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Evaluating the Efficiency of Methods to Recruit Asian Research Participants

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Few empirical studies have evaluated the efficiency of recruitment methods to recruit non-English-speaking research participants. We attempt to fill this research gap by conducting a systematic evaluation using recruitment data from a large cognitive testing study that pretested the translations of the American Community Survey. In our study we contacted 1,084 Chinese and Korean speakers to identify those who spoke little or no English. We measured the efficiency of the recruitment methods (newspaper advertisements, flyers, online communication, and word of mouth) using four criteria: time spent, outreach capacity, screener completion, and eligibility rate. We also examined differences in recruitment efficiencies by recruiters and sublanguage groups. Among the recruitment methods examined, newspaper advertisements were most efficient in reaching a larger number of Asians while using the least amount of recruiters' time. For recruiting non-English speakers, word of mouth by recruiters with strong ties to the ethnic community worked best.

Key words: Community-based recruitment; recruitment efficiency; cognitive interview.

1. Introduction

Language barriers can prevent non-English speakers from responding to surveys that are available only in English. As the population in the United States becomes more diverse, the inclusion of non-English speakers may have potential implications for the estimates of major national surveys. Therefore, translating English language survey questionnaires can reduce language barriers and encourage survey participation of non-English speakers (native speakers of non-English languages, regardless of their English language proficiency). To ensure that the translations convey the intended meanings, researchers are conducting cognitive testing of the translations to pretest and evaluate the quality of the translations. These cognitive interviews require the successful recruitment of participants who speak a language other than English and also speak little or no English, because recruiting participants who speak English well does not represent the intended population, namely non-English speakers who are likely to use the translated survey questionnaires.

Asians form a significant segment of the population who may benefit from translated survey questionnaires and materials. Among non-English languages spoken in the United States, Chinese and Korean were among the top five languages for which the U.S. Census Bureau provided language assistance in the 2010 Census (Kim and Zapata 2012).

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When Asian non-English speakers were recruited to participate in cognitive testing of the translations, past studies cited several challenges to recruitment, including a lack of trust and unfamiliarity with research studies in general (Pan et al. 2007; Yuan et al. 2009), stemming from the participants' lack of English fluency.

To date, very few studies in the literature address the efficiency of methods for recruiting Asian research participants or non-English speakers overall. Although a wealth of public health literature has investigated the topic of participant recruitment, most studies have concentrated on English-speaking and specific clinical populations (Lai et al. 2006; Yancey et al. 2006). This line of literature has recommended a community-based approach, such as using personal referrals, to address the recruits' possible concerns and to encourage the participation of minority populations. These findings have tended to come from the reporting of recruiting practices and recruiters' debriefings. In contrast, empirical studies that test hypotheses regarding the efficiency of the recruitment methods have been less common. This article attempts to fill this gap by investigating the efficiency of four common recruitment methods: non-English language newspaper advertisements, flyers, online communication, and word of mouth. Using recruitment data collected for a large cognitive testing study with Asian research participants (Chinese and Korean) in the United States, we improved upon the exploratory efficiency measures used in Liu et al. (2013) by refining the existing measures of time efficiency, outreach capacity, and eligibility rate and by adding screener completion rate, and we conducted a systematic evaluation of the efficiency of these recruitment methods. The measures we used were time efficiency, outreach capacity, screener completion rate, and eligibility rate determined from the screening process. We also examined the effect of the community-based approach when recruiters with strong ties to the Asian communities were present.

2. Related Research

Most of the published research on participant recruitment comes from the public health literature. A key concern in this literature is to identify factors that influence participant recruitment (e.g., Areán and Gallagher-Thompson 1996; Yancey et al. 2006), and the results tend to be similar. Representative of this line of literature, Fujimoto (1998) categorized three barriers that hindered research participation by minority populations: (1) simple logistical barriers that can easily be addressed, such as transportation, child- or eldercare, and scheduling; (2) complex logistical barriers, such as a fear of institutional settings, research staff who lack cultural diversity or sensitivity, or inappropriately written recruitment materials; and (3) complex barriers that pertain to recruits' knowledge, beliefs, and attitudes (e.g., general distrust of research studies).

Much of the literature has focused on the African American population group because African Americans tend to have a traditionally lower research participation rate than the general population. Several studies found that a common reason for the lower participation rate among African Americans was their distrust of research conducted by white-dominated research communities. To address the distrust issue, researchers recommended network-based recruitment approaches, such as the use of referrals in a church-based community (Coleman et al. 1997; Holcombe et al. 1999; Gorelick et al. 1996; Reed et al. 2003; Stoy et al. 1995).

However, recruitment of other minority populations, especially non-English-speaking populations, has not been studied as extensively. Similarly to the recruitment of African American research participants, researchers also observed distrust as the main hurdle to participation in recent cognitive testing studies involving non-English speakers (Pan et al. 2007; Yuan et al. 2009). The reasons for this distrust seemed to have stemmed from non-English speakers' limited exposure to research studies and social experience in the United States.

