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Recruiting Fathers for Parenting Research: An Evaluation of Eight Recruitment Methods and an Exploration of Fathers' Motivations for Participation

Haley E. Yaremych  and Susan Persky 

SYNOPSIS

Objective. We evaluated eight recruitment methods (Craigslist, Facebook ads, Google AdWords, in-person, newspaper, parenting magazines, ResearchMatch, and direct mailing) in terms of their ability to accrue fathers of 3- to 7-year-old children into a laboratory-based behavioral trial for parents. The trial was related to child obesity risk and parental health behaviors. **Design.** Each recruitment method was implemented such that half its occurrences advertised for fathers only, and half advertised for mothers and fathers. Methods were evaluated in terms of number of fathers recruited, cost- and time-efficiency, response rates, and demographic characteristics of individuals recruited. We also assessed fathers' and mothers' motivations for participating in the study. 101 fathers and 260 mothers were recruited. **Results.** Father-targeted ads were essential for father recruitment; 79% of accruals from father-targeted ads were male, whereas only 14% of accruals from parent-targeted ads were male. Craigslist, ResearchMatch, and Facebook ads were the most cost-efficient for accruing fathers. A greater proportion of fathers was motivated by increasing fathers' representation in research (16%) compared to mothers who wished to increase mothers' representation in research (5.4%). Similar proportions of fathers and mothers were motivated by improving their parenting knowledge and improving their child's health. **Conclusions.** Future researchers should employ father-targeted recruitment materials (rather than parent-targeted) that capitalize on fathers' unique motivations for participating in research.

INTRODUCTION

Fathers play a pivotal role in their children's development from infancy to adolescence. In terms of socioemotional development, fathers influence their children both directly (e.g., via sensitivity and support during parent-child interactions) and indirectly (e.g., via spousal relationships and coparental interactions). Both of these modes of influence have been linked to children's social, cognitive, and academic outcomes, sometimes above and beyond the influence of mothers (e.g., Gordon, 2016; Hertz, Bernier, Cimon-Paquet, & Regueiro, 2019; Meuwissen & Englund, 2016; Okorn, Verhoeven, & Van Baar, 2021; Popp & Thomsen, 2017; Suh et al., 2016). In terms of health and physical

development, fathers are frequently involved in and responsible for their children's eating and exercise (Khandpur, Blaine, Fisher, & Davison, 2014; Vollmer, Adamsons, & Mobley, 2019).

Despite this evidence, fathers remain vastly underrepresented in research related to parenting, family processes, and child development (Bogossian et al., 2019; Cabrera, Volling, & Barr, 2018; Davison et al., 2016; Parent, Forehand, Pomerantz, Peisch, & Seehuus, 2017). According to reviews of the clinical and developmental literature, only about 25% of studies analyzed mothers and fathers separately (Braunstein, Peniston, Perelman, & Cassano, 2013; Parent et al., 2017; Phares, Lopez, Fields, Kamboukos, & Duhig, 2005); in the pediatric health literature, this was true for only 10% (Davison et al., 2016). Such underrepresentation has led to an often-inaccurate reflection of contemporary families (Cabrera et al., 2018) as well as significantly biased findings regarding fathers' contributions in socioemotional (Fabiano & Caserta, 2018; Flanders, Leo, Paquette, Pihl, & Séguin, 2009) and health-related (Davis, Canter, & Pina, 2019; Khandpur et al., 2014; Vollmer et al., 2019; Wong et al., 2017) contexts. Across these domains, scholars agree that children's development should be studied in a way that reflects the rich contextual network in which it takes place, which often includes both parents; thus, fathers' representation in parenting research needs to increase (Cabrera et al., 2018; Davison et al., 2016; Khandpur et al., 2014; Parent et al., 2017).

Fathers' lack of inclusion can be attributed to practical barriers as well as theoretical and researcher-held biases. Social norms regarding gender roles have perpetuated the assumption that fathers do not actively engage in hands-on parenting and that their primary contribution to children's development is economic (Amato & Gilbreth, 1999; Cabrera et al., 2018; Davison et al., 2016; Duncan, Morris, & Rodrigues, 2011). Thus, fathers' lack of availability due to full-time work is cited as the most significant barrier to their research participation relative to mothers (Mitchell et al., 2007; Parent et al., 2017; Wong, Roubinov, Gonzales, Dumka, & Millsap, 2013), even though mothers' involvement in full-time work has increased dramatically in recent decades (Bureau of Labor Statistics, 2020). The idea that fathers' research participation is precluded by employment has been steadily debunked; simply offering scheduling flexibility outside of normal working hours seems to successfully circumvent the issue (Costigan & Cox, 2001; Doyle, Weller, Daniel, Mayfield, & Goldston, 2016; Vollmer et al., 2019). Thus, it appears that researcher treatment of fathers as less important or less willing to engage in parenting research is equally or more problematic than practical barriers (Davison, Charles, Khandpur, & Nelson, 2017; Lechowicz et al., 2019; Lundahl, Tollefson, Risser, & Lovejoy, 2008; McGirr et al., 2020; Sherr, Davé, Lucas, Senior, & Nazareth, 2006). Indeed, in a study investigating fathers' perceived reasons for their underrepresentation in research, over 80% of fathers cited not being asked to participate (Davison et al., 2017).

Additionally, there is almost no conclusive evidence regarding recruitment approaches that most successfully accrue fathers into parenting studies. Some work has attempted to address this issue, however discussion of father accrual is almost always anecdotal. Face-to-face recruitment, especially when conducted in settings wherein fathers feel comfortable, may yield success (Davison et al., 2017; Doyle et al., 2016; Mitchell et al., 2007; Sherr et al., 2006; Vollmer et al., 2019), and internet-based methods such as social media and Amazon Mechanical Turk have shown promise (Bennetts et al., 2019; Leach, Bennetts, Giallo, & Cooklin, 2019; Parent et al., 2017). Past work has also shown that emphasizing and explaining that father involvement is indeed important may be useful for recruitment (Doyle et al., 2016; Mitchell et al., 2007; Sherr et al., 2006), as well as clearly stating the benefits of participation for fathers and their families (Davison et al., 2017; Fabiano & Caserta, 2018; Garcia-Huidobro et al., 2019). In general, however, objective and evaluative evidence regarding how and where to successfully recruit fathers remains scant.

Limited work has included quantitative evaluation of recruitment approaches for parents. Whether recruiting for online-, home- or laboratory-based behavioral studies, internet methods (e.g., Facebook ads, Craigslist, mass mailing listservs) typically yield the best cost- and time-efficiency outcomes and the greatest quantity of parents recruited relative to traditional methods (Bennetts et al., 2019; Bergmann et al., 2017; Dworkin, Hessel, Gliske, & Rudi, 2016; Khavjou, Turner, & Jones, 2018). However, most of these studies solely recruited mothers, did not report on the gender composition of parents recruited, or organically recruited mostly mothers and did not attempt to attain a comparable number of fathers. These findings likely cannot be generalized to fathers, and there remains a need to evaluate recruitment methods in terms of their ability to accrue fathers specifically.

A few studies have begun to note the potential utility of advertising for fathers specifically, rather than parents. Fathers typically assume the word “parent” is interchangeable with “mother” when viewing advertisements for parenting interventions and programs (Bayley, Wallace, & Choudhry, 2009; La Placa & Corlyon, 2014; McGirr et al., 2020; Vollmer et al., 2019). Advertising for fathers may communicate that their participation is valued and important (Davison et al., 2019; McGirr et al., 2020; Parent et al., 2017). There is preliminary evidence that father-targeted ads may be necessary for ensuring adequate representation of fathers in parenting studies (Bennetts et al., 2019; Leach et al., 2019).

