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Social Media Recruitment and Online Data Collection: A Beginner's Guide and Best Practices for Accessing Low-Prevalence and Hard-to-Reach Populations

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One facet of the growing social media phenomenon is the opportunity to directly appeal to prospective research participants. An example of this is Facebook advertising to defined populations. In conjunction with online data collection, social media advertising can simplify and accelerate data collection, and it can do so at greatly reduced costs. Thanks to these contemporary tools, responses can be collected at the same time from participants living in Vancouver, Toronto, and St. John's. In this article, we describe how social media can be used for rapid and cost-effective data collection. Moreover, these methods allow researchers to directly access prospective study participants who may be otherwise difficult to reach (because of their low prevalence, their remote location, or organisational barriers). For illustrative purposes, we review methods from 2 studies: 1 of older adults with bipolar disorder and 1 of Canadian paramedics and their spouses. In both cases, participants clicked sociodemographically targeted Facebook advertisements and were directed to online study questionnaires. Based primarily on these 2 lines of research, we offer recommendations and best practices for researchers interested in utilizing social media for online recruitment and data collection. We contend that in many instances, social media may be the most effective means to recruit participants from low-prevalence and invisible populations. The majority of Canadians, and indeed much more of the world population than was previously accessible, can be reached via social media today. In addition to offering strategies to improve participant communication, we also review the limitations of social media advertising and online research.

Keywords: participant recruitment, data collection, technology, social media, Facebook

Not so very long ago, survey data were commonly collected via pen, paper, and Canada Post. Reminder cards were often mailed once or twice (DeVellis, 2012) and participant lists were manually edited as completed questionnaires were returned. Often, however, these reminders were received after questionnaires were posted, irritating participants and wasting postage. Completed questionnaires were returned in the mail over weeks or months, with responses then manually transferred to coding forms or electronic spreadsheets. With large scale studies, data were entered in duplicate by separate research assistants (RAs), reducing human error but doubling the cost of this tedious task (e.g., Canadian Study of Health and Aging Working Group, 1994). This was in addition, of course, to the expensive print advertising. Participant recruitment and data collection for large scale studies invariably required enormous planning, teams of research assistants across multiple study sites, and many years of effort.

Fortunately, new technologies have allowed researchers to eliminate many of the aforementioned challenges. More precisely, social media platforms such as Facebook offer innovative means to target and reach participants, whereas online data collection enables participants to enter their responses directly into electronic databases, virtually eliminating data transfer time along with data entry costs and errors. For example, in one of our recent studies, online responses from participants were collected almost immediately from Canada and Israel and received simultaneously in Vancouver (O'Rourke, Carmel, Chaudhury, Polchenko, & Bachner, 2013). Cross-national research today is much less complicated thanks to the Internet and social media.

In this article, we describe how to use social media to target and recruit participants to undertake online data collection. We contend that in combination, these strategies confer advantages to psychologists and other social scientists conducting questionnaire research. To offer recommendations for best practices, we report

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descriptive findings from two recent studies using these methods: (a) a study of older adults with bipolar disorder (BD) from 30 countries; and (b) a study of Canadian paramedics or emergency medical service (EMS) personnel and their spouses. The prevalence of both populations is low; for instance, roughly 2% of Canadians have BD (Schaffer, Cairney, Cheung, Veldhuizen, & Levitt, 2006). Online recruitment and data collection enable rapid and cost-effective means to access low-prevalence, invisible, and other hard-to-reach populations.

Perhaps more problematic than low prevalence, psychologists have often required the permission and/or assistance of employers and professional associations (e.g., EMSs) or psychiatrists and/or psychiatric clinics (e.g., BD) for access to many study populations. The Internet allows us to bypass these traditional barriers by directly reaching prospective study participants. The importance of this ability to make targeted appeals cannot be overstated; in this way, social media advertising democratizes data collection.

Appeals to prospective participants can be targeted very narrowly. For example, in our study of older adults with BD, we recently shifted our recruitment efforts in the last days of data collection to those 60+ years of age to avoid positive skewness (i.e., age normally distributed). Using social media, prospective participants can be targeted by age, language, location, relationship status, political opinion, favourite sport, or any combination of these and other study inclusion criteria. Although a range of social media are at our disposal, both examples we describe in this article used targeted Facebook advertising to recruit samples.

Immediacy is an integral advantage of combining social media recruitment and online data collection. More precisely, social media advertisements can bring prospective participants directly to study questionnaires in a single click. After reading information on the *splashpage* (i.e., landing page) and providing electronic consent (by means of clicking on an appropriate button or providing an electronic signature), participants can be directed to the first study instrument before interest subsides. As they are using social media when the request is received (vs. preparing meals, working, or caring for children), prospective participants may well have 20–30 min at that moment to complete questionnaires. In other words, social media recruitment allows the social scientist to approach prospective participants during down-times when they are more likely to take part in questionnaire research. This assessment is in accord with altruism research indicating that people are more willing to help others (e.g., psychologists) when requests are made at opportune times (e.g., Hui, Xu, Li, Crowcroft, Latora, & Lio, 2009). Furthermore, responses provided in the privacy of one's home tend to be less biased by impression management (i.e., social desirability; Paulhus, 1998).