A handful of research articles focusing on recruitment of non-English speakers are available in both public health and exploratory methodological research. In addition to common recruitment methods, such as print and online advertising or flyer posting, recruiters often used community organizations serving the target minority populations to recruit Latino and Asian immigrants (Berrigan et al. 2010; Lau and Gallagher-Thompson 2002; Forsyth et al. 2007; Wellens 1994). Sha and her colleagues (2010) reported community-based word of mouth as the most successful method for recruiting Spanish speakers to pretest a large housing survey. Similarly to research on African American recruitment, they noted that in-person recruiting in the community helped to establish trust. After examining basic efficiency measures of time, outreach, and eligibility, Liu et al. (2013) also found word of mouth to be efficient in identifying eligible non-English speaking Asians. However, these findings lacked statistical testing. Like many other studies that used a community-based approach, Maxwell et al. (2005) also reported successfully recruiting Filipinos for a cancer screening study through a female project liaison. Most of these findings are based on descriptive reporting of recruitment experience, rather than a systematic analysis of recruitment data.

Regardless of the various recruitment targets, recruiters in the literature we reviewed used similar recruitment methods such as printed or online advertisements, flyers, and word of mouth to implement snowball recruitment. However, depending on the population, the method used most frequently and successfully to reach a certain population varied (Appel et al. 1999; Bistricky et al. 2010; Gilliss et al. 2001; Harris et al. 2003; Hughes et al. 2004; McLean and Campbell 2003; The DPP Research Group 2002; Wisdom et al. 2002). From the published recruitment literature, Yancey et al. (2006) concluded that when study eligibility criteria were general, reactive methods (e.g., a newspaper ad that asked interested people to call a researcher) were likely to reach target population groups, whereas proactive methods (e.g., in-person appeals by study staff) tended to be more productive when eligibility criteria were very specific. Several studies found that broadcasting or printed media reached a larger group of potential participants and worked particularly well for the general population, especially white participants. However, they tended to render a high ineligibility rate (Appel et al. 1999; Gilliss et al. 2001; McLean and Campbell 2003). Referrals or word of mouth seemed to work better for identifying minority participants who qualify for the study. However, they reached a far smaller number of potential participants (Bistricky et al. 2010; Gilliss et al. 2001; Wisdom et al. 2002).

Based on past literature, we observed that a community-based approach, mostly implemented via word of mouth, was frequently used to recruit minority populations. However, most of these studies involved public health research with English-speaking populations, or lacked systematic analysis. To attempt to fill this research gap, we used

recruitment data from a large non-English language cognitive testing study to examine the following research questions:

(1) Which is the most efficient recruitment method (a) for reaching the target population quickly ("time efficiency"), (b) for reaching a larger number of people ("outreach capacity"), (c) for completing a larger number of screening questionnaires without breakoffs ("screener completion rate"), and (d) for identifying qualified non-English speakers for the purpose of the research ("eligibility rate")?
(2) Are there differences in recruiting efficiency by sublanguage groups (Chinese speakers vs. Korean speakers) and by recruiters (strong ties to ethnic community vs. weaker ties)?
(3) What is the effect of having recruiters with strong ethnic ties?

Because we do not know how many people actually saw the recruitment message (we only know for certain for the ones that contacted us), our use of the term "reach" indicates how many successful contacts were made after contacting the target population. These measures affected the success of recruiting eligible research participants and complemented one another in the recruitment process. For example, a recruitment method may render a high eligibility rate, but also be less time efficient. More details about how the four measures were derived can be found in the Methods section.

3. Methods

3.1. Recruiters and Recruits

To study the efficiency of methods to reach potential Asian participants, we used the recruitment data from a large cognitive testing study conducted by the U.S. Census Bureau. This study pretested the Chinese and Korean translations of the American Community Survey (ACS) questionnaire with Chinese and Korean speakers who spoke little or no English. The recruiters contacted 1,084 potential participants and administered 845 screening questionnaires that collected information on English language proficiency and additional information to ensure that a significant cross-section of the population was included (e.g., demographics, years in the United States, etc.). Among these 845 screened participants, 497 potential participants met the eligibility criterion of being non-English speakers of the target languages. Ultimately, 258 cognitive interview participants were selected to represent the diverse demographics desired for the testing, a figure that mirrored the targeted Korean or Chinese populations who were likely to need the translated ACS language guide based on the previous ACS statistics. A team of cognitive interviewers conducted the cognitive interviews in the greater Washington, DC area, Illinois, and North Carolina.

This ACS study used eight recruiters who spoke both English and a target language (Chinese or Korean). Three of the eight recruiters (two Chinese and one Korean) had strong ties to their ethnic communities; they interacted regularly with Chinese or Korean speakers at their workplace (e.g., a social service agency serving immigrants and a language school). We categorized the rest of the recruiters as having weaker ethnic ties. They had access to the Chinese and Korean communities through their personal social networks, but the interactions were not as regular or extensive as those with strong ties.