Finally, little is known about the factors that motivate fathers to participate in research related to their children. In pediatric health research, parents most frequently cite altruism, benefit to one’s own child, learning about their child’s health condition, learning about parenting, or a desire to contribute to science (Glogowska, Roulstone, Enderby, Peters, & Campbell, 2001; Hayman, Taylor, Peart, Galland, & Sayers, 2001; Oesterle, Epstein,

Haggerty, & Moreno, 2018; van Stuijvenberg et al., 1998), however this work has been overwhelmingly mother-focused as well. MacDonald (2019) qualitatively studied father-specific motivations for attending parenting training sessions; only four fathers were assessed, but all cited a commitment to shared parenting and two cited a desire to be a better parent. Some researchers (e.g., Mitchell et al., 2007; Vollmer et al., 2019) have noted that longer-term benefits of the research should be emphasized, especially as they relate to benefits for the child. Similarly, Fabiano and Caserta (2018) found that fathers from low-income families cited child outcomes (e.g., academic, social, emotional) as most important for participating in parenting interventions. In summary, fathers' unique motivations for participating in parenting research remain largely unknown, although emergent evidence suggests that factors related to child and familial improvement are most salient.

The overarching goals of this study were to quantitatively evaluate popular recruitment strategies for accruing fathers into a laboratory-based behavioral research study related to child health risk and parent feeding behavior, as well as to assess fathers' motivations for participating in the study. As a comparative tool, we present findings regarding mother recruitment in parallel. We evaluated eight methods: Craigslist, newspaper ads, Facebook ads, Google AdWords, in-person flyering, direct mailing, ResearchMatch, and parenting magazine ads. For each method, half its occurrences were parent-oriented and advertised for "moms and dads," whereas half were father-oriented and advertised only for "dads." Following previous work (Birnbaum et al., 2017; Gioia, Sobell, Sobell, & Agrawal, 2016; Khavjou et al., 2018; Lattie et al., 2018; O'Dwyer & Moyle, 2014; Sherr et al., 2006), each method was evaluated on multiple criteria in concert with the following primary aims and hypotheses.

Aim 1: to quantitatively compare the effectiveness of each recruitment method for accruing fathers versus mothers. Here, we collapsed across father- and parent-oriented materials to assess overall differences across the eight methods. Effectiveness was defined as the proportion of all fathers in the sample who were recruited by a given method (e.g., by Facebook ads), and the same definition was used for mothers. *Hypothesis 1a*: For most methods, effectiveness would differ by parent gender. This hypothesis arose from general findings that fathers respond differently than mothers to recruitment material. However, due a lack of targeted prior research, it was difficult to formulate specific directional hypotheses for each recruitment method. For fathers, face-to-face recruitment has been studied the most. Based on this work, *Hypothesis 1b* posited that in-person recruitment would be more effective for fathers than mothers, as it provides an opportunity to explain the benefits of participation for fathers and their families.

Aim 2: to compare the effectiveness of father- versus parent-oriented materials for accruing fathers. Again, effectiveness was operationalized as the proportion of all fathers in the sample that were accrued by each father- and parent-oriented method. *Hypothesis 2*: Father-oriented materials would be more effective than parent-oriented materials for recruiting fathers. This expectation was based on prior findings that fathers perceive parent-oriented recruitment material as being geared toward mothers.

Aim 3: to compare the cost- and time-efficiency of each recruitment method for mothers and fathers, focusing on the efficiency of parent-oriented versus father-oriented materials for recruiting fathers. *Hypothesis 3*: Compared to parent-oriented materials, father-oriented materials would yield substantially better cost- and time-efficiency for recruiting fathers.

Aim 4: to evaluate response rates for each recruitment method with respect to both mothers and fathers, focusing on father response rates across parent-oriented versus father-oriented materials. *Hypothesis 4*: Compared to parent-oriented materials, father-targeted materials would yield higher response rates for fathers.

Aim 5: to describe the demographic characteristics of mothers and fathers recruited by each method. A lack of prior research precluded us from forming specific hypotheses.

Aim 6: to quantitatively compare fathers' versus mothers' motivations for participating in our study. *Hypothesis 6a*: Compared to mothers, a greater proportion of fathers would be motivated by improving their representation in and contributing to research (e.g., Davison et al., 2017). *Hypothesis 6b*: gender differences would *not* emerge with respect to motivations related to learning about one's child, improving parenting skills, and improving child outcomes. This expectation arose from emergent evidence that fathers are largely motivated by child- and family-relevant benefits.

METHOD

Larger Study Objectives and Participants

The current study was conducted in the context of recruiting parents for a laboratory-based behavioral trial evaluating parents' affective and behavioral responses to information about their children's obesity risk, focusing on differences by parent gender. Participation involved completion of online surveys and one hour-long in-person visit to the Immersive Virtual Environment Testing Area at the National Institutes of Health (NIH) in the Washington DC metro area. Total time commitment was approximately three hours, and participants were compensated \$90.

The primary eligibility criterion was being the parent of a 3- to 7-year-old child. This was the only criterion advertised in recruitment materials. There were additional eligibility criteria assessed after initial data were

collected, however these criteria did not impact this report. The target N for the trial was 90 mothers and 90 fathers. Only one parent per household could participate in the study. Recruitment took place for approximately 10 months in 2018–2019.

Procedure

Parents of 3- to 7-year-old children were invited to participate in the Parents' Thoughts About Kids and Eating (TAKE) Study at the NIH (Persky et al., 2021). All recruitment materials included a URL that led parents directly to an online eligibility survey; the majority of parents used this link. Materials also included phone and e-mail contact for the study team if further information was desired. Individuals who contacted the study team were given a brief summary of study purpose and procedures, then directed to the online eligibility survey. Because the in-person stage of the trial involved the use of virtual reality, all recruitment materials very generally advertised virtual reality as a potential attractor to the study.

All language and imagery in the recruitment materials were approved by the Institutional Review Board of the National Human Genome Research Institute prior to distribution. All methods were implemented in waves to avoid time effects. To compare the effectiveness of father- versus parent-oriented ads, each method was implemented such that half of its occurrences advertised for “dads” and the other half advertised for “moms and dads.” See specific descriptions of each ad type below for more detail on how this was accomplished. Aside from small language changes due to advertisement formatting requirements, all parent- and father-oriented ads contained identical information. See the Online Supplement for exemplars of all image- and text-based recruitment materials used in this study.

When participants visited the online eligibility survey, they were asked to read a brief overview of the study procedure. Following this, a page of questions appeared, the top of which read: “The questions on this page do NOT determine your eligibility for the study. These questions are important for helping us understand the characteristics of people that we reach with our recruitment materials.” This disclaimer was included for transparency and to discourage parents from entering false information out of fear of disqualification. Following this, eligibility screening for the larger trial began. Only data collected on the first page of the survey are discussed in the current report. Data were collected through SurveyMonkey online software (SurveyMonkey, 2012) and subsequently analyzed in *R* (R Core Team, 2020). Duplicate names and IP addresses were removed prior to analysis. Due to the low-risk nature of the data included here, a waiver of consent was obtained from the IRB.

Measures

Self-Report

Participants reported how they heard about the study from a drop-down list of options which matched the recruitment methods reported here. Each recruitment method was associated with a unique URL for the survey, allowing us to confirm the accuracy of participant reports. Participants then reported their gender, employment status, education level, race, and ethnicity.¹

We collected participants' ZIP code to determine neighborhood socioeconomic status (SES), quantified in terms of median household income and proportion of residents living below the poverty line in each ZIP code. After obtaining the median household income data (www.censusreporter.org; www.datausa.io), we created groups based on standardized income brackets for the United States (Statista, 2019).

Following this, participants reported their motivations for seeking participation in the study. Response options were: *I want to help others*; *I want to improve my child's health*; *I want to contribute to science*; *I am interested in the technology/virtual reality aspect of the study*; *Curiosity/I enjoy learning*; *I want to improve my knowledge about parenting*; *I want [mothers or fathers, matched to participant gender] to be better represented in research*; *I want my personal perspective to be better represented in research*; and *compensation*. Options were first presented in a "Please check all that apply" format, then presented a second time wherein participants were required to select one primary motivation; we report the latter. Some options were based on prior work which has examined parents' reasons for participating in research (Glogowska et al., 2001; Hayman et al., 2001; MacDonald, 2019; Oesterle et al., 2018; van Stuijvenberg et al., 1998). Other response options were generated by the study team.

