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Enrollment of Low-income Minority Seniors in a Cyber café:

Psychological Barriers to Crossing the Digital Divide

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Abstract

We investigated why some low income, predominantly immigrant seniors (n =91) choose to enroll in free training and start to use computers and the Internet, yet others choose not to enroll. The study was conducted in collaboration with a senior center in downtown Los Angeles that provides free Internet access and training to its seniors. The results suggest that psychological variables (e.g., computer anxiety, computer self-efficacy, and aging anxiety) are stronger predictors of older adults' enrollment than their age or actual experience in using computers. We discuss ways to motivate seniors to participate in computer training by reducing potential barriers.

Low-income Minority Seniors' Enrollment in a Cyber café:

Psychological Barriers to Crossing the Digital Divide

Internet use holds many attractions for seniors (Seals, Clanton, Agarwal, Doswell, & Thomas, 2008), such as increased autonomy (Chaffin & Harlow, 2005; McConatha, McConatha, Deander, & Dermigny, 1995; McMellon & Schiffman, 2002), increased connectivity to friends and family (Cody, Dunn, Hoppin, & Wendt, 1999; Dillon, 2003; Nahm & Resnick, 2001; Opalinski, 2001; White, McConnell, Clipp, Branch, Sloane, Pieper et al., 2002; Xie, 2007), increased levels of empowerment and self-efficacy (Opalinski, 2001; White et al., 2002) and information about health and hobbies (Campbell & Nolfi, 2005; Cody et al., 1999; Hardt & Hollis-Sawyer, 2007; McMillan & Macias, 2008; White et al., 2002). Despite the potential benefits the Internet can provide for senior citizens, it is well known that older adults are significantly less likely to be online than the younger population (Loges & Jung, 2001; Saunders, 2004). Older adults have been reported to be less connected than the general population (Chaffin & Harlow, 2005; Nahm & Resnick, 2001; Saunders, 2004). According to the *Generations Online* report from the Pew Internet and American Life project (2006), Internet use still varies significantly across age groups. While 87% of teens 12-17 and 82% of 18-24 year-olds are now online, only 57% of adults between the ages of 65 and 69 report using the Internet, and the numbers drop dramatically after age 70 (26%) and 76 (17%). Similarly, Public Policy Institute of California (2008) reports that only 58% of adults 55 and older use the Internet and that Internet use has not grown during the last several years among those age 55 and older with household incomes of less than \$40,000 . Families with incomes less than \$20,000 are the least likely to go online.

Stark-Wroblewski, Edelbaum, and Ryan (2007) reported that older adults who use email are likely to be wealthier than those who do not. Members of immigrant minority groups are also less likely to go online compared to non-Hispanic Whites and non-Hispanic blacks (The Pew Internet and American Life project, 2007). The low-income minority senior is thus particularly marginalized with respect to Internet use (Loges & Jung, 2001).

However, the access issue is not the only reason that seniors are less likely to go online than young people. Even when Internet access and training is provided, seniors might not opt to use the Internet for reasons having as much to do with attitudes, beliefs, and personal characteristics, such as anxiety, motivational indifference, or lack of relevant knowledge (Peacock and Künemund, 2007) as with mere access. Therefore, the goal of this paper is (1) to determine attributes and predisposing factors that are associated with low-income immigrant seniors' willingness to take advantage of access and training opportunities offered through a senior center; and (2) to discuss tailoring strategies in encouraging marginalized seniors to take the leap across the digital divide.

We collaborated with a senior center in downtown Los Angeles that provides free Internet access and training to its clients. Before the official opening of the computer center, called the "CyberCafé," we interviewed a culturally diverse sample of seniors who might or might not go on to enroll for the individual computer lessons. Guided by the theories and previous empirical studies on seniors' use of computers and the Internet, we investigated why some seniors chose to enroll in training and started to use computers and the Internet yet others chose not to enroll. Based on our identification of factors that inhibited seniors from enrolling for the computer and

Internet training class, we discuss systematic and efficient ways to create tailored messages to recruit seniors by taking an approach of social marketing to reduce potential barriers. There are only cross-sectional studies of older adult Internet use. This study took advantage of the plans for a Cyber-Cafe in a longstanding senior center to do a prospective study of Internet adoption behaviors.

