New Consumer Behavior Marketing Research Instruments: Online Survey Development, Testing, and Validity Verification

Abstract

Internet technology has become a major communication channel throughout the industrialized world. Hundreds of radio channels, videos, and news stories flash across the World Wide Web's electronic pipelines, but most ubiquitous of all is the use of email. With penetration rates now well over 50 percent, this communication technology is reaching the end of the early majority stage of adoption. Simultaneously, existing communication technologies, such as the home phone line and traditional mail (snail mail) use is shrinking. Methods for surveying consumers, that were developed over fifty years ago, are becoming increasingly difficult to administer when the very tools, door-to-door interview, mail, and phone are decreasingly irrelevant in the early 21st Century. The use of the Internet as a surveying/experimentation tool in consumer behavior has begun, but the first steps are tenuous and risky ones from the standpoint of research validity.

This study proposes to develop and test survey tools for use over the Web, while testing the many questions surrounding validity, such as oversampling, nonresponse, and external validity. Three well established marketing theories, directly derived from survey and/or experiment, will be replicated over the Web. The three replications will include one open-ended survey approach (CIT as performed by researchers such as Hoffman and Bitner), a behavior experiment (ELM by Petty and Cacioppo), and a standard survey completion form (CETSCALE by Shimp and Sharma). Replication results will be compared to the original results to test the capabilities of the Web-based research to match traditional methods.

In addition to three types of behavioral research methods, three methods for drawing participants over the Internet will be employed and then compared for effectiveness as well as any specific interactions with the type of survey/experiment. The approaches include text-based email invitation, rich email (HTML mail) invitation, and portal Web site banner advertisement invitation. All the invitations will be further divided into intrinsic and extrinsic offers, with extrinsic offers simply promising some gift for participation and intrinsic offers explaining the research purpose and not offering a gift.

Applications include a more complete understanding of how Web-based surveys/experiments can be planned, executed, and interpreted. Also, a clearer picture of the cost/benefit ratio of using the Internet to draw sample participants. Most importantly, relationships can be determined between the behavior research methods and techniques used to draw sample participants and the resulting quality of the data. Because the original data results are known, the replication results can be tested directly against models and theories assumed to be correct.

Background

Sampling

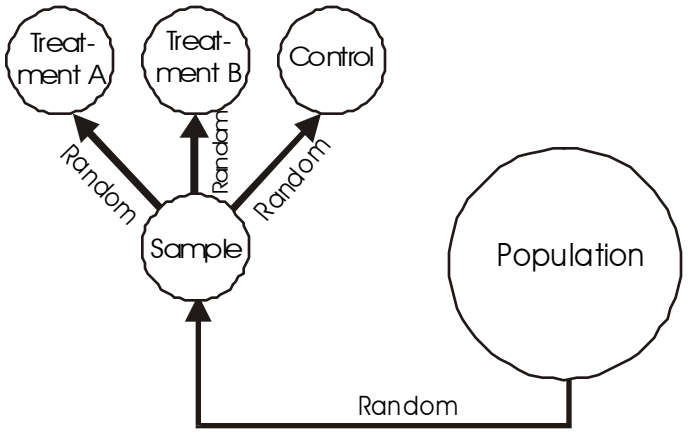
Error in sampling is impossible to avoid, but sometimes calls attention to itself due to the importance of the result. The 1936 *Literary Digest* incorrectly predicted the 1936 presidential election would go to Alf Landon, defeating Democratic incumbent Franklin Roosevelt. The prediction was grossly off target, even though the sample size was over ten million (Freedman, Pisani, Purves, 1997). At the same time, George Gallup accurately predicted the winner with a sample size of only 50,000. Reminiscent of that event, was the 2000 US elections where every major news organization called the election for George Bush, only to later withdraw the declaration when the election was too close to call. Both events are examples of sampling error that is caused mostly by the lack of randomness in the sampling. The reason Gallup was able to predict the winner accurately in 1938 was that his mail sample was sent out to randomly selected citizens, while the *Literary Digest* survey was mailed to people who read the publication as well as telephone and car owners (representing the upper class and more conservative of the time).

Today, as in the past, there is a temptation to use samples that are convenient, such as exit sampling in the US election of 2000. The Internet is very tempting to researchers because of its to access and low cost for data collection. In the past, the users of the Internet were a special group of computer oriented males, but that profile has changed today to more accurately reflect the population in general. The international nature of the Web can also have benefits for researchers attempting across culture studies. Near home in Taiwan, the number of Web users in China presently number over 10 million and are growing faster than any other country in Asia (McCarthy, 2000). The low cost of obtaining an online presence is not only encouraging the growth of small and medium enterprises online (Quelch & Klein, 1996; Hamill, 1997) but also researchers. Just as firms are unsure of what is the best strategy for success online, researchers are also unsure what methods are valid for online research.

Traditional Behavior Research Instruments

Beginning with Sir Ronal Fisher, (see Cowles, 1989 for a discussion of this father of analysis of variance), the basis of behavioral research sampling has been the random sample. Since whole populations are not convenient to sample, and often not even definable, samples are drawn from the population, with the expressed desire that the sample approximates the population. Samples are further divided into treatment groups, again in a random fashion. Any unusual members should be canceled out as the unusualness will be equally spread among the experiment groups. Furthermore, the selection of treatments and/or controls is assigned randomly (see Figure 1).

Figure 1. Random selection and randomization



Pure random approaches, probability sampling, include: stratified sampling, cluster sampling, two-stage cluster sampling, and systematic sampling. Poincare (1996) pointed out nearly fifty years that the random design makes the research a true gamble, with the outcome unknown. Anything less runs the risk loading the dice and influencing the outcome. While in theory the best approach, complete randomness at each stage of the sampling procedure (probability sampling) is often impossible. Nonprobability sampling is more common and includes techniques such as quota sampling, purposive sampling, and accidental sampling. Kerlinger and Lee (2000) observe that the nonprobability designs are not inherently more prone to error than probability designs as long as the researcher knows the risks and takes care to correct for any sampling method's weaknesses.

Sampling

Marketing specifically, and sociology generally, have a well established history and tradition of sampling. The most commonly used methods today have changed little in the past fifty years. From a review of the advantages and disadvantages of these methods, we can synthesize a modified method that takes advantages of the strengths while attempting to eliminate the weaknesses for use in the electronic arena of the Internet.

Interviews

Personal interviews are the most expensive form of data collection but offers benefits not obtainable in other ways. An interview is a conversation between two people that is initiated by the interviewer and focuses on content specified by the research objectives (Kahn & Cannell, 1968). Binghan et al. (1959) early on defined the interview as a type of *communication system*. The high cost of the interview is mainly derived from the requirement of the interviewer to be physically present. It is this requirement that also gives the method its main strengths.