Cost- and Time-Efficiency

Throughout recruitment, the research team kept a detailed record of time spent designing, implementing, and distributing each father- and parent-oriented recruitment method. Time spent was then multiplied by a standard research assistant salary, \$16.17/hour (NIH, 2019), to arrive at labor cost. All additional costs, if applicable, were recorded in detail. Some recruitment strategies were free to use, and their only expenditures resulted from labor. Total costs were summed and divided by number of participants recruited by each method to arrive at cost per accrued participant. Minutes spent per accrued participant were calculated similarly.

¹In this study, we were required to collect participants' race and ethnicity according to categories supplied by the United States Office of Management and Budget (OMB). Participants classified themselves according to these categories. Therefore, the wording used in this report to describe our methods and results regarding race and ethnicity corresponds to the self-identified term chosen by participants. We note that such racial categories are, in general, problematic.

We computed cost- and time-efficiency for fathers and mothers separately, due to our goal of comparing the efficiency of father-oriented materials and parent-oriented materials for recruiting fathers. When computing cost- and time-efficiency for the parent-oriented ads, we divided total money spent by total fathers recruited (disregarding the number of mothers recruited), and separately divided total money spent by total mothers recruited (disregarding the number of fathers recruited). For computations involving the father-oriented ads, we divided total money spent by number of fathers recruited (disregarding the number of mothers recruited, if any). Calculations were done in such a way that would allow sensible comparisons between parent-oriented and father-oriented ads for recruiting fathers. Although some father-oriented ads incidentally recruited mothers, money and time spent per mother was not calculated due to lack of utility. Time-efficiency calculations were conducted by the same procedure.

Reach and Response Rates

As another indicator of efficiency, we estimated response rates: the number of participants recruited divided by the number of potential participants reached by each method. We estimated the reach of each method disaggregated by gender, such that response rates for fathers and mothers could be separately calculated. It was possible to obtain the exact or estimated gender-specific reach of most methods reported here (described in detail below).

Recruitment Methods Evaluated

Facebook Ads

After creating a Facebook page specific to the study, we built our campaign in Ads Manager. Our goal was to maximize clicks on the ad (rather than views). A strength of Facebook advertising is that ad campaigns can be designed to reach a specific population; our target audience was composed of adults in the Washington DC/Maryland/Virginia area between the ages of 18 and 50. Additionally, viewers were required to have “parent” listed as an attribute on their personal profile. We set our daily budget to \$5.00. Aside from small language changes, the parent- and father-oriented ads were identical. Maximization goal (link clicks) and target audience were the same for both ad types. We did not restrict the father-oriented ad to male viewership to allow for the possibility that women would send ad information to their male partners. The parent-oriented ad ran for 2 months, then the father-oriented ad ran for 2 months, for a total running time of 4 months that was evenly split between ad types. Facebook Ads Manager reported the number of views for each ad, disaggregated by gender, so the reach of each ad was known.

Newspaper

We alternated between running a parent-oriented newspaper ad and a father-oriented newspaper ad, each spaced 2–3 weeks apart. In total, two parent-oriented and two father-oriented newspaper ads were placed. Each ad was approximately 1/8 page in size and ran in the Washington Post Express, a daily newspaper that was widely distributed among public transit stops throughout the Washington DC metro area. The newspaper publicly reports the volume and gender breakdown of daily readership, which we used to approximate the reach of our ads.

In-person

We conducted in-person recruitment by distributing study flyers at high-traffic public transit stops in the DC metro area. We chose this avenue of face-to-face recruitment due to easy public transit access to our study location, large population of public transit users, and barriers encountered at local schools and doctors' offices. Members of the research team distributed parent-oriented flyers for 8 hours and father-oriented flyers for 8 hours over the course of 2 months, for a total 16 hours of flyer distribution that was evenly split across ad types. Flyer distribution took place in 1-hour increments, alternating between father-oriented and parent-oriented advertising. While distributing parent-oriented flyers, team members verbally advertised a study for moms and dads, but for father-oriented flyers, advertised a study for dads. Individuals of any gender were free to take both flyer types. It was not possible to calculate reach for this method.

Parenting Magazine Ads

We placed ads in a local monthly magazine, *Washington Parent*, for 4 months. One ad was placed in the monthly publication each month; we alternated between the parent- and father-oriented ad, and in total, two of each were placed. Each was 1/8 page in size. The parenting magazine reports approximate volume and gender composition of monthly readership on their website; we applied these numbers to estimate the reach of this method.

Craigslist

Under the “community” section on Craigslist, there is a “requests for volunteers” category where research teams frequently post study ads. Our parent-oriented ad was titled “NIH Research Study: For moms and dads of 3–7 year olds;” the father-oriented ad was titled “NIH Research Study: For dads of 3–7 year olds.” The body of the ad briefly described the purpose and procedure of the study. The parent-oriented ad was posted six times, once a week over the course of 6 weeks, then the same was done for the father-oriented ad. Thus, there were twelve total Craigslist ads posted over 12 weeks. Due to a lack of available data about ad viewership, it was not possible to calculate the reach of this method.

ResearchMatch

ResearchMatch is a national registry that connects individuals interested in participating in clinical trials to research teams seeking participants. Individuals can register by providing basic demographic data and health information, and research teams at participating institutions can seek participants.

The headline of our parent-oriented message read “Study for Moms and Dads of 3–7 Year Olds,” whereas our father-oriented headline read “Study for Dads of 3–7 Year-Olds.” The body of the message contained basic information about the study. We implemented a location filter (maximum distance of 25 miles from Bethesda, MD) and age criteria (18 and older).

We sent our parent-oriented ad to 2,300 users, and gender breakdown was estimated based on the composition of male and female ResearchMatch users in the Washington DC metro area. ResearchMatch users in our specified geographic region are 73% female, so we estimate that approximately 1,679 women and 621 men received the parent-oriented message. We then applied a gender filter and sent our father-oriented message to an additional 1,020 men.

Direct Mailing

We mailed letters to 8,000 parents in the Washington DC metro area inviting them to participate in the study. The letters provided a brief overview of the study purpose and procedure, and invited parents to visit the online eligibility survey. Names and addresses were purchased from the Alesco Data Group, whose database is compiled from the U.S. Postal Service and U.S. Census Bureau data. 4,000 mothers and 4,000 fathers were contacted. All mothers received a letter containing parent-oriented language. 2,000 fathers received a letter with father-oriented language, and 2,000 received parent-oriented language. Approximately 25% of letters were returned-to-sender due to invalid addresses; this return rate was taken into account upon computing reach and response rates.

Google Ads

Google AdWords allows advertisers to create a set of ads with associated keywords and phrases; ads appear in response to Google searches that match those keywords. The goal of our Google AdWords campaign was to maximize ad clicks; thus, we created two “ad groups,” each containing two unique ads with slightly varied language (see Online Supplement for examples). All ads were associated with the same keywords: *kids, fathers, parents, mothers, parenting, kids health, parenting tips, paid research, meal tips, family health, healthy eating, child health, family meals, healthy volunteer, and kids studies*, which were chosen in an effort to target parents who were interested in health and/or research without being too broad. Ads appeared to English-speaking

users within the Washington DC/Virginia/Maryland area. Our daily budget was \$15.00. The parent-oriented ad set ran for 1.5 months, then the father-oriented ad set ran for 1.5 months, for a total running time of 3 months that was evenly split across ad types. Due to formatting constraints, Google ads contained a smaller amount of study information than other recruitment methods.

The overall number of views for each ad was reported by Google AdWords, but gender was known for only 12% of viewers. We assumed that this 12% was a representative sample of all viewers and applied these gender proportions to the overall number of views. Thus, total reach of each Google ad was known, but gender breakdown was estimated.

Analytic Plan

Analytic approaches corresponding with our six primary aims are described below. For many aims, we relied on descriptive statistics and qualitative comparisons to explore our research questions. We took this approach because, for some aims, descriptive comparisons were most sensible, and for other aims, sample size was not large enough to allow for meaningful inference. All analyses were conducted in *R*, version 4.0.3 (R Core Team, 2020).

Aim 1: To compare each method's effectiveness across fathers versus mothers, we conducted a chi-square test of independence on the counts of fathers and mothers accrued by each method, collapsing across parent- and father-targeted materials. For this test, the null hypothesis was that each recruitment method accrued an equal proportion of mothers and fathers (e.g., if a method accrued 15% of fathers, then it also accrued 15% of mothers). To follow up on a statistically significant omnibus test, we examined standardized residuals for each cell. A standardized residual greater than +2 or less than -2 indicates that there were significantly more, or fewer, participants recruited than would be expected if each method were equally effective across parent gender.