3.2. Recruitment Methods

The recruitment materials were written in Chinese and Korean and all contained the same recruitment message. Directed at Chinese and Korean speakers, the message stated the purpose of the study, the length of the interview, and the monetary incentive. It also specified the study sponsor. Each recruiter was responsible for three of the four recruitment methods: flyers, online communication, and word of mouth. One recruiter per language managed the fourth method, advertising in Chinese and Korean language newspapers.

Recruiters carried out similar specific activities for each recruitment method. For example, they posted flyers at locations that potential participants frequented, such as ethnic business areas or churches with large congregations of Chinese and Korean origins. They also sent electronic messages using ethnic group e-mail lists that key informants suggested and posted online advertisements on Chinese and Korean language websites. These websites were intended for immigrants to exchange information. They usually contained an electronic bulletin board for questions and answers and an internet-based classified section for jobs, housing, and announcements relevant to Asian immigrants. Both the group e-mailing list and the websites could be considered "cold calls", because the recruiters did not usually know who the recipients were. For the word-of-mouth method, recruiters contacted local community centers, engaged community leaders or key informants to spread the recruitment message, recruited participants in group gatherings, and also asked people to spread the message. Therefore, the specific activities conducted for each recruitment method were the same across all recruiters, regardless of their level of ethnic ties. To control cost, the recruiters visited community centers and business areas closer to them; thus recruitment sites differed somewhat. The activities of posting flyers, online communication, and placing newspaper advertisements were most active at the beginning of the recruitment period. After they delivered the recruitment message using those three methods, recruiters answered incoming calls from potential recruits (those who responded to the recruitment message) and then administered the screening questionnaire. As part of the screening process, recruiters asked where the potential participant first saw the recruitment message, which helped to identify the specific recruitment method.

One method – word-of-mouth activities – continued throughout the recruitment period because it required relationship building and continued interactions with key informants and others. Sometimes the recruiters had to travel to meet with the key informants or screen participants in person when they recruited participants in group gatherings. Usually, potential participants recruited through word of mouth were screened on the telephone, as were those potential participants recruited from flyers, online communication, and newspaper advertisements.

3.3. Recruitment Data

To support the systematic analysis of recruitment methods, study researchers documented detailed information about all recruitment activities. First, the recruiters recorded the answers to the screening questionnaire ("screener") to determine a recruit's eligibility for the study. They also recorded the demographic characteristics of the potential participants, the recruitment source (where the potential participants first heard about the study), and a record of calls ("contact history"). The contact history recorded the time each recruiter

spent in an attempt to establish the contact, the mode of contact (phone vs. in person), and the contact result (whether a screener was completed). In addition, the recruiters kept a detailed list of activities that led to the contact with a recruit ("recruitment activity record"), including the type of activity (e.g., travel to ethnic business areas, calling community centers), date and time spent for the recruitment activity, and the financial costs, such as newspaper advertisement fees.

3.4. *Efficiency Measures*

To improve on the exploratory efficiency measures used by Liu et al. (2013), we developed a complete set of measures as shown in Table 1: time efficiency, outreach capacity, screener completion rate, and eligibility rate. Using these measures, we conducted statistical tests to evaluate the efficiency of the common recruitment methods used to recruit this large group of Asian research participants.

Time efficiency, the first measure, indicated the recruitment time spent for a potential participant. Recruitment time refers to the time recruiters spent on conducting recruitment activities. For example, for a newspaper advertisement a recruiter developed the ad, identified the appropriate newspapers, communicated with the newspapers, and coordinated the details to ensure that the ad was published as requested. Because the time efficiency measure was meant for recruitment activities only, we did not include time spent administering screeners.

Outreach capacity, the second efficiency measure, assessed the power of a recruitment method by how many potential participants and associated calls (i.e., number of people) were generated following one particular recruitment attempt. A recruitment attempt was defined as each time a recruiter tried to establish contact with a potential participant.

Screener completion rate, the third efficiency measure, showed how many interested potential participants actually completed the screener without breaking off. If potential participants resulting from a particular recruitment method broke off at a higher rate (low screener completion rate), the value of the recruitment method decreased, even though that method may have reached a large number of people (outreach capacity) while spending less time (time efficiency). We reason that the ultimate purpose of recruitment is to secure eligible research participants. Without completed screeners, the time spent in

Table 1. Efficiency measures and calculation formula

Efficiency measures	Formula
Time efficiency	$\frac{\text{Total recruitment time}}{\text{Total number of potential participants}}$
Outreach capacity	$\frac{\text{Total number of potential participants}}{\text{Total number of recruitment attempts}}$
Screener completion rate	$\frac{\text{Total number of potential participants who completed screeners}}{\text{Total number of potential participants}}$
Eligibility rate	$\frac{\text{Total number of non-English speakers}}{\text{Total number of screened participants}}$

recruitment was essentially wasted because recruiters could not determine the potential participants' eligibility.

