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## Geosocial Networking App Use Among Men Who Have Sex With Men in Serious Romantic Relationships

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### Abstract

Geosocial networking (GSN) mobile phone applications (“apps”) are used frequently among men who have sex with men (MSM) to socialize and meet sexual partners. Though GSN apps are used by some MSM in partnered relationships, little is known about how the use of GSN apps among MSM in serious romantic relationships can influence couples' sexual and relationship health. MSM in serious relationships ( $N = 323$ ;  $M$  age = 40 years) were recruited through a popular GSN app for MSM. Participants completed open-ended items regarding the costs and benefits of app use to their relationships, discussions of app use with their partners, and preferences for relationship education related to app use. Reported benefits of app use included improving sex and communication with one's primary partner and fulfilling unmet sexual needs. Although approximately half had not discussed app use with their partners, citing app use as a “non-issue,” many cited various drawbacks to app use, including jealousy and being a distraction from the relationship. Few described sexual health concerns as a drawback to meeting partners through apps. Regarding relationship education preferences, most wanted help with general communication skills and how to express one's sexual needs to a partner. Although GSN app use can enhance relationships and sex among partnered MSM, unclear communication about app use may contribute to negative relationship outcomes and could prevent partners from having sexual needs met. Relationship and sexual health education programs for male couples should consider addressing social media and technology use in their curricula.

### Keywords

Men who have sex with men; Male homosexuality; Smartphone applications; Romantic relationships; Sexual communication

## Introduction

Geosocial networking (GSN) mobile phone applications (“apps”) are used frequently among men who have sex with men (MSM) to socialize and to meet sexual partners. The most widely used programs, such as SCRUFF and Grindr, report millions of users worldwide (8 and 5 million, respectively) (Grindr, 2014; Wyatt, 2015), and over half of MSM surveyed in one study reported having at least one GSN app account on their smartphone (Lehmiller & Ioegeer, 2014). These apps typically offer users the opportunity to create individualized profiles with pictures and brief descriptions of themselves, locate other users in their vicinity using the global positioning system, and message potential sexual and romantic partners. Users also can take advantage of the applications' functionalities to make friends and network within the gay community (Holloway et al., 2014; Phillips et al., 2014; Rice et al., 2012). Research on use of these mobile technologies among MSM has emerged only recently and has primarily focused on characterizing the patterns of app usage among individual MSM and associations with sexual risk and protective behaviors (Lehmiller & Ioegeer, 2014; Rendina, Jimenez, Grov, Ventuneac, & Parsons, 2014; Rice et al., 2012; Winetrobe, Rice, Bauermeister, Petering, & Holloway, 2014). For example, GSN app users have reported higher numbers of sexual partners (Lehmiller & Ioegeer, 2014; Phillips et al., 2014; Rice et al., 2012), more lifetime diagnoses of sexually transmitted infections (Beymer et al., 2014; Lehmiller & Ioegeer, 2014), and lower rates of HIV testing relative to MSM in general, but higher rates than the general population (Rendina et al., 2014). Findings regarding condomless sex with partners met through apps are equivocal, with some indicating that men may be more likely to practice safer sex with these partners (Rice et al., 2012; Winetrobe et al., 2014) and some indicating that they are less likely (Holloway, Pulsipher, Gibbs, Barman-Adhikari, & Rice, 2015).

Apart from sexual health and protective behaviors, recent findings showed that a majority of MSM first met their most recent primary partner via some form of dating mobile phone application and/or website (Prestage et al., 2015), and use of GSN apps often persists throughout the duration of the romantic relationship (Lehmiller & Ioegeer, 2014; Phillips et al., 2014). However, only recently has empirical research begun to examine patterns of app use among partnered men and its effect on their relationships (McKie, Lachowsky, & Milhausen, 2015). As GSN app use within the context of a primary relationship has the potential to affect couples' sexual and relationship health, the present study sought to describe app use among MSM in serious relationships,<sup>1</sup> investigate whether men discuss boundaries for app use with their partners, and identify preferences for relationship education related to GSN app use.

## Relationships and Modern Communication Technologies

Research on heterosexual samples reveals that the use of Internet- and smartphone-based communication technologies can play a variety of functions for couples and can influence

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<sup>1</sup>In this article, a “serious relationship” or “serious partnership” refers to a relationship with a primary or main romantic partner. “Serious” is self-defined by each participant but typically refers to a heightened level of commitment relative to a casual partnership. Among MSM, a serious relationship does not necessarily equal a sexually monogamous one and instead can represent a range of different relationship agreements that vary in their sexual exclusivity.

relationships in both positive and negative ways (Coyne, Stockdale, Busby, Iverson, & Grant, 2011). For example, online social networking sites and GSN apps can facilitate relationship initiation by helping participants find and build a virtual connection with sexual and/or romantic partners (Hertlein & Ancheta, 2014; McKie et al., 2015). Technologies also can contribute to relationship development and maintenance by enabling partners to resolve conflicts virtually or via text message, being a resource for information that can improve relationships and sex lives, allowing partners to display commitment by sharing information about their relationships on social networking sites, and improving partners' connectedness in long-distance relationships (Hertlein & Ancheta, 2014). A recent study of young MSM reflected similar benefits of technology use on dating and sexual relationships (McKie et al., 2015).

Despite technology's ability to facilitate positive relationship development, negative consequences of its use also are common. For example, one study showed that 70 % of heterosexual participants in married or cohabitating partnerships reported that smartphone and cell phone use interfered with relationship activities and time with romantic partners (McDaniel & Coyne, 2014). Online and mobile technologies can increase distance within a couple by making interactions less personal or intimate, spur feelings of jealousy and trust issues within relationships (Hertlein & Ancheta, 2014), and facilitate controlling behaviors such as monitoring a partner's online activity (Rueda, Lindsay, & Williams, 2014). Moreover, conflicts between partners over the use of social media (e.g., using social media too often) have been related to increased relationship problems (Clayton, 2014). Although GSN apps likely have similar benefits and drawbacks when used in the context of MSM's relationships (McKie et al., 2015), the unique patterns of app use within the gay community may affect relationships in distinct ways and warrants further research.