Literature Review

Barriers to Enrollment in Internet Training

Rogers' (2003) diffusion of innovations model provides a useful framework for looking at the differences between those seniors who enroll in computer training courses and those who do not. In his diffusion model, Rogers' (2003) noted that late adopters tend to be skeptical about the innovation and must make absolutely sure it is worth trying out. On the other hand, earlier adopters tend to feel more confident and willing to take chances, and thus feel less anxious about the innovation. In this regard, we anticipate computer anxiety to be a distinguishing variable between those who enroll and those who do not. Specifically, Laguna and Babcock (1997) suggested that older adults are significantly more likely than younger adults to have high levels of computer anxiety. These high levels of computer anxiety can cause seniors to be more hesitant to use computers (Chaffin & Harlow, 2005; Czaja et al., 2006; Mayhorn, Stronge, McLaughlin, & Rogers, 2004; Saunders, 2004). Thus, we hypothesize that anxiety towards computers will be a significant predictor for enrollment in the computer and Internet training class.

H1: Computer anxiety will be negatively related to enrollment in a computer and Internet training class.

In addition, Rogers (2003) reported that those who adopt an innovation earlier also tend to feel more confident about the innovation. Those who feel they will be able to learn how to use the innovation are more likely to adopt early on. Those who are unsure of their ability to use the innovation tend to wait until many others have adopted the innovation before making the decision to adopt. Thus, we hypothesize that feelings of *computer self-efficacy* will predict enrollment in the computer and Internet training course. In a similar vein, previous computer experience will be a significant predictor for seniors' enrollment.

H2: Computer self-efficacy will be positively related to enrollment in a computer and Internet training class.

H3: Computer experience will be positively related to enrollment in a computer and Internet training class.

Rogers (2003) proposed that earlier adopters have more favorable attitudes toward change. Those who feel anxious about change, for instance, those transitions that come with aging, are less likely to adopt innovations. Thus, we propose that anxiety about aging will act as a distinguishing variable between those who do and do not sign up for training.

H4: Aging anxiety will be negatively related to enrollment in a computer and Internet training class.

Another important difference between early and late adopters is that earlier adopters are more likely to be embedded in social networks and their local community because an innovation or idea perceived as new often spreads over time throughout a social system (Rogers, 2003).

With respect to seniors' adoption of Internet use, Ito and her associates proposed that it is helpful

to think of Internet use in terms of perceptions of relevance to one's life (Ito, O'Day, Adler, Linde, & Mynatt, 2001). Seniors who want to use the Internet and who have the resources available may still not do so because they do not see the Internet as a relevant technology or do not have a shared context in which to participate. In their study of SeniorNet, an organization to help seniors learn about technology, Ito and colleagues found that access was more a matter of "enrolling people into a place they feel they belong" than simply providing seniors with the physical means to connect to the Internet. When being online is made relevant to seniors, and when seniors feel they can belong on the Internet, they are likely to overcome any initial reluctance to connecting. As Eastman & Iyer (2004) noted, seniors who are online are more likely to associate with groups that are technophilic and reward participation, and who understand the social participation possibilities afforded by the medium. They are also more likely to be still working or have friends and/or relatives who use the Internet and promote its adoption as a means to stay in touch. In other words, these seniors are situated in a context where they can feel as if they 'belong' on the Internet and are able to see the Internet as something relevant to their lives. Thus, we speculate that levels of belongingness (to both a senior center and to one's neighborhood) and the availability of a social support network will be distinguishing variables between those who do and those who do not enroll for Internet training.

H5: The feeling of belonging to the neighborhood will be positively related to enrollment in a computer and Internet training class.

H6: The feeling of belonging to the senior center will be positively related to enrollment in a computer and Internet training class.

H7: The feeling of social support will be positively related to enrollment in a computer and Internet training class.

Digital Divide: Age, Education, Income, and Gender

The diffusion of innovation model also predicts that those who adopt innovations early tend to have higher education and income levels than those who adopt later (Rogers, 2003). Thus, we hypothesize that both education and income will be significant predictors of enrollment in a computer and Internet training class.

H8: Education level will be positively related to enrollment in a computer and Internet training class.

H9: Income will be positively related to enrollment in a computer and Internet training class.