Eligibility rate, the final efficiency measure, showed the proportion of non-English speakers among screened potential participants. If potential participants from a particular recruitment method were ineligible at a higher rate, the value of that recruitment method decreased, even though the methods tested well for the other three measures. Because the purpose of the study was to pretest the translation with potential users of the translation, those who spoke English very well did not qualify and were screened out. Therefore, the eligibility rate was critical in assessing the efficiency of a recruiting method.

The formula in Table 1 provides more details: For time efficiency, a lower number indicates greater efficiency, meaning the recruiters spent less time (either for incoming calls or outgoing calls) to produce one call from potential participants. For outreach capacity, screener completion rate, and eligibility rate, a higher number indicates greater efficiency. In other words, more people were reached per each recruitment attempt (outreach capacity), more people recruited via a certain recruitment method completed screeners (screener completion rate), and more people who fit our eligibility criteria (i.e., being a non-English speaker) were recruited (eligibility rate). A summary of potential participant demographics, number of potential participants recruited by each recruitment method, and the recruiter characteristics is presented in the appendix.

4. Analysis and Findings

4.1. Efficiency of Recruitment Methods

To analyze the efficiency of the recruitment methods in locating Asian research participants, we began by comparing the four methods (newspaper ads, flyers, online communication, and word of mouth) with the four efficiency measures: time efficiency, outreach capacity, screener completion rate, and eligibility rate. As shown in Table 2, newspaper advertisements achieved the highest time efficiency and outreach capacity. Specifically, potential participants responding to newspaper ads took 0.8 minutes of recruitment time compared with 5.4 minutes for online communication, 11.3 minutes for word of mouth, and 13.9 minutes for flyers. In addition, the outreach of newspaper advertisements brought 39.5 calls per one recruitment attempt, followed by online (3 calls), flyer (2 calls), and word of mouth (1.8 calls).

Table 2. Recruitment efficiency across four recruitment methods

Recruitment method	Newspaper advertisements ($n = 237$)	Flyers ($n = 192$)	Online communication ($n = 140$)	Word of mouth ($n = 276$)
Time efficiency (minutes)	0.8	13.9	5.4	11.3
Outreach capacity (frequency of calls)	39.5	2.0	3.0	1.8
Screener completion rate (% calls)	95	91	74	93
Eligibility rate (% screened callers)	54	59	49	86

For the third measure of efficiency (screener completion rate), online communication produced the lowest screener completion rate (74%). We found that potential participants failed to complete the screener more often when they were recruited online than when recruited by any other method. Almost three out of ten calls originating from online communication broke off during screening, thus preventing the recruiters from gathering enough information to determine whether the recruits were eligible to participate. As a comparison, the screener completion rates of other recruitment methods were much higher, above 90%.

Finally, for the fourth efficiency measure (eligibility rate), word of mouth had the highest eligibility rate. About 86% of screened individuals recruited via word of mouth were non-English speakers, whereas eligibility rates of recruits via other methods remained between 49% and 59%.

4.2. *Efficiency of Recruitment Methods by Language Groups and by Recruiters*

The next step in analyzing the efficiency of the recruitment methods was to further examine whether the same patterns held true for language groups (Chinese vs. Korean). Our analysis showed an overall similarity between the efficiency pattern as a whole and at the subgroup levels. As shown in Table 3, regardless of language, newspaper advertisements ranked as the most efficient method for time efficiency and outreach capacity, and word of mouth showed the highest eligibility rate. Screener completion rates, on the other hand, varied somewhat across languages. Screener completion rate of potential participants recruited by physical flyers ranked the lowest for Chinese speakers (which had a small number of recruits $n = 17$), while the screener completion rate of potential participants recruited by via online communication was lowest for Korean speakers. Word of mouth and newspaper advertisements were efficient in generating high screener completion rates for both languages.

To further analyze the effectiveness of our recruitment methods, we examined the efficiency measures to see whether a general efficiency pattern of the methods emerged among recruiters who had varying levels of connection to the Chinese or Korean communities. Our analysis revealed that regardless of whether the recruiters had strong ties to ethnic communities, ethnic newspaper advertising reached a larger number of people in less time than other methods, and word of mouth reached more non-English speakers than other methods. Again, online communication had the lowest screener completion rates, while the rates were about the same (above 90%) for potential participants recruited via other methods, regardless of the level of recruiters' ethnic ties. These results corroborate the efficiency pattern observed in the language subgroup analyses. Specific efficiency scores are shown in Table 3.