### **Mobile Technology Use and MSM**

MSM have long used the Internet and online social networking as a way of connecting with other sexual minority individuals (Gro, Breslow, Newcomb, Rosenberger, & Bauermeister, 2014). In fact, use of hookup or dating technologies such as GSN apps for meeting sexual partners is common among MSM (Gudelunas, 2012; Holloway et al., 2014; Van De Wiele & Tong, 2014). However, unlike heterosexually oriented online dating sites and mobile apps that generally are intended for the sole purpose of meeting romantic and/or sexual partners, GSN apps targeted toward MSM also are frequently used for non-sexual purposes (e.g., chatting, networking) and are viewed as a fixture among gay communities in the United States (Gudelunas, 2012). Social networking sites and mobile apps also serve as a way to meet friends and connect to a gay community (Holloway et al., 2014; Van De Wiele & Tong, 2014). These social and belonging needs continue to be important even when individuals are in serious romantic relationships. As such, MSM in serious partnerships may continue to use the apps for social purposes after establishing a relationship, and/or to flirt or meet others for sex depending on the nature of their relationship agreement (i.e., monogamous or non-monogamous) or individual desires. These apps also have the potential to increase sexual variety within one's relationship and allow partners to explore unmet sexual needs (e.g., fantasizing about others, threesomes with primary partner and partner met through app).

The topic of app use among MSM in serious relationships has been widely discussed in online forums and popular media in recent years. Specifically, partnered men have sought advice on the appropriateness of GSN app use in a serious relationship, how to approach discussions about app use with one's primary partner, and how to use these apps when partnered (Savage, 2013; Stafford, 2012). Recent data indicate that GSN app use is not uncommon among partnered MSM, with 22–28 % of men in these studies reporting being in a relationship of some kind (Holloway et al., 2015; Lehmilller & Ioerger, 2014; Rendina et al., 2014). Moreover, partnered men may be more likely than single MSM to use these apps to identify potential sexual partners (Goedel & Duncan, 2015). As such, continued research into GSN app use and its costs and benefits among partnered MSM can inform educational interventions that help couples navigate use of such tools and effectively communicate about their technology use with each other, which can mitigate negative consequences and promote positive outcomes related to technology use within and among couples.

### **The Current Study**

GSN app use among MSM in serious relationships has the potential to impact couples' sexual and relationship health, yet little is known about how these apps are used and perceived by partnered MSM. The current study sought to (a) describe patterns of GSN app use among MSM in serious relationships, (b) examine positive and negative effects of app use on their relationships, (c) assess the extent to which MSM in relationships negotiate rules about app use with their partners and barriers to these discussions, and (d) assess preferences for relationship education focused on discussing and negotiating app use with one's primary partner.

## **Method**

### **Participants**

We recruited participants (Table 1) via banner and pop-up advertisements placed on a popular GSN application for MSM. The campaign served the dual purpose of recruiting participants for a randomized clinical trial (RCT; not reported here) and to collect survey data from MSM who were ineligible for the RCT. Once the RCT recruitment targets were met and pre-paid advertisements continued to run, all MSM were offered the opportunity to participate in this survey. Advertisements ran from November 2014 through February 2015 and described a survey to better understand and serve the health needs of the gay community. Advertisements were shown throughout the United States, with pop-up ads shown five times—each shown the first time a user logged onto the application within the scheduled 24-h advertising period. In addition to pop-up messages, banner advertisements ran continuously during the period with a total of three million banner ad impressions and 10,000 full screen interstitial ad impressions. Pop-up advertisements featured an image of a man flexing his bicep with the text, “Looking for a few good men.” Banner ads featured the following text: “Looking to have your voice heard? Want to help your community? We need experts like you! Fill out our survey today!” Advertisements did not specifically target men who were in relationships. No incentives for participation were provided for completing the surveys, although depending on the responses participants may have been routed to the RCT

that provided compensation. This study was approved by the university's Institutional Review Board.

Potential participants who clicked on advertisements were directed to an eligibility screener administered online on their mobile device's browser (outside of the app). A total of 4783 individuals clicked the advertisements and 2932 (61.3 %) consented and started the screener. Of those, 801 (27 %) were ineligible for the current survey on GSN app use in relationships because of demographic characteristics (female or under 18 years of age), provisional eligibility for the larger RCT (age 18–29 years, male sex assigned at birth and male gender identity, not in a serious monogamous relationship lasting more than 6 months, had sex with a male, had condomless anal sex [CAS] in prior 6 months, and HIV-negative or unknown status), or failure to complete the screener. Participants who met the RCT eligibility criteria but who were either not interested in participating or who refused to consent for the RCT were re-routed into the surveys.

In data cleaning, participants were recorded as ineligible if they were identified as a duplicate participant. Potential duplicates were identified based on matching on 10 demographic characteristics (e.g., age  $\pm$  1 year, ZIP code). From that analysis, 53 cases in which participants potentially completed the survey more than once were identified for further examination on additional variables (survey date and completion time, survey responses), resulting in 33 cases that were subsequently removed as duplicates. The remaining 2098 participants were routed to various surveys, including 380 who were offered the opportunity to complete surveys associated with the current study. Of those, 378 initiated the survey, and 55 participants who indicated that they were in a relationship lasting less than 6 months were excluded from the current article.

## Measures

All participants completed a screening questionnaire assessing sociodemographic information, sexual orientation, gender identity, HIV status, and relationship status. Relationship status was assessed by asking participants to select from one of four options that described their current relationship: (a) in a serious, monogamous relationship that has lasted more than 6 months (neither of us have had sex with any one besides each other in past 6 months); (b) in a serious, non-monogamous or open relationship that has lasted more than 6 months (we date and/or have sex with other people); (c) in a serious or casual relationship that has been going on for less than 6 months; (d) not in a relationship. Participants also provided information pertaining to their sexual history, including the gender of their sexual partners in the last 6 months (e.g., male only, male and female, female only, male and transgender), and frequency of CAS in the past 6 months.