Loges & Jung (2001) indicated that the digital divide has to do with the level of one's actual Internet *connectedness*, and how much the Internet is embedded in, and is a part of one's everyday life. Internet connectedness is defined in terms of history and context (e.g., for how long and where one uses the Internet), scope and intensity (e.g., the range of goals one uses the Internet to achieve and how long one spends on each goal), and centrality to one's life (e.g., how much a person would miss the Internet if he or she no longer had access). The investigators found that age was negatively correlated with history, context, scope and intensity. Older adults were more likely to have used the Internet for shorter periods of time, in fewer places, for fewer goals, and for shorter periods of time (Loges & Jung, 2001). An abundance of data from reports cited earlier, including the work by Loges and Jung (2001), leads us to anticipate that older

seniors will be less likely than their younger counterparts to enroll in Internet training courses.

Thus we propose:

H10: Age will be negatively related to enrollment in a computer and Internet training class.

Finally, a number of researchers have focused on gender differences in Internet use, interest and attitudes (e.g., Colley, 2003; Colley & Comber, 2003; Durndell & Haag, 2002; Jackson, Ervin, Gardner, & Schmitt, 2001; Kadjevich, 2000; Madell & Muncer, 2004; Nachmias, Mioduser, & Shemla, 2000; Schumacher & Morahan-Martin, 2001; Shaw & Gant, 2002; Tsai, 2002; Weiser, 2000). Nachmias and colleagues (2000) found that more males than females used the Internet. In addition to heavier use of the Internet by males, previous investigators, in general, found that male students expressed more favorable attitudes towards the Internet (Durndell & Hagg, 2002; Tsai, Lin, & Tsai, 2001). Hargittai and Shafer (2006) reported that women tended to undervalue their Internet skills relative to men. A study by Tsai and Lin (2004) also found that males showed more positive attitudes than did females with respect to perceived usefulness and perceived control of the Internet. Thus we propose that:

H11: Males are more likely than females to enroll in a computer and Internet training class.

Method

Overview

An interdisciplinary team of researchers from a private Western university engaged in a three-year research effort aimed at understanding the determinants and the consequences of

enrollment in an Internet training class at a large multipurpose senior center in downtown Los Angeles. The center has served the multi-ethnic elderly (age 60 and older) of the downtown area by providing professional social work services, reduced-price meals, transportation, and adult day care for the past 30 years. Many of the clients are first generation immigrants from countries all over the world, such as Korea, China, and Mexico.

Individual Internet training was provided to the seniors, in English, Korean, Chinese, or Spanish, in a bistro-style cybercafé located next to the center's main dining room. Coffee and refreshments were available to casual visitors as well as to those using the computers.. In the CyberCafé, seniors were encouraged to socialize and interact with their mentors and their peers as well as with the computers. Mentors could be college students, volunteers, or peers with advanced skills. The mission of the CyberCafé is not only to provide seniors with a venue for socializing, but also to increase seniors' Internet and computer literacy (The cyber café experience, 2004).

Procedure

Approximately four months prior to the opening of the CyberCafé, individual interviews were conducted with 91 seniors at five congregate meal sites of the senior center, including locations in Chinatown, a mixed-ethnicity mid-city residential hotel, a senior housing complex with a largely Chinese population, a congregate meal site in Korea town, and the main site of the center itself in downtown Los Angeles. To cater to the multi-cultural and multi-ethnic nature of the population in the senior center, the research team was composed of multi-ethnic individuals who speak both English and one of the native languages of the target population: Chinese,

Spanish, and Korean.

Interviews rather than self-administered surveys were used to eliminate literacy issues in the target population. Interviews were scheduled by appointment, with a follow-up phone call or message where possible to confirm the time of appointment. All interviews were conducted orally in either English, Spanish, Chinese (Mandarin or Cantonese), or Korean, according to interviewee preference. Interviews were conducted over a series of two weeks at each of the congregate meal sites.

Multilingual teams translated the measures used in the study from the source language (English) to the target language (Spanish, Korean, and Chinese). Both the forward and backward translations teams were trained by the principal investigators of the study based on guidelines prescribed in Behling and Law (2000). The translation teams were instructed to (1) keep in mind the experience and the sensibilities of the participants; (2) make a note of any concepts that are simply not translatable due to non-existing cultural equivalence; and (3) signal if an item was culturally unacceptable. All these issues were later compiled and reviewed for the best resolution. A forward translation team translated the measures from English into the target language (Spanish, Korean, and Chinese). When this first step was completed, a backward translation team translated the newly translated measure back into the source language (English). The backwards translation team was blind to the original measures in English. Then, both the forward and backward translator teams met to resolve inconsistencies and arrive at the best translation.

