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Tobacco use in the sexual borderlands: The smoking contexts and practices of bisexual young adults

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Abstract

Little is known about why bisexual people use tobacco at higher rates than any other sexual identity group. Non-binary sexualities, such as bisexuality, exist within the socially constructed borderland between homosexuality and heterosexuality. Exploration of the everyday smoking contexts and practices of bisexual individuals may reveal unique mechanisms driving tobacco use. We employed a novel mixed method, integrating real-time, smartphone-administered surveys of (non)smoking situations, location tracking, spatial visualization of participant data, and subsequent map-led interviews. Participants (n = 17; ages 18–26, California) identified as bisexual, pansexual, and/or queer. Most were cisgender women. Survey smoking patterns and situational predictors were similar to other young adults'. However, interviews revealed unique roles of tobacco use in participants' navigation of differently sexualized spaces in everyday life: 1) stepping away from uncomfortable situations related to bisexual identity; 2) facilitating belonging to LGBTQ+ community; and 3) recovering from bisexual identity perception management. Similar studies can examine the place-embedded practices and spatiotemporal patterns of other substance use and other stigmatized identity experiences.

Keywords

Substance use; Queer geographies; Sexual minorities; Mixed methods; Qualitative GIS; Eclogical momentary assessment

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1. Introduction

Little is known about why bisexual people are more likely to use tobacco than any other sexual identity group. A recent national United States survey found that 42% of bisexual individuals use at least one tobacco product, compared to 25% of heterosexuals, 30% of gay men, and 30% of lesbian women (Emory et al., 2016). These disparities are present also for cigarette use alone, with 20% of heterosexuals, 29% of gay men, 27% of lesbian women, and 37% of bisexuals reporting cigarette smoking (Emory et al., 2016). A growing body of health disparities research has found persistently high rates of tobacco use among bisexual adolescents and adults (Boehmer et al., 2012; Corliss et al., 2013; Fallin et al., 2015a, 2015b). Bisexuals start smoking at younger ages than other sexual identity groups (Corliss et al., 2013), and disparities in tobacco and alcohol use between sexual minority and heterosexual youth appear to not only persist but escalate as they transition from adolescence into young adulthood (Marshal et al., 2012). Among bisexuals, women and girls have especially pronounced risk for tobacco use and other risky behaviors (e.g., binge drinking) (Fallin et al., 2015a, 2015b). Attending to the tobacco use behaviors of young bisexual women and girls is particularly pressing, as disparities in tobacco use for sexual minority girls appear to be widening over time rather than closing, as observed among sexual minority boys (Watson et al., 2018).

Bisexuality is the fastest growing sexual identity in the United States, especially among younger populations (Copen et al., 2016). It is crucial to address tobacco use among young adults, as this age group has higher smoking rates (28%) than the general American population (24%) (Jamal et al., 2014), and quitting smoking before age 30 avoids most health consequences of tobacco use (U.S. Department of Health and Human Services, 2014). Among young American adults, sexual minorities are more likely to report smoking than their heterosexual young adult peers (Li et al., 2018). Furthermore, bisexual women under age 50 have greater odds of smoking than those over age 50 (Boehmer et al., 2012). Although a variety of sexual identities are used by individuals to express their attraction to more than one gender (e.g., pansexual, queer, fluid), we employ the term 'bisexual' in this paper to refer to all non-binary sexual identities so as to avoid confusion with non-binary gender identity (e.g., gender queer).

Smoking disparities among bisexuals exemplify the increasing concentration of tobacco use and associated health risks within socioeconomically disadvantaged and/or stigmatized groups and places (Pearce et al., 2012). There is growing interest in understanding the role of context in the persistence of these "smoking islands" (Thompson et al., 2007) that remain after decades of broad anti-tobacco interventions (Barnett et al., 2017). Calls have been made for examining not only area-level effects on tobacco use, (e.g., Moon,'s et al., 2012 study on residential segregation), but also the social contexts, social practices, and meanings of tobacco use from the perspectives of smokers themselves (e.g., Blue et al., 2016; Poland et al., 2006; Frohlich et al., 2002; Tan, 2012). Nonetheless, the unique drivers of tobacco use for bisexuals have largely gone uninvestigated (Blosnich et al., 2013), and bisexuality has received little attention in geographies of sexualities (see, as exceptions, Hemmings, 2002; Weier, 2018; McLean, 2003; Maliepaard, 2015).