Aim 2: To test whether father- versus parent-oriented materials were more effective for accruing fathers, we conducted a chi-square test of homogeneity on recruitment counts for fathers only, no longer collapsing across parent- and father-targeted materials. For this test, the null hypothesis was that each recruitment method accrued an equal proportion of fathers (i.e., all methods were equally effective). To follow up on a statistically significant omnibus test, we again examined standardized residuals for each cell to determine which methods accrued more or fewer fathers than would be expected if all methods were equally effective. As a comparative tool, we conducted the same chi-square test and examined residuals among mothers.

Aim 3: We descriptively compared cost- and time-efficiency of each method for recruiting fathers and mothers, focusing on the efficiency of father- versus parent-oriented ads for accruing fathers.

Aim 4: We quantified and descriptively compared response rates among fathers versus mothers for each method. To allow for sensible comparisons, we created response rates that were gender-specific: The reach of each method was divided by gender, such that we obtained or estimated the number of males and females who viewed the recruitment material. Thus, the “denominator” of each response rate was composed of only one gender (e.g., number of fathers recruited $\div$ number of fathers who viewed the material).

Aim 5: We descriptively compared the demographic characteristics of fathers and mothers accrued by each method, including self-identified race, educational attainment, employment status, and neighborhood SES based on reported ZIP code.

Aim 6: To formally test whether different proportions of fathers versus mothers reported each motivation, we used the *prop.test()* function in R. When comparing two group proportions, this procedure yields a χ^2 statistic with 1 degree of freedom (*df*), and tests the null hypothesis that group proportions are equal (i.e., that an equal proportion of fathers and mothers reported the motivation, for example, if 15% of fathers reported being motivated by compensation, then 15% of mothers also reported being motivated by compensation).

RESULTS

Participants

In total, 101 fathers and 260 mothers were recruited. See Table 1 for demographic characteristics of the sample alongside characteristics of the Washington DC metro area. In terms of race and ethnicity, the sample was representative of the area. However, our sample was skewed toward ZIP codes with high median income; only 7% of fathers and 3% of mothers reported living in a ZIP code whose median income was less than \$49,999. Additionally, our sample was well-educated; 22% held a Bachelor’s degree and 44% held a post-graduate degree.

See Figure 1 for recruitment sources of the entire sample. Most fathers were recruited by a father-oriented newspaper ad ($n = 24$, 23%), parent-oriented Facebook ad ($n = 15$, 15%), father-oriented Facebook ad ($n = 14$, 14%), and father-oriented in-person recruitment ($n = 8$, 8%). In contrast, the overwhelming majority of mothers were recruited by a parent-oriented Facebook ad ($n = 166$, 64%), followed by Craigslist ads ($n = 19$, 7%), magazine ads

Table 1. Sample characteristics alongside characteristics of the Washington DC metro area.

	Fathers (<i>n</i> = 101)	Mothers (<i>n</i> = 260)	DC Metro Area
	<i>n</i> (%)	<i>n</i> (%)	(%)
Self-Reported Race			
White	47 (47%)	154 (59%)	45%
Black/African American	29 (29%)	50 (19%)	25%
Asian	10 (10%)	26 (10%)	10%
Multiracial	11 (11%)	22 (8%)	3%
Middle Eastern/North African	1 (1%)	3 (1%)	<1%
Other	3 (3%)	5 (2%)	<1%
Ethnicity			
Hispanic/Latino	11 (11%)	22 (8%)	16%
Not Hispanic/Latino	90 (89%)	238 (92%)	84%
Education			
Post graduate	44 (44%)	108 (42%)	25%
College graduate	22 (22%)	80 (31%)	26%
Some college	21 (21%)	49 (19%)	22%
High school graduate or GED	10 (10%)	18 (7%)	18%
Some high school	2 (2%)	3 (1%)	6%
Elementary only	0	1 (.3%)	3%
No school/only kindergarten	2 (2%)	1 (.3%)	<1%
ZIP Code Median Income			
> \$49,999	7 (7%)	8 (3%)	23%
\$50,000 – \$74,999	21 (21%)	43 (17%)	14.3%
\$75,000 – \$99,999	20 (20%)	73 (28%)	12.7%
\$100,000 – \$149,999	42 (42%)	106 (41%)	20%
< \$150,000	10 (10%)	23 (9%)	29.9%

Wording and categories concerning race and ethnicity correspond to self-identified terms selected by participants.

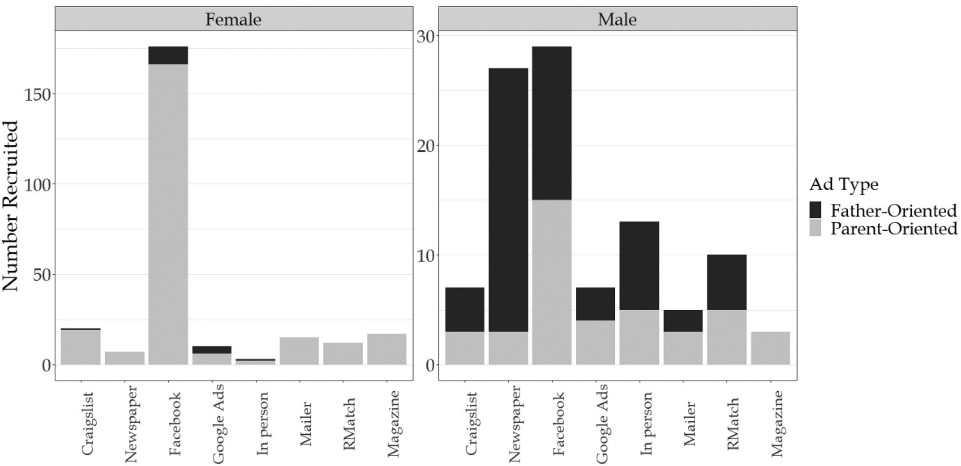


Figure 1. Mothers (*n* = 260) and fathers (*n* = 101) recruited by each father- and parent-targeted recruitment method. Y-axis scales are different for mothers and fathers. RMatch = ResearchMatch.

(*n* = 17, 7%), and direct mailing (*n* = 15, 6%). Of all participants recruited via father-oriented materials, 79% were male. In contrast, of all participants recruited via parent-oriented materials, only 14% were male.

Table 2. Chi-square test of independence and standardized residuals to assess significant differences in proportion of fathers vs. mothers recruited by each method (collapsing across parent- and father-targeted materials).

	Fathers	Mothers
	<i>n</i> (%)	<i>n</i> (%)
	Standardized residual	Standardized residual
Craigslist	7 (6.93%) -.25	20 (7.69%)+.25
Newspaper	27 (26.73%) +7.02*	7 (2.69%)–7.02*
Facebook	29 (28.71%) –6.71*	176 (67.69%)+6.71*
Google	7 (6.93%) +1.24	10 (3.85%)–1.24
In person	13 (12.87%) +4.86*	3 (1.15%)–4.86*
Direct Mailing	5 (4.95%) –.31	15 (5.77%)+.31
ResearchMatch	10 (9.90%) +1.88	12 (4.62%)–1.88
Parenting Magazine	3 (2.97%) –1.33	17 (6.54%)+1.33

$\chi^2(7) = 93.26, p < .001$, Cramer’s $V = .19$. *denotes cells in which the standardized residual comparing observed and expected counts was greater than ± 2 . A positive standardized residual indicates the cell count was higher than expected under the null hypothesis; a negative standardized residual indicates the cell count was lower than expected under the null hypothesis (null hypothesis is that, for each method, the proportion of fathers and mothers recruited was equal).

Aim 1: Method Effectiveness for Fathers versus Mothers

To test for significant gender differences in the efficacy of each method, we conducted a chi-square test of independence (Table 2). Here, we collapsed across father- and parent-oriented ads to assess overall differences. The test revealed at least one significant difference between observed and expected counts, $\chi^2(7) = 93.26, p < .001$, Cramer’s $V = .19$. To follow up on this result, we examined standardized residuals for each cell. We found that newspaper ads and in-person recruitment yielded significantly more fathers than would be expected if all methods were equally effective across parent gender. Additionally, Facebook ads yielded significantly more mothers than expected under the null.