Online Data Collection

For the majority of our online studies, we publish dedicated Web sites with unique domain names or Internet addresses (e.g., https://www.sfu.ca/agingresearch/reminiscence). University study Web sites and questionnaires are hosted on secure (https) servers so that participant responses are encrypted before being transmitted over the Internet, a process similar to online credit card purchases. Responses are then entered directly into spreadsheets that can later be imported into statistical software quite easily.

Participation Response Incentives for Online Research

To facilitate data collection, we commonly award a lottery prize as a response incentive to a randomly selected participant. Surprisingly, however, we have to select and contact two or three prospective winners before we receive a reply. This is likely because of the volume of spam or bogus email messages we all receive. We now ask for our participants to provide unique nicknames (e.g., Carlos Danger) to include in email subject lines to prompt study recall before the message is deleted. Note that the word "lottery" should not appear in subject lines to avoid being filtered as spam.

For studies with more intensive demands, we sometimes remunerate participants with a gift card or gift certificate (vs. *chance* of winning with a lottery response incentive). As part of a recent later-life divorce study, for example, we mailed participants $10 Starbucks or Tim Horton's gift cards (their choice). Both paramedics and spouses were mailed $40 Starbucks or Chapters gift cards in the EMS study. Alternatively, PayPal or similar online payment services enable direct cash remuneration to study participants (i.e., credit applied to the bank account or credit card linked to that participant's email address). We intend to use the latter in the future now that many people have PayPal accounts. Retailers (e.g., Cineplex) are also beginning to offer electronic gift certificates that may be redeemed either online or in-store, delivered conveniently by email. As technologies continue to advance, so too do the ease and utility of online recruitment and data collection.

Online Data Quality

To maintain participant engagement, we often intersperse *factoids* between questionnaires specific to that population (e.g., Canadians 85+ years are the fastest growing age group). These factoids should be topical but not directly related to the variables and behaviours under study, to avoid potential priming or skewing participant responses. Our participants often report that these factoids help to maintain interest as they proceed though study questionnaires (i.e., feedback we receive in a final open-ended question). Even with strictly quantitative research, participants appreciate the opportunity to provide helpful feedback.

Progress bars at the bottom of each page allow participants to see how far they have progressed and what remains. This reduces discontinuation (i.e., closing the browser because they do not know how much remains to be completed). For example, if a participant sees she has completed 2/3, she is more likely to complete the remaining questionnaires knowing that only 1/3 remains; in other words, most of the time required to participate has already been invested. In our experience, asking participants to dedicate much more than 30–35 min of questionnaire responding (~200 questions) can be too burdensome and result in higher rates of noncompletion. If more time is required, either a second battery of questionnaires can be completed or a follow-up request can be sent to participants (e.g., Elmer, 2012). Our experience is that 40–50% of Time 1 online participants will take part in one or more subsequent waves of online data collection (e.g., O'Rourke et al., 2013). These retention rates are high compared with more traditional methods of questionnaire research (DeVellis, 2012).

One advantage of online data collection is the ability to determine how long each participant takes to complete study instru-

ments. This allows us to identify participants who race through online questionnaires without reading questions. This can occur more frequently when offering a lottery prize or direct remuneration in online studies. According to their discretion, researchers can flag and exclude these atypical responses to reduce measurement error (e.g., O'Rourke, Cappeliez, & Claxton, 2011). Unless completed under observation, social scientists generally do not know how long participants take to complete self-report questionnaires. Electronic questionnaires offer such additional insights into participant behaviour.

Online Data Collection 2.0

One limitation of first-generation Web-based research was higher rates of item nonresponse compared with other self-selection recruitment methods (Granello & Wheaton, 2004). To redress this limitation, we ask participants if they intended to skip items before proceeding to the next page or questionnaire (items without responses are displayed within a pop-up JavaScript box). Although participants are allowed to skip questions (i.e., proceed without responding to questions), this feature reduces if not eliminates inadvertently missed data (less than 0.5%, missing data at random; O'Rourke et al., 2013).

One risk when conducting online data collection is the possibility of receiving multiple responses from the same respondent. We are able to identify duplicate submissions by comparing Internet Protocol (IP) addresses; moreover, we are able to compare reported country of residence with that participant's IP address. In effect, this serves as a validity check or single-item deception scale. Of course, comparing IP addresses is problematic in couples research as partners may share the same computer. In these instances, other identifying information (e.g., a unique username) should be used to distinguish between dyad members. IP addresses nonetheless offer a degree of verification that couples are in fact residing together.

What About Online Selection Biases?

Existing research suggests few differences between data obtained online and that which is collected using traditional self-report methods (O'Rourke & Chou, 2008). This conclusion was reached by Gosling and colleagues (2004) who compared responses and participant sociodemographic characteristics from studies published in the *Journal of Personality and Social Psychology* (2002; n = 102,959) to data obtained from two large online studies (n = 361,703 and n = 132,515). Contrary to common misconceptions, participants recruited via the Internet are more demographically diverse and equally motivated to provide viable data (Gosling, Vazire, Srivastava, & John, 2004). In other words, Web-based study participants do not appear to differ from participants recruited by more traditional means (Gosling et al., 2004). It should be noted that opinion polling firms today use online data collection instead of random dialing to home phone numbers (Palmer, 2013).