Interviewers must be trained and paid for their work. Characteristics of personal interviews include the following: flexibility, insights into the motivation of respondent,

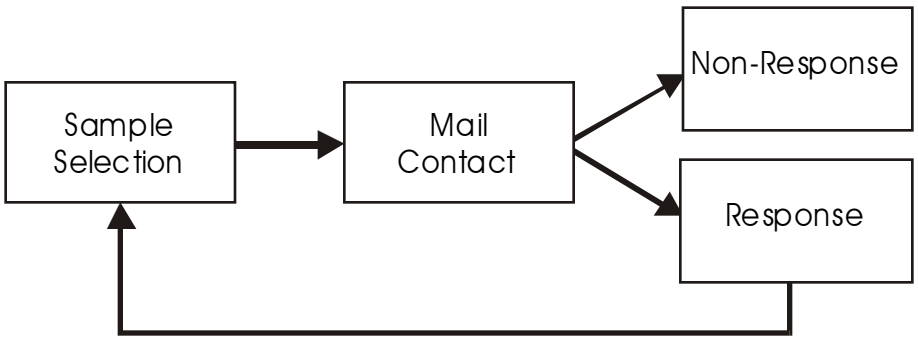
long interview length, personal anonymity, high response rate, no response time limit, elaboration of responses, observation of body language (Richardson, 1965; Kahn & Cannel, 1957; Sudman, 1967). However, many of the aspects of the interview can only be taken advantage of when the interviewer exhibits some level of skill and/or experience with the technique. These capabilities add up to create a survey approach that can begin with a general direction, but quickly change course to follow up on what the subject feels is important, the CIT method is a perfect example (Flanagan, 1954; Bitner et al.,1990; 1994), thus removing the influence of apriori assumptions.

Different approaches to determining who to interview have been developed, with stratefied quota sampling (Neyman, 1934) and area sampling (Cochran, 1977; Kish, 1965; Sudman, 1975). By all accounts, it is the personal interview, with respondents chosen by area probability samples which can lead to the least error in descriptions of the general population. With the exception of government surveys, door-to-door interviews are not carried out any longer due to the high cost, as well as the low level of people staying at home in the last decade (increasing levels of working women).

Mail

Mail surveys have certain advantages well understood by researchers since the early 1950's, these include: wide distribution, lower distribution bias, no interviewer bias, confidential response, time for thought, centralized control of project, and cost savings. While the cost savings is often a major attraction for researchers, the cost of obtaining a mailing list can be high. Without such a list, there is a high chance that the mailing will not truly represent the population under study and may in fact over represent a sub population. Most serious is the problem of non-response and/or incorrect response. Non response is a serious problem for mailed surveys, as the obtainment of over 80 percent response was recommended by the Advertising Research Foundation for valid survey data. This very high rate was obtainable in the mid 1950's (Cohen et al., 1958) but has since become nearly impossible. Without the high rate of response, the level of error introduced into the sample is too high to place mail survey responses on the same reliability level as interviews. That assumption, however, is based on the same sample size, which interviews are rarely able to obtain simply because people are not home. Physical return trips to contact respondents is very costly compared to simply calling back on the phone or mailing a follow up.

Figure 2. Mail sampling approach



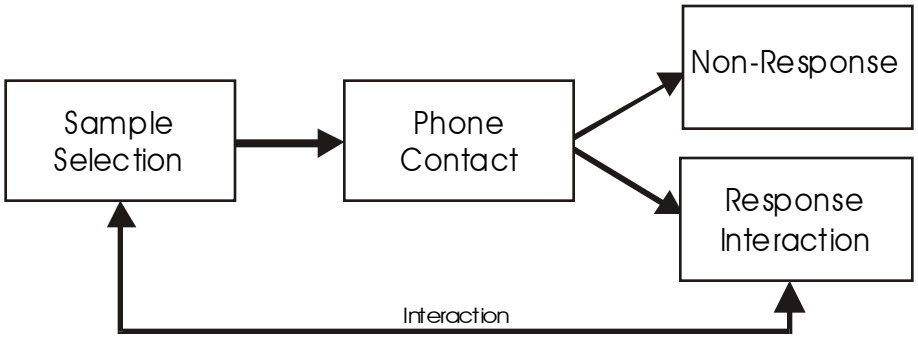
Telephone

Telephone interviewing introduces another level of technology into surveying. Previous shortcomings of this method included the fact that not everyone owned a telephone. While this is not such a serious limitation any longer, it still is true that people share phones and in some circumstances not with family members (such as in dorms). Interestingly, this drawback may actually increase in the future as phone use shifts to mobile phones as the main communication device. In developing countries, such as the PRC, development trends may lead to consumers using mobile phones before ever having an installed phone line in their homes. This raises serious issues about the use of telephone surveying.

Specific issues in telephone surveys include: unlisted numbers, directory obsolescence, lack of visual stimuli, short interview length, and lack of body language cues. The biggest advantage to telephone interviews is the lower cost. Unlike mailing, unanswered calls do not have an associated cost. Yet the telephone does require an interviewer, who must be trained, or a computerized system which represents higher fixed costs. In the final analysis, the telephone and mailing approaches are approximately equal in cost, due to the extremely low rate of response to mailings and the somewhat higher rate of telephone survey responses. There may be a serious tradeoff in validity however, when we examine just who answers telephone surveys.

Issues of sampling using the telephone have been around for a long time and mostly center on the method used to choose phone numbers. Telephone directories leave out numbers, especially in urban areas (Glasser & Metzger, 1972). Even with more sophisticated methods of random dialing, such as the Waksberg-Mitofsky method (Waksberg, 1978), telephone sampling always oversamples people who are at home and answer the phone (this can also include a member of a family who tends to answer the phone most of the time).

Figure 3. Phone sampling approach



New Instruments

Sudman and Blair (1999) are quite critical of *sloppy* samples such as mall interview intercept methods, newspaper, magazine, television, and Internet-based sampling methods. These approaches all depend on volunteer participation in the sample and thus

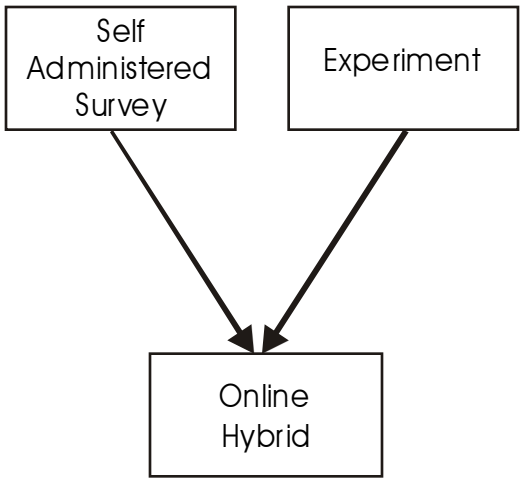
are open to biases such as demographic characteristics and interest in the topic being questioned. Such problems can be guarded against but not eliminated.

Computer-based Pen & Paper

Computer-assisted self-administered survey instrument (CASI) were developed in the 1980s when PC ownership grew. While CASI implementations of traditional survey techniques often exhibit higher accuracy when dealing with personal issues (Tourangeau & Smith, 1996), it is less clear how accurate the approach is at replicating results from mail surveys. Employing actual computer-based searches Hoque (1999) found unique attributes for Web-based activity compared to traditional paper survey approaches pointing out the importance of matching the manipulation's format with the Web medium under study. Donovan et al. (2000) showed that computerized pen and paper surveys result in consistent scores when compared to traditional administration techniques.

Traditional survey and experiment techniques do not allow mixing, i.e., a mail survey cannot suddenly change its questions based on a respondent's previous answers. Thus experimentation and surveys have been clearly separated. However, computer software does allow this mixing, where a survey can actually change while in the middle of completion in order to adapt to the respondent's answers. Extending this trend, it is equally valid that numerous behavior experiments could be administered through computers, where the images on the screen and the sounds from the speakers are abstract representations of reality (see Figure 4). Computer user sophistication has reached a level where the abstractness of objects appearing on the screen is not a barrier for user cognitive understanding. With good interface programming and intelligent software(Cox & Walker, 1993; Fischler & Firschein,1987), nearly any object or concept from the *real world* can be represented on the computer screen.