In-depth understanding of how and why high rates of smoking persist among bisexual people is needed to develop interventions to reduce associated health disparities (Blosnich et al., 2013; Lee et al., 2009). Explanations for the persistence of high smoking rates among sexual and gender minorities as a group, in other words lesbian, gay, bisexual, transgender, queer (LGBTQ) individuals, include: having smokers in one's peer network (Remafedi, 2007), the role of bars in sexual and gender minority communities and the reinforcing effects of alcohol and nicotine (Blosnich et al., 2013; McKee et al., 2004), tobacco retail and marketing density in neighborhoods with concentrations of same-sex couples (Lee et al., 2016), and targeted tobacco marketing campaigns (Stevens et al., 2004). The minority stress model (Meyer, 2003) has been particularly influential in LGBTQ tobacco research (Blosnich et al., 2013). It focuses on processes through which prejudice, stigma, and discrimination contribute to poor mental health, including experience of prejudice events, expectations of rejection, hiding and concealing, internalized homophobia, and ameliorative coping processes. These types of events link to smoking, as smokers often report experiencing smoking as a helpful way to cope with stressful events (Antin et al., 2017). In addition to understanding tobacco initiation among LGBTQ+ individuals, reasons for continuing to smoke warrant attention, particularly among young adults, whose light and intermittent smoking is highly influenced by social context (Thrul et al., 2014; Glenn et al., 2017; Nichter et al., 2010).

The unique experiences of people with non-binary sexual identities, like bisexuality, in navigating everyday contexts may help explain their higher smoking rates. The metaphor of the "sexual borderland" is helpful in this regard (Callis, 2014). Popular views of sexuality in Western societies have long maintained a firm binary construction wherein sexualities are either normal (heterosexual; attracted only to the opposite sex) or abnormal (homosexual; attracted only to the same sex) (Brown et al., 2007). Recently, more individuals are stepping outside monosexual identity categories to claim labels that better align with their attraction to more than one gender, such as bisexual, pansexual, queer, fluid, and ambisexual (Copen et al., 2016).

A growing body of literature outside geography has documented experiences of navigating the "ambiguous both-and-neither-place" (Callis, 2014) at the border between heterosexual and homosexual identities (Davidson et al., 1997; Shokeid, 2002; Lingel, 2009). This literature highlights how bisexual people risk social invisibility as their identity is often misread as gay or straight in different settings due to assumptions that everyone is attracted either to men or women. Within academic literature, bisexual identities (as well as transgender and gender non-conforming identities) are most often subsumed into a general 'sexual and gender minority' group along with lesbian and gay individuals, rendering the experiences of these groups invisible (see, for example, a recent review of scholarship concerning tobacco use among sexual and gender minorities by Blosnich et al., 2013). The absence of a 'bisexual community' that is felt by many bisexual individuals compounds these experiences of invisibility (McLean, 2003; Weier, 2018).

Many bisexual individuals experience a 'twice rejection' from both the straight population for being 'too homosexual', and from the gay/ lesbian population for being 'too straight', and are exposed to stereotypes of bisexual identities, such as being closeted homosexuals or

attention-seeking heterosexuals, diseased (in the case of bisexual men), and untrustworthy 'lesbian heartbreakers' (in the case of bisexual women) (see, for overview, Callis, 2013; Callis, 2014).

Building on largely theoretical work on bisexual identities and space (Maliepaard, 2015; Hemmings, 2002), geographers have recently begun to explore the experiences of bisexual individuals as they move through space and time in everyday life and interact with various contexts (McLean, 2003; Weier, 2018). These studies have drawn inspiration from work on geographies of sexualities that examines how spaces and places are sexualized, and how norms and categories of gender, sex, and sexuality are deployed and performed within different spaces (Browne, 2006; Oswin, 2008; Brown et al., 2007; Binnie, 1997; Namaste, 1996). The tensions between power and sexuality and the (self-) disciplining of the individual to conform to social norms underpins many of these works (Foucault, 1978). A case study of the everyday geographies of bisexual Canadian men (McLean, 2003) found that experiences and practices associated with sexual identity were compartmentalized and shifted across space and time depending on the normative expectations of heterosexual versus homosexual settings. Some of these men felt that their identity was contingently 'fixed' to either homosexuality or heterosexuality depending on the gender of their current partner. A case study of young bisexual individuals (ages 19–35) in the American Midwest (Weier, 2018) highlighted the undesirability and/or invisibility of bisexuality within gay spaces due to the 'policing' of these spaces for homonormative ideals.