Special Issues in Online Research

The immediacy and ease of online recruitment and data collection may engender additional points of concern, such as the limited dialogue between participants and researchers. In our research, we have taken a number of steps to ensure opportunities for communication at all stages of online recruitment and data collection. For instance, participants are encouraged to contact researchers by email or toll-free phone number with questions or concerns. Contact information is typically displayed prominently on study Web sites. In studies involving repeated measurement, we commonly contact participants at recruitment by phone or Skype to provide clarification and ensure that they are clear as to the study's requirements and expectations (e.g., King & DeLongis, 2014). Initial contact can help foster greater participant commitment (i.e., retention) in longitudinal studies.

In our experience, a dedicated study Web site has the advantage of providing more detailed information that participants can read at their leisure. Well-designed study Web sites also convey professionalism and credibility that can further facilitate recruitment and data collection (e.g., http://www.badas.ca). We typically include a "frequently asked questions" section to address common participant questions and concerns. Other steps such as providing links to online mental health and support services can be considered depending on the nature of the research. Online recruitment and data collection also have the advantage of allowing participants to make decisions without the pressures that can occur in face-to-face research (e.g., feeling compelled to decide whether or not to participate when initially asked).

Social Media Recruitment

Although researchers have at their disposal a variety of online recruitment methods, social media present unique opportunities for rapid, cost-effective data collection from populations with very specific demographics or interests. Exposure is a primary advantage. For example, *Media Technology Monitor* (2012, as cited in Oliveira, 2013) reported that 70% of Internet users in Canada access social media on a daily or nearly daily basis, up 6% from 2011 (N = 4,001). Among the available platforms (e.g., Twitter, LinkedIn, and Pinterest), Facebook accounts for ~93% of all social media and is used by 63% of all Internet users (Oliveira, 2013). What's more, social media are no longer restricted to technology enthusiasts or younger generations (Oliveira, 2013; Turcotte & Schellenberg, 2006). The omnipresence of social media and its growing integration into daily life make resources like Facebook uniquely positioned for research recruitment, even from highly circumscribed populations. Large and growing numbers of Canadians—in fact, the majority—can now be reached by this single method of advertising (Oliveira, 2013) and at relatively low cost (Elmer, 2012).

Facebook Advertising

Today, Facebook is the most effective social media platform, not only for its global reach but also for its sociodemographic targeting options. Generally speaking, Facebook ads operate on either a cost-per-click (CPC) or a cost-for-impressions (CPM) basis that determine both the means of payment and how ad exposure is optimized. An *impression* refers to each occasion in which an ad is shown to a user. Advertisers may choose to pay every time a user clicks on an ad (i.e., CPC) or for every 1,000 impressions regardless of whether users click through (i.e., CPM).

In either case, advertisers bid (with ranges suggested by Facebook) to compete against other advertisers for a designated audience (e.g., 50+ years, gay, and in South Africa; Elmer, 2012).

The higher one's CPC or CPM bid, the more likely the ad will be shown to targeted Facebook users. CPC and CPM bids can be as low as $0.01 or as high as the prespecified daily budget. Spending can accumulate quickly depending on the scope of the advertising campaign, but preset daily and weekly budgets help control spending. Start and end dates for Facebook advertising campaigns can also be fixed. One key measure of a campaign's effectiveness is the click-through rate (CTR) or the ratio of total clicks to total impressions. For instance, a 1% CTR means that there is 1 click for every 100 impressions or ad displays. CTRs commonly range between 0.04% and 0.05%, sometimes reaching above 0.11%. CTRs vary for a number of reasons that we discuss later. Advertisers may also calculate a *unique* CTR by dividing the number of unique people who clicked on the ad by the number of unique people the ad reached (also referred to as *unique impressions* or *reach*). Because the same ad can be shown to the same person multiple times, and since a single person may click on the same ad more than once, the unique CTR may provide a more accurate metric of ad performance.

In consideration of more traditional means of participant recruitment and data collection, the CTR and unique CTR serve as the best indicators of response rate within a social media context. As an alternative measure of response rate, researchers may also divide the number of clicks (i.e., visits to the Web site) by the number of completed surveys. In the studies examined in this article, we explore a number of these methods for illustrative purposes. Regardless of preference, however, such statistics provide researchers with precise quantifiable means of monitoring questionnaire response rates in real-time. This underscores a further advantage of social media recruitment, as advertisements may be edited and adjusted based on any parameter while the ad is active. Being able to better monitor and respond to indices of effectiveness may be especially important in studies using rolling or ongoing recruitment, allowing the researcher to reduce wasted time, effort, and resources while honing the precision of online recruitment methods.

As social media become more ubiquitous, and as the use of social media on portable devices expands, researchers are faced with a growing number of options for online recruitment. In addition to its standard methods, Facebook also offers more organic advertising options based on user activity (e.g., sponsored stories, page post ads), allowing advertisers to capitalize on the natural distribution of ads by users themselves. Many of these methods are similar to traditional snowballing and word-of-mouth approaches to recruitment. As well as paying for advertising on Facebook, constructing a Facebook "page" for a particular research study is another method of online snowballing that is also free. As more people "like" our *Foundation for Wellness with Bipolar Disorder* page (https://www.facebook.com/WellwithBD), for instance, their friends who may also have BD (e.g., family members) can choose to follow the foundation on Facebook. News articles and study results disseminated via Facebook are commonly shared by those who have liked the page.