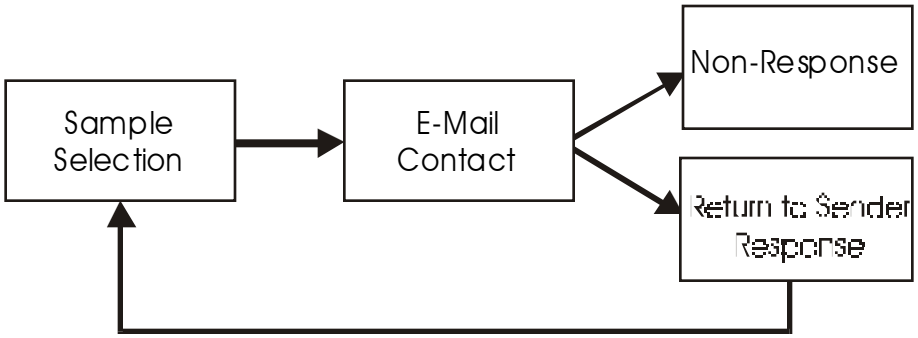
Figure 4. Experiments can be merged with the survey sampling approach



Email

Sudman and Blair (1999) observe that it is likely electronic surveys will displace the telephone survey within the next twenty-five years. Because email use penetration is so high, it would appear to offer an opportunity to reach a large sub population. Its approach is very similar to that of regular mail, but less the mailing expense (see Figure 5).

Figure 5. Email survey approach



Web Pages (HTML)

Tuten et al. (2000) found that Web-based banner advertisements for joining a research survey obtain higher rates of responses when the ad uses intrinsic motivations rather than extrinsic monetary rewards. In this approach a web surfer sees a banner that offers something, such as a gift, or participation in a research study, and when clicked on opens a window to the research Web site (this click through can also be implemented in email, where the respondent receives an email with a text line pointing out the URL address of the research site (see Figure 6 and Figure 7). Even so, the rates of click-through (web users who see the ad and then click on it) were very low at less than 0.5 percent. Li and Bukovac have found that animation and ad size help to increase click-through for Web banner ads. Such a result shows that researchers may find it difficult, or at least expensive, to get Web surfers' attention.

Figure 6. Emails can also lead to a Web page survey

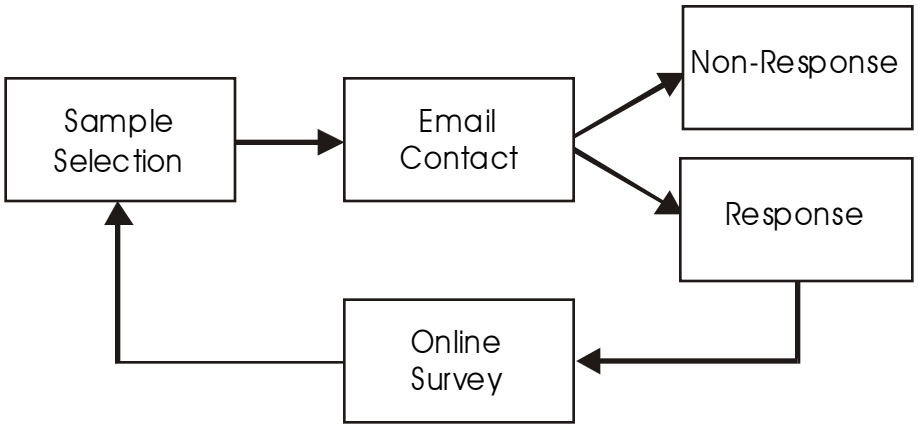
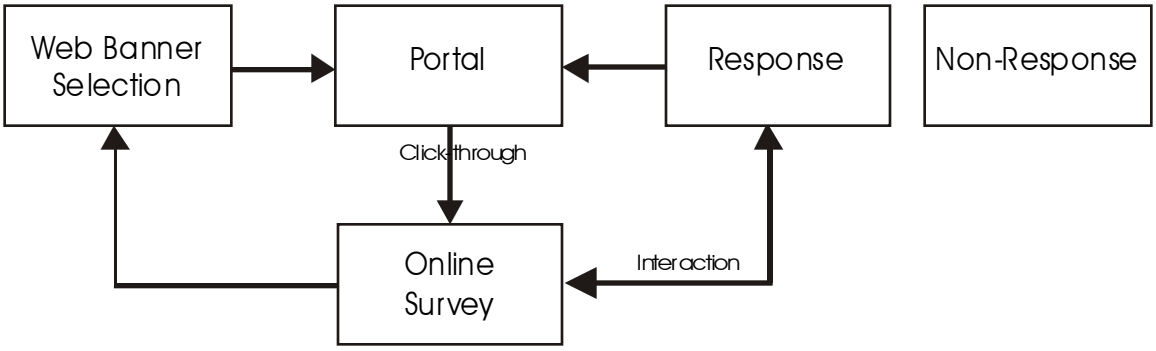


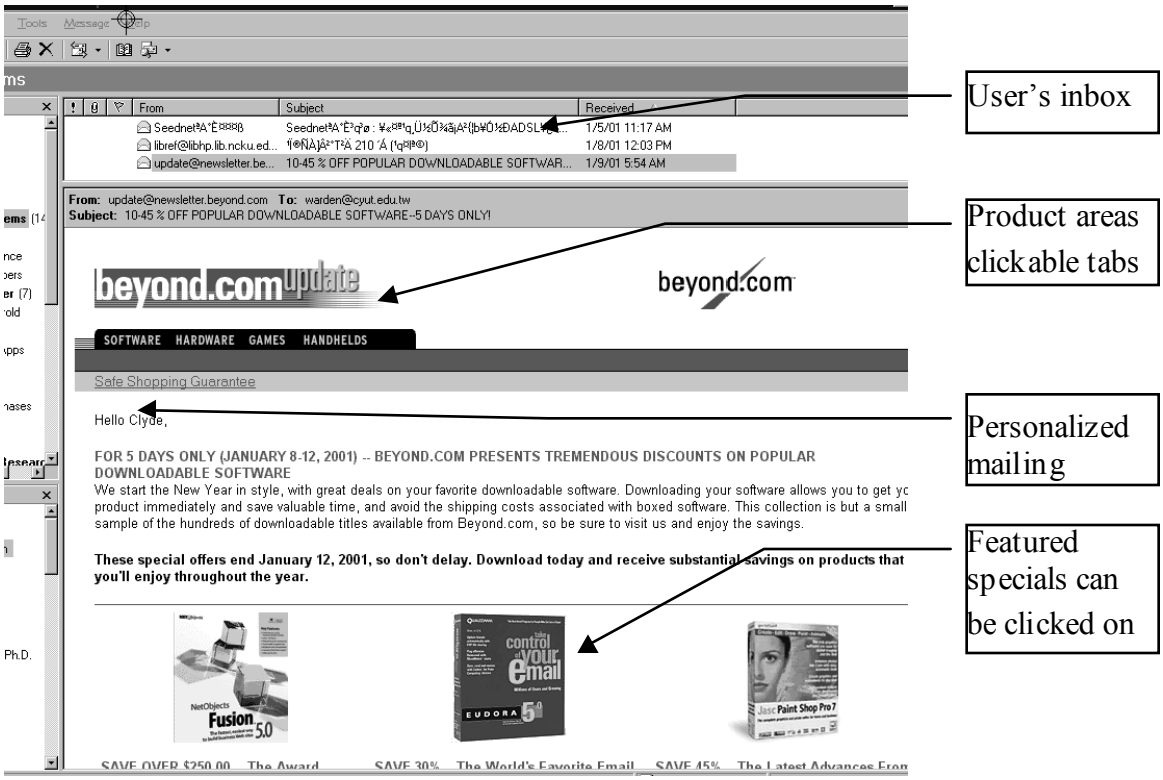
Figure 7. Web page approach drawing respondents from click-through from a banner



Rich Email

A hybrid technology between email and Web pages is known as rich email (see Figure 8). This type of message is sent and received like a normal email, but the electronic letter page has the same appearance as a Web page and can include text hyperlinks, icons, graphics, audio and video. Blank (2000) found that rich email response rates were much higher than Web page banners, and better than targeted traditional text-only email. Another special feature of rich email is it ability to be sent to friends simply by clicking the forward mail button in an email program. This can increase response rates dramatically since the rich email is being sent to receivers who are interested, or at least will look more closely than normally since the mail is being sent from a friend.