Participants routed to the GSN app survey were then asked several general questions about their relationships, including whether they had discussed a relationship agreement with their primary partner, and app use, including what they use the applications for (e.g., chatting, meeting friends, hooking up) and the relationship status listed on their profile (1 = single and 2 = partnered). Other items related to their partner and partner's app use covered whether their partner also used mobile dating applications, whether they had separate or joint accounts on these applications, and whether their partner was aware of the respondent's use

of mobile dating apps. The remaining questions (Table 2) addressed (a) whether their use of mobile dating apps had changed since entering their current relationship (response options: yes, no, don't know), (b) whether using mobile apps during their relationship had been beneficial or harmful to the relationship (response options: only beneficial, only harmful, both beneficial and harmful, no impact, don't know), (c) whether their relationship agreement included rules about mobile dating app use (response options: yes, no, don't know), and (d) participants' interest in information on how to discuss mobile dating app use with their main partner (response options: yes, no, don't know). Each of these four questions was followed by an open-ended item asking participants to elaborate on their responses.

## Data Analysis

Descriptive statistics were calculated for all quantitative variables of interest. One-way analyses of variance for continuous data and non-parametric tests for categorical data were conducted to examine whether different relationship characteristics were related to app use patterns.

Participants' responses to the open-ended items described above (perceived benefits/costs of app use; barriers to discussing app use in relationship agreement; guidelines participants would like to receive for app use in relationships) were analyzed thematically (Miles & Huberman, 1994). Two coders, who had graduate training in psychology and qualitative methods, independently reviewed the responses to each item and generated a list of 29 emergent themes across the items. Constant comparison (Glaser & Strauss, 1967) was used to reduce these themes into 20 discrete axial codes (Table 2) which were subsequently applied to participants' responses to each item by the lead coder. Reliability coding was performed on 20 % of the open-ended responses and yielded a kappa of 0.98, indicating excellent intercoder reliability (Fleiss, 1971). Codes are described in terms of the number of participants who endorsed the code, and participants' answers could include multiple codes within one response. Following Matthews (2005), lengthy explanations of quotes are avoided; instead, quotes are presented to illustrate conclusions drawn from the data. With the exception of minor edits to spelling and grammar to improve readability, all quotes are presented verbatim.

## Results

### Participant Characteristics

The analytic sample consisted of 323 gay, bisexual, and queer-identified men (mean age = 40.1 years,  $SD = 10.8$ ) who endorsed being in a serious relationship with a male partner for at least 6 months (Table 1). Most were White (69.6 %), from urban areas (50.9 %), had completed college (70.0 %) and were employed full-time (71.5 %); 18.3 % were HIV-positive. Regarding sexual behavior, 67.8% reported engaging in CAS with any partner in the 6 months prior to completing the surveys. Most participants (68.4 %) reported being in a non-monogamous relationship, whereas the rest reported being in a monogamous relationship (31.6 %). Sixty-one percent of participants reported having had explicit discussions about their relationship agreement; the remaining participants indicated their

relationship agreement was understood (i.e., not explicitly discussed), or did not have or did not know whether they had a relationship agreement.

### **Descriptive Statistics on App Use**

The vast majority of participants used at least one GSN application to talk with or meet other men in the past 6 months (98.8 %). Most reported using these apps for chat (82.0 %), hookups (71.2 %), and meeting friends (58.5 %); relatively few reported using the apps to find dates (14.9 %) or relationship partners (9.3 %). Participants with non-monogamous relationship agreements were more likely to use the apps for hooking up relative to their monogamous counterparts (90.5 vs. 29.4 %),  $\chi^2(1, N=323) = 127.02, p < .001$ ; otherwise, both groups endorsed similar patterns of use.

In addition, most acknowledged being in a relationship on their profile (e.g., dating, exclusive, partnered, married, open relationship; 75.7 %), while 24.3 % listed their relationship status as single. A chi-square test indicated that self-reported relationship agreement types did not differ between participants who stated that they were single versus participants who stated that they were in a relationship on their profiles,  $\chi^2(1, N=309) < 1, p = .71$ . In addition, qualitative results did not appear to differ systematically by participants' relationship status on their profile. When asked about their own and their partner's GSN app accounts, over half of participants had a separate account from their partner (58.9 %), 25.7 % said their partner did not have a GSN app account, 9.4 % did not know if their partner had an account, and 6.0 % reported sharing an account with their partner. Most participants reported that their partners were aware of their app use (74.7 %).

### **Changes in App Use Since Entering Relationship**

Slightly over half of participants indicated their use of apps had changed (i.e., increased, decreased, or nature of use had changed) since entering their current relationship (52.8 %,  $n = 169$ ). Of those participants, the most commonly endorsed changes were using the apps less frequently overall (40.2 %); began using the apps by themselves to look for outside sex partners (39.1 %); began using the apps to socialize, chat, or relieve boredom (31.4 %); and began using the apps with their primary partner to look for outside sex partners (27.8 %). Others saw an increase in their app use (26.0 %), including a subset of men who began using the apps after their relationship had started (27.2 %; e.g., participants whose relationships preceded smartphones and geosocial networking apps).

### **Perceived Benefits of App Use to Primary Relationship**

Over half of participants reported that their use of mobile dating apps had some effect on their relationship: overall positive (13.4 %,  $n = 43$ ), overall negative (7.2 %,  $n = 23$ ), or both positive and negative (32.2 %,  $n = 103$ ). The remaining participants indicated that their app use either had no impact (39.4 %,  $n = 126$ ) or an unclear impact on their relationship (7.8 %,  $n = 25$ ). Compared to those reporting monogamous relationship agreements, participants who reported a non-monogamous relationship agreement were more likely to endorse that their app use impacted their relationship in some way (60.7 vs. 35.6 %). In addition, compared to those with a non-monogamous agreement, those with a monogamous

agreement were more likely to indicate that their app use had no impact or an unclear impact on their relationship (64.4 vs. 39.2 %).