4.3. *Statistical Testing of the Efficiency of Recruitment Methods*

The next crucial step in our analysis was to conduct statistical testing of these findings. We conducted analysis of variance (ANOVA) and post-hoc analyses (Tukey test) to investigate the statistical significance of our findings and to understand more about the differences among the recruiting methods. This testing was only available for two (screener completion rate and eligibility rate) of the four efficiency measures because the

Table 3. Efficiency measures by language and strength of recruiters' ethnic ties

Measure	Total ($N = 845$)	Language		Recruiters ties	
		Chinese ($n = 261$)	Korean ($n = 584$)	Strong ($n = 253$)	Weaker ($n = 592$)
Time Efficiency (minutes)					
Newspaper advertisements	0.8	3.0	0.3	NA	1.0
Physical flyers	13.9	27.1	12.7	21.3	12.3
Online communication	5.4	13.6	1.5	18.6	2.2
Word of mouth	11.3	14.3	7.8	15.7	6.4
Outreach Capacity (frequency of calls)					
Newspaper advertisements	39.5	12.5	93.5	NA	31.8
Physical flyers	2.0	2.4	2.0	1.3	2.4
Online communication	3.0	1.6	5.3	0.8	8.1
Word of mouth	1.8	1.6	2.3	1.2	4.1
Screener Completion Rate (% calls)					
Newspaper advertisements	95	98	94	100	93
Physical flyers	91	71	93	91	91
Online communication	74	80	72	85	72
Word of mouth	93	90	98	91	96
Eligibility Rate (% screened callers)					
Newspaper advertisements	54	80	47	70	50
Physical flyers	59	83	57	72	56
Online communication	49	72	37	56	47
Word of mouth	86	87	85	89	83

other two measures (time efficiency and outreach capacity) were based on the sum of all recruitment time, recruitment attempts, and number of calls by potential participants, and we therefore constructed measures consisting of different entities to facilitate comparisons of recruitment methods in different aspects, which prevented further statistical testing. For this reason we used screener completion rate and eligibility rate only as separate dependent variables and recruitment methods as the independent variables.

As shown in Table 4, the differences of screener completion rates across recruitment methods were statistically significant as a whole ($F = 16.9$, $p < .0001$) ($F = 28.4$, $p < .0001$) as well as at the subgroup levels ($F = 4.6$, $p = .0037$ for Chinese, $F = 18.8$, $p < .0001$ for Korean, $F = 16.6$, $p < .0001$ for recruiters with weaker ties). The only exception was for recruiters with strong ties. The post-hoc analyses showed that the difference between the online and other recruitment methods drove the overall statistical significance of the ANOVA test. The differences among the other three methods (flyers, newspaper ads, and word of mouth) appeared equally efficient in terms of screener completion rates, and none of them reached statistical significance except for one difference between flyers and newspaper ads in the Chinese data.

Our analyses also revealed that the pattern shown via the ANOVA and post-hoc analysis of eligibility rate was somewhat similar to the outcome of the screener completion rate analysis in one aspect – one particular recruitment method was quite different from other methods and it drove the statistical significance. The differences in the eligibility rates across recruitment methods were statistically significant as a whole ($F = 28.4, p < .0001$ for eligibility rate) as well as all the subgroups, with the exception of the Chinese data ($F = 21.4$, $p < .0001$ for Korean, $F = 7.0$, $p = .0002$ for recruiters with strong ties, $F = 14.4, p < .0001$ for recruiters with weaker ties). The post-hoc analyses indicated that the difference between word of mouth and other recruitment methods drove the overall statistical significance of the ANOVA test. The other three methods (flyers, newspaper ads, and online) appeared equally efficient in reaching Chinese or Korean speakers who also spoke little or no English, and none of these differences reached statistical significance. The group differences that had statistical significance ($p = .05$) are summarized with an asterisk (*) in Table 4.

4.4. *Efficiency Measures by Recruiters*

As an additional examination of the methods used, we compared the efficiency measures according to recruiters' ethnic ties. As show in Table 5, recruiters with strong ties to the ethnic community had completed screeners at a higher rate (92% vs. 89%) and recruited a higher number of non-English speakers (80% vs. 59% in eligibility rate). However, recruiters with strong ties exhibited less efficiency in two respects. Compared with their counterparts who had weaker ties to the ethnic community, these recruiters tended to be less time-efficient in making contacts (13.9 minutes vs. 5.4 minutes) and had a much lower outreach capacity compared with recruiters with weaker ties (1.4 potential participants vs. 5.0 potential participants).