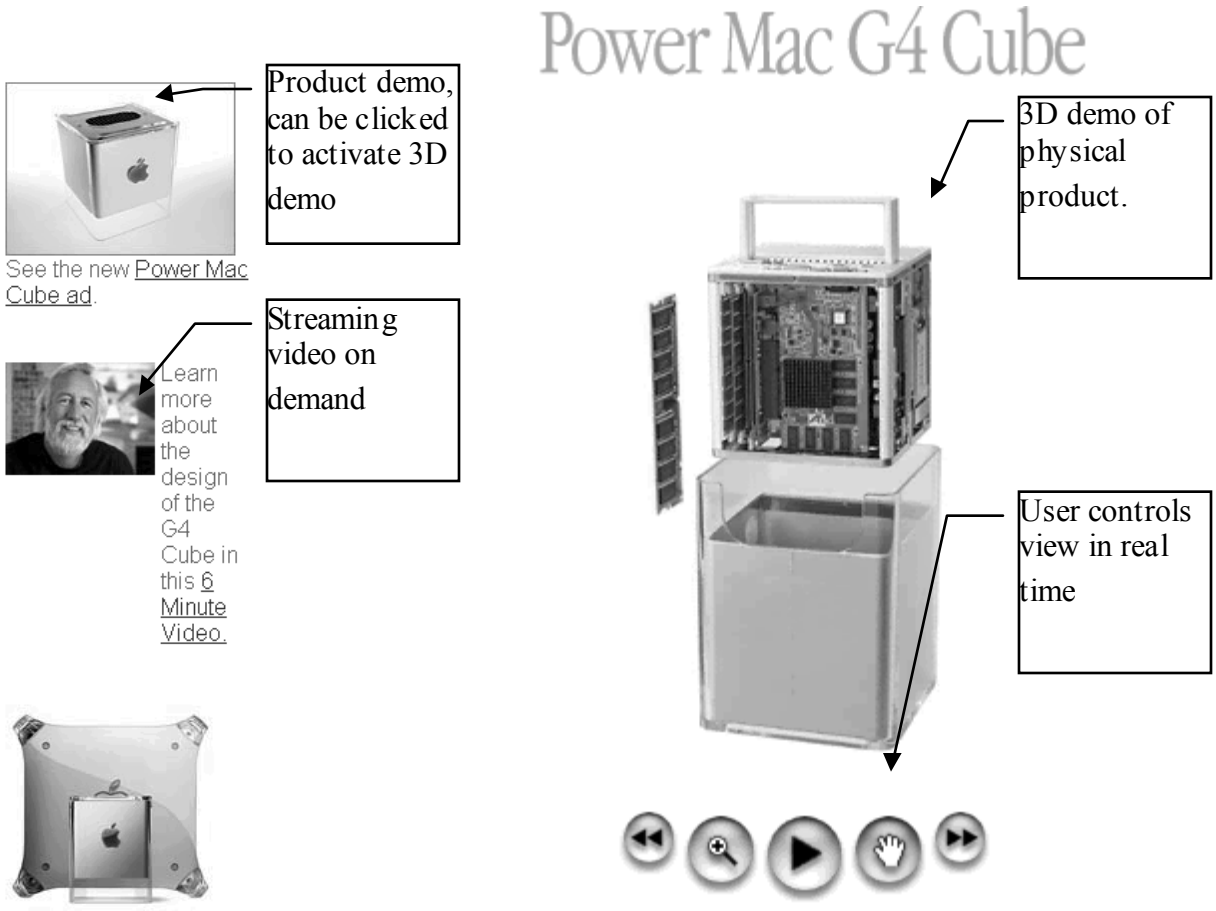
Figure 8. Rich email example



Streaming Technology (Broadband)

Broadband technology has gained acceptance and reached a price point in Taiwan where consumers are adopting it quickly (an example of broadband service is ADSL). With increased download speeds, the ability to implement video with sound in real time is possible. Simulations with real time interactions are possible, which makes more complex online experiments achievable (see Figure 9).

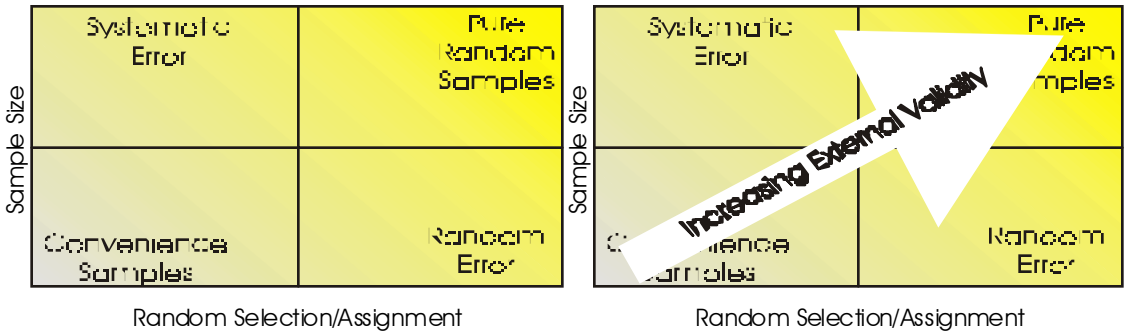
Figure 9. Example of broadband interaction from the Apple Web site



Validity Issues

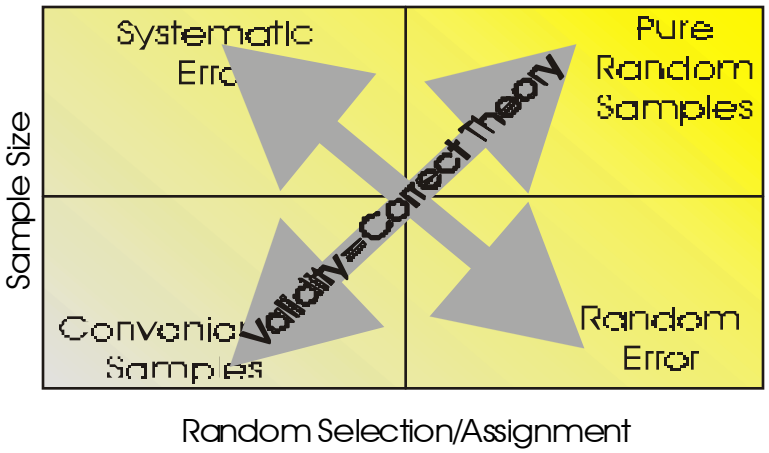
Sudman and Blair (1999) point out that the samples researchers collect follow one of two methodological issues: modeling or description. Describers (Groves, 1989) work on assuring that the sample is an accurate representation of the population, and take measures to adjust sample data and correct for over sampling and nonresponse. Modelers, by contrast, place emphasis on modeling the sample, and are not concerned with assuring the sample matches the general population. Where does Internet sampling fit into this? Email and Web-based surveys are completely voluntary and raise serious issues of oversampling and nonresponse. Some would assert that no matter what prevention is taken, the small sample size of Internet based efforts increases the random error to unacceptable ranges. This argument (see Figure 10) asserts that the only way to reduce random sample error is through increased sample size and special care must be taken to avoid oversampling which can lead to systematic error (this is done through randomized selection of respondents).