Whether one chooses CPC or CPM depends on a number of important factors. For mass campaigns targeting large and diverse populations, a cost-for-impressions strategy can increase the frequency with which an advertisement will be shown to targeted users. In more focused or more circumscribed campaigns, a cost-per-click strategy is generally preferable (i.e., to optimise click-through rates). Both strategies can be tested simultaneously by rotating multiple ads, allowing the researcher to adjust tactics depending on relative ad performance.

Targeting of advertisements. The prime utility of social media advertising is the ability to apply filters so that the researcher can target prospective participants using sociodemographically defined criteria. This reduces funds wasted promoting the study to those who do not meet inclusion criteria (and who we want to exclude). In other words, we can be generally confident that participants are from our target population because they are the only ones we directly approach. In this way, sociodemographically targeted advertising differs from mass advertising (e.g., newspaper ads). The precision in targeting and wide reach make Facebook advertising highly cost-effective, especially with narrowly defined populations.

Ad campaign exposure may be defined by location (e.g., country, county/region, and town/city), age, gender, ethnicity, language, sexual orientation, relationship status, education, workplace and/or occupation, and behaviours such as travel and mobile device use. These options enable defined recruitment based on very specific demographic information, allowing for large-scale recruitment from otherwise invisible and inaccessible populations. However, targeting options are not restricted to demographics; Facebook also allows researchers to target prospective participants with precise interests, from gardening and teaching to politics and sports. Newly added parameters such as parental status, generation (e.g., Baby Boomers, Generation X), and U.S. political affiliation reflect Facebook's continuing diversification of its targeting capabilities.

The researcher can be creative when specifying and refining targeting tactics. As advertisements are created and adjusted, Facebook displays updated audience summaries reporting the number of reachable users according to specific filter settings. These filters and parameters can be updated any time and several ads targeting different groups can be run simultaneously as part of the same ad campaign and budget.

Facebook Advertisement Specifications

With the volume of information on Facebook newsfeeds and timelines, it is necessary to catch the attention of prospective participants. There are a variety of specifications in Facebook ads that are worth considering in this regard; namely, the ad headline, text, and image. For example, advertisements with male silhouettes enabled recruitment and data collection from a global sample of 3,600 gay and bisexual men in just 10 days (Elmer & O'Rourke, 2012). Later we compare the effectiveness of three different advertisements from our BD study and describe factors that helped draw the attention of prospective participants.

In traditional Facebook advertisements, headlines (ad titles) are restricted to 25 characters (including spaces) and text (ad bodies) to 90 characters; ad images may be 100 pixels (width) by 72 pixels (height). These restrictions refer specifically to ads that appear on the right-hand column of Facebook's Web interface. Different advertising options with fewer restrictions are available in other ad types allowing for larger ads with higher character counts and

images. These other ad options are becoming increasingly relevant given the more widespread use of social media on smart phones and tablets. All ads must include a link to a Facebook page or external Web site where participants are directed upon clicking the ad. As Facebook is an evolving and dynamic medium, restrictions will likely become fewer over time.

In conjunction with online data collection, social media recruitment is an invaluable tool for social scientists. Although the studies discussed in this article refer specifically to Facebook, the most popular social media platform in Canada (Oliveira, 2013), similar forms of advertising are now offered by Twitter and Google Plus. The potential utility of these alternative platforms, however, vary depending on study goals. In the case of Twitter, advertisements are restricted to the site's traditional 140-character limit. CPC and CPM methods of online advertising are also available with Yahoo and Google search engines, though the same precision of demographic targeting is not possible. Instead, search engine advertising is based on key words and phrases entered into search queries (e.g., particular environmental threats or social circumstances); these ads are presented to users searching for particular topics with varying degrees of specificity during defined windows of data collection (e.g., Lee-Baggley, DeLongis, Voorhoeave, & Greenglass, 2004). There are certainly instances when search engine advertising may be ideal.

Next we discuss our successes with social media recruitment using Facebook. We caution, however, that different studies require different recruitment strategies. The specific features of the targeted population, as well as the goals of the research, need to be considered in tandem when planning social media recruitment campaigns. It is our goal to offer a general introduction to researchers who have not yet seized this recruitment opportunity.

Social Media Recruitment and Online Data Collection

Example 1: Older Adults With BD

Contrary to common misconceptions, older Canadians are regular Internet users. For instance, those 65–74 years of age use the Internet as often as Canadians in their 30s (Turcotte & Schellenberg, 2006). This is commensurate with our experience having conducted Web-based geropsychology research for the past 15 years. Moreover, Internet usage by older adults is likely to increase as baby boomers and other generations grow older.