Participants who endorsed positive or mixed (i.e., both positive and negative) effects of app use were asked to describe how app use had positively affected their relationship with their primary partner. In the 119 responses to this item, five themes emerged, representing benefits to oneself, one's relationship, and one's social life. Participants most frequently described how the apps helped to *fulfill sexual needs* not met in their primary relationship ( $n = 37$ ). This code included references to sexual experiences with an outside partner, as well as experiences with both one's primary partner and outside partners (e.g., threesomes, group sex). This also included activities such as flirting, sharing sexual text messages, or photos with other men on the apps, and using the apps for sex while they or their partners were out of town. The following participant describes several of these sub-themes:

My partner and I...travel often for work and this gives us an opportunity to have sexual adventures and exploration while apart for long periods of time...It has opened our eyes to non-monogamous relationships which are usually not discussed outside the gay community. My partner and I are also totally open about who we have sex with—no secrets— and enjoy swapping each other's phones and reading each other's messages with other men, which can be highly sexually stimulating and/or arousing to live vicariously through the other person's sexual encounters.  
(Participant 980, 29 years old in non-monogamous relationship)

Several participants reporting monogamous relationship agreements tended to describe using the apps to fulfill their sexual needs by flirting with other men on the app, or fantasizing about other men on the app with their partner: “We look at guys and talk about it. It's a shared interest that allows us to flirt with guys online but stay true to each other” (Participant 4666, 49 years old in monogamous relationship).

Participants also described how the app *improved the quality of their primary relationship* ( $n = 35$ ). This code was applied to references to perceived improvements in communication; openness to discussing desires, fantasies, and sexual interests; as well as feelings of closeness and trust with one's primary partner. Most participants described how their app use promoted transparency within their relationship about their emotional and sexual needs, which led to other improvements in their relationship. For example: “... [Our] use of apps has also helped up speak more open and honestly with each other and brought us a deeper level of trust and respect for each other” (Participant 4104, 33 years old in non-monogamous relationship).

App use also provided participants and their partners with outlets for *social networking* ( $n = 35$ ). Most excerpts referred to meeting friends through the apps: “It has allowed us to more easily meet people, both friends and/or sexual partners. Meeting others, either as just friends or for sex, has actually strengthened our relationship” (Participant 4019, 32 years old in a non-monogamous relationship). A minority of excerpts described how app use reduced feelings of social isolation and gave a sense of connection to community: “I don't feel like the only gay person in the suburbs” (Participant 1720, 35 years old in monogamous relationship).



Participants also described how their app use *improved sex life with their primary partner* ( $n = 24$ ). Most responses in this category were brief and expressed that using the apps added variety and excitement to their primary relationship by increasing their desire for each other. For example, participants described how app use “added ‘spice’ to a boring sex life” (Participant 1980, 49 years old in non-monogamous relationship), and “reinvigorates [their] libido” (Participant 4682, 29 years old in monogamous relationship), or decreased boredom with their sex life.

Finally, few participants described using the app for *self-improvement* ( $n = 3$ ). Participants described psychological improvements in their own lives related to their app use, such as “less stress” (Participant 1322, 41 years old in a non-monogamous relationship) and the ability to “relax about sex” (Participant 1948, 55 years old in non-monogamous relationship), which in turn positively impacted their relationship. Another participant described more complex psychological benefits to his app use: “Help processing of sexual urges; gain distinction of feeling between attraction & desire versus love and commitment... improve self-esteem” (Participant 4183, 41 years old in non-monogamous relationship).

### Perceived Drawbacks of App Use to Primary Relationship

Participants who endorsed either negative or mixed effects of app use were asked to describe how app use had negatively affected their relationship with their primary partner. Of the 99 open-ended responses given, the most frequently endorsed theme was that app use by one or both partners led to *jealousy and lack of trust* ( $n = 44$ ) in participants' relationships, as illustrated by this quote: “Any time you involve more parties in a relationship or [sexual] interaction, it gets more complicated. There can be some jealousy caused by attraction to others...that attraction would exist even were we in a monogamous relationship” (Participant 4261, 31 years old non-monogamous relationship). Several participants also described jealousy and resentment between partners when other men on the apps expressed more interest in one partner than in the other: “It has spurred some resentment when one of us gets more messages/attention than the other” (Participant 316, 27 years old in non-monogamous relationship). This code also was applied to descriptions of perceived threats to the primary relationships directly related to one or both partners' app use, including suspicious feelings, secretiveness, and assumptions that one's partner wanted to end the relationship.

Another commonly described drawback was that app use *takes focus away from their primary relationship* ( $n = 34$ ). This included references to oneself or one's partner spending too much time using the apps and not investing enough time in their primary relationship: “Spent more time looking for hookups online than I did with him. I felt very distant from him” (Participant 3701, 38 years old in monogamous relationship). Other participants expressed how app use led to fewer conversations with their partner: “Harmful when we are on it too much and neglect interacting w[ith] one another” (Participant 423, 31 years old in non-monogamous relationship). Finally, for some, app use led to more frequent sex without side partners, and not enough sex or less interest in sex with their primary partner: “The apps can be a distraction, and specifically regarding sex, the availability of sex outside the

relationship can diminish the [quantity] of sex within the relationship” (Participant 4019, 32 years old in non-monogamous relationship).

Among the less frequently described consequences of app use was *conflict in relationship* ( $n = 8$ ). This code was applied to references to conflict, tension, or stress arising within the relationship as a result of app use. Most responses referred to minor arguments with one's partner; for example, “hooking up with the wrong characters can introduce short term turmoil” (Participant 2020, 46 years old in non-monogamous relationship). However, one participant described more severe consequences to his app use: “We have...broken up many times and he used to beat me when he found out I was meeting other guys” (Participant 893, 21 years old in non-monogamous relationship).