The interviewer team was composed of multilingual graduate students who were trained in terms of interviewing protocol. They were instructed not to be overly friendly to the

interviewees, merely be polite and pleasant; not to react to or comment on the interviewee's answers; and, not to allow the interviewee to engage them in chat. They were also instructed to be encouraging but not to force the respondents if they were tired or reluctant to answer. The interviewers were also instructed to make a mental note if the respondent appeared to have cognitive lapses which might render his or her answers unreliable. During the interview, the interviewer read the introductory material and each of the items of the questionnaire *exactly as it was written* (the interviewee was also provided with the printed copy of the same questionnaire for his or her own verification). Interviewers would repeat as necessary. Each time after reading out an item, the interviewer directed the respondent to a printed response card showing the scale in large font, unless it appeared to produce irritation. Then the interviewer circled the answers accordingly. The interview team was instructed to offer a brief explanation if asked but not to get into a prolonged discussion with the interviewee about the meaning of a particular word or phrase, or the context in which it applied. The investigators provided a guide to terms and anticipated questions to standardize the responses of the interviewer team.

Participants

Ninety-one seniors participated in the study. The participants had the following characteristics: 60.4% were male and 39.6% were female; with respect to ethnicity, 41.8% were Chinese, 20.9% were Korean, 13.2% were Caucasian, 8.8% were Mexican American; 7.7% were Hispanic/not Mexican; 2.2% were African American, and 5.5% were "other." With respect to marital status, 48.4% were married or had a domestic partner; 17.6% were single; 16.5% were widowed; 8.8% were separated; and 8.8% were divorced. Highest education level was

represented in the sample as follows: 6.6% had a master's or additional postgraduate education; 18.7% had graduated from college; 7.7% had completed some college work; 3.3% had attended a technical or business college; 12.1% were high school graduates; 11% had completed some high school; 36.3% had completed eighth grade. With respect to income, only 12% of the sample reported total annual incomes in excess of \$20,000. Slightly more than fifty-nine percent of the subjects reported never having used a computer. With respect to age, the average age was 75 with a range from 62 to 91. Of the 91 subjects interviewed, 12 subsequently enrolled for the CyberCafé when it first opened and an additional four persons from the original interview cohort enrolled in the CyberCafé during the next several months.

Measures

The feeling of *belonging to the neighborhood* was measured by adapting Matei and Ball-Rokeach (2001). This eight-item measure includes four items on subjective and four items on objective attachment/involvement with the neighborhood. For the four subjective items, the interviewees were asked to rate on a response scale anchored by "Strongly Disagree—(1)" to "Strongly Agree—(5)" the extent to which (a) they are interested in knowing their neighbors, (b) they enjoy talking to their neighbors, (c) it is easy to become friends with their neighbors, and (d) their neighbors can borrow things from them. For the four objective items they were asked how many of their neighbors they knew well enough to ask them for assistance (the respondent could specify any number equal to or greater than 0). The items were: (a) keep watch on one's house or apartment, (b) ask for a ride, (c) talk with them about a personal problem, and (d) ask for assistance in making a repair. These four items were capped at 10 and were further divided by 2

to be brought to the same metric as the subjective items. The final score of the index is the sum of the scores on the eight items and the index ranges from 0 to 40. Alpha reliability was .78.

Feelings of *belonging to the senior center* were measured using 20 Likert-type items asking the interviewees to rate their sense of belonging to the senior center where the CyberCafé was located or the congregate meal site where they came for lunch and socializing (Cody, Dunn, & Witmer, 1999). These 20 items included statements about whether they got along with other seniors at the center, whether they discussed and shared opinions and feelings, whether they helped each other, and whether they enjoyed each other's companionship and friendship. The final score on the index was the average of 20 items ($\alpha = .88$). Higher scores indicated a greater sense of belonging.

The *aging anxiety index* was drawn from Kafer, Rakowski, Lachman, and Hickey's (1980) Aging Anxiety Scale. Interviewees were asked to respond to six Likert-type items: (a) I always worried about the day that I would look into the mirror and see gray hairs; (b) The older I become, the more I worry about my health; (c) The older I become, the more anxious I am about the future; (d) The older I become, the more I worry about money matters; (e) I worry about not being able to get around on my own when I'm older; and (f) I worry that people will have to make decisions for me when I'm older. The final score was the average of the 6 items ($\alpha = .80$). Higher scores indicated greater anxiety about aging.

