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Comparison of Internet and Mailing Methods to Recruit Couples into Research on Unaided Smoking Cessation

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Abstract

In smoking cessation studies with restrictive criteria (e.g., single-smoker couples), thousands of potential participants might need to be screened to obtain a reasonable sample size. Consideration of recruitment methodology is critical because recruitment methods influence both the success and cost effectiveness of recruitment. Although traditional recruitment methods are often used to recruit participants into smoking cessation research, newer technologies, such as paid Facebook advertising, might offer more cost-effective alternatives for recruitment. The current analysis compares two versions of paid Facebook advertising and a specialized mass mailing method used to recruit single-smoker couples into an intensive three-week study of unaided smoking cessation. The three methods are compared in terms of demographic characteristics, eligibility, and cost-effectiveness. Although Facebook's "Promote Your Page" mechanism achieved the fastest recruitment rate (2.75 couples per month; 498 USD per couple), Facebook's "Send People to Your Website" mechanism was the least expensive and provided the most demographically diverse sample (1.64 couples per month; 181 USD per couple). The specialized mailing method was not productive or cost-effective (0.80 couples per month; 454 USD per couple). Paid Facebook advertising fared better as a recruitment method than a specialized mailing method often used in survey research. Studies that have less restrictive eligibility criteria, that draw from a larger local population, or that recruit for a less intense study might find paid Facebook advertising to be quite feasible.

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Jaye Derrick, Rebecca Eliseo-Arras, and Courtney Hanny designed the study and prepared the study protocols. Rebecca Eliseo-Arras, Courtney Hanny, Maggie Britton, and Sana Haddad conducted literature searches and provided summaries of previous research studies. Jaye Derrick conducted the statistical analyses. All authors contributed to the first draft of the manuscript. All authors contributed to and have approved the final manuscript.

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The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Keywords

recruitment; internet; mass mailing; smoking cessation; single-smoker couples; dual-smoker couples

INTRODUCTION

Recruitment methods influence the success and cost effectiveness of recruitment. A recent pilot study of married and cohabiting single-smoker couples (i.e., one current smoker and one never/former smoker) recruited only 5.8% of those who initially expressed (LaChance et al., 2015), suggesting that researchers might need to screen thousands of respondents to obtain a reasonable sample size. Recent studies of smoking cessation within couples (single- and dual-smoker) recruited participants through print advertising (LaChance et al., 2015; Lipkus, Ranby, Lewis, & Toll, 2013; Lüscher et al., 2015), television or radio advertising (LaChance et al., 2015), and academic or marketing institutions (Lüscher et al., 2015; Scholz et al., 2013). Newer technology-based methods, like web-based advertising (Lipkus et al., 2013; Lüscher et al., 2015; Scholz et al., 2013) and crowd-sourcing (vanDellen, Boyd, Ranby, MacKillop, & Lipkus, 2015), are becoming common. Specialized mailing methods have successfully recruited drug-using couples (Homish & Leonard, 2009), but such methods are new to research on smoking couples. We compare three methods (two Facebook advertising methods and a targeted direct mailing method) to recruit single-smoker couples into a study on unaided smoking cessation.

Paid advertising on Facebook reaches much of the local population (Frandsen, Walters, & Ferguson, 2014), accesses hard-to-reach populations (Rait, Prochaska, & Rubinstein, 2015), allows targeting by demographics or keywords (Carlini, Safioti, Rue, & Miles, 2015; Ramo & Prochaska, 2012; Ramo, Rodriguez, Chavez, Sommer, & Prochaska, 2014), and can be less expensive than traditional advertising and other types of internet recruitment (Carlini et al., 2015; Ramo et al., 2014; but see Rait et al., 2015). Accordingly, paid Facebook advertising might be ideal to recruit smoking couples from a local population. We included two methods of Facebook advertising in the current study. In Facebook Method 1, clicking on the study ad sent potential respondents to our Facebook page where they could follow a link to our screening survey. In Facebook Method 2, clicking on the study ad bypassed our Facebook page and sent potential respondents directly to our screening survey.

Traditional use of mass mailing to recruit participants is expensive, both in resources and time (Bornstein, Jager, & Putnick, 2013; Fouad et al., 2004), and provides relatively low pay-offs in terms of response rates (Aitken, Gallagher, & Madronio, 2003). Therefore, we used a “targeted” direct mailing approach (Derrick, Leonard, & Perry, 2015; Homish & Leonard, 2009), based on the Tailored Design Method (TDM; Dillman, Smyth, & Christian, 2007), to achieve higher response rates and improve the cost-effectiveness of postal mail recruitment. The TDM obtains a sample through a series of five mailed contact points. We used the TDM to recruit and screen participants for our larger study.