Several participants described *breaks or unwanted changes in their relationship agreement* ( $n = 6$ ) related to their app use. For example, one participant described feeling “more temptation to open up the relationship” (Participant 3199, 46 years old in non-monogamous relationship) by extending the boundaries of their existing non-monogamous agreement. Others described breaking a relationship agreement by cheating on their partner: “I've been hooking up with men while married to a woman” (Participant 3605, 48 years old in non-monogamous relationship).

Some participants described feeling *guilt, shame, or regret* about their app use ( $n = 5$ ). One participant expressed feeling bad because his partner was unaware of his app use: “Makes me feel guilty for not telling my partner” (Participant 4682, 29 years old in monogamous relationship). *Sexual health concerns* related to meeting sexual partners through the apps were infrequently described ( $n = 5$ ). One participant expressed a feeling common across these excerpts: “...constant worry about [the] possibility of bringing STDs... or worse (HIV) to the other person” (Participant 4676, 54 years old in non-monogamous relationship). Finally, participants also expressed *social consequences* ( $n = 2$ ) of their app use, such as feeling judged by others for meeting outside partners for sex through the app, as well as the perception of being gossiped about for using the app: “Small community here, so everybody talks about your business” (Participant 3983, 36 years old in non-monogamous relationship).

### Discussions About App Use in Relationship Agreements

Of the 191 participants who reported having had an explicit discussion with their partner about their relationship agreement, 55.0 % ( $n = 105$ ) had discussed “rules” for using mobile dating apps in context of their agreement. These participants were asked to select from a list and describe in an open-ended item the parameters of their app use within their relationship. Agreements most frequently allowed participants to use the app for non-sexual purposes, such as chatting with friends, meeting new friends, or networking (68.6 %). Participants' agreements also involved using the app to find partners to hook up with as a couple (56.2 %), and using the app to hook up with men separately (52.4 %). Other rules described by participants in an open-ended item included obtaining “pre-approval” from one's partner before hooking up with a man met through an app (6.6 %), prohibition on using the apps when their partner is present (6.6 %), and having safer sex and/or sex with HIV-negative partners met from the apps (4.8 %).

In addition, of the participants with explicit relationship agreements, 41.8 % reported that they did not specifically discuss the topic of app use when negotiating their agreement. These participants were asked an open-ended question assessing their reasons for not doing so, in which four themes emerged. The most commonly described theme reflected an assumption that their existing *relationship agreement was broad enough to cover interactions on mobile apps* ( $n = 22$ ). This theme included references to the agreement allowing communication with other potential partners regardless of the medium used to do so. For example, “[Mobile apps] are just the vehicle, our rules are about the actual sex that sometimes happens” (Participant 1442, 54 years old in non-monogamous relationship). This theme also was applied to responses indicating that the participant's current relationship agreement with their partner had no rules or limitations, or that the participant and his partner had an open, non-monogamous agreement.

Other participants stated that they had not discussed their app use in their relationship agreement simply because it *has not come up or is a non-issue* ( $n = 21$ ). This code was applied to references to participants' beliefs that this topic did not need to be discussed with their partner, either because it was not a problem within their relationship or because app use was not being used for dating-related purposes. For example:

Because we are a monogamous couple and acknowledge that, at times, we still require interaction with other individuals. Often, that interaction can be as simple as checking someone out because they're handsome, or it can carry on and into conversation, but it ends at that. (Participant 2479, 27 years old in monogamous relationship)

Other participants referenced never discussing app use with their partners. This theme was applied to participants intentionally or unintentionally concealing their app use from their partners, e.g., “He doesn't know I use them” (Participant 346, 30 years old in non-monogamous relationship).

Another group of participants had *somewhat discussed, but not defined* their app use in the context of their relationship agreement ( $n = 11$ ). This code included references to partners discussing or defining rules to some degree in their relationship agreement, or “some” rules being implemented around app use within their relationship. For instance, some participants reported having an “understanding” within their relationship about their app use, whereas one participant described this as: “We agreed to use them but it didn't occur to either of us to have rules about apps” (Participant 2420, 46 years old in non-monogamous relationship).

Finally, few mentioned *fear and uncertainty* ( $n = 3$ ) as a reason they had not discussed app use with their partner. One of these participants cited concern for how his partner might feel if the participant conveyed his concerns about his partner's app use: “I'm afraid it may make me seem controlling and distrustful” (Participant 2631, 22 years old in a monogamous relationship).

### **Interest in Information About GSN App Use in Relationships**

Approximately half of participants (49.5 %,  $n = 152$ ) expressed interest in receiving guidelines or advice on how to talk with their partners about using mobile dating apps within

the context of their relationship. These participants were subsequently asked what type of advice they would like to receive, and 107 provided responses to this open-ended question. Themes included advice on sexual health and safety with partners met through the apps, communicating about GSN app use, using the apps to explore sexual needs in relationships, and guidelines on creating relationship agreements that involved the apps. Participants described these themes both in terms of the specific questions they wanted to have answered, as well as in advice they thought would be useful to other MSM in the future based on their experiences.

The most frequently discussed theme reflected participants' interest in obtaining guidance on *developing communication skills* to help them communicate openly and honestly with their partner about their app use ( $n = 52$ ). Participants were specifically interested in guidance on initiating conversations with their partner about topics such as addressing jealousy and trust issues within the relationship. Other participants expressed interest in conflict management skills training, especially when use of mobile dating apps becomes problematic within their relationship, as reflected in this excerpt: "How can you make someone turn the app off when it's inappropriate to have it on? Just asking him to do it doesn't work" (Participant 3183, 44 years old in non-monogamous relationship).