Because recruiters with strong ethnic ties had more frequent and regular access to non-English speakers than those with weaker ties, we suspected that recruiters with strong ethnic ties relied on the word-of-mouth method more often. If that is the case, the effect of

Table 4. ANOVA and Tukey test of screener completion and eligibility rate

	Difference between means by				
		Language		Recruiters ties	
Source comparison	Total ($n = 845$)	Chinese ($n = 261$)	Korean ($n = 584$)	Strong ($n = 253$)	Weaker ($n = 592$)
Screener Completion Rate (% calls)					
Word of mouth vs. flyers	0.02	0.19	0.04	0.00	0.05
Word of mouth vs. newspapers	−0.01	−0.08	0.04	−0.09	0.03
Word of mouth vs. online	0.19*	0.10	0.26*	0.06	0.25*
Flyers vs. newspapers	−0.03	−0.27*	0.00	−0.09	−0.02
Flyers vs. online	0.17*	−0.10	0.22*	0.06	0.19*
Newspapers vs. online	0.20*	0.18*	0.22*	0.15	0.22*
F	16.9	4.6	18.8	2.0	16.6
p-value	<.0001	0.0037	<.0001	0.114	<.0001
Eligibility Rate (% screened callers)					
Word of mouth vs. flyers	0.28*	0.04	0.28*	0.18	0.27*
Word of mouth vs. newspapers	0.33*	0.08	0.38*	0.20*	0.33*
Word of mouth vs. online	0.38*	0.16	0.48*	0.33*	0.36*
Flyers vs. newspapers	0.05	0.04	0.11	0.03	0.06
Flyers vs. online	0.1	0.12	0.21*	0.16	0.1
Newspapers vs. online	0.05	0.08	0.11	0.14	0.04
F	28.4	1.7	21.4	7.0	14.4
p-value	<.0001	0.1618	<.0001	0.0002	<.0001

Table 5. Recruitment efficiency by strength of recruiters' ethnic ties

Measures	Recruiters ties	
	Strong ($n = 253$)	Weaker ($n = 592$)
Time Efficiency (minutes)	13.9	5.4
Outreach Capacity (frequency of calls)	1.4	5.0
Screener Completion Rate (% of calls)	92	89
Eligibility Rate (% screened callers)	80	59

a recruiter's ethnic ties was commingled with the effect of word of mouth, and we should not simply interpret that they recruited at a higher eligibility rate, but were far less efficient in other measures. By running a cross-tabulation of the recruitment methods and recruiters' levels of community ties, we confirmed that recruiters with strong ethnic ties depended heavily on word of mouth: They used word of mouth most often (57.3%) among the four methods, and their dependence on word of mouth was conspicuous compared with other recruiters (22.1%), reaching statistical significance (Chi-square = 99.84, $p < .0001$). This tendency was true for both Chinese (78.5% of recruiters with strong ties versus 40% of recruiters with weak ties, Chi-square = 69.5 [$p < .0001$]) and Korean data (39.4% of recruiters with strong ties vs. 16.3 % of recruiters with weak ties, Chi-square = 40.5 [$p < .0001$]).

As explained in the methods section, the word-of-mouth method sometimes involved traveling to a specific location and having face-to-face interaction. It is therefore not surprising that this method was less efficient in terms of time efficiency and outreach capacity. What is less clear, however, is why word of mouth worked better for recruiting non-English speakers compared with the other recruitment methods. To tease out the effect of word of mouth and recruiters with strong ethnic ties, we set up a logistic regression to predict whether screened individuals were non-English speakers, and we used recruitment methods and recruiters' ethnic ties as independent variables. To explain the different effects of recruiter's ethnic ties on the word-of-mouth recruitment method, an interaction term between word of mouth and recruiters with strong ties was included. Potential participants' language (Chinese or Korean) was also included in the model to explain language differences. All of the independent variables were included as dummy variables: online communication, recruiters with weaker ties, and Korean speakers were the reference groups to be used as the baseline of the parameter interpretation. The Logistics regression model is as follows:

$$f(z) = \frac{e^z}{e^z + 1} = \frac{1}{1 + e^{-z}},$$

$$Z = \beta_0 + \beta_1 * \text{newspaper} + \beta_2 * \text{Flyer} + \beta_3 * \text{Word-of-mouth} + \beta_4 * \text{Recruiter with strong ties} + \beta_5 * \text{Interaction of recruiters with strong ties and Word-of-mouth} + \beta_6 * \text{Chinese speakers}$$

First, we ran the model with the entire data set. The overall model was adequate (Wald Chi-Square = 90.96 [$p < .0001$]) to predict the dependent variable – whether the

screened potential participants were non-English speakers – and we can reject the global null hypothesis that none of the independent variables in the model were related to changes in the probability of reaching non-English speakers. As seen in Table 6, through the Wald Chi-Square test of the parameter estimates, we found statistically significant positive estimates of flyers (0.9), word of mouth (2.13), recruiters with strong ties (1.04), and Chinese speakers (1.04). These findings show the positive contribution of these variables to the dependent variable. That is, potential participants recruited via flyers, word of mouth, or potential participants recruited by recruiters with strong ethnic ties had an increased probability of being non-English speakers compared with the reference groups. These results confirm that using word of mouth and having recruiters with strong ethnic ties have independent effects on recruiting qualified non-English speaking research participants.