Overview

We examined three methods to recruit single-smoker couples into the Daily Experiences with Smoking Cessation (DESC) Study, an ecological momentary assessment study of unaided quitting. We compared these three methods in terms of demographic diversity, eligibility, and cost-effectiveness.

METHOD

Facebook Recruitment

We used two paid Facebook advertising tactics to target users 18–55 years old who were in a relationship and lived within 25 miles of Buffalo, NY. “Promote your Page” is designed to increase “likes” and “shares.” Facebook optimizes performance of the ad by showing it to people similar to those who liked or shared the Facebook page in the past. In our study, users could like or share the page, or they could click on the ad itself to be sent to our Facebook page. On our Facebook page, they could learn more about the study and link to our online screening survey (**Facebook Method 1**, used for eight months). “Send People to Your Website” is designed to increase traffic to an external website. Facebook optimizes performance of the ad by showing it to people similar to those who visited the external website in the past. In our study, Facebook users bypassed our Facebook page by linking directly from our ad to our screening survey, where they learned more about our study through the consent information (**Facebook Method 2**, used for 14 months). We used the same series of ads in both recruitment methods. These ads included a small photo (e.g., of a cigarette), and a single statement: “Couples from Buffalo area needed for confidential, paid study on quitting smoking.”

Targeted Direct Mail Recruitment

To recruit via mail, we purchased names and addresses from Click2Mail (<http://click2mail.com/mailling-list-services>), a direct mail marketing company that provides tailored lists to target households based on public real estate records, telephone directories, and consumer history. We specified households in Erie County, NY with married occupants between the ages of 18–55 with a history of purchasing tobacco products. Of the 13,752 households in the database that fit our selection criteria, we purchased a randomly selected list of 800 names.

We initiated TDM mailing procedures (Dillman et al., 2007) with a new batch of 100 households each month for eight months. Because pre-contact increases response rates (vs. no contact; Edwards et al., 2009), we sent a pre-notice letter (Mailing 1) to indicate that a survey would arrive shortly. Five days later, we sent an invitation letter, screening survey, and return envelope (Mailing 2). To increase response rates, we personalized the invitation letter, included a non-conditional monetary incentive (1 USD), and used first class mail to deliver the surveys (Edwards et al., 2009). One week later, we sent a postcard (Mailing 3) to thank respondents and to remind non-respondents to complete the survey. We sent Mailings 1–3 to all households. Mailing 4, sent only to non-respondents, included a cover letter, duplicate survey (replacement surveys enhance response rates; Edwards et al., 2009), and

business reply envelope. Eight weeks later, we sent continued non-respondents a final letter (Mailing 5).

Eligibility Criteria

To be eligible after **Initial Screening**, couples needed to meet relationship criteria (a different-sex relationship; cohabiting at least six months or married), demographic criteria (both partners 18–55 years old; comfortable reading/writing English), and smoking criteria (one smoker interested in quitting and one never/former smoker). Interested and initially eligible couples were contacted via telephone for more in-depth screening (Phone Screening).

To be eligible after **Phone Screening**, the smoking partner had to meet additional smoking criteria (smoked 2+ years; smokes 10+ cigarettes per day; no non-cigarette forms of tobacco; motivation to quit of at least 50 on a 1–100 scale; not seeing a provider or taking medication to quit smoking). The couple also had to meet logistical criteria (partners lived together; neither partner worked nights; both partners could receive texts during the day), and safety criteria (i.e., no severe violence). Both partners had to agree to participate, and the smoker had to quit smoking 12+ hours before the first appointment (verified with an expelled breath carbon monoxide reading of <10ppm).

RESULTS

We asked three questions: 1) Did respondent demographic characteristics differ by recruitment method at Initial Screening? 2) Did respondent eligibility differ by recruitment method? 3) What was the most effective recruitment method?

Demographic Characteristics

First, we examined whether demographic characteristics reported in Initial Screening differed by recruitment method. Several differences were observed (see Table 1). Targeted TDM respondents and their partners were older, less likely to be smokers, less likely to be Black or Hispanic, more educated, less likely to be in unmarried cohabiting relationships, more likely to be married, and less likely to be in same-sex relationships than Facebook Method 1 or Method 2 respondents and their partners. Similarly, Facebook Method 1 respondents and their partners were older, less likely to be Black, more educated, more likely to be married, and less likely to be in same-sex relationships than Facebook Method 2 respondents and their partners. In summary, Facebook Method 1 respondents generally fell between targeted TDM and Facebook Method 2 respondents.