Aim 2: Effectiveness of Father- versus Parent-Oriented Materials among Fathers

We conducted a chi-square test of homogeneity to assess significant differences in method efficacy among fathers (Table 3). The chi-square test indicated at least one divergence from expected counts, $\chi^2(14) = 79.74, p < .001$, Cramer’s $V = .24$. Standardized residuals indicated that father-targeted newspaper ads, father-targeted Facebook ads, and parent-targeted Facebook ads all accrued a larger proportion of fathers than expected under the null hypothesis of equal effectiveness. Father-targeted newspaper ads yielded the largest standardized residual.

Table 3. Chi-square test of homogeneity and standardized residuals to assess significant differences in proportion of fathers recruited by each parent- and father-oriented method.

	<i>n</i> (%)	Standardized residual
Craigslist		
Parent	3 (2.97%)	– 1.49
Father	4 (3.96%)	– 1.09
Newspaper		
Parent	3 (2.97%)	– 1.49
Father	24 (23.76%)	+6.89*
Facebook		
Parent	15 (14.85%)	+3.30*
Father	14 (13.86%)	+2.90*
Google		
Parent	4 (3.96%)	–1.09
Father	3 (2.97%)	–1.49
In person		
Parent	5 (4.95%)	– .69
Father	8 (7.92%)	+ .51
Direct Mailing		
Parent	3 (2.97%)	–1.49
Father	2 (1.98%)	–1.89
ResearchMatch		
Parent	5 (4.95%)	–.69
Father	5 (4.95%)	–.69
Parenting Magazine		
Parent	3 (2.97%)	–1.49
Father	0 (0%)	N/A

$\chi^2(14) = 79.74, p < .001$, Cramer's $V = .24$. *Denotes cells in which the standardized residual comparing observed and expected counts was greater than ± 2 . A positive standardized residual indicates the cell count was higher than expected under the null hypothesis; a negative standardized residual indicates the cell count was lower than expected under the null hypothesis (null hypothesis is that each recruitment method accrued an equal proportion of fathers).

Table 4. Chi-square test of homogeneity and standardized residuals to assess significant differences in proportion of mothers recruited by each parent-oriented method.

	<i>n</i> (%)	Standardized residual
Craigslist	19 (7.31%)	– 2.23*
Newspaper	7 (2.69%)	– 4.55*
Facebook	166 (63.85%)	+26.23*
Google	6 (2.31%)	– 4.74*
In person	2 (.77%)	– 5.52*
Direct Mailing	15 (5.77%)	– 3.00*
ResearchMatch	12 (4.62%)	– 3.58*
Parenting Magazine	17 (6.54%)	– 2.61*

$\chi^2(7) = 695.80, p < .001$, Cramer's $V = .62$. *Denotes cells in which the standardized residual comparing observed and expected counts was greater than ± 2 . A positive standardized residual indicates the cell count was higher than expected under the null hypothesis; a negative standardized residual indicates the cell count was lower than expected under the null hypothesis (null hypothesis is that each recruitment method accrued an equal proportion of mothers). Mothers accrued via father-targeted materials were disregarded from this analysis for simplicity.

As a comparative tool, a similar chi-square test was conducted to assess differences in method effectiveness among mothers (Table 4). For simplicity, we disregarded mothers accrued via father-oriented ads for this analysis. This test also revealed divergence between observed and expected counts, $\chi^2(7) = 695.80$, $p < .001$, Cramer's $V = .62$. Facebook ads yielded a significant positive standardized residual, whereas all other methods yielded significant negative standardized residuals. Here, it appears that the very large proportion of mothers accrued via Facebook drove our results.

Aim 3: Cost- and Time-Efficiency

See Table 5 for a full summary of the cost- and time-efficiency of each method. For recruiting fathers, the most cost-efficient methods were father-oriented Craigslist ads (\$1.52 per father), parent-oriented Craigslist ads (\$2.02), father-oriented ResearchMatch postings (\$4.69), and father-oriented Facebook ads (\$12.62). Time-efficiency results followed a similar trend, but father-oriented newspaper ads yielded the lowest time spent per father (1.3 min). For mothers, the most cost-efficient methods were parent-oriented Craigslist ads (\$0.32), Facebook ads (\$1.82), and ResearchMatch postings (\$4.55). The most time-efficient methods were parent-oriented Facebook ads (6.0 min), Craigslist ads (7.7 min), and newspaper ads (10.0 min).

Table 5. Cost- and time-efficiency of parent-oriented and father-oriented recruitment methods.

Method	Recruited		Money Spent (US\$)	Time Spent (minutes)	Price per Participant		Minutes per Participant	
	Dads	Moms			Dads	Moms	Dads	Moms
Parent-Oriented								
Direct Mailing	3	15	\$4371.30	1560	\$1457.10	\$291.42	520.0	104.0
Facebook	15	166	\$302.02	90	\$20.13	\$1.82	6.0	.5
Google	4	10	\$756.79	122	\$189.20	\$75.68	30.5	12.2
Parenting Magazine	3	17	\$935.00	130	\$311.67	\$55.00	43.3	7.7
Newspaper	3	7	\$833.09	30	\$277.70	\$119.01	10.0	4.3
ResearchMatch	5	12	\$54.65	203	\$10.93	\$4.55	40.6	16.9
Craigslist	3	19	\$6.06	23	\$2.02	\$0.32	7.7	1.2
In person	5	2	\$137.44	510	\$27.49	\$68.72	102.0	255.0
Father-Oriented								
Direct Mailing	2	0	\$1466.53	555	\$733.27	–	277.5	–
Facebook	14	10	\$176.71	90	\$12.62	–	6.4	–
Google	3	4	\$772.50	122	\$257.50	–	40.7	–
Parenting Magazine	0	0	\$935.00	130	–	–	–	–
Newspaper	24	0	\$833.09	30	\$34.71	–	1.3	–
ResearchMatch	5	0	\$23.45	87	\$4.69	–	17.4	–
Craigslist	4	1	\$6.06	23	\$1.52	–	5.8	–
In Person	8	1	\$137.44	510	\$17.18	–	63.8	–

Direct mailing costs are hypothetical, as our research team was not required to pay for first-class postage.

Table 6. Reach and response rates for parent-oriented and father-oriented recruitment strategies.

Method	Recruited		Est. Reach		Est. Response Rate	
	Dads	Moms	Male	Female	Male	Female
Parent-Oriented						
Direct Mailing	3	15	1500	3000	.20%	.50%
Facebook	15	166	8236	24459	.18%	.68%
Google	4	10	23874	36597	.02%	.03%
Parenting Magazine	3	17	5250	169750	.06%	.01%
Newspaper	3	7	100845	123255	.003%	.01%
ResearchMatch	5	12	621	1679	.81%	.71%
Craigslist	3	19	—	—	—	—
In person	5	2	—	—	—	—
Father-Oriented						
Direct Mailing	2	0	1500	—	.13%	—
Facebook	14	10	16496	—	.08%	—
Google	3	4	33860	—	.01%	—
Parenting Magazine	0	0	5250	—	—	—
Newspaper	24	0	100845	—	.02%	—
ResearchMatch	5	0	1020	—	.49%	—
Craigslist	4	1	—	—	—	—
In person	8	1	—	—	—	—

All response rates are gender-specific. Reach was divided by gender, such that we obtained or estimated the number of males and females who viewed the recruitment material. Thus, the “denominator” of each response rate is comprised of only one gender (e.g., number of fathers recruited ÷ number of fathers who viewed the ad).

Aim 4: Response Rates

See Table 6 for reach and response rates for all methods. Overall, response rates for each method were low. Among fathers, the highest response rates were observed for the parent-oriented (0.81%) and father-oriented (0.49%) ResearchMatch postings, followed by parent-oriented direct mailing (0.20%) and parent-oriented Facebook ads (0.18%). Among mothers, the highest response rates were observed for parent-oriented ResearchMatch postings (0.71%) and parent-oriented Facebook ads (0.68%).