5. Discussion

In this study, we analyzed the efficiency of four recruitment methods (newspaper advertisements, flyers, online communication, and word of mouth) using four criteria: time spent, outreach capacity, screener completion, and eligibility rate. We also examined differences in recruitment efficiencies by recruiters and sublanguage groups. Our findings show that newspaper advertisements are the most efficient method for reaching a larger number of Asian research participants in less time, whereas word of mouth works best for reaching non-English-speaking participants. This finding holds true for both Chinese and Korean speakers, regardless of whether the recruiters had strong ties to the ethnic community. These findings echoed prior recruitment research that shows media broadcasting or printed materials reach a larger portion of the general population (Appel et al. 1999; Gilliss et al. 2001; McLean and Campbell 2003), and that word of mouth was effective for recruiting Hispanics who spoke little or no English (Sha et al. 2010).

We also found that the differences of screener completion rates across the recruitment methods were statistically significant. As a whole and at the subgroup levels, online communication was less efficient in persuading interested potential participants to complete the screening questionnaire compared to other recruitment methods (newspaper advertisements, physical flyers, word of mouth). Almost three out of ten calls originating from online communication broke off during screening, thus preventing the recruiters

Table 6. Analysis of maximum likelihood estimates from logistic model predicting non-English speaking research participants

Parameter	Estimates	Wald Chi-Square	Pr > ChiSq
Intercept	−0.74	7.97	0.0048
Newspapers	0.34	1.20	0.561
Flyers	0.9	**8.75**	0.0031
Word of mouth	2.13	**28.62**	< .0001
Recruiters with strong ties	1.04	**14.88**	0.0001
Interaction of word of mouth and strong ties	−0.14	0.06	0.8113
Chinese speakers	1.04	**23.33**	< .0001

from gathering enough information to determine whether the recruits were eligible non-English speakers. As a comparison, the screener completion rates of other recruitment methods were much higher, above 90%. A possible explanation is that messages from the Internet are commonly considered less credible than traditional media platforms, such as newspapers (Flanagin and Metzger 2000; Koo and Skinner 2005). As such, people who realized that they had to answer a screening questionnaire might have broken off the call rather than spend time to complete the screener. Completion of screeners is important because we cannot determine potential participants' eligibility or obtain their contact information without information gathered during the screening process. We may also gauge potential participants' willingness to participate based on whether they broke off or completed the screeners. To our knowledge, however, no literature supports or dismisses the notion that people recruited via online methods are less likely to complete the screener.

It should be noted that the online recruitment methods used in this study were "cold calls" because they were limited to the use of ethnic group emailing lists and postings on Chinese and Korean language websites. However, "online" can be just a medium for communication and recruiters could have also sent the recruitment message to their acquaintances. If such a personal contact was involved in online methods, our finding of low screener completion rate via online recruits may not hold true.

The differences among recruitment efficiencies, eligibility rate in particular, across the recruitment methods were statistically significant, and this statistical significance was driven by the unique nature of the word-of-mouth method. These findings were reported previously by Yancey et al. (2006): Word of mouth is distinct from the other reactive recruitment methods (newspaper advertisements, flyers, and online communication) that require potential participants to take the initiative to respond. By contrast, word of mouth is a proactive method for which recruiters actively seek qualified research participants among the target groups. However, we also found that the word-of-mouth method demands significantly more time to deliver the necessary recruitment message because of its in-person communication format.

Because our study analyzed the recruitment of Chinese and Korean speakers, the finding that recruiters spend more time using the word-of-mouth method during a recruitment attempt may not be surprising. Asians may have a culturally based expectation that the recruiters will create a friendly context before stating their needs (i.e., delivering the actual recruitment message). The emphasis on harmonious interpersonal relationships and politeness in the Asian culture (Markus and Kitayama 1991) most likely explains this expectation and finding. As described in the methods section, the word-of-mouth method in this study may necessitate in-person visits, and the level of personal interactions was relatively high compared with other recruitment methods. The cultural expectations that come with personal interactions could have contributed to widening the gap between word of mouth and the rest of the recruitment methods in this study.

In addition, our analysis showed that recruiters with strong ties to the Asian communities used the word-of-mouth method quite extensively. As corroborated in prior literature on participant recruitment, recruiters with strong ties were successful in reaching eligible participants (i.e., non-English speakers in this study). Compared with recruiters with weaker ties, recruiters with strong ties spent relatively more time recruiting (and thus were less time efficient) and reached a smaller number of people at each recruitment

attempt (lower outreach capacity). The logistic regression analysis teased out the commingled effect of recruiters with strong ties and word of mouth by controlling for recruitment methods. These results demonstrate that recruiters with strong ethnic ties were more successful in reaching non-English speakers regardless of the recruitment methods they used. Not surprisingly, recruiters with strong ethnic ties had more success in recruiting non-English speakers because they interacted with the target populations at a higher frequency and intensity. Compared to their counterparts, recruiters with strong ties are more likely to know the target population better simply because of more frequent interactions, and they could focus their recruitment efforts on these highly eligible participants group with this prior knowledge. We can interpret the high eligibility rate for recruiters with strong ties as the combined results of easy access to the target populations, prior knowledge about the target population, and the trust they could more easily establish by the virtue of their access. The relatively low time efficiency and low outreach capacity results can be explained easily by these recruiters' heavy dependence on word of mouth among the four recruitment methods.