Eligibility

Flow through the study design differed by recruitment method (see Table 2). We first examined group differences in Initial Screening completion. The dramatic difference in screening completion rates between the two Facebook methods reflects the fact that respondents to Facebook Method 1 viewed the study information on our Facebook page before clicking on the link to our screening survey (i.e., not counted until they were interested), whereas respondents to Facebook Method 2 bypassed our Facebook page to go

directly to the screening survey (i.e., counted before deciding they were interested). Next, we examined group differences in eligibility. Targeted TDM couples were least likely to be eligible after Initial Screening, but Facebook Method 2 couples were least likely to be eligible after Phone Screening. Finally, we examined study completion rates. Significantly fewer Facebook Method 2 couples completed the orientation session than Facebook Method 1 couples.

Recruitment Effectiveness

Overall, Facebook Method 2 was our best method of recruitment. Although we recruited more couples per month using Facebook Method 1 (2.75 couples per month) than Facebook Method 2 (1.64 couples per month) or the targeted TDM (0.80 couples per month), Facebook Method 2 couples were less than half the price to recruit (see Table 2), were more demographically diverse (see Table 1), and did not differ in terms of EMA completion rate, compliance with the reporting schedule, or compliance with lapse reporting (see Table 2).

DISCUSSION

Our aim was to compare three recruitment methods in terms of demographic characteristics, eligibility, and cost-effectiveness. We found the “Send People to Your Website” tactic (Facebook Method 2) to be a better recruitment method than the “Promote your Page” tactic (Facebook Method 1) or the targeted TDM (Dillman et al., 2007). Although we were able to recruit more couples per month using Facebook Method 1 than Method 2, Facebook Method 1 was very costly. The targeted TDM was not productive or cost-effective.

Although Facebook Method 2 was our best recruitment method, it was associated with lower eligibility after Phone Screening and a lower orientation session completion rate. Thus, recruitment staffing costs for Facebook Method 2 would likely be more expensive than for Facebook Method 1. It was also still considerably more expensive (at 181 USD/couple) than in many previous studies using Facebook recruitment (Carlini et al., 2015; Ramo & Prochaska, 2012; Ramo et al., 2014). Our Facebook recruitment efforts targeted a small, local population. Recruitment strategies that target large populations tend to be more cost-effective (e.g., a national sample at 4.28 USD/person; Ramo & Prochaska, 2012) than those that recruit local populations (e.g., 149.64 USD/person; Rait et al., 2015). The current study also included highly specific and restrictive eligibility criteria, which tends to make studies more expensive (e.g., 149.64 USD/person; Rait et al., 2015) than those with fewer requirements (e.g., 8.92 USD/person; Carlini et al., 2015). Finally, the larger study required two in-lab sessions and a 3-week EMA commitment. Recruitment costs for studies requiring an in-person session tend to be higher (e.g., 149.64 USD/person; Rait et al., 2015) than for studies completed online (e.g., 20.14 USD/person in Fenner et al., 2012; 8.80 USD/person in Ramo et al., 2014).

Our targeted TDM response rates were unexpectedly low in comparison to other studies (i.e., 34% in the current study vs. e.g., 66% in past studies; Homish & Leonard, 2009). Although the TDM has been touted as a successful method for recruiting from populations that are typically underrepresented in survey research (e.g., lower education; Dillman et al., 2007), our targeted TDM was less successful than our Facebook methods in this regard.

With increased accessibility of the Internet, most people prefer e-mail to postal mail as their standard method of communication (Dillman et al., 2007). Participants might perceive that it takes more effort to return a survey through postal mail than to click a button online. Additionally, mailed surveys might appear to be advertisements or “junk mail.” Accordingly, surveys distributed via postal mail might be ignored more often.

Conclusions

Researchers studying smoking cessation face many challenges when choosing recruitment methods. Shifting demographic trends and the possibilities and limitations of communication technologies are central concerns for designing studies that reach targeted populations effectively and efficiently. Comparison of our three recruitment methods demonstrates that differences between methods can be subtle but significant. These concerns are likely to become increasingly important as communication technologies continue to develop.

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HIGHLIGHTS

- Cost-efficient recruitment methods are critical to smoking cessation research.
- This paper compares three methods used to recruit single-smoker couples.
- Two Facebook advertising methods and one specialized mailing method were compared.
- The “Send People to Your Website” Facebook mechanism was the most feasible.

Table 1

Demographic characteristics of respondents at Initial Screening by recruitment method.