Participants also requested advice on *creating a relationship agreement* that also incorporated GSN app use ( $n = 47$ ). This theme included any references to developing a new relationship agreement or altering one's current agreement to fulfill both partners' needs. Participants specifically requested advice on what guidelines to follow or topics to discuss when developing their agreement, as well as advice that acknowledges that different agreements work for different couples.

Definitely a guide that realizes there is not a single answer or set of rules that will work for everyone. Every relationship is different so gearing a guide towards that mindset is important. (Participant 3003, 32 years old in non-monogamous relationship)

This code also was applied to references to opening one's current relationship, creating shared goals surrounding mobile app use, and making decisions about using mobile apps together, as illustrated by this participant:

Should you ask for a joint account? Should we have access to each other's accounts if there is no joint account? Do you only use the app when together or only apart or both? Only use the app when apart so together time is just you two? How should discussion go with interested parties? (Participant 350, 32 years old in monogamous relationship)

Participants also requested information on *exploring sexual needs in their relationship* ( $n = 19$ ). This code was applied to any requests for guidance on communicating one's sexual interests to their partner, as well as having their sexual needs met with other partners while maintaining a healthy primary relationship: "How to balance healthy interest in men while being in a relationship"(Participant 2928, 57 years old in non-monogamous relationship). In addition, some participants expressed interest in information on frequency of app usage and the different types of GSN apps available for exploring their sexual needs. For example,

“Some [apps] are for sex ONLY, some are social, some are for specific types of sex”  
(Participant 4644, 58 years old in monogamous relationship).

Finally, participants also expressed interest in obtaining guidance on *sexual health and safety* ( $n = 13$ ). This code was applied to references to risk or concern regarding the acquisition or transmission of STIs/HIV, or general risks to sexual safety as a result of meeting partners through mobile apps. Participants requested information on what questions should be asked of potential partners when using apps (e.g., HIV status, substance use) and how to minimize risk when meeting and having sex with those partners: “What questions are critical to ask especially if [their status] isn't discussed or presented in their profile?”(Participant 4362, 41 years old in monogamous relationship). One participant was interested specifically in receiving information on what demographic factors increased one's risk of transmitting an STI or HIV.

Include indicators of the likelihood of getting STI-HIV, as indirect and social level data...area of town vs other correlations [with how likely one is to get HIV] by distance [from my location], age, sex habits. (Participant 2736, 35 years old in non-monogamous relationship)

## Discussion

Smartphone applications aimed at meeting nearby social and sexual partners are widely used among MSM. Although most research has focused on establishing patterns of GSN app use and their associations with HIV risk behavior among single MSM, GSN apps can serve a variety of purposes even for those who are in relationships. For example, GSN apps can be used after men enter romantic relationships to maintain connectedness with the larger gay community, and to identify potential partners outside the primary relationship, among other reasons. Yet, the impact of app use on men's romantic relationships has received scant empirical attention. We sought to explore men's perspectives on the benefits and costs of GSN app use in romantic relationships, identify barriers to discussing app use with a partner, and shed light on information about GSN app use that relationship education programs for same-sex male couples can incorporate into their curricula.

Overall, app use patterns among this sample of partnered MSM reflected trends seen in prior work on predominantly single samples of MSM (Goedel & Duncan, 2015; Grov et al., 2014; Lehmler & Ioerger, 2014; Phillips et al., 2014), with most participants using one or more GSN apps for chat, finding potential partners for sex, and/or meeting friends. In addition, our findings showed that most participants maintained separate GSN app accounts from their partners and that their partners were aware of their app use. One-quarter of participants stated that they were single on their profiles despite reportedly being in a serious relationship for greater than 6 months; however, we did not observe differences in their perceived costs and benefits of app use, preferences for relationship education, or relationship agreements relative to participants who disclosed that they were in a relationship. Finally, the most commonly reported changes in app use since relationship initiation included using the apps less frequently, or using them to look for outside sex partners. Increases in app use during a

relationship were not uncommon, especially among men whose relationships preceded the advent of GSN apps.

Participants identified several sexual, social, and relational benefits to their app use that had a positive impact on their primary relationship. Consistent with previous work with heterosexuals (Hertlein & Ancheta, 2014), participants described how app use contributed to improved relationship quality by promoting honest communication with one's partner about emotional and sexual needs. Yet unlike research with heterosexual samples, our participants frequently described that their app use fulfilled sexual needs not met in their primary relationship, as well as improved sex with their primary partner. For example, men who reported monogamous partnerships described using the app to fantasize about other men, while those who reported non-monogamous agreements described using the app to meet outside partners. Being able to fulfill these needs via their app use could catalyze sexual activity with one's partner (with or without an outside partner met from the apps) as well. Moreover, MSM relied on GSN apps to facilitate platonic social connections, though sexual partners met through the apps sometimes became friends with the couple as well. These findings highlight the unique role GSN apps play in the social and sexual lives of MSM and suggest that such apps could function as a tool to promote sexual and relationship satisfaction.

However, app use also led to several negative consequences. Participants described conflict, jealousy, reductions in trust, and a belief that app use decreased their partner's focus on their relationship, which have been reported among heterosexual samples (Clayton, 2014; Hertlein & Ancheta, 2014; McDaniel & Coyne, 2014; Rueda et al., 2014). We also found that jealousy and trust issues were referenced primarily in context of breaks in the couple's relationship agreement (e.g., not checking with main partner prior to a sexual encounter with a partner met through the app), or when prospective sexual partners who couples met through the app gave a disproportionate amount of attention to one partner. Moreover, although existing literature has demonstrated an association between GSN app use and HIV and STI risk behaviors among MSM (Lehmiller & Iorger, 2014; Rendina et al., 2014; Rice et al., 2012; Winetrobe et al., 2014), and although participants reported using the apps to find outside sex partners or cheat on their primary partner, few mentioned sexual health concerns. As MSM are more likely to use condoms with casual partners (Hoff, Chakravarty, Beougher, Neilands, & Darbes, 2012; Mustanski, Newcomb, & Clerkin, 2011), they may have fewer concerns about contracting HIV and other STIs from outside partners met through GSN apps. Another potential explanation is that GSN app use likely posed obvious, tangible consequences to interpersonal relationships with their partner, such as relationship conflict and tension, while the potential consequences for the couple's sexual health may have seemed more remote. As sex with outside partners met through GSN apps may still place MSM and their primary partners at risk for HIV, the low frequency of this theme does not necessarily indicate its lack of importance for couples' health. Together, these findings suggest that clinicians and educators working with partnered MSM should assess whether and how couples use GSN apps and discuss how to maximize benefits and minimize potential risks of their app use.