Figure 10. Sample size and sampling error



Lynch (1999) argues quite strongly that the obsession with external validity, matching results of the sample with the population, is a misplaced effort. Results from a sample can be generalized across sub populations (a sample after all is a sub population) and not to a super population (Lynch, 1982, Cook & Campbell, 1979). In fact, Lynch (1982) states that any claim to generalize findings is *pseudo-science* since future behaviors are not sampled in present samples. It is the underlying theory development that can predict future behavior, and that theory is derived from the findings in research samples.

Figure 11. Validity may not require sampling methods, but good theory



In contrast to Figure 10, where validity is based on the control of unknown errors, Figure 11 shows that validity can exist under numerous experimental conditions. The validity of the experiment, or survey, is based on the robustness of the underlying theory and the capability of such theory to withstand multiple implementations in different contexts and mixed with different variables which may act as moderators. From this perspective, it is very possible that Internet-based experiments and surveys can accurately describe reality, even though error is not specifically contained through increased sample size or quota sampling.

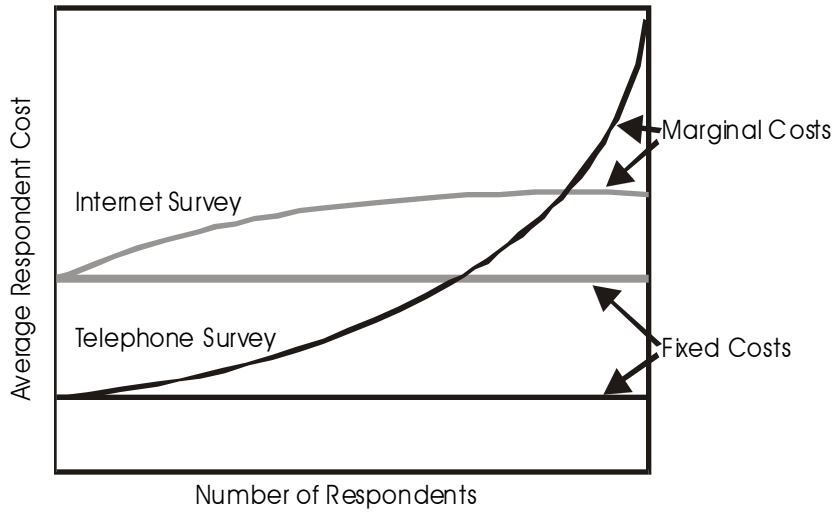
Practical Issues

Population Sampling

The first step to designing a sample is to define the population which is to be described. If the population to be described is simply a small sample itself, such as in laboratory experiments, then the most financially economical procedure can be undertaken. However, if a larger population is sought to be described, it is vital that the issue of nonresponse be dealt with, but this must be viewed within the context of total cost and benefit.

While the fixed costs for installing a server, software, and custom program is higher than phone surveying, the marginal cost for additional respondents is nearly zero, just the cost of an incentive gift, if included. Telephone survey's marginal costs increase as telephone bills increase and the increased cost of long-distance, and phone number list purchases as well as increased interviewers (assuming the survey is not computer driven).

Figure 12. Costs associated with different methods



Qualitative Measures

The new technology of computer based sampling opens the possibility of measuring behavior in an open-ended way that is a hybrid from previous sampling methods. Qualitative methods do not directly ask questions of respondents, but instead observe behaviors of one or more consumers. The method of triangulation is central to validity of qualitative behavioral research (Bodgan & Taylor, 1975; Deshpande, 1983; Filstead, 1970; Glaser & Strauss, 1967; Rist, 1977; Sieber, 1973; Webb et al., 1966;). Most recently, the work of behavioral researchers such as Paco Underhill (1999) have underscored the importance of this observational approach. Web sites can monitor every part of a consumer's online behavior, including mouse movement, times between actions, clicks, etc. Thus Internet surveying has, at least technically, the potential to implement many behavioral research methods.

References

Bitner, Mary Jo, Booms, Bernard H., and Mohr, Lois A. (1994). Critical service encounters: The employee's viewpoint. *Journal of Marketing*, 58(October), 95-106.

Bitner, Mary Jo, Booms, Bernard H., and Tetreault, Mary Stanfield (1990). The service encounter: Diagnosing favorable and unfavorable incidents. *Journal of Marketing*, 54(January), 71-84.

Blank, Christine (2000). Beating the banner ad. *American Demographics*, June, 42-44.

Bogdan, Robert, and Taylor, Steven J. (1975). *Introduction to Qualitative Research Methods*, New York: Wiley.

Cook, Thomas, and Campbell, Donald T. (1979). Chapter 2: Validity. In *Quasi-Experimentation: Design and Analysis Issues in a Field Setting*. Chicago: Rand McNally, pp. 37-94.

Cowles, M. (1989). *Statistics in Psychology: An Historical Perspective*. Hillsdale, NJ: Lawrence Erlbaum.

Cox, Kevin, and Walker, David (1993). *User Interface Design*. New York: Prentice Hall.

Deshpande, Rohit (1983). Paradigms lost: On theory and method in research in marketing. *Journal of Marketing*, 47(Fall), 101-110.

Donovan, Michelle A., Drasgow, Fritz, and Probst, Tahira M. (2000). Does computerizing paper-and-pencil job attitude scales make a difference? New IRT analyses offer insight. *Journal of Applied Psychology*, 85(2), 305-313.

Filstead, William J., ed. (1970). *Qualitative Methodology: Firsthand Involvement with the Social World*. Chicago: Markham.

Fischler, Martin A., and Firschein, Oscar (1987). *Intelligence: The Eye, the Brain, and the Computer*. Reading, Massachusetts: Addison-Wesley.

Flanagan, John C. (1954). The critical incident technique. *Psychological Bulletin*, 51(July), 327-58.

Freedman, David, Pisani, Robert, and Purves, Roger (1997). *Statistics 3rd edition*. New York, NY: W.W. Norton & Company

Glaser, Barney, and Strauss, Anselm (1967). *The Discovery of Grounded Theory*. Chicago: Aldine.

Glasser, Gerald L., and Metzger, Gale D. (1972). Random digit dialing as a method of telephone sampling. *Journal of Marketing Research*, 9(59), 59-64.

Groves, Robert (1989). *Survey Errors and Survey Costs*. New York: John Wiley.

Hamill, J. (1997) The Internet and international marketing. *International Marketing Review*, 14(5), 300-323.

Hoffman, D.L. and Novak, T.P. (1997). A new marketing paradigm for electronic commerce. *The Information Society*, 13(I), pp. 43-54.