Aim 5: Demographics

In this section, we collapse across parent- and father-oriented materials; see Table 7. In terms of fathers recruited, the majority of methods yielded participants with racial diversity that appeared to be representative of the DC metro area. For most methods, the largest proportion of fathers recruited self-identified as White. An exception was Craigslist; 57% of fathers recruited by this method identified as Black/African American. A similar trend emerged for mothers, however the exception here was Facebook, which accrued a disproportionately large number of self-identified White mothers (73%). Education level was dichotomized as college-educated or non-college-educated. For fathers, most methods recruited more college-educated fathers than non-college-educated fathers. Again, a notable exception was Craigslist, which accrued 86% non-college-educated fathers and 65% non-college-educated mothers. Employment

Table 7. Demographic characteristics of fathers and mothers recruited by each method. All table entries are *n* (%).

Method	Self-Identified Race				Education			Employment			Neighborhood Income	
	White	Black/African American	Other	College educated	Non-college educated	Full or part time	Stay at home	Un-employed	Below national average	Above national average		
Fathers												
Craigslist	2 (29%)	4 (57%)	1 (14%)	1 (14%)	6 (86%)	5 (71%)	1 (14%)	1 (14%)	4 (57%)	3 (43%)		
Newspaper	15 (56%)	9 (33%)	3 (11%)	24 (89%)	3 (11%)	23 (85%)	2 (7%)	2 (7%)	10 (37%)	17 (63%)		
Facebook	13 (45%)	6 (21%)	10 (34%)	17 (59%)	12 (41%)	21 (72%)	6 (21%)	2 (7%)	9 (31%)	20 (69%)		
Google	2 (29%)	3 (43%)	2 (29%)	3 (43%)	4 (57%)	5 (71%)	0 (0%)	2 (29%)	3 (50%)	3 (50%)		
In person	7 (54%)	4 (31%)	2 (16%)	7 (54%)	6 (46%)	13 (100%)	0 (0%)	0 (0%)	3 (23%)	10 (77%)		
Mailing	1 (20%)	2 (40%)	2 (40%)	4 (80%)	1 (20%)	4 (80%)	1 (20%)	0 (0%)	1 (20%)	4 (80%)		
Research	6 (60%)	1 (10%)	3 (30%)	7 (70%)	3 (30%)	7 (70%)	2 (20%)	1 (10%)	2 (20%)	8 (80%)		
Match												
Magazine	1 (33%)	0 (0%)	2 (67%)	3 (100%)	0 (0%)	3 (100%)	0 (0%)	0 (0%)	0 (0%)	3 (100%)		
Mothers												
Craigslist	4 (20%)	11 (55%)	5 (25%)	7 (35%)	13 (65%)	15 (75%)	4 (20%)	1 (5%)	9 (45%)	11 (55%)		
Newspaper	1 (14%)	5 (71%)	1 (14%)	3 (43%)	4 (57%)	5 (71%)	1 (14%)	1 (14%)	4 (57%)	3 (43%)		
Facebook	128 (73%)	14 (8%)	34 (19%)	135 (77%)	41 (23%)	101 (57%)	68 (37%)	7 (4%)	37 (22%)	135 (78%)		
Google	1 (10%)	6 (60%)	3 (30%)	5 (50%)	5 (50%)	7 (70%)	1 (10%)	2 (20%)	2 (25%)	6 (75%)		
In person	0 (0%)	3 (100%)	0 (0%)	2 (67%)	1 (33%)	1 (33%)	1 (33%)	1 (33%)	0 (0%)	3 (100%)		
Mailing	7 (47%)	2 (13%)	6 (40%)	14 (93%)	1 (7%)	13 (87%)	2 (13%)	0 (0%)	3 (20%)	12 (80%)		
Research	6 (50%)	4 (33%)	2 (16%)	7 (58%)	5 (42%)	11 (92%)	0 (0%)	1 (8%)	4 (33%)	8 (67%)		
Match												
Magazine	7 (41%)	5 (29%)	5 (30%)	15 (88%)	2 (12%)	13 (76%)	3 (18%)	1 (6%)	4 (24%)	13 (76%)		

Neighborhood income was assessed by comparing the proportion of residents living below the poverty line in the participant's ZIP code against the national average of 12.3%. Results are aggregated across father-oriented and parent-oriented methods. Wording and categories concerning race and ethnicity correspond to self-identified terms selected by participants.

statuses were categorized as: employed full/part time, stay-at-home parent, or unemployed. For both fathers and mothers, all methods yielded a majority of parents recruited who were employed full-time. Facebook accrued the greatest percentage of stay-at-home parents (21% for fathers; 37% for mothers).

Finally, to characterize neighborhood income, we created a dichotomous indicator to compare the percentage of residents living below the poverty line in the participant's ZIP code against the national average (12.3%). Most methods yielded a majority of parents whose ZIP code's income patterns were above the national average (i.e., less than 12.3% of residents lived below the poverty line). For fathers, the only exception was Craigslist, which yielded 57% of fathers whose ZIP code was characterized as below average. For mothers, the exception was newspaper, which also yielded 57% of mothers from below-average ZIP codes.

Aim 6: Motivations for Participation

Figure 2 shows fathers' and mothers' primary motivations for participation. The majority of fathers reported that they were motivated by contributing to science (20%), increasing fathers' representation in research (16%), or improving their child's health (16%). Mothers' most frequently reported primary motivations were curiosity (24%), contributing to science (24%), and improving their child's health (17%).

The proportion of fathers whose primary motivation was increasing fathers' representation in research (16%) was significantly higher than the proportion of mothers whose primary motivation was increasing mothers' representation in research (5.4%), $\chi^2(1) = 7.91$, $p = .005$, $\phi = .15$. Additionally, a significantly greater proportion of mothers (23.8%) versus fathers (9.9%) reported curiosity as

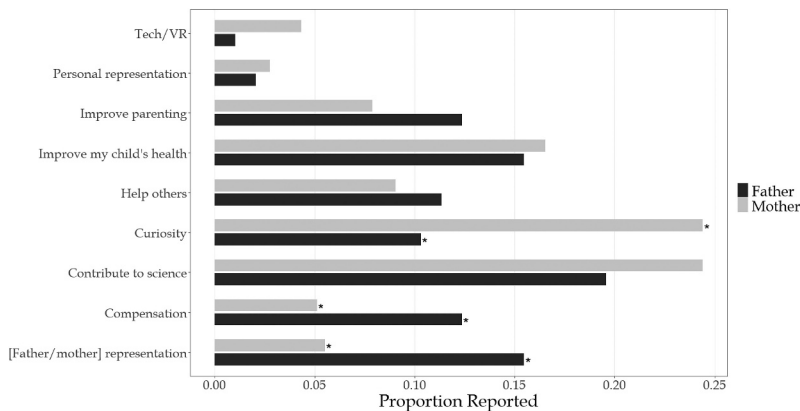


Figure 2. Fathers' and mothers' primary motivations for participation. Asterisks (*) depict statistically significant ($p < .05$) difference in the percentages of fathers vs. mothers that reported the primary motivation.

their primary motivation, $\chi^2(1) = 7.72$, $p = .005$, $\phi = .15$. Finally, a significantly greater proportion of fathers (11.9%) versus mothers (5%) reported compensation as their primary motivation $\chi^2(1) = 4.54$, $p = .033$, $\phi = .11$.

DISCUSSION

This study is among the first to objectively evaluate common strategies for father recruitment. We compared father- and parent-targeted ads in terms of recruitment yield, cost- and time-efficiency, response rates, and demographic characteristics of accrued participants.

Aim 1: Method Effectiveness for Fathers versus Mothers

Consistent with Hypothesis 1a, the relative effectiveness of many strategies differed between mothers and fathers (Table 2). Newspaper ads and in-person recruitment both yielded significantly greater proportions of fathers than mothers. Indeed, Hypothesis 1b posited that in-person recruitment would be more effective for fathers than for mothers; a growing body of work suggests that face-to-face recruitment is an effective strategy for reaching fathers, although most prior evidence is anecdotal. Here, we provide quantitative evidence that in-person recruitment may be more worthwhile for fathers than mothers.