Relatively few participants had explicitly negotiated app use with their partners. Those who did not discuss app use with their partners assumed that their current relationship agreement was broad enough to cover their app use, including meeting sexual partners through the apps, while others reported that a discussion of boundaries surrounding their app use “never came up.” Moreover, one-quarter of participants stated their partners were not aware of their app use. As many reported using GSN apps to meet new sexual partners, lack of communication about one's app use may pose a risk to the couple's sexual health. Together, these results highlight that even though app use is common, having explicit discussions about how it fits into a couple's relationship agreement are not. Many individuals may be unsure about how to bring up this discussion with their partners and could benefit from education around how to include this in their relationship agreements. This is especially important as lack of clarity about agreements may be one source of relationship difficulties, and could even play a role in the transmission of STIs and HIV.

Finally, results indicate that partnered MSM are interested in and may benefit from guidance about using GSN apps while in a serious relationship. Participants were chiefly interested in improving communication with their partners about boundaries for their app use and learning to negotiate a relationship agreement. Although communication skills training is typically a cornerstone of relationship education programs (Halford, Markman, Kline, & Stanley, 2003), the overwhelming majority of these programs are geared toward heterosexuals, are offered through religious institutions prior to marriage, and typically do not focus on sexual health in serious relationships. Of the few evidence-based educational programs that do exist for same-sex couples (e.g., Buzzella, Whitton, & Tompson, 2012), none explicitly address the role of technologies like GSN apps in the development and maintenance of couples' relationships or teach men how to communicate about their relationship agreements. Additionally, most programs typically assume a monogamous relationship agreement and there is a need to incorporate a focus on more diverse relationship arrangements. Future efforts to develop relationship education for male couples should consider acknowledging the evolving role of social media and GSN dating apps in relationships and gay culture, addressing concerns the couple may have about their use of these technologies as well as perceived benefits, and include communication skills training specific to sexual health and relationship agreements.

The current study had several limitations. First, the sample of men who completed the study may not be representative of male GSN app users in serious relationships. Due to the nature of the survey branching, many younger individuals who used GSN apps may have been routed to different surveys or the ongoing RCT. Younger men may perceive different risks and benefits to app use, or underestimate risks given that Internet and mobile technology use is prevalent and normative among younger MSM, especially for seeking information about sex and sexual partners (Kubicek, Carpineto, McDavitt, Weiss, & Kipke, 2011; Mustanski, Lyons, & Garcia, 2011). Of the individuals who were eligible to complete this study, most were identified as White men over the age of 40 who were in non-monogamous relationships. GSN app use patterns and implications for HIV prevention may differ among younger users, racial or ethnic minorities, and among participants in monogamous relationships. Furthermore, the current study only surveyed MSM in serious relationships currently using GSN apps, thus not representing individuals who previously used the apps.

Surveying non-app users could provide further information as to their motivations against their use. In addition, participants completed the survey on a phone or tablet, which may have limited the depth of information obtained from participants. Moreover, we did not obtain precise data on participants' relationship length, which precluded us from examining differences in app use patterns by this variable. Finally, we did not assess the characteristics of partners our participants met through GSN apps and sexual behavior with those partners. As such, sexual risks associated with GSN app use among MSM in serious relationships warrant further study.

This study is among the first to highlight the costs and benefits of GSN app use among partnered MSM. Although past research has often focused on the adverse impact GSN apps can have on heterosexual relationships (Clayton, 2014; Coyne et al., 2011; Hertlein & Ancheta, 2014; McDaniel & Coyne, 2014; Rueda et al., 2014), the current study offers insight into ways that same-sex male couples can utilize such tools to fulfill each other's social and sexual needs. Although GSN app use can enhance relationships and sex among partnered MSM, unclear communication about app use may contribute to negative relationship outcomes and could prevent partners from having sexual needs met. Relationship and sexual health education programs for male couples should consider addressing social media and technology use in their curricula.