The *computer anxiety index* was adapted from Heinssen, Glass, and Knight (1987). We used the parsimonious form with six items, but left out the "interpreting a computer printout" item as dated and not suited to the subject population's actual experiences with computing. The

final score of the index was the average of the items with three items reverse coded ($\alpha = .71$).

Higher scores indicated greater anxiety about using computers.

The *computer self-efficacy index* was adapted from Durndell, Haag, and Laithwaite (2000). The original index contained 29 items asking how confident the participants felt about a specific computer skill. We added items to reflect the kinds of skills to be taught in the CyberCafé classes and made it a 33-item index. All items started with the phrase “I feel confident” and were then followed by a computer skill such as taking photos with a digital camera. Scales ranged from “very little confidence” (1) to “quite a lot of confidence” (5). Factor analysis of the items supported the essential unidimensionality of the scale. The final score on the index was the average of the 33 items ($\alpha = .98$).

In addition, the *multidimensional scale of perceived social support index* was used to measure participants’ perceived social support from friends, family, and a special person or significant other. The index is adopted from Zimet, Dahlem, Zimet, & Farley (1988) and Canty-Mitchell and Zimet (2000). Twelve Likert-type measures included four items per each of the three subscales, anchored by “Strongly Disagree” (1) to “Strongly Agree” (5). The final score of the total perceived social support index was the average of 12 items (Cronbach’s $\alpha = .93$). The final scores on perceived social support from the three subscales were the average of four items per each subscale (from friends [Cronbach’s $\alpha = .86$], from family [Cronbach’s $\alpha = .95$], and from a special other [Cronbach’s $\alpha = .86$]). Higher scores indicated greater perceived social support.

Finally, we measured participants’ use of the Internet, asking how much time the

participants spent on the Internet in a typical week and how much they would miss the Internet if they were unable to use it, anchored by “would not miss it at all” (1) to “would miss it an extreme amount” (10). These measures are adopted from Internet connectedness studies (e.g., Jung, Kim, Lin, & Cheong, 2002; Jung, Qiu, & Kim, 2001; Loges & Jung, 2001). Demographic data such as gender, age, educational level, marital status, and income as well as variables related to computer use were also measured.

Results

Maximum likelihood estimation of a logit model was used to test the hypotheses. The Wald statistic, the equivalent of the *t* test in linear regression, was used to determine the statistical significance of the logit coefficients (Knoke, Bohrnstedt, & Mee, 2002).

Hypotheses 1, 2, 4, 8, and 11 were supported. The odds for enrollment in the computer and Internet class increased when older adults reported less computer anxiety (H1, $p < .01$), less aging anxiety (H4, $p < .01$), more years of education (H8, $p < .05$), and their gender as male (H11, $p < .05$). Fifty-four interviewees did not answer the questions on computer self-efficacy because they had never used a computer. Therefore, computer-efficacy was not included in the final analysis. Hypotheses 5, 6, 7, 9 and 10 were not supported. No significant differences were found with respect to neighborhood belonging (H5), feelings of belonging to the senior center (H6), and feelings of social support (H7), income (H9), and age (H10). Hypothesis 3 with respect to the computer experience was marginally supported ($p < .06$). Table 1 summarizes the results of the logistic regression.

Three psychological barriers were significant predictors for enrollment in the computer

and Internet training class. Consistent with Hypothesis 4, aging anxiety was a significant predictor ($p < .01$). A one unit increase in aging anxiety (having more anxiety about aging) decreased the odds that an older adult would enroll in the CyberCafé by 290%. Similarly, a one unit increase in computer anxiety (having more anxiety about using computers) decreased the odds for older adults' enrollment in the CyberCafé by 259%. Thus, Hypothesis 1 was supported.

As shown in Table 1, there was a marginally significant relationship between previous computer experience and enrollment. As predicted, the odds of those who reported having previously used a computer now enrolling in the CyberCafé was 2.96 times the odds of those who had never used a computer enrolling in the CyberCafé. Thus, older adults with computer experience were more likely to enroll in the computer and Internet training class.