Kahn, Robert L., and Cannell, Charles F. (1968). Research methods. In *The Handbook of Social Psychology*, Lindzey, Gardner, and Aronson, Elliot, (Eds.), Reading, Mass.: Addison-Wesley.

Kerlinger, Fred N., and Lee, Howaard B. (2000). *Foundations of Behavioral Research 4th edition*. Orlando, FL: Harcourt Inc.

Kish, Leslie (1965). *Survey Sampling*. New York: John Wiley.

Li, Hairong, and Bukovac, Janice L. (1999). Cognitive impact of banner ad characteristics: An experimental study. *Journalism & Mass Communication Quarterly*, 76(2), 341-353.

Lynch, John G., Jr. (1982). On the external validity of experiments in consumer research. *Journal of Consumer Research*, 9(December), 225-239.

Lynch, John G., Jr. (1999). Theory and external validity. *Journal of the Academy of Marketing Science*, 27(3), 367-376.

McCarthy, T. (2000) China dot now. *Time*, (February, 28), 16-23.

Neyman, Jerzy (1934). On the two different aspects of the representative method: The method of stratified sampling and the method of purposive selection. *Journal of the Royal Statistical Society*, 97, 558-606.

Petty, Richard, and Cacioppo, John (1986). The elaboration likelihood model of persuasion. In *Advances in Experimental Social Psychology*, 19, Berkowitz, L., (ed.). New York: Academic Press.

Poincare, H. (1996). *Science and Method*. Herndon, VA: Books International.

Quelch, J.A., and Klein, L.K. (1996). The Internet and international marketing. *Sloan Management Review*, (Spring), 60-75.

Richardson, S. A. (1965). *Interviewing*. New York: Basic Books.

Rist, Ray C. (1977). On the relations among educational research paradigms: From disdain to detente. *Anthropology and Education Quarterly* 8(May), 42-49.

Shimp, Terence A., and Sharma, Subhash (1987). Consumer ethnocentrism: Construction and validation of the CETSCALE. *Journal of Marketing Research*, 24(August), 280-289.

Sieber, Sam D. (1973). The integration of field work and survey methods. *American Journal of Socialogy* 78 (May), 1335-1359.

Sudman, S. (1967). *Reducing the Cost of Surveys*. Chicago: Aldine.

Sudman, Seymour (1975). *Applied Sampling*. Orlando, FL: Academic Press.

Sudman, Seymour, and Blair, Edward (1999). Sampling in the twenty-first century. *Journal of the Academy of Marketing Science*, 27(2), 269-277.

Tourangeau, Roger, and Smith, Tom M. (1996). The impact of data collection mode, question format, and question context. *Public Opinion Quarterly*, 60, 275-304.

Tuten, Tracy L., Bosnjak, Michael, and Bandilla, Wolfgang (1999). Banner-advertised Web surveys. *Marketing Research*, (Winter/Spring), 17-21.

Underhill, Paco (1999). *Why We Buy: The Science of Shopping*, New York, NY: Simon & Schuster.

Webb, E. J., Campbell, D. T., Schwartz, R. D., and Sechrest, L. (1966). *Unobtrusive Measures: Nonreactive Research in the Social Sciences*. Chicago: Rand McNally.

Zikmund, William G. (2000). *Business Research Methods 6th edition*. Fort Worth, TX: Dryden Press.

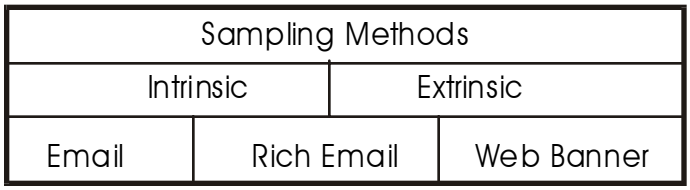
Research Design

This research is designed for completion in stages, each of which have significant and important applications, as well as allowing for adjustment in and rerunning of each stage in order to answer questions of validity in the new survey/experiment instruments developed.

The three established marketing study constructs will first be adapted to the electronic environment. This will present special challenges to assure the constructs and boundaries are accurately represented. Previous NSC sponsored studies' results, by the authors, will act as inputs to this undertaking.

Overall, this project can be represented by a 2X3X3 design (see Figure 13), where there are two respondent motivators (intrinsic and extrinsic), three methods for drawing participants (email, rich email, and Web banner), and thee types of survey methodologies (open-ended interview, experiment, straight survey). Each replication further has its own design, with independent and dependent variables.

Figure 13. Main variables of this study



Replication Studies

Three classic marketing research results will be tested for suitability in the Internet environment. Each one places a special emphasis on one type of marketing research methodology and presents challenges not previously fully addressed within the electronic context. Most straightforward is the adaptation of paper and pencil survey methods to the Web, although special considerations do still exists (especially in the questions of non-response and oversampling and the impact on result validity). At the other end, the most difficult method to enact may be the open ended survey/interview where the communication between the interviewer and respondent is open to move in new directions, while also being guided in the general direction of the research topic.

Open Ended Survey

This marketing research method is difficult and costly to administer due to time and training requirements. If it could be adapted to electronic implementation, the benefits would be large. CIT interviews have been used by researchers such as Hoffman to explore dissatisfaction with services. In our study, attempts will be made to replicate earlier work of Hoffman through the automated CIT interviews through the computer.

Experiment

The experiments of Petty and Cacioppo in support of ELM (Elaboration Likelihood Model) have often been carried out in laboratory settings. These experiments often require visual and/or audio artifacts for subjects to examine. By employing the visual and audio capabilities of the Web, this study will evaluate just how accurately such an experiment can be carried out over the Internet.

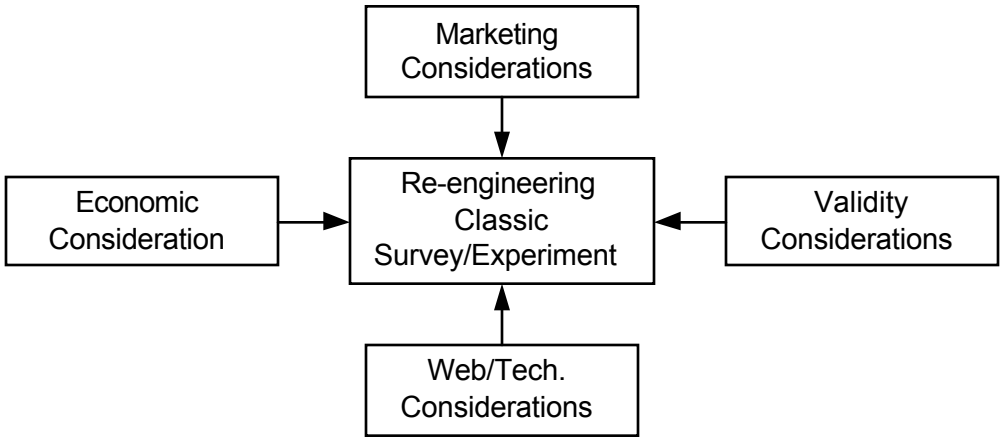
Question/Answer Survey (Paper & Pencil)

The CETSCALE by Shimp and Sharma is a well established measure, even across numerous cultures, of ethnocentrism level in consumers. Adaptation of this paper and pencil survey technique should be relatively simple, but the data provided in the results will have important implications for future Internet based marketing research. Simply because the CETSCALE has been implemented and reported on widely, the results from the present study will be readily placed within that context and validity measured. Specific interactions that are unique to the Cyberspace environment can then be described.