The measures developed in this study may be applicable to future studies even when they are not cross-cultural. We evaluated the four recruitment methods commonly used in many research studies, and our findings strengthened prior literature on participant recruitment reported for the general population as well as minorities. The unique issues facing recruitment of non-English speakers may be identifying the most popular outlets for print and online advertisements as well as identifying and retaining recruiters with strong ties to ethnic communities.

In addition to its contributions to the research, this study has several limitations. First, we only recruited non-English speaking Chinese and Koreans in Illinois, North Carolina, and the greater Washington, DC area. These sites were selected because of their proximity to highly skilled Chinese- and Korean-speaking cognitive interviewers and because many people of Chinese and Korean origin live in these areas. For example, we were able to choose from several Korean language newspapers in the greater Washington, DC area, which resulted in the successful recruitment of eligible Korean speakers. The same result might not be achieved in other areas of the country or among other population groups. Second, in reality people may see the recruitment message disseminated by multiple recruitment methods (e.g., in a newspaper advertisement and a flyer) and then decide to participate. In our analysis, we had to assume that a potential participant was contacted by only one method because there was no systematic way to determine which method encouraged participation.

6. Conclusion

This article has discussed common methods to recruit research participants, which include placing print or online advertisements and getting help from the potential participants' community. Few research studies have examined the efficiency of recruiting non-English speaking participants, in particular, because empirical studies were not conducted or they were lacking in systematic analysis. We attempted to fill this research gap by examining the efficiency of common recruitment methods using the measures of time efficiency, outreach capacity, screener completion rate, and eligibility rate. We used large-scale

recruitment data of Asian research participants – that is, Chinese and Korean speakers – in a cognitive testing study.

Our findings show that the word-of-mouth method identified more non-English speakers, and newspaper advertisements reached a larger number of people in less time. In general, callers recruited via online communication completed screener questionnaires at a lower rate. We also looked into the effect of using recruiters with strong ethnic ties and found that when controlling for recruitment methods, they had a positive effect on recruiting for non-English speakers. In addition, the four recruitment methods we evaluated are commonly used in many research studies; therefore, we believe that the efficiency measures we developed in this study may inform systematic analysis of the recruitment methods to recruit other minority populations or the general population. Clearly, this area could benefit from future research.

Based on the findings of this study, we recommend choosing recruitment methods appropriate for the particular needs of the study. If a study needs to recruit eligible Asian non-English speakers quickly, newspaper advertisements are most efficient. However, researchers may not wish to use both newspapers and flyers because the demographics (i.e., age, education, home ownership status, immigration year) of the individuals recruited via these two methods are similar. For example, our earlier analysis in Park et al. (2011) showed that the average age and the gender distribution of the recruits who responded to newspapers and flyers were very similar. In addition, when a study needs to recruit under very specific eligibility criteria, the word-of-mouth method focusing on the targeted group of people and desired characteristics for the research would likely render more success. Online methods do not seem advantageous for recruiting non-English speaking Asian participants, particularly since online methods have low screening completion rates as well as low eligibility rates. Furthermore, involving recruiters with strong ties to the target community will likely recruit more eligible non-English speakers. Through their strong ties, these recruiters are usually trusted members of the community and can increase the study's credibility.

Appendix. Characteristics of Recruits (n = 845)

	Categories	Frequency (%)		Categories	Frequency (%)
Language	Chinese	261 (30.9%)	Gender	Female	476 (62.6%)
	Korean	584 (69.1%)		Male	285 (37.5%)
Recruited from	Illinois	394 (46.6%)	Age	18–24	59 (7.8%)
	VA/DC/MD	306 (36.2%)		25–34	119 (15.6%)
	North Carolina	145 (17.2%)		35–44	139 (18.3%)
				45–54	194 (25.5%)
Recruited by Recruiters Whose tie to Ethnic Community was:	Strong	253 (29.9%)		55–64	127 (16.7%)
	Weaker	592 (70.1%)			
Recruitment Source	Newspaper	237 (28.1%)		65 +	123 (16.2%)
	Flyer	192 (22.7%)	Education	Less than High School	94 (12.4%)
	Online	140 (16.6%)		High School	243 (31.9%)
	Word of Mouth	276 (32.7%)		College or above	424 (55.7%)
Eligibility	English Speaking	264 (34.7%)	Entry to the U.S.	Before 1980	56 (7.4%)
	Non-English Speaking (eligible)	497 (65.3%)		1980–1989	125 (16.4%)
				1990–1999	177 (23.3%)
				2000–2009	310 (40.7%)
				After 2010	93 (12.2%)
Number of Contacts per potential participant	1 time	665 (78.7%)			
	2 times	146 (17.3%)			
	3 + times	34 (4.0%)			

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