We recently completed the instrument development and validation phase for our Bipolar Affective Disorder and older Adults (BADAS) Study. Using both Facebook advertising and more traditional methods (e.g., online newsletters), we recruited 1,011 adults with BD and 1,100 control participants from 30 different countries, most living in the United States, Canada, the United Kingdom, Australia/New Zealand, and Ireland. By design, half were 45+ years of age. Facebook advertisements were targeted to a global population of ~6.2 million English-speaking Facebook users with interests related to BD, psychology, psychiatry, and the like. Over the course of 19 days, ads were seen 35.3 million times (i.e., six times on average to each person in this population). In total, 12,094 clicked on the advertisement directing them to the study splashpage and 3,572 proceeded to the second page for a click-through rate of 0.04%. The average cost per click was $0.49, whereas the most expensive was $0.73.

We asked participants to indicate how they came to hear of the BADAS Study. More than 90% indicated that they were recruited via Facebook advertising or posts on Facebook timelines and newsfeeds; the latter at no cost. Stated otherwise, fewer than 10% of participants were recruited via mental health association newsletters, BD listserv notices, or postings on Web sites. Of note, all Participants 50+ years of age with BD were recruited via Facebook. To our surprise, this method of recruitment appeared particularly effective with our older participants. Although costs will vary depending on the demographic criteria used by any one Facebook ad campaign, the recruitment of over 900 adults using social media required just under $6,000 in total expenditure. This amounts to a minimal recruitment cost of approximately $7 per participant.

For our BADAS Study, we tested the relative utility of three different Facebook advertisements (see Figure 1). The text was identical for each; only the accompanying image differed. To our surprise, least effective was the Simon Fraser University (SFU) logo with a CTR of just 0.027%; next was our more abstract BADAS Study logo (aka "Charlie") at 0.035%. Most effective was the version with a photo of a despondent woman at 0.04%. In other words, the advertisement with the photo was three times more effective, and cost efficient, than the version with the SFU logo. To better demonstrate the performance of our top performing ad, the despondent woman resulted in a *unique* CTR of 0.47%, indicating that of the unique people reached by the ad, 0.47% clicked through to the study Web page. This miniexperiment suggests that there can be considerable variability in the effectiveness of ads, and that accompanying images should be selected with deliberation. The remaining Facebook participants were recruited via notices ap-

Figure 1. BADAS Study Facebook advertisements. The color version of this figure appears in the online article only.

pearing on the timelines and newsfeeds of participants (i.e., by going *viral*).

More than 90% of BADAS study participants provided us with email addresses and permission to contact them in the future. This enabled us to undertake a follow-up test–retest study, and to retain a large pool of prospective participants for future BD research. In total, roughly 40% of Time 1 participants also provided us with Time 2 responses, with an average of 67 days between points of measurement (age range of 19–89 years). This rate of retention is high compared with other data collection procedures (DeVellis, 2012).

Over time, we have devised a three-reminder system for longitudinal online research. An initial notice is sent followed by a reminder 2–3 weeks thereafter; a third and final notice is sent 3–4 week after the second reminder. This method allows us to maximize longitudinal data collection without antagonizing participants. (We have used this procedure for several waves of data collection; O'Rourke et al., 2011.) The response graph in Figure 2 depicts Time 2 BADAS Study data collection. Peaks appear on days notices are sent with decreasing effectiveness over time; moreover, the trail-off becomes more pronounced with each successive notice. Two waves of data collection were completed within 4 months, with 428 adults with BD providing complete Time 1 and Time 2 responses. To put this achievement in context, another recent Vancouver research group required roughly 2 years to recruit 200 adults with BD (Michalak & Murray, 2010); with targeted Facebook advertising, we were able to do the same in days.

At both points of measurement, we asked participants to indicate their diagnosis (and BD subtype), date of birth, and country of residence. This was done to compare responses between points of measurement to provide us with greater confidence in the validity of participant identity (i.e., whether responses were truly from persons diagnosed with BD). Regarding diagnosis, participants were asked two distinct questions at Time 1 and Time 2, respectively: *Do you have BD?* and *Have you been diagnosed with BD?* According to participant responses, there was a 97% agreement in report of BD diagnosis between time points. Similar agreement rates of 96% and 97% were observed between Times 1 and 2 for reports of date of birth and country of residence, respectively. The consistency of information between Time 1 and Time 2 reports, separated by 67 days on average (SD = 18, range = 43–143), further supports the reliability of responses and the validity of social media recruitment.

We also asked participants to list their prescribed medications by category (mood stabilizers, antidepressants, anxiolytics, and antipsychotics). This supplemental information offered an innovative means of verifying BD diagnosis, allowing us to determine the frequency with which participants accurately listed and categorised their prescriptions. Accuracy was high across groups. Of the 202 participants listing medications in the anxiolytics category, 97% were correct in their classification. This was compared with accuracy frequencies of 95% for both mood stabilizers (n = 293) and antidepressants (n – 337), and 84% for antipsychotics (n = 193). Given participants' ability to describe their pharmacotherapy with such accuracy, we contend that it is highly unlikely that participants obfuscated their identities. In other words, these are truly participants with BD.

Example 2: Paramedics and Their Spouses

Within 13 months, we recruited 87 paramedics and their cohabiting spouses who together took part in an intensive longitudinal study of daily stress and interpersonal support processes (King & DeLongis, 2014). This allowed us to undertake a daily process study of couples in which one partner was employed in a high-stress occupation. Both partners completed online questions multiple times daily for a period of 1 week as well as standardized measures of individual differences and traits. According to Statistics Canada (2006), there are over 21,000 paramedics working in this country.