Our finding related to newspaper ads was less expected, however another gender-specific pattern may be at work. Past studies have regarded newspaper recruitment as outdated and ineffective (e.g., Bergmann et al., 2017; Raynor et al., 2009) but did not report on gender composition of accrued parents, and therefore were likely mother-focused. For fathers specifically, we provide evidence that newspaper recruitment is a useful approach.

Finally, our findings further support the notion that Facebook is an effective strategy for recruiting both mothers and fathers; each of our within-parent analyses (Tables 3 and 4) indicated that Facebook ads accrued a greater proportion of participants than expected under the null hypothesis of equal efficacy.

Aim 2: Effectiveness of Father- versus Parent-Oriented Materials among Fathers

Our findings suggest that father-targeted recruitment materials are essential for ensuring adequate representation of fathers alongside mothers, consistent with Hypothesis 2. Among fathers, the chi-square test of homogeneity (Table 3) indicated that father-targeted newspaper ads and father-targeted

Facebook ads yielded the largest standardized residuals, indicating that these methods accrued significantly more fathers than would be expected if all recruitment materials had been equally effective.

Additionally, of all the parents we accrued via parent-oriented methods, only 14% were male, whereas father-oriented methods yielded 79% male participants. This result is similar to those observed previously for Facebook ads (Bennetts et al., 2019; Leach et al., 2019), and extends those findings to a broader array of recruitment approaches. Notably, our parent-oriented materials advertised for “moms and dads” rather than “parents.” Despite this explicit mention of “dads,” these materials accrued far more mothers. It appears that materials targeting “moms and dads” do not organically achieve an adequate representation of fathers, further supporting the idea that fathers consider parent-related recruitment material as being geared toward mothers.

As noted, 79% of participants recruited by father-oriented methods were male, meaning that 21% were female, the majority of whom came from Facebook ($n = 10$). We chose *not* to restrict the viewership of our Facebook ads to males-only, thus allowing for the possibility that mothers would pass study information along to their male partners. Although we could not explicitly measure the extent to which this occurred, the notable proportion of mothers accrued through father-targeted Facebook ads suggests that mothers may *not* have frequently passed along study information, rather choosing to attempt self-enrollment. Indeed, in recruitment scenarios where the mother is required to gauge the father’s potential interest and/or answer on behalf of the father, father participation and engagement may be lower (Doyle et al., 2016; Gershy & Omer, 2017; Mitchell et al., 2007). This finding supports the need for direct recruitment of fathers, rather than recruitment through mothers (Vollmer et al., 2019).

Aim 3: Cost- and Time-Efficiency of Recruitment

We descriptively compared father- and parent-oriented strategies in terms of their cost- and time-efficiency for recruiting fathers. Consistent with Hypothesis 3, father-oriented methods yielded dramatically better efficiency. For example, with newspaper ads, father-oriented ads yielded \$34.71 per father, whereas parent-oriented ads yielded \$277.70 per father. Similar trends emerged for nearly all recruitment methods studied, including Facebook (\$12.62 vs. \$20.13 per father), in-person (\$17.18 vs. \$27.49 per father), and ResearchMatch (\$4.69 vs. \$10.93 per father). Additionally, for most methods, acquisition costs per father from the father-oriented ads were comparable to acquisition costs per mother from the parent-oriented ads.

Cost- and time-efficiency findings were similar across parent gender in that internet-based methods were the most efficient. Within internet-based methods, however, Google ads were a major outlier, yielding costs as high as \$75 per

mother and \$257 per father. Prior work has found Google ads to be ineffective for accruing general populations, like parents, as opposed to highly specific populations (Alley, Jennings, Plotnikoff, & Vandelanotte, 2016; Birnbaum et al., 2017; Buller et al., 2012; Davies & Kotter, 2018; Morgan et al., 2017; O'Dwyer & Moyle, 2014). This trend is likely due to the nature of the keyword matching system by which Google ads are prompted to appear. Keywords for recruiting general populations (e.g., *kids health*, *parenting tips*; used here) are likely employed by a large array of advertisers. Specific keywords that are relevant to studies of disease (e.g., *myelopathy*) are likely less competitive among advertisers.

Father-targeted in-person recruitment and newspaper ads yielded acquisition costs almost as low as internet-based methods (\$17.18 and \$34.71 per father, respectively). This result was a notable departure from our findings related to mothers, as well as previous parent recruitment studies employing all- or mostly-female samples (Bergmann et al., 2017; Raynor et al., 2009).

Aim 4: Reach, Response Rates, and Self-Selection Bias

We hypothesized that, among fathers, father-targeted recruitment materials would yield higher response rates than parent-targeted recruitment materials. However, limitations of our data make it difficult to assess whether this hypothesis was supported. A general limitation of our study is that we used convenience sampling rather than probability sampling, which precludes our ability to generalize findings to the entire population of interest (Bornstein, Jager, & Putnick, 2013; Jager, Putnick, & Bornstein, 2017). Convenience samples also open the door for self-selection bias, which further hinders generalizability. This appears to have been an issue in the current sample as response rates for all recruitment methods were less than 1%. These findings align closely with rates previously reported in similar studies (Bennetts et al., 2019; Oesterle et al., 2018). Indeed, self-selection bias is pervasive in developmental research, resulting in skewness toward European American, well-educated, higher-income participants (Nielsen, Haun, Kärtner, & Legare, 2017). Self-selection bias is difficult to completely avoid in developmental research, so it is essential to consider strategies for minimizing this problem going forward, and to identify strategies for gaining more representative samples in the context of this problem (Barbot et al., 2020).

Findings from the current study may begin to inform this effort. We have identified some recruitment methods that may be particularly helpful for moving beyond well-educated, high-income samples and instead targeting specific demographic “slices” of the population of underrepresented fathers. For example, Craigslist accrued mostly non-college-educated fathers and fathers who identified as Black/African American (discussed further in the following section).

It may also be relevant to consider the degree to which one's population or subpopulation of interest can be targeted with each recruitment method (Jager et al., 2017; Khavjou et al., 2018). Some methods used here were very wide-reaching, meaning that many people saw the recruitment material as we were unable to restrict viewership to parents-only or fathers-only. Using father-oriented newspaper ads as an example, although reach of the method was reported as 100,845, perhaps only 5,000 of these potential ad viewers fit our study criteria. In contrast, other methods were more targeted, meaning fewer people saw the material but we could restrict viewership to parents specifically. Using father-oriented direct mailing as an example, of the 1,500 people reached by these mailers, it is likely that nearly 1,500 were indeed eligible for the study. The true denominator of the response rate likely changes along with reach type (i.e., highly targeted versus general viewership).

Although each type of reach yielded similar overall quantities of fathers, we should consider this result through the lens of self-selection bias. Because methods with the widest, most general reach typically showed the lowest response rates, we may intuitively expect that these methods create the most severe self-selection problems. However, if a large proportion of viewers is ineligible for the study in the first place, it may be that self-selection bias is not as problematic among those who are eligible. The current data do not allow us to ascertain whether targeted versus general viewership creates worse self-selection problems, however we encourage further investigation of this topic going forward. Ultimately, it may be most worthwhile to employ a wide range of highly targeted recruitment strategies, each of which successfully accrues a specific demographic "slice" of the population, to create an overall more representative sample. Such approaches have been noted as promising (e.g., Khavjou et al., 2018), and may be a good path forward for mitigating the limiting effects of self-selection bias.

Aim 5: Demographics

Here it is important to note that some methods accrued only a small number of fathers (e.g., 3 from parenting magazine ads, 5 from direct mailing), hindering our ability to discuss demographic variability among those fathers. In general, however, most recruitment methods yielded fathers who were demographically consistent with the sample as a whole (majority self-identified as White, college-educated, employed, and from ZIP codes characterized by above-average income profiles). A notable exception was Craigslist. This result is consistent with prior findings that Craigslist is useful for accessing populations that are typically underrepresented in research (Martinez et al., 2014; Ramo, Hall, & Prochaska, 2010; Ybarra, Prescott, &

Holtrop, 2014). Craigslist may be a fruitful avenue for future researchers to pursue, but it can only take us so far. As mentioned above, other avenues for targeting demographic “slices” of fathers must be explored in future work.