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**Table 1**

**Sample characteristics (N = 323)**

|                                | Monogamous (n = 102) |      | Non-monogamous (n = 221) |      | Test statistic (t, Fisher's exact test, or chi-square) |      |                              |
|--------------------------------|----------------------|------|--------------------------|------|--|------|------------------------------|
|                                | N                    | %    | N                        | %    |  |      |                              |
| Age (years): mean, SD          | 40.1                 | 10.8 | 35.5                     | 10.2 | 42.3   | 10.4 | $t = -5.46 (p < 0.0001)$     |
| Sexual identity                |                      |      |                          |      |  |      |                              |
| Gay                            | 297                  | 92.0 | 94                       | 92.2 | 203  | 91.9 | FET $p = 0.49$               |
| Bisexual                       | 15                   | 4.6  | 6                        | 5.9  | 9  | 4.1  |                              |
| Queer/questioning/unsure/other | 11                   | 3.4  | 2                        | 2.0  | 9  | 4.1  |                              |
| Race/ethnicity                 |                      |      |                          |      |  |      |                              |
| White                          | 217                  | 69.6 | 64                       | 65.3 | 153  | 71.5 | FET $p = 0.68$               |
| Black                          | 13                   | 4.2  | 4                        | 4.1  | 9  | 4.2  |                              |
| Latino                         | 59                   | 18.9 | 22                       | 22.5 | 37   | 17.3 |                              |
| Other                          | 23                   | 7.4  | 8                        | 8.2  | 15   | 7.0  |                              |
| HIV status                     |                      |      |                          |      |  |      |                              |
| Positive                       | 59                   | 18.3 | 9                        | 8.8  | 50   | 22.7 | $\chi^2 = 12.86 (p = 0.002)$ |
| Negative                       | 243                  | 75.2 | 82                       | 80.4 | 161  | 73.2 |                              |
| Never tested                   | 20                   | 6.2  | 11                       | 10.8 | 9  | 4.1  |                              |
| Education                      |                      |      |                          |      |  |      |                              |
| High school graduate or less   | 15                   | 5.5  | 7                        | 6.9  | 11   | 5.0  | $\chi^2 = 2.77 (p = 0.25)$   |
| Some college                   | 79                   | 24.5 | 30                       | 29.4 | 49   | 22.2 |                              |
| College graduate               | 226                  | 70.0 | 65                       | 63.7 | 161  | 72.9 |                              |
| Employment status              |                      |      |                          |      |  |      |                              |
| Employed full-time             | 231                  | 71.5 | 71                       | 69.6 | 160  | 72.4 | $\chi^2 = 2.38 (p = 0.67)$   |
| Employed part-time             | 28                   | 8.7  | 8                        | 7.8  | 20   | 9.1  |                              |
| Full-time student              | 20                   | 6.2  | 8                        | 7.8  | 12   | 5.4  |                              |
| Unemployed                     | 24                   | 7.4  | 10                       | 9.9  | 14   | 6.3  |                              |
| Other                          | 20                   | 6.2  | 5                        | 4.9  | 15   | 6.8  |                              |
| Area of residence              |                      |      |                          |      |  |      |                              |
| Rural                          | 36                   | 11.3 | 12                       | 12.2 | 24   | 10.9 | $\chi^2 = 0.13 (p = 0.94)$   |
| Suburban                       | 120                  | 37.7 | 37                       | 37.8 | 83   | 37.7 |                              |

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|                                    | Monogamous (n=102) |      | Non-monogamous (n = 221) |      | Test statistic ( <i>t</i> , Fisher's exact test, or chi-square) |
|------------------------------------|--------------------|------|--------------------------|------|---|
|                                    | N                  | %    | N                        | %    |   |
| Urban                              | 162                | 50.9 | 49                       | 50.0 |   |
| Condomless anal sex, last 6 months | 208                | 67.8 | 60                       | 60.0 | $\chi^2 = 4.08$ ( $p = 0.04$ )                                  |
| Relationship agreement             |                    |      |                          |      |   |
| No agreement                       | 48                 | 15.3 | 15                       | 15.3 | FET $p = 0.25$  |
| Agreement was explicitly discussed | 191                | 61.0 | 56                       | 57.1 | 62.8  |
| Unspoken agreement                 | 70                 | 22.4 | 24                       | 24.5 | 21.4  |
| Unsure                             | 4                  | 1.3  | 3                        | 3.1  | 0.5   |

**Table 2**  
**Axial codes by item, code application frequencies, and code definitions**

| Axial code   | No participants | Definition  |
|--|-----------------|---|
| How has the use of mobile dating apps in your relationship positively affected your relationship?  |                 |   |
| Fulfill sexual needs not met in relationship   | 37              | References to fulfilling sexual needs when partner is away or in threesomes/group sex   |
| Improve relationship quality   | 35              | References to improving communication, ability to express oneself, and feelings of closeness  |
| Social networking  | 35              | References to talking with and meeting other people in the gay community  |
| Improved sex life with partner   | 24              | References to increasing variety in sexual encounters, exploring sexuality, and having "better sex."  |
| Self-improvement   | 3               | References to increases in self-esteem and physical improvements  |
| How has the use of mobile dating apps in your relationship negatively affected your relationship?  |                 |   |
| Jealousy   | 44              | References to instances when a perceived or anticipated threat to primary relationship exists   |
| Takes focus away from primary relationship   | 34              | References to over use of apps, decreased sex with primary partner, and time spent looking for other partners   |
| Conflict with partner  | 8               | References to development of tension or stress within the primary partnership due to app use  |
| Breaking or changing relationship agreement  | 6               | References to breaking or changing a relationship agreement, or deciding against an open relationship   |
| Guilt about app use  | 5               | References to negative emotional responses to app use, including shame, sadness, and regret   |
| Risk of STI/HIV infections   | 5               | References to risk regarding infection or transmission of STI/HIV, or general risks to sexual safety  |
| Social consequences  | 2               | References to receiving judgment from community members for app usage   |
| Why haven't you talked with your partner about rules for using mobile dating apps in your relationship?  |                 |   |
| Assume agreement covers interactions on mobile apps  | 22              | References to assumed inclusion of app use in relationship agreement, or that this does not apply due to an open relationship                         |
| Has not come up/non-issue  | 21              | References to participant not discussing this topic, or not believing this issue should be discussed with their partner                               |
| Rules are not necessary  | 13              | References to participant's beliefs that rules are not needed due to trust or lack of worry   |
| Somewhat discussed/defined in agreement  | 11              | References to discussing or defining app use in relationship agreement, but not explicitly defined  |
| Fear/uncertainty   | 3               | References to fear of jealousy or partner's response to discussions around app use  |
| What should we include in these guidelines? What advice would you want to receive? What questions would you want us to answer about using mobile dating apps when in a relationship? |                 |   |
| Communication skills   | 52              | References to requests for skills to improve ability to communicate openly and honestly, and to assist with conflict resolution within partnership    |
| Creating relationship agreement  | 47              | References to developing a relationship agreement, altering an existing agreement, or requests for common rules/guidelines to include in an agreement |
| Explore sexual needs in relationships  | 19              | References to requests for guidance in exploring sexual needs within relationships, especially in communicating interests to partner                  |
| Sexual health & safety   | 13              | References to risk or concern regarding the infection or transmission of STI/HIV, or general risks to sexual safety                                   |