Facebook advertising was the primary means used to recruit this very narrowly defined sample. In just over a year, we received 558 inquiries of interest from paramedics; roughly 75% via Facebook advertising. Other methods of recruitment included pamphlets and flyers posted at emergency medical service stations and hospitals, newspaper advertising, employer-sponsored emails, and listserv announcements. In total, we spent approximately $3,000 on recruitment using Facebook advertising. To offer perspective on this

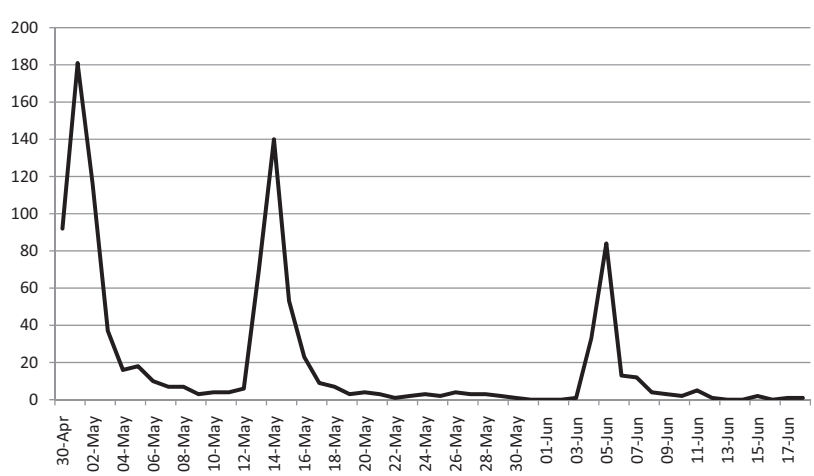

Figure 2. Time 2 BADAS response graph (three email reminders).

number, we paid $450 for a 1-day ad in a local newspaper that led to no noticeable increase in study interest. Given the highly defined nature of this population, the cost effectiveness of Facebook recruitment was quite evident. Facebook recruitment appears to be especially cost advantageous when recruiting participants from small and circumscribed populations. This conclusion is in line with previous studies with Canadian youth (Chu & Snider, 2013) and young adult smokers (Ramo & Prochaska, 2012).

We utilized three images in Facebook ads, each salient to paramedicine: an emergency call (i.e., ambulance with its lights on); a jacket with *EMS* on the back; and a white-outlined, six-pointed blue star with the rod of Asclepius in the centre (this *Star of Life* is the international symbol for emergency medical services and EMS personnel). It was this third image that had the highest CTR (i.e., most effective), likely because the symbol's authoritative appearance bolstered the perceived credibility of the ad. Moreover, the contrast of solid blue against white may have more effectively captured the attention of Facebook users. See Figure 3 for an example of one of our Facebook ads that utilized this image. Our overall CTR average was 0.035. For the ad with the Star of Life; the average CTR was slightly higher at 0.042.

For this study, we were unable to filter ads for "paramedic" as a reported occupation. This is because Facebook does not allow advertisers to target an occupation until the number of Facebook users specifying that occupation surpasses a certain threshold. However, we circumvented this by targeting users on the basis of profession-related *interests* (i.e., *paramedics*, *paramedicine*, *emergency medicine*, *EMS*, *prehospital care*, or *emergency health care*). Even when possible to target on the basis of occupation, it is ideal to also select on the basis of related interests, as users may choose not to disclose certain demographic information in their Facebook profiles. We have effectively recruited participants from several narrowly defined populations using such interests in targeted advertising campaigns (e.g., BD interests).

When prospective participants clicked on the Facebook ads, they were directed to a study Web site. Given our specific inclusion criteria (i.e., full-time paramedics in cohabiting relationships), we first asked prospective participants to read a page describing inclusion criteria and complete a short eligibility questionnaire. Those who met criteria and provided email addresses were later contacted to confirm eligibility and discuss next steps in the study. Having phone contact with paramedics offered an additional means of verifying identity; given that schedules are unique to paramedics within certain regions, we were able to gain confidence in their employment as paramedics. This was further reflected in their daily descriptive reports of most stressful work experiences, which characterised paramedics' job duties in such a way that would have been difficult to fabricate (e.g., "My partner had trouble intubating an unconscious trauma patient"). Regarding the verification of cohabitation with spouses, partners independently confirmed mailing addresses for purposes of remuneration. These data gave us confidence that the sample we recruited was most certainly composed of paramedics and their spouses.

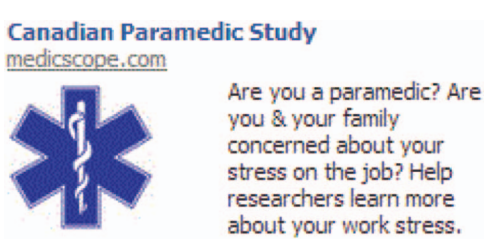

Figure 3. Facebook advertisement targeting paramedics (star of life). The color version of this figure appears in the online article only.

Figure 4 offers a perspective on the relationship between number of Facebook ad clicks and the number of submitted eligibility questionnaires. As can be seen in this graph, changes in Facebook ad clicks over the 13-month period were reflected by similar changes in number of submitted eligibility questionnaires. The bivariate correlation between these monthly clicks and monthly eligibility questionnaires was 0.67 ($p < .05$).