Consistent with Hypothesis 8, education was a significant predictor for enrollment in the computer and Internet training class among older adults. For each one year increase in education, the odds for enrollment in the CyberCafé among older adults increased by about 31%.

The result of logistic regression showed a significant gender-based difference in terms of enrollment ($p < .05$). Consistent with expectations, women were less likely than men relative to their numbers to enroll in the computer and Internet training class. More specifically, the odds for men enrolling in the CyberCafé was 5.8 times higher than the odds for women enrolling in the CyberCafé. Thus, Hypothesis 11 was supported.

Finally, the four significant variables were entered into a logistic regression analysis to examine the combined effect of a linear combination of the significant scaled variables: total years of education, gender (treated as a categorical variable), aging anxiety, and computer

anxiety.

The result of logistic regression showed that gender ($p < .05$), aging anxiety ($p < .05$), and computer anxiety ($p < .05$) significantly predicted older adults' enrollment in the computer and Internet training class. However, total years of education became non-significant after controlling for the other three predictor variables. Although the Hosmer and Lemeshow test indicated a good fit of the model (Hosmer and Lemeshow test = 6.57, $df = 8$, $p > .10$), we conducted a χ^2 difference test using two-times log-likelihoods among nested models to find a better model (see Table 2).

A new model without the education variable yielded an inferior model ($\chi^2_{\text{diff}} = 12.01$, $df = 1$, $p < .0001$; Hosmer and Lemeshow test = 11.20, $df = 8$, $p > .10$). Although all the predictor variables (gender, aging anxiety, and computer anxiety) were significant at the .05 level, the individual paths became weakened as shown in Table 2. Therefore, the former model with the four predictor variables predicts older adults' enrollment in computer and Internet training class best. In the combined model, the odds for men enrolling in the CyberCafé was 12.37 times higher than the odds for women enrolling in the CyberCafé after controlling for the other three predictor variables. Consistent with the previous results, a one unit increase in aging anxiety (i.e., having more anxiety about aging) decreased the odds that an older adult would enroll in the CyberCafé by 322%, after controlling for the other three predictor variables. In a similar vein, the result showed that a one unit increase in computer anxiety (i.e., having more anxiety about computer use) decreased the odds of an older adult's enrollment in the CyberCafé by 353%, after controlling for the other three predictor variables. Thus, a typical enrollee was a man with less

anxiety about aging, and less anxiety about computing than a typical non-enrollee.

Discussion

The purpose of our exploratory study was to identify potential barriers for low-income immigrant seniors' enrollment for computer training. Our results showed that enrollees reported significantly less anxiety about computing and aging than other immigrant seniors who did not enroll. In addition to the psychological variables related to computers, previous experience with computers was also a moderately significant predictor for older adults' enrollment. Slightly more than 63% of the enrollees reported previous experience with computers, as opposed to only 36.7% of those who did not enroll. The results imply that the psychological variables are stronger predictors for older immigrant seniors' enrollment than actual experience of using computers. In other words, older immigrant seniors who have never used computers but have less anxiety in using computers were more likely to enroll in the CyberCafé; whereas, older immigrant seniors who have used computers but are still afraid of using computers were relatively less likely to enroll in the CyberCafé.

One of the most significant contributions of our prospective study is the focus on the marginalized population that is seldom studied yet is the most in need of being addressed in terms of minimizing for digital divide. As might be expected in launching of a new computer center, while the potential for data on enrollment was good (91 seniors), relatively few actually signed up. Nonetheless, this was a unique opportunity to explore the factors in minimizing the digital divide across generations in a multi-lingual population in a real life setting. In addition, female participants have been predominant in previous studies about seniors' use of the Internet

(e.g., Cody et al., 1999; Oermann, Hamilton, & Shook, 2003; Saunders, 2004; Segrist, 2004). In our study there are more male participants than female participants, which demonstrates the added value of our data and also enables us to compare the genders in relation to their use of the Internet. Finally, our target population is a group of culturally diverse seniors who are first generation immigrants. This population has been typically underserved so far, and yet is likely to benefit greatly from using the Internet to get in touch with friends and relatives at a distance, as well as to retrieve information relevant to countries where they originally came from. Although we may not be able to generalize our findings from this study to seniors in general due to the sample characteristics, our findings shed light on an overlooked population of immigrant seniors with respect to their Internet training and use.