	Facebook Method 1 ^a	Facebook Method 2 ^b	Targeted TDM ^c	X ² /F
Respondent				
Age, <i>M</i> (<i>SD</i>)	33.50 (9.37) ^a	30.38 (8.51) ^b	44.25 (8.88) ^c	227.76 ***
Smoker (%) ^d	413 (86%) ^a	956 (85%) ^a	65 (26%) ^b	427.35 ***
Race/Ethnicity				
White (%)	435 (90%)	985 (88%)	234 (89%)	2.34
Black (%)	21 (4%) ^a	97 (9%) ^b	4 (2%) ^c	22.67 ***
Hispanic (%)	18 (4%) ^a	63 (6%) ^a	3 (1%) ^b	10.77 **
Other (%)	22 (5%)	47 (4%)	76 (4%)	1.68
Employed (%)	347 (72%) ^a	834 (74%) ^a	199 (81%) ^b	6.43 *
Years of Education, <i>M</i> (<i>SD</i>)	13.64 (1.99) ^a	13.10 (1.81) ^b	14.30 (2.25) ^c	44.13 ***
Partner (per Respondent)				
Age, <i>M</i> (<i>SD</i>)	34.36 (9.79) ^a	31.67 (9.18) ^b	44.52 (10.42) ^c	164.34 ***
Smoker (%)	369 (78%) ^a	721 (67%) ^a	52 (24%) ^b	196.12 ***
Race/Ethnicity				
White (%)	420 (89%) ^a	905 (84%) ^b	205 (87%) ^{ab}	6.82 *
Black (%)	33 (7%) ^a	106 (10%) ^b	6 (3%) ^c	14.89 **
Hispanic (%)	20 (4%) ^a	52 (5%) ^a	1 (0%) ^b	9.59 **
Other (%)	20 (4%)	61 (6%)	8 (3%)	2.86
Employed (%)	366 (77%)	850 (79%)	178 (82%)	1.63
Years of Education, <i>M</i> (<i>SD</i>)	13.12 (1.93) ^a	12.83 (1.79) ^b	14.02 (2.23) ^c	35.50 ***
Relationship				
Relationship Status				
Dating (%)	23 (5%) ^a	117 (9%) ^b	22 (8%) ^b	11.11 **
Cohabiting (%)	225 (44%) ^a	558 (44%) ^a	22 (8%) ^b	122.35 ***
Married (%)	226 (44%) ^a	408 (32%) ^b	173 (66%) ^c	109.28 ***
Same-Sex Couples (%)	9 (2%) ^a	59 (6%) ^b	0 (0%) ^c	21.38 ***

Note. Columns within a row that are labeled with different subscripts differ at $p < .05$. Post hoc tests for significant F -tests were made using Sidak comparisons and for significant χ^2 tests using z-tests for two population proportions.

^a Comparisons are based on 509 respondents who provided demographic information at Initial Screening in response to Facebook Method 1.

^b Comparisons are based on 1267 respondents who provided demographic information at Initial Screening in response to Facebook Method 2.

^c Comparisons are based on 263 respondents who provided demographic information at Initial Screening in response to the targeted TDM.

^d Respondents could be the smoker or the partner of a smoker.

* $p < .05$,

** $p < .01$,

 $p < .001$

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Table 2

Progress of couples through screening and data collection by recruitment method.

	Facebook Method 1	Facebook Method 2	Targeted TDM	Total
Began Initial Screening^{a b c d}	1313	15,240	763	17,509
Total Completed Initial Screening				
(% of Initiated)	509 (39%) ^a	1267 (8%) ^b	263 (34%) ^c	2223 (13%)
Total Eligible after Initial Screening				
(% of Completed Screening)	113 (22%) ^a	274 (22%) ^a	42 (16%) ^b	471 (21%)
<i>Met Relationship Criteria</i>	429	868	192	1626
<i>Met Demographic Criteria^e</i>	458	1042	177	1833
<i>Met Smoking Criteria^f</i>	134	384	62	648
Total Eligible after Phone Screening				
(% of Eligible after Initial Screening)	36 (32%) ^a	57 (25%) ^b	13 (31%) ^a	126 (27%)
<i>Met Smoking Criteria</i>	38	62	15	138
<i>Met Logistical Criteria</i>	36	61	14	131
<i>Excluded for Severe Violence</i>	0	1	0	1
Both Partners Agreed to Participate				
(% of Eligible after Phone Screening)	27 (75%) ^a	46 (81%) ^a	12 (92%) ^a	101 (80%)
Total Completed Orientation				
(% of Agreed to Participate)	23 (85%) ^a	24 (52%) ^b	8 (67%) ^{ab}	64 (63%)
Total Completed EMA				
(% of Completed Orientation)	22 (96%) ^a	23 (96%) ^a	8 (100%) ^a	62 (97%)
Of Completed EMA:				
<i>Compliance with Reporting Schedule^g</i>	80%	84%	79%	79%
<i>Compliance with Lapse Reporting^h</i>	56%	61%	72%	60%
Total Cost to Recruitⁱ				
(not including staffing)	10,966 USD	4,156 USD	3,635 USD	18,757 USD
Cost per Couple	498 USD	181 USD	454 USD	303 USD