Replication Design

Each of the three marketing research designs will be interpreted and re-engineered for use in the Internet environment. This will require special consideration and attention to marketing theory, experimental validity, technical concerns, as well as cost of implementation.

Figure 14. Consideration inputs for re-engineering traditional studies



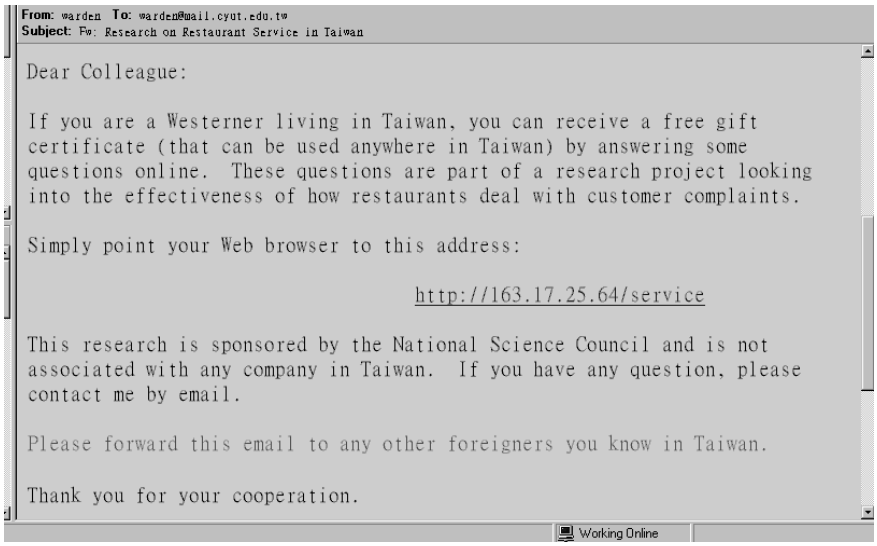
Population/Sample Draw

Samples will be drawn to the experiment server through three different methods. Each of these methods will employ one of two techniques—intrinsic or extrinsic. The intrinsic approach will attempt to interest participants through explaining the survey and what purpose it has. Since researchers such as Hoffman and Novak (1996) observe two types of use on the Web, i.e., a daze like surfing with no cognitive directive and a purposeful searching for information, there may be a difference in response rates when monetary rewards are offered to survey participants compared to cognitive rewards being offered. More importantly, all three research replications will receive equal numbers of respondents from each of these two conditions, thus differences between the responses can be explored in addition to response or click-through rates.

Email Draw

Traditional email will be sent out through purchased email lists from local ISP (Internet Service Provider) firms. The mail will be completely text-based with the server address able to be clicked on to open a browser window to the experiment Web site.

Figure 15. Traditional email invitation



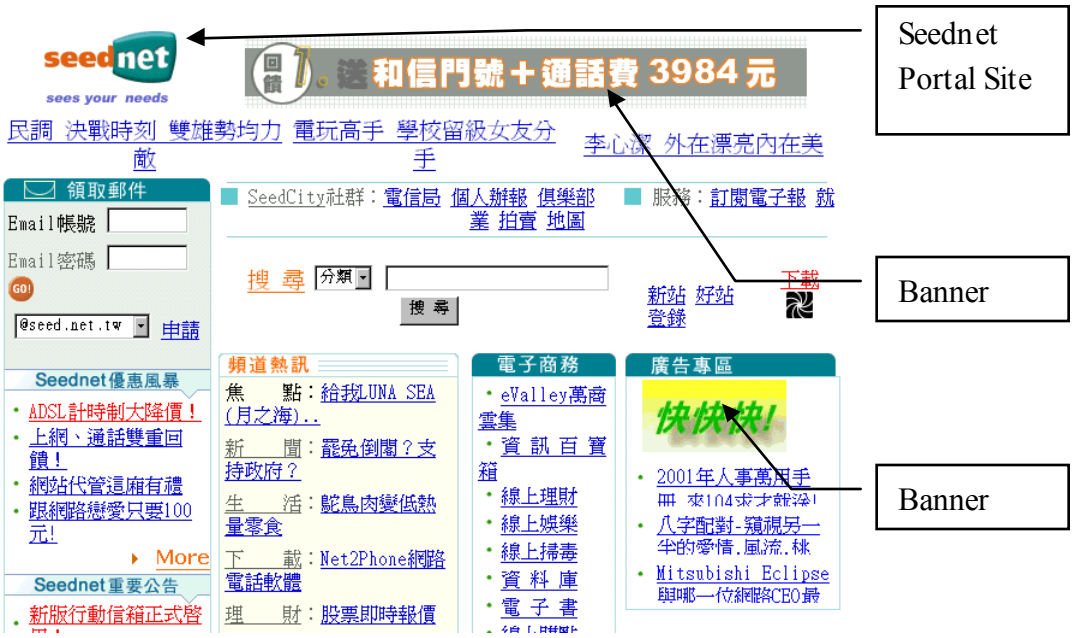
Rich Email Draw

Rich email will be sent out through purchased email lists from local ISP (Internet Service Provider) firms. The mail will include graphics and animations which can be clicked on for further information and opening a browser window directly to the experiment Web server.

Figure 16. Rich email example, with click-through graphics

Portal/Banner Draw

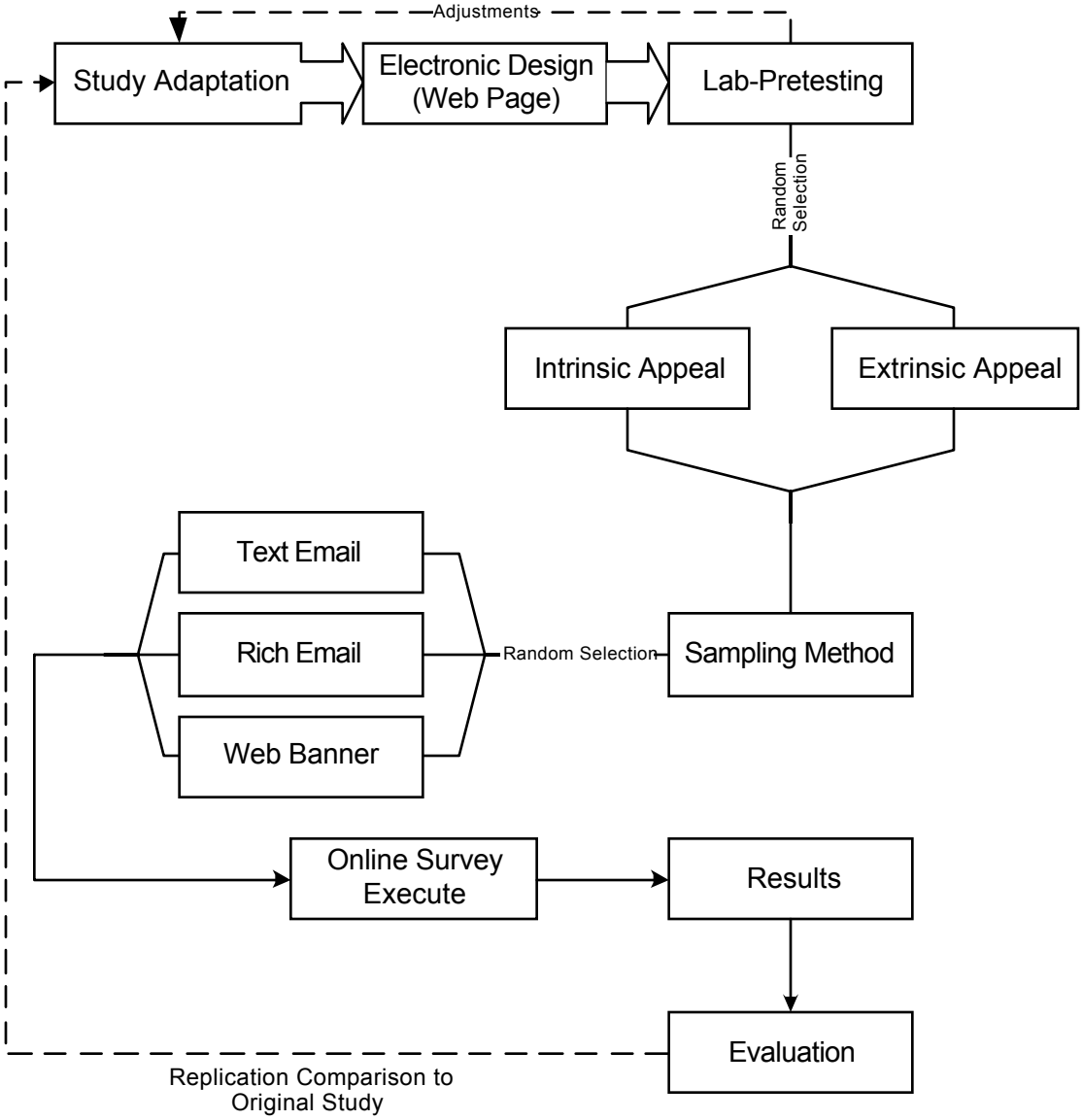
Portal space will be rented from local ISP (Internet Service Provider) firms. Banners advertising the experiment will be placed on the portal's main Web page. Viewers will be able to click-through which opens a browser window to the experiment's Web site.



