survey size information and incentive conditions

were presented to the individual (Hypotheses 2C and 2G, respectively). Half of the individuals were presented with the sentence, “This survey is ten pages long, and there are 200 total questions, not including this page.” The other group was not presented with this sentence. The incentive factor was operationalized by presenting half of the sample with the sentence, “Participants who finish the entire survey will be rewarded at the end of the survey.” The other half was not presented with this sentence.

The following surveys were presented to the sample, and are based around two areas of interest to this study. The first three deal with volunteer behavior and are:

The Emotional Empathy Scale (Mehrabian & Epstein, 1972)

The Social Interest Scale (Crandall, 1975)

The Machiavellianism Scale (Christie & Geis, 1968)

The next three are based on response characteristics of a sample, specifically concerned with the measurement and control of response biases, and are:

Marlowe-Crowne Social Desirability Scale (MCSD) (Crowne & Marlowe, 1960)

Responding Desirably on Attitudes and Opinions Scale (RD-16) (Schuessler, Hittle, & Cardascia, 1978)

The CPI Good Impression Scale (Gough, 1952)

As each page was finished, the participant was instructed to click on a button on the bottom of the page that submitted the responses from that page to the server. That act also sent a message to the server to give the next page to the participant. After all questionnaire pages had been completed, the final page was sent to the individual. The final page was a listing of various resources and web sites that could be of interest to the

participant.

Results and Discussion

The hypothesis (1A), that the number of people completing the survey pages will decline over the length of the survey, was analyzed by a simple count of the number of page hits (the number of times that a page is seen). Page hits were then regressed on page number. A quadratic term was added to the regression in anticipation that the drop-off in page hits would be dramatic initially and level off subsequently after the less committed participants click away. As expected, page number, $B = -471.9$, $SE = 115.2$, $p < .005$, and the quadratic term, $B = 28.2$, $SE = 8.627$, $p < .01$, were excellent predictors of how far participants made it through the site.

The strong support for this first hypothesis makes it a crucial point to keep in mind when designing Internet-based surveys. Page number and probably length should be kept to an absolute minimum necessary in order to maximize compliance rates. No unnecessary questions should be added. Furthermore, research should be conducted to determine the optimal page length/page number combination for Internet-based surveys. A one page site of 200 questions, that takes two minutes to download will probably not do as well as four 50 question pages that take only 30 seconds each. That sweet-spot of page number and length can reasonably be expected to change depending on the nature of the experiment. A strictly, Likert-type survey will have less keeping power than an interactive, graphics-laden experiment. Of course the latter will take considerably longer to load.

The second group of hypotheses, 2A through 2G, tested using one-way, one-

tailed ANOVAS, received some support. Hypothesis 2A, that participants with slower connections (M = 6.72, SD = 4.22) would complete fewer pages than individuals with faster connections, (M = 6.33, SD = 4.15) was not supported, F(1, 293) = .629, p. = .22. In fact, participants using high speed connections completed fewer pages than their counterparts. Two explanations for the failure to support the hypothesis are that the pages given in the web site were too small to make a noticeable difference in load times between the two groups, and that broadband users have less patience for waiting for downloads, which is why they got high speed access in the first place.

The second hypothesis (2B) in this group should give a better picture of download wait as a predictor of page completion. Perceived speed of current connection ((1) M = 9.00, SD = 3.37; (2) M = 6.13, SD = 4.18; (3) M = 6.91, SD = 4.18; (4) M = 5.79, SD = 4.02; (5) M = 6.05, SD = 4.31; ranging from slowest to fastest rating) was not a significant predictor of page completion, F(4, 330) = 1.52, p. = .10. As was previously noted, the size of the pages of the experimental site was relatively small. There were no graphics and very few links. For those individuals with slow connections, the site may have actually seemed quite fast in comparison with other sites. Participants with fast connections would not have noticed much of a difference between this and other sites. Further research should be done on this subject with a more powerful manipulation of this variable.

That compliance rates are more a function of page number than connection speed, perceived or actual, implies that it is the time that it takes for the participant to actively engage in compliance rather than the time it takes for the situation to present

itself, that determines the degree of compliance. That it is not the waiting, but the doing, not the passive, but the active, supports a more egoistic modeling of compliance rates when using this paradigm.