Note. The non-italicized rows contain final counts/percentages for each stage of flow through the study design. Within these non-italicized rows, percentages that do not share a subscript differ at $p < .05$ using the two-proportions z-test. EMA = ecological momentary assessment.

^aFew screenings took place over phone/email, and we do not have specific data regarding how they heard about the study (e.g., some called in response to flyers, but others called in response to the mailed screening survey or the Facebook ads). Accordingly, we do not present respondents screened by phone/email in a separate column in the table, although they are included in the Total count (last column). We obtained 42 respondents through phone/email that met eligibility criteria after Initial Screening. Of those, 20 were eligible after Phone Screening, 16 agreed to participate, 9 completed the orientation session, and 9 completed the daily portion of the study.

^bThe numbers for initiated screening for Facebook Method 1 and Method 2 likely includes duplicate entries. We are unable to remove duplicates from the file as we did not obtain identifying information until the end of the screening survey due to IRB concerns about confidentiality (i.e., not collecting contact information from potential respondents who chose not to participate—i.e., those who dropped out of screening). However, the numbers for completed Initial Screening and beyond do not contain duplicates.

^cThe vast majority of those who did not complete screening dropped out at a page containing consent information, where we described the full study in detail.

^dThe mailed screening survey was sent to 800 addresses. Of those, 37 were returned as undeliverable, leaving a total of 763 who received surveys. Of those, 3 requested no further contact, 8 returned blank surveys, and 263 returned completed surveys.

^eEleven couples were recorded as eligible after Initial Screening even though the respondent's partner fell outside the eligible age range. Those couples are included here as meeting demographic criteria and as eligible after Initial Screening. Only two of these couples were described as eligible after Phone Screening. Both agreed to participate, but only one completed the orientation session. That couple also completed the EMA portion of the study.

^fOur study focused on single-smoker couples, but many respondents did not meet initial smoking criteria because they were in a dual-smoker couple. Of those who completed Initial screening, 320 Facebook Method 1 respondents (63% of those who completed Initial Screening), 626 Facebook Method 2 respondents (49% of those who completed Initial Screening), 23 mailing respondents (9% of those who completed Initial Screening), and 93 who initiated contact through other means (51% of those who completed Initial Screening) were in dual-smoking couples, for a total of 1062 (48%) of all respondents who completed Initial Screening.

^gFor 100% compliance with the reporting schedule, participants needed to complete 21 fixed-interval Morning Reports, 21 fixed-interval Evening Reports, and 60 randomly-prompted reports (3 per day for 20 days), for a total of 102 reports. Compliance with the reporting schedule did not differ significantly by the three recruitment methods presented here, $F(2, 48) = 0.87, p = .429$.

^hFor 100% compliance with lapse reporting, smokers needed to complete a Lapse Report every time they smoked. To avoid missing any cigarettes, we asked participants about smoking at the beginning of each Morning, Evening, and Random-Prompt report (i.e., participants could complete "make-up" reports). To calculate compliance, we obtained the ratio of cigarettes reported in Lapse Reports (i.e., "on-time") to the total number of cigarettes reported (on-time + make-up). Compliance with lapse reporting did not differ significantly by the three recruitment methods presented here, $F(2, 45), 0.60, p = .552$ (df differ from compliance with the reporting schedule because smokers did not complete a lapse report if they did not smoke).

ⁱThese costs refer solely to recruitment costs (i.e., not to further costs for the larger study), and they refer to all aspects of recruitment except staffing costs. Staffing costs for Facebook recruitment would be minimal (basically confined to a few clicks on Facebook every couple of weeks, accomplished by the principal investigator in this study). Staffing costs for the mailing would be quite high as they would require folding materials and stuffing envelopes for stages 1, 2, 4, and 5 of the mailing procedure, making the cost for the mailing procedure even more prohibitive than the 454 USD per couple reported here. We were assisted by undergraduate research assistant volunteers, and thus, the financial staffing costs for recruitment in our study were minimal.