Discussion

It is somewhat disconcerting how easily those of us who populate social media can be identified and contacted with efficiency and precision. However, as social scientists, opportunities abound because of this newfound ability to make appeals directly to prospective participants; low-prevalence and remote populations can now be targeted who would have been otherwise impossible or difficult to reach in years past, and rarely (if ever) in large numbers. This is exemplified by our research with older adults with BD, a low-prevalence and (generally) invisible sector of the population (King et al., 2013), and by our research on paramedics and their spouses throughout Canada (King & DeLongis, 2014).

In addition to these core examples, we have also successfully implemented sociodemographically targeted Facebook advertising to recruit gay men 18–88 years of age (N = 3,600 from 40 countries; Elmer & O'Rourke, 2012) and older yoga enthusiasts living in Vancouver (Wertman, 2012). Other authors have similarly noted the utility and cost-effectiveness of Facebook advertising for recruiting circumscribed populations (e.g., Chu & Snider, 2013). Ramo and Prochaska (2012) underscore the potential reach of Facebook as one of its primary benefits. We remind readers, however, that Facebook is one of multiple online platforms that can be utilized for these means. For instance, Google search engine advertising has proven useful in previous research on thoughts and behaviours related to infectious disease outbreaks (e.g., Lee-Baggley et al., 2004). Most certainly, new opportunities will arise in the future.

The breadth of possible applications of such recruitment strategies within the social sciences is clearly great. The effectiveness of social media recruitment is due in part to the sheer size of social media databases (e.g., 10 million Facebook users worldwide with BD interests); and also the precision with which we can make appeals directly to prospective participants. This precision provides greater confidence in the homogeneity of samples and the integrity of participant data. However, in the examples cited, social media efforts did not result in overly homogenous samples in terms of age, sex, or ethnicity, common concerns among researchers exploring innovative means of participant recruitment. Furthermore, regarding age, it is a misconception that older Canadians do not use the Internet or visit social media sites (Oliveira, 2013; Turcotte & Schellenberg, 2006). It has been our experience that indeed the Internet and social media platforms are used by a variety of Canadians whose demographics and psychosocial characteristics are diverse (e.g., O'Rourke et al., 2013).

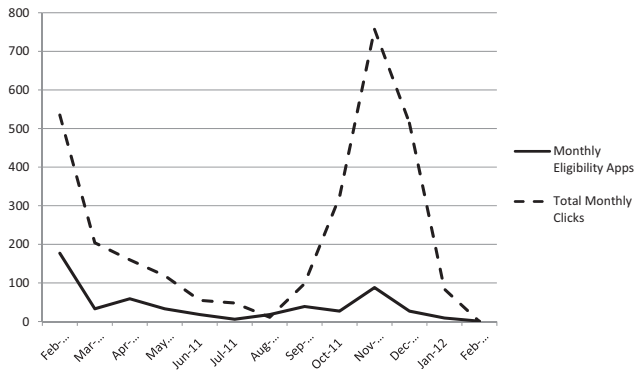

Figure 4. Monthly Facebook advertisement clicks and eligibility questionnaires received.

Given the novelty of these online methods for many social scientists, it may be best to summarise with a few recommendations for best practice. These recommendations are intended as points of reference for the novice based on our experience with the aforementioned populations.

1. Create a Dedicated Study Web Site

A dedicated study Web site can offer a number of benefits to both researchers and participants, linking to study questionnaires and electronic consent forms on secure servers and providing additional contact information. In lieu of or in tandem with a unique URL, a study Facebook page can also be used to recruit additional participants and to further enhance participant engagement. When the page is liked it appears on the newsfeeds of one's Facebook friends, offering an effective means of snowballing. Following the completion of a study, a Facebook page can also serve to communicate study results to participants and all end users, addressing the additional goal of knowledge translation.

2. Use a Multipronged Recruitment Strategy

With any online ad campaign (on Facebook or otherwise), we recommend using multiple advertisement tactics simultaneously, as well as a variety of images, headlines, and text. If a particular strategy, ad, or image elicits a higher click-through rate relative to others, it should be favoured and others dropped (except in cases where the ads are targeting different subsamples of the same population). In studies where large and diverse populations are targeted (as opposed to more narrow campaigns), a CPM strategy may be most effective, as it increases the frequency with which an ad will be shown to the users of one's choice. Nevertheless, researchers may benefit from testing both CPM and CPC strategies simultaneously under the same campaign budget, and adjusting their efforts according to user responses.

Our experience suggests that images are integral to the success of social media recruitment, and that several should be tested. Images should be germane to the population under investigation and attract the user's eye through social media clutter. In our BD in later life study, a photo of a despondent woman proved most effective; whereas with paramedics, the profession's logo was best. We recommend that researchers compare the performance of 2–3 images and make few assumptions (e.g., that a university logo carries credibility).