Hypothesis 2C was also not supported. Although having the knowledge of the length of the survey (M = 6.64, SD = 4.12), as opposed to not having that knowledge (M = 6.00, SD = 4.25), led to a greater completion rate, that difference was not significant, F(1, 334) = 1.71, p. = .09. This result is not entirely surprising in that the participants are probably aware of what is required of them in this type of survey, at least in a general sense. As personal interest in the topic increases, the effect of the knowledge variable could be expected to decrease. A truly random sample of Internet users might be more affected, whereas individuals looking for information about a specific subject might be willing to undertake a good deal of work to get it.

The hypothesis (2D) that females (M = 6.63, SD = 4.19) would complete more pages than males (M = 6.20, SD = 4.13) was also not supported, F(1, 334) = 1.04, p. = .16. Females' greater inclination to help others may have been cancelled out by the novelty of internet data collection. As was mentioned before, males are more likely to help in novel situations. It is also possible that the survey itself was not costly enough for the participants to bring out the differences in the preceding predictor variables, although the strong lack of participants completing the entire survey argues against this interpretation.

The next two hypotheses, 2E and 2F, had greater empirical support. Hypothesis 2E, gave support, F(1, 332) = 3.50, p. < .05, to the idea that individuals with a previous

history of participation in online surveys (M = 6.72, SD = 4.19) complete more pages than individuals without that history (M = 5.77, SD = 4.04). Two explanations could be given for this: (1) previous participation gives knowledge of what is expected, so further participation, if undertaken, is done so with a commitment to the task; and (2) previous participation shows interest in the material and, perhaps, greater curiosity.

The current setting of the individual was a surprisingly (to this author) good predictor of page completion, F(2, 328) = 4.018, p. < .01. Rural-based residents (M = 7.79, SD = 3.79) completed more pages than suburban (M = 6.24, SD = 4.32) and urban participants (M = 6.03, SD = 4.06). Post hoc comparisons show significant differences between rural and urban, (Tukey a = 1.75, SE = .65, p. < .025), rural and suburban, (Tukey a = 1.55, SE = .63, p. < .05), but not between suburban and urban dwellers, (Tukey a = .21, SE = .50, p. = .913).

The test on the last hypothesis, 2E, failed to give, F(1, 334) = .25, p. = .31 support for the contention that participants given information about a reward for completing the survey (M = 6.33, SD = 4.35) would complete more pages than those who did not have that information (M = 6.55, SD = 3.99). In fact, participants who had the reward information completed fewer pages than those who didn't. Perhaps the reward, an informational one, was not salient enough to induce compliance, or that knowledge provoked enough curiosity for those participants to jump ahead to the debriefing page. Further research could be conducted to determine the most effective reward. Different types of informational rewards, such as special reports, or financial rewards, such as online coupons or a monetary sweepstakes, could be explored. It is also possible that

the motivation for participants is entirely internal. Rewards for participation may actually hurt the cause more than help the individual researcher. If participants begin to expect compensation, Internet-based research could become more costly.

The implication of these results is that Internet-based research should be viewed in a different way that it has been. The typical comparison, with lab-based, paper-and-pencil questionnaires is less appropriate than with mail-based surveys, with their attendant problems of compliance and dropout rates. The methodological ramifications of that necessitate treating Internet-based studies in the same way, mandating similar reporting of compliance statistics.

Appendix A

Privacy, Consent, and Debriefing

The issue of security on the Internet has grown right alongside the Internet itself. The main privacy consideration for Internet research is that each individual coming to a site leaves identifying information. Although it is very difficult for a non-accomplished computer user to take that information and trace it back to the individual, it is not impossible. While most web surfers do not realize this, it should be addressed when briefing research participants on the Internet just as it would be in a traditional setting.

The primary way that individuals leave traces at web sites is in the visitors logs that almost all web servers keep for each web site. These files contain information on every visitor including the site from which the individual came, what pages they visited on the current site, and their IP node number. The last piece of information is the most identifying.

The IP number is the Internet address for every computer connected to the Internet. Every time a person uses their modem to connect to their Internet service provider, the computer is assigned a special number for the purposes of communicating with other computers. That number takes the form of four numbers separated by periods. The numbers can be one, two, or three digits each. Some examples could be 122.45.33.654, or 66.432.77.89. In general, the server that an individual uses for their Internet access is given a permanent address, and each computer that logs on gets an address that links it to that server. Every computer linked to the Internet through the University at Albany server, for example, would have the same first three numbers, but

the last one would be unique.