Replication Validity Confirmation

Stages in the experiment can be seen in Figure 17. This series of stages will be undertaken for each of the three replications. Emphasis is placed on development and adjustment through laboratory and online pre-testing.

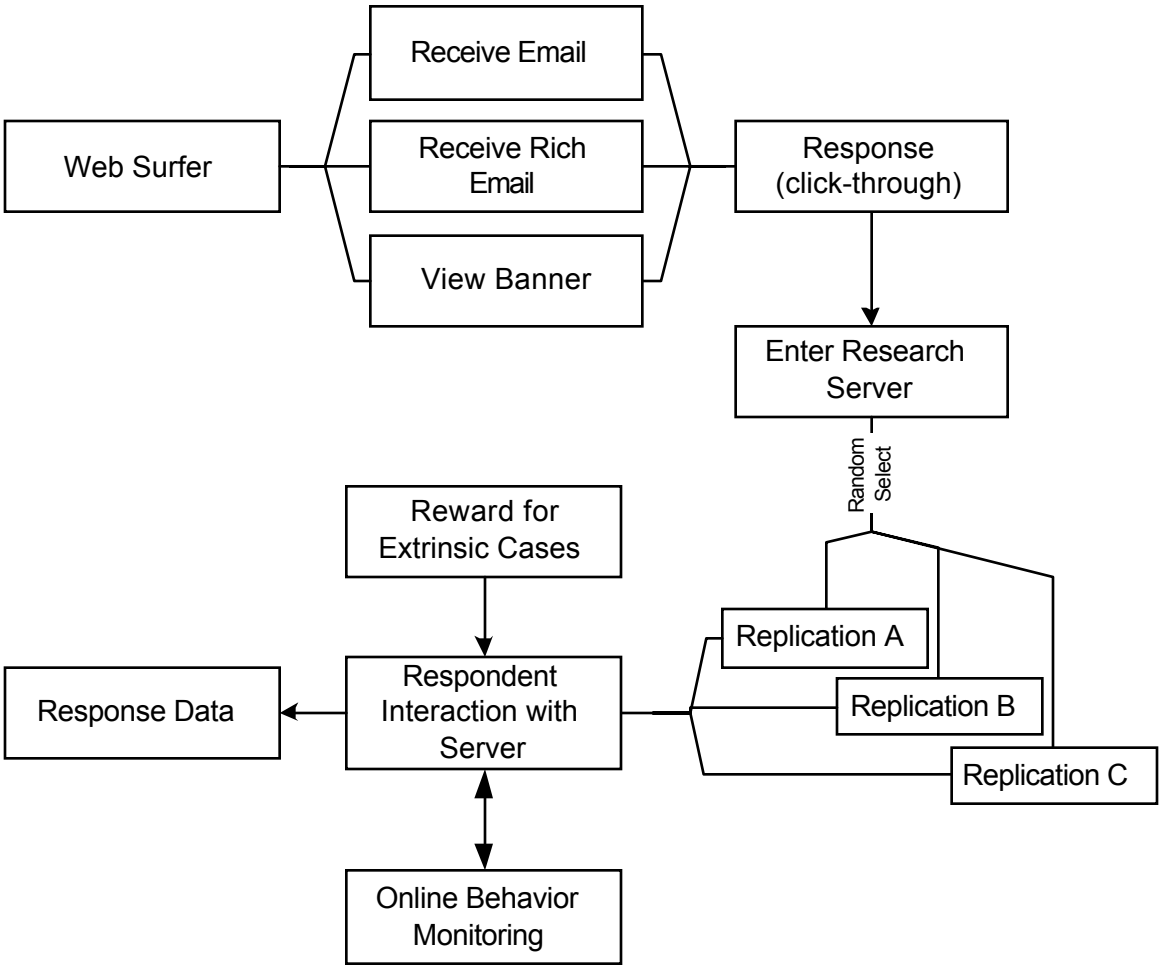
Figure 17. Research stages



Data Collection

Survey respondents will enter the experiment Web site through one of the three paths, after which the individual replications are begun. Each respondent will only enter the site once, and will be directed to a specific replication study through random selection at the time of entering. While at the experiment site, the respondent's actions will be monitored for such variables as time, and clicks in the page interface. Response data will be saved to the server's database. More complicated is the level of interaction required for guiding the respondent in open-ended interviews and the streaming of visual and audio data for the experiment.

Figure 18. Respondent data collection process



Expected Results

Results of this study cover multiple areas and are summarized in Table 1. These results hold the potential to address the numerous problems encountered as people undergo lifestyle changes that make traditional surveying techniques difficult and costly to administer. While the future promises increasing levels of Web use and improved demographic representation across all groups, this study can help to prepare for that time by establishing maximum approaches to implementing online surveys and experiments and how to interpret the results or the weighting of results if necessary.

Table 1. Results Summary

Project Topic	Expected Result	Application
Re-engineering pen & paper survey	Special considerations to assure ease of use can lead to very high reliability of online surveys	Improved coverage at a time when respondents are harder to approach with traditional mailings
Re-engineering open-ended survey	With special approaches to allowing expanded responses, Web-based interviews can approximate person to person interview results	Reduced cost to interviewing and increased coverage as time and geographic constraints can be removed
Re-engineering behavior experiment	Visual and audio ability allows experiments to be performed on line	Greatly reduced cost of experiment implementation in behavior research, including higher convenience in participation
Intrinsic vs. extrinsic click-through rates	Advantages of both approaches, but different characteristics of respondents	Improved sampling that covers a larger population of online consumers
Validity/reliability of online consumer behavior marketing research	Discovery of online variables that interact with traditional survey methods	Design of blocking designs and weighting of results for improved validity on online research