These studies provide insight into the everyday social contexts of bisexual individuals, and suggest ways in which tobacco use practices (Blue et al., 2016) interplay with navigation of everyday life. Studies of tobacco use practices have found that individuals use tobacco to create a protected time to rest and reflect during everyday routines, transition from one context or activity to another, ease social interactions, selfsoothe, and cope with crisis (McQuoid et al., 2018a; Graham, 1993; Antin et al., 2017; Gough et al., 2009; Keane, 2002). The relationship between experiences of acute stress and desire to smoke is also acknowledged in accounts of smoking practices (e.g., Antin et al., 2017). These everyday affordances of tobacco use may lend tobacco to helping bisexually-identified individuals negotiate and transition between homosexual/heterosexual spaces, given their unique position on the sexual borderlands between straight and gay/lesbian identities.

This article works toward explaining why bisexuals' smoking rates are even higher than their gay and lesbian counterparts' by exploring the everyday smoking contexts and practices of bisexual young adults. We employed a novel mixed method that integrates collection of real-time surveys of (non)smoking situations, spatial visualization of participant data, and in-depth interviews guided by maps of participants' own data (see McQuoid et al., 2018b). Our study included 17 young adults (ages 18–26) in the San Francisco Bay Area who identify as bisexual, pansexual, and/or queer and regularly use cigarettes. Most were cisgender female identified. We asked: 1) Where are participants' smoking and craving episodes concentrated in everyday life? 2) What contextual factors and place-based practices drive spatial and temporal patterns of smoking? and 3) How, if at all, does bisexual identity interplay with these contextual factors and place-based practices of smoking?

2. Methods

2.1. Study design

We piloted a geographically explicit ecological momentary assessment (GEMA) mixed method (McQuoid et al., 2018b). Ecological momentary assessment (EMA) methods employ "repeated collection of real-time data on subjects' behavior and experience in their natural environments," (Shiffman et al., 2008, 3). A variety of data collection tools are used, including written diaries and cell phones, with which participants repeatedly report on factors such as their current state, activities, and observations of their surroundings over a pre-defined time period (e.g., a month) (Shiffman et al., 2008). Tobacco use is particularly well-suited for study with EMA because it is an episodic behavior with discernible small-scale events thought to be related to mood and context as the individual goes about everyday life (Ferguson and Shiffman, 2011; Shiffman, 2009). Quantitative ecological momentary assessment studies have examined situational factors of smoking for sexual and gender minorities, finding that smoking is more influenced by external situational factors (e.g., number of other smokers present) than for heterosexuals (Nguyen et al., 2018) and that experiences of discrimination are positively linked to nicotine and substance use risk (Livingston et al., 2017).

Recently, the EMA method has been expanded by integrating Global Positioning System (GPS) tracking data; referred to as geographically explicit ecological momentary assessment (GEMA) (Kirchner and Shiffman, 2016), GEMA allows for spatial analyses of relationships such as those between participant self-reports (e.g., drug craving intensity), location types (e.g., home) and objective environmental ratings (e.g., neighborhood disorder). Few GEMA studies have integrated qualitative methods. However, one prior GEMA tobacco study (Pearson et al.,2016) incorporated a 'place' survey wherein participants were assisted in geo-tagging their personal mobility maps with the tobacco rules and norms experienced in different locations. To our knowledge, our study is the first to employ a GEMA mixed method to examine tobacco use by a high-risk group. It is also the first to integrate GEMA in a qualitative GIS (Elwood and Cope, 2009) mixed method design. It leverages maps of participants' own survey and location tracking data to guide in-depth interviews in order to produce reliable and ecologically valid measures of situational predictors of smoking (e.g., locations, time of day, presence/absence of other people) and reveal the richness of individuals' experiences of their everyday smoking contexts.

Participants first completed a baseline survey online regarding basic demographics, smoking history, and current behavior. Then, participants used their own smartphones to collect data on non-smoking and smoking situations for 30 days. In absence of an established standard for length of GEMA monitoring, we selected the 30-day period in order to collect observations on enough days to make the resulting data representative, while at the same time not overburdening participants by a long study duration. The study app collected continuous location tracking data. Participants were instructed to report every time they smoked a cigarette *(cigarette reports).* A random subset of up to a maximum of three of these cigarette reports each day triggered a survey prompt (*smoking surveys*). Participants were also prompted at random three times per day (*random surveys*) to complete survey so

as to assess non-smoking as well as smoking situations. Each morning, participants were prompted with a survey regarding their tobacco use during the day prior (*daily diary assessment*). Smoking survey and random survey questions examined aspects of each sampled (non)smoking situation, as in location type, intensity of cigarette craving, if they were drinking/ eating, and if specific smoking triggers were present (e.g., others smoking, ashtrays, tobacco advertisements). Participant responses were logged with GPS coordinates. All data were time and date-stamped.