When the computer finally logs off of the ISP server, the IP number is put back into the available pool of numbers for that server. When the computer is reconnected later, the server randomly assigns it a new address from the available pool. It is unlikely that that computer will get the same IP address, although after a while it may repeat an address. The server usually keeps a record of who has been assigned which number, although that information is kept secure.

There are, however, individuals that keep the same IP address. People with constant connections to the Internet, such as those with connections through their cable company, are assigned a specific address. While the advantage of constant connection to the Internet is the disappearance of connection hassles such as busy signals, the disadvantage is that it makes a home computer more of a target for hackers.

This IP address, then, is a very good way to identify a research participant as he or she progresses through an online survey. It does very little to identify the individual, in most cases, while at the same time is fairly unique. There are millions of possible numbers, so the likelihood of an overlap between participants is highly unlikely unless the number of participants is extremely high. Additionally, because the participant keeps the number during the entire session, the data can be checked to see if any participants submitted data more than once during that session. This does not prevent the individual from logging off and back on again therefore getting a new IP address, but at least makes it more difficult for that individual to get away with sabotaging data collection efforts.

Another option for tracking an individual is through the use of small files, called cookies, that a web site server will install on the visitor's computer. When and if the visitor returns to that site, the web site server will ask the visitor's computer if a cookie is present. If it detects one, it knows that person has been there before. If the visitor revealed some information about him or herself, the server can recall that information and link any new information given to the old information. Therefore, if the visitor gave a name during the first visit, the server can recall that name and link any new information, such as what pages are visited during the subsequent visit, to the name. The cookie cannot, however, access any other files on the visitor's computer to gain additional information about the visitor. A cookie can only sit on a hard drive waiting to be looked at.

The use of cookies is widespread on the Internet. Most commercial sites use them to personalize their web pages to their visitors. This allows the visitor to customize the site to look a specific way. A bookseller can keep a list of preferences for an individual and present options for additional books based on those preferences. A portal site, which presents blocks of information such as news, weather, and stock prices, can allow visitors to decide where they want each block to be when they log onto the site. Cookies serve a very useful purpose on the web, and attempts to abuse them leads to mistrust in the community.

The last important point to make is that a privacy policy should be present and explicit on all web-based surveys. This could be set up as a separate page, or on the home page itself. It should be religiously adhered to both for ethic's sake, and because

the Internet community will come down hard on any site that violates the unwritten etiquette, or netiquette, that the community governs itself by. It is not difficult to spot deception embedded in the code of a web page, because every time a participant views a page, nearly the entire code behind that page is available to the individual.

Consent is also an issue of great importance for psychology as a whole and must be as great a concern for Internet based research. The use of digital signatures is nowhere near commonplace, so a non-signature based consent agreement is the most reasonable to use. For a web site, perhaps the easiest way to establish consent is to place a consent statement on the home page. The research participant would be advised to read it and "sign" it by clicking a link at the bottom consisting of the phrase, "I agree, " which would send the participant to the first page of the survey. Alternatively, if the participant declined, a link consisting of the phrase, "I decline," could be selected that would send the individual elsewhere. Options for elsewhere could be a debriefing page, the APS page dealing with informed consent if there is one, or even the White House (http://www.whitehouse.gov). If the latter is chosen, make sure that the ending is .gov and not .com. Trust me on this one.

Debriefing subjects on the Internet can also be simple, assuming that the participant finishes the survey. In this case, submitting the last page of data, should lead to a page containing the debriefing statement. In the event that an individual does not complete the experiment, special code can be inserted into the web page that will open a new window containing a page with a debriefing statement if the original browser window is closed. That window can be immediately closed as well, but some effort is

better than none. The debriefing page file should be as small as possible in order to be presented as quickly as possible. The participant may close the new window before the page is fully presented.

One other possibility for getting the debriefing statement to the participants is to request an e-mail address for the participant and then e-mail the statement to them. This, of course, brings up the issue of privacy again, and every effort should be made to present the study as an honorable scientific endeavor as opposed to a shady commercial one. The information should be disassociated with survey responses and that should be made clear to the research participants if this method is used.

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