Another contribution of the study is that our finding supported that computer anxiety is a strong predictor for failure to enroll for low-income immigrant seniors. Even when they were provided with the opportunity of free enrollment and training in their native languages, only a small percentage of the seniors took advantage of this opportunity. It suggests the closing the gap of digital divide is not as easy as providing access. To enhance the success of senior centers implementing Internet training and access programs, a strong educational and recruitment campaign to address the fear of the seniors is important. Based on our findings, we also suggest that it might be effective to tap into anxiety about aging by suggesting that there may be benefits to computer and Internet literacy which are important to healthy aging such as access to medical information, tips on stretching a limited income, and expansion of social support networks (Cohen, 2001; Karavidas et al., 2005; Robinson, Kestnbaum, Neustadtl, & Alvarez, 2000).

The results also suggest that women, people with aging anxiety, and those who are fearful of computing did not sign up for the classes. Women have previously been found to be less likely than men to have positive attitudes towards computers, have higher levels of computer anxiety and consequently be less likely to use computers or the Internet as frequently as men (Bimber, 2000; Irizarry & Downing, 1997; Karavidas, Lim & Katsikas, 2005), and our data support these findings. Additionally, our results support previous findings that computer anxiety predicts less positive attitudes towards computers and less frequent use of them (Bozionelos, 2004; Eastman & Iyer, 2004). Rogers (2003) argues that those who feel more comfortable with changes are more likely to be early adopters of innovation. Our findings support this claim, indicating that those with higher levels of aging anxiety (those who feel anxious about the changes that come with aging) are less likely to enroll in the Cyber café classes. Since this population—women and those with high levels of computer anxiety and aging anxiety—would be highly desirable to serve, we propose increased attention to recruitment strategies which focus on demystifying the process, emphasizing an individualized pace of instruction geared to beginners, and communicating benefits of Internet use of particular interest to women. For example, Holladay and Seipke (2007) found that grandparents believed email as a useful communication tool and used it more frequently than face-to-face communication when they were geographically separated from their grandchildren. Grandparents who used email frequently were satisfied with the relational quality with their grandchildren even without extensive face-to-face interaction. Based on the results, Holladay and Seipke (2007) suggest that emailing provide “an important sense of connectedness to the other” (p. 292). If recruitment messages highlight communicating

benefits of Internet use as “keen-keepers” (Holladay & Seipke, 2007, p. 291), grandmothers may show more interests in enrolling in computer classes.

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Table 1

Logistic Regression: Enrollees vs. Non-enrollees

Predictors	Mean (S.D.)	Logit Coefficients (β)	Exp (β)	Wald Tests
Age	75 (6.41)	-0.01	0.99	0.03
Education (years)	10.7 (5.33)	0.13*	1.14	4.31
Income ^a	1.95 (1.78)	0.16	1.17	1.22
Gender	-	1.76*	5.80	4.95
Aging Anxiety	2.46 (0.58)	-1.35**	0.26	7.07
Computer Anxiety	3.29 (0.75)	-1.28**	0.28	7.82
Computer Self-Efficacy	2.61 (1.07)	1.12*	3.05	5.56
Computer Experience	-	1.09 ⁺	2.96	3.64
Total Belonging	15.82 (5.34)	0.05	1.05	0.70
Belonging to Senior Center	3.24 (0.61)	-0.38	0.69	0.65
Perceived Social Support	3.52 (0.92)	-0.40	0.67	1.84

Note. ⁺ $p < .06$, two-tailed. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

^aIncome was measured using a 11-point Likert Scale ranging from less than \$10,000 to more than \$100,000.

Table 2

 χ^2 Difference Tests Between Nested Models

Model/ Predictors	-2 Log likelihood	$\chi^2_{\text{diff/df}}$	Coefficient (β)	Exp (β)
Four-predictor model	51.78			
Education			.05	1.05
Gender			2.52*	12.37
Aging Anxiety			-1.44*	0.24
Computer Anxiety			-1.51*	0.22
Three-predictor model	63.79	12.01***		
Gender			1.82*	6.14
Aging Anxiety			-1.26*	0.29
Computer Anxiety			-1.28*	0.28

Note. * $p < .05$, two-tailed. ** $p < .01$, two-tailed. *** $p < .001$, two-tailed.