For example, although not utilized in this study, past work has noted the effectiveness of community-centered in-person recruitment for difficult-to-reach populations of fathers. Fathers may be more likely to enroll and engage when study information is communicated to them via spaces and people that are trusted. Employees and staff at community centers, schools, doctors’ offices, children’s sports events, and barbershops have been successful in past work (e.g., Davison et al., 2017; Pfitzner, Humphreys, & Hegarty, 2017; Vollmer et al., 2019). Word-of-mouth is also cited as effective, although this technique may exacerbate sampling bias problems. Here, our in-person recruitment was simple and not community-based, and did not accrue a particularly large proportion of underrepresented fathers. We note that RA gender in our study was balanced, such that male and female RAs spent identical amounts of time dispensing father- and parent-oriented flyers. It is unlikely that gender of our team members had any spurious effects on our results.

Finally, interesting gender differences emerged in terms of demographic characteristics of parents accrued by each method. For example, Facebook ads yielded a large majority of self-identified White, college-educated, and stay-at-home mothers. Prior work has similarly found that Facebook-recruited mothers heavily skew toward being White and well-educated (Bennetts et al., 2019; Oesterle et al., 2018). However, we did *not* observe such a strong trend among fathers. Prior conclusions drawn about the characteristics of parents accrued via certain recruitment strategies are likely mother-specific, and should not be generalized to father recruitment.

Aim 6: Motivations for Participation

Consistent with Hypothesis 6a, a significantly larger proportion of fathers was primarily motivated by improving fathers’ representation in research compared to mothers who sought to increase mothers’ representation in research. Indeed, in prior work, most fathers cited not being asked to participate as the primary reason for their lack of inclusion in research (Davison et al., 2017). Together, evidence suggests that many fathers are interested in research participation and its associated benefits, particularly benefits for their children and family, provided they are explicitly offered an opportunity to be involved.

Hypothesis 6b asserted that gender differences would *not* emerge with respect to motivations related to learning about one’s child, improving parenting skills, and improving child outcomes. Indeed, comparable proportions of fathers and mothers were motivated by contributing to science (20% and 24%, respectively) and improving their knowledge about parenting (16% and

17%, respectively). Additionally, we did *not* find that fathers were less motivated than mothers by improving their knowledge about parenting or improving their child's health. We provide further evidence that often-reported explanations for fathers' underrepresentation in research, particularly a lack of interest or involvement in child development, are inaccurate. Fathers are actively involved, interested, and want to be included in research and programming to improve their parenting (Lechowicz et al., 2019; McGirr et al., 2020).

In this study, participants were required to choose a primary motivation from options generated by the research team. Most of these options were grounded in prior qualitative work, but it is possible that this question format lead participants to choose motivations that they would not have otherwise indicated. At the same time, studies employing a variety of methods (best-worst rankings, e.g., Fabiano, Schatz, & Jerome, 2016; multiple choice, e.g., Davison et al., 2017; anecdotal observations, e.g., Doyle et al., 2016; Mitchell et al., 2007) have observed similar trends with regard to fathers' motivations and feelings about research participation. Across studies and methodologies, fathers report prioritizing child outcomes and a desire to tell their story.

These trends appear to remain stable regardless of father ethnicity and SES profiles across studies. Although the current sample of fathers lacked diversity in some respects, our findings echo those from other demographic groups. For example, Fabiano et al. (2016) surveyed low-income fathers and found that improving the child's behavior, social skills, academic skills, and improving parenting were rated as the most important factors for an intervention program. Similarly, Doyle et al. (2016) noted that many African American fathers shared feelings that research is "behind the times" or "old fashioned" to assume that fathers are not involved in childcare.

Limitations and Future Directions

Limitations of the study are important to consider. Most notably, despite employing eight recruitment methods, only 101 fathers were recruited, underscoring the difficulty that researchers face as they endeavor to improve father involvement in parenting research. Although recruitment yield was somewhat low, documentation of the relative success and efficiency of each method represents a step in the right direction toward better father recruitment. Fathers' representation in research will only increase as the result of a concerted effort to improve recruitment, and we aim to provide preliminary data in support of this effort. Some methods recruited particularly few fathers, namely the parenting magazine ($n = 3$) and direct mailing ($n = 5$). Findings with respect to these methods should certainly be interpreted with caution, but these low numbers are also informative, suggesting that these methods may

not be useful in similar studies going forward. Relatedly, fathers from low-income neighborhoods were particularly underrepresented in our sample, so findings in this respect are largely preliminary.

Second, we were recruiting for a larger trial which only enrolled one parent per household. Results may have differed had we sought to recruit couples or families, and thus, findings may not generalize to such projects. Third, our study was conducted in a large metropolitan city. Though we made efforts to evaluate recruitment methods that would be generalizable to other locations, some methods may have yielded different results in less urban areas; for example, some of our approaches relied on the public transit system. Fourth, the current trial was focused on parental feeding behavior and child health. This specific study topic may have yielded different findings than would be obtained from, for example, a study of paternal depression. We encourage future researchers to replicate and extend our findings to a greater variety of research topics concerning parenting and child development.

Finally, due to the design of this study in concert with the larger trial, we were unable to report on attrition rates associated with each recruitment method. This limitation speaks to the broader applicability of our study to intervention research, which typically requires a longitudinal commitment. In these contexts, it becomes relevant not only to consider recruitment methods, but also strategies for father engagement and retention (Gershby & Omer, 2017). A small body of literature has begun to probe these topics, finding that factors such as hands-on engagement, goal-directed tasks, involvement of the child in the treatment program, and respectful rapport with staff members all contribute to better father retention (e.g., Fabiano & Caserta, 2018; Mitchell et al., 2007; Nicolia, Fabiano, & Gordon, 2020; Pfitzner et al., 2017; Vollmer et al., 2019). For intervention applications, future researchers should continue to document the relative success and efficiency of strategies for father recruitment, engagement, and retention.

IMPLICATIONS FOR FUTURE RECRUITMENT

Our findings begin to shed light on father recruitment strategies that may be most fruitful to pursue going forward. Most importantly, future researchers should employ *father-targeted recruitment materials* (rather than parent-targeted) that capitalize on fathers' unique motivations for participating in research. Many fathers report a desire to improve their own representation in research, as well as to learn on behalf of themselves and their children. Recruitment materials should align with these motivations by highlighting how fathers and their children may benefit from participation and explaining how fathers can specifically make their voices heard through the research process.

Father-targeted internet-based recruitment methods including Craigslist, ResearchMatch, and particularly Facebook, appear to be the most cost- and time-efficient, so we recommend their use going forward, as well as the exploration of other internet-based methods, such as local parenting listservs or online message boards. An important exception here is Google AdWords, which was cost-ineffective and yielded very few fathers or mothers. Additionally, our findings suggest that direct mailing and magazine ads are particularly ineffective and likely outdated. In order to recruit diverse samples of fathers, we encourage researchers to employ a variety of thoughtfully chosen strategies. It appears that many popular recruitment methods organically accrue fathers that skew toward being European American and well-educated; additional strategies must be employed that, together, create representative samples. Craigslist may be a particularly useful strategy for achieving this goal, although future work with larger samples should explore this further.

In general, we encourage researchers not to rely on prior findings regarding mother recruitment. We observed important differences in recruitment yield and efficiency for fathers versus mothers, as well as notable gender differences in motivation for participating in our study. Effective father recruitment should be informed by father-specific findings.

In summary, this study is among the first to provide a quantitative evaluation of the effectiveness and efficiency of popular recruitment strategies for fathers. Additionally, we provide novel data about fathers' motivation for participating in parenting research. Our goal is for the evidence provided here to begin aiding future researchers across domains of child development, parenting, family psychology, and pediatric health in their pursuits to achieve adequate father representation alongside mothers, thereby obtaining a more complete picture of how familial and developmental processes unfold.

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Ethical principles

The authors affirm having followed professional ethical guidelines in preparing this work. These guidelines include obtaining informed consent from human participants, maintaining ethical treatment and respect for the rights of human or animal participants, and ensuring the privacy of participants and their data, such as ensuring that individual participants cannot be identified in reported results or from publicly available original or archival data.

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