3. Incorporate Online Data Collection Whenever Possible

Social media recruitment appears most advantageous to researchers when used together with online data collection. By clicking a Facebook advertisement, for instance, prospective participants can be taken directly to a study splashpage followed by an electronic consent form and the first questionnaire, all within a few minutes. However, even when online data collection is not feasible, social media recruitment can be effectively used in studies requiring laboratory visits and direct researcher contact (as in experimental research). In these cases, social media can aid researchers in identifying and recruiting samples, particularly if a population is difficult to access.

4. Maximize Results by Considering All Parameters

Online studies should be as brief as possible to maximize data collection and minimise participant burden and subsequent discontinuation. We have found that ~200 questions appear to be a ceiling, requiring no more than 40–45 min to complete; after this point, participants may be more likely to give up before completing all questionnaires. Factoids can help maintain interest and response incentives such as direct PayPal payments or electronic gift cards will expedite data collection.

What's the Catch?

Although we advocate strongly for the use of social media for participant recruitment, some limitations exist. For instance, there may be limits to the generalizability of findings obtained from social media platforms such as Facebook. However, this is of little concern for psychologists who tend to be interested primarily (or exclusively) in individual differences (vs. describing populations). If necessary, sociodemographic weights can be applied to reflect the composition of populations and subpopulations can be oversampled. Although validating participant identities may be seen as an additional limitation of online recruitment, a number of methods are available to improve researchers' confidence in the validity of data (i.e., that participants are who they say they are). These methods include confirming reports of demographic information at multiple time points (reliability of measurement), cross-referencing mailing addresses in dyadic research, and matching IP addresses to reported countries of residence, among others.

Such electronic methods also limit the opportunity for face-to-face participant contact and the subsequent development of participant rapport. This can be a concern for researchers studying participants longitudinally or remotely. However, participant retention was good in both our BADAS follow-up study (40%) and in our daily diary study of paramedics (with 80% completing at least 9 of 12 time points during a 4-day work period). Nevertheless, these concerns can be easily mitigated by offering additional online resources for participants, such as a study Web site or Facebook page with frequently asked questions, information on the research team, and contact information. Occasional thank-you emails and study updates can also offer encouragement, and phone

calls can be utilized where long-term commitment is sought (King & DeLongis, 2014).

Recent research suggests that socially anxious individuals experience greater state anxiety while using Facebook, and that these two factors interact to predict greater use of the social networking site (McCord, Rodebaugh, & Levinson, 2014). Although the reach of social media is considerable (Gosling et al., 2004; Oliveira, 2013), psychosocial variables such as these should be considered in regards to participant self-selection. Research has further suggested an association between Facebook use and social comparison, which in turn appears negatively correlated with self-esteem (Lee, 2014). Such phenomena should be examined in research that is particularly sensitive to these variables.

Moving Forward

By and large, the limitations are few (and not altogether unsurmountable) compared with the many advantages these methods have to offer. Although this information may at first seem daunting, social media advertising is becoming increasingly user-friendly and can be readily adopted by the novice. With invisible and low-prevalence populations in particular, this may be one of the most effective means of participant recruitment. Indeed, regardless of the population of interest, the cost effectiveness and potential reach of social media are well noted. As social media and online technologies continue to evolve, new and exciting opportunities will undoubtedly emerge for Canadian researchers.

Résumé

La possibilité de solliciter directement des sujets potentiels pour la recherche est l'un des avantages du phénomène croissant des médias sociaux. Sur Facebook, la publicité ciblant certains segments de la population en constitue un exemple. Parallèlement à la collecte de données en ligne, la publicité diffusée sur les médias sociaux peut simplifier et accélérer le processus de collecte de données, cela à un coût beaucoup moindre. Grâce à ces outils modernes, il est possible de recevoir simultanément les réponses de répondants habitant à Vancouver, à Toronto et à St. John's. Dans cet article, nous expliquons la façon d'utiliser les médias sociaux pour effectuer une collecte de données rapide, efficace et peu onéreuse. De plus, ces méthodes permettent aux chercheurs de communiquer directement avec des participants aux études prospectives qui seraient difficiles à joindre autrement — en raison d'une faible prévalence, de leur lieu d'habitation dans une région éloignée ou d'obstacles organisationnels. À titre d'information, nous examinons les méthodes employées dans deux études : une consacrée aux adultes âgés présentant un trouble bipolaire, et l'autre consacrée au personnel paramédical canadien et à leurs épouses ou époux. Dans les deux cas, les répondants ont cliqué sur les annonces de Facebook ciblées sur le plan sociodémographique et ont été dirigés vers des questionnaires d'étude. En nous basant principalement sur ces deux domaines de recherche, nous présentons des recommandations et des pratiques exemplaires aux chercheurs souhaitant utiliser les médias sociaux pour effectuer un recrutement et une collecte de données en ligne. Nous estimons que, dans de nombreux cas, les médias sociaux constituent le moyen le plus efficace de recruter des sujets au sein de segments de population à faible prévalence et méconnus. Aujourd'hui, la plupart des Canadiens — et, bien entendu, une plus grande partie de la population mondiale qu'auparavant — peuvent être joints par l'intermédiaire des médias sociaux. En plus de proposer des stratégies pour améliorer la communication avec les répondants, nous étudions les limites de la publicité sur les médias sociaux et celles de la recherche en ligne.

Mots-clés : recrutement de sujets, collecte de données, technologie, médias sociaux, Facebook.

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