Upon completion of the GEMA data collection period, the first author visualized each participants' GEMA data in ArcGIS, creating map layers of where participants went during the data collection period, and where they reported high cravings, and smoking. Map layers were made for the entire 30-day GEMA data collection period, one weekday, and one weekend day as close to the interview date as possible.

Interviews were held within a few days of GEMA data collection completion. The first author conducted the interviews, which lasted about an hour. During interviews, the participant was shown the map layers of their GEMA data in Google Earth. The interviewer (and/or participant) toggled between and zoomed in and out of the map layers and the participant was prompted to discuss apparent spatial clusters of smoking and high cravings, as well as places where they had spent time but did not report these tobacco use experiences and behaviors. This encouraged discussion regarding the locations, times, situational experiences, and routines linked to the use of and craving for tobacco in everyday life. Then, the maps of two recent sample days were shown. The participant was asked to 'lead' the interviewer through each sample day, providing vivid 'play-by-play' detail of their activities, movements, and experiences, including tobacco use and craving.

Prior to being interviewed, participants were told that the study was about LGBTQ young adults who smoke. After exploring their maps, participants were asked more directly about their sexual identity, including if they feel they "belong to the LTGBTQ+ community", and if they are aware that LGBTQ young adults smoke at higher rates than their heterosexual peers, and why they think that is.

2.2. Study context and participants

Participants were recruited from a larger GEMA study of smokers ages 18–26 in Alameda and San Francisco Counties, California (n = 149), the research aims of which were distinct from this pilot study. Within California, sexual and gender minorities have higher rates of tobacco use, tobacco-related disease, and secondhand smoke exposure than the general population (Tobacco Education and Research Oversight Committee, 2014). The San Francisco Bay Area is known as a particularly tolerant places for sexual and gender minority individuals relative to the rest of the state and country.

Eligible participants had smoked at least 100 cigarettes in their lifetime, currently smoked at least one cigarette per day at least three days per week and owned and used daily a smartphone with GPS capabilities. They were recruited through Facebook, Craigslist, and LGBTQ+ youth serving organizations. Advertisements linked to the study's website with an eligibility questionnaire, which took eligible participants to the informed consent webpage.

Post-GEMA data collection, participants were invited to give an interview if they had completed at least 50% of prompted GEMA surveys and had selected 'gay', 'lesbian', 'bisexual' and/or wrote in 'pansexual' or 'queer' or another non-heterosexual identity on the baseline survey. Over half of participants from the larger GEMA study (54%) achieved medium or high data collection compliance (> 50% of prompted GEMA surveys). Of these, 44% self-identified as LGBTQ. The vast majority of interview-eligible LGBTQ participants were bisexual/pansexual/queer (82%).

The resulting pilot sample (n = 17) was composed mostly of bisexual, cisgender young women (ages 18–26). Six wrote in 'pansexual' or 'queer', alone or in combination with 'bisexual' and/or 'straight'. All 17 expressed attraction to more than one gender during their interview. Twelve were cisgender women, three were gender queer individuals assigned female at birth, and two were cisgender men. They were from a variety of socioeconomic backgrounds as determined by mother's highest education and a variety of racial/ethnic groups, although African Americans were notably under-represented (Table 1). An additional eighteenth participant who identified as lesbian was excluded from this analysis.

Data were collected in 2016 and 2017. Participants received up to $180 in gift card incentives, based on compliance with the GEMA surveys. Participants received $60 for completing the face-to-face interview. Ethics approval for this study was granted by University of California, San Francisco Institutional Review Board.

2.3. Analysis

First, the quantitative and qualitative data sets were analyzed separately. The second author descriptively analyzed the GEMA data at the case and sample levels, using Stata 14. Cigarette reports and smoking surveys were examined, focusing on smoking locations, times of high frequency of smoking at each location, presence of others, and reports of specific smoking triggers (e.g., ashtrays, cigarette packs). Baseline survey data were used to compare and contrast the GEMA data with how participants globally recall and report their smoking behavior. Daily diary assessment data were descriptively analyzed for smoking (i.e., number of days per month and cigarettes per day).

Interviews were audio recorded, transcribed verbatim, and coded by the first author in AtlasTI. Memos of initial impressions of the data were kept throughout data collection and initial coding. Thematic analysis followed an integrative inductive-deductive approach (Bradley et al., 2007). The initial coding scheme was developed from domains from the GEMA surveys to facilitate integration of the qualitative and quantitative data at the case level: smoking location types (e.g., home, car), smoking episodes, and cravings for cigarettes. Then, excerpts concerning smoking episodes and cravings were re-examined by location type to identify emergent themes regarding the experiences driving smoking and cravings in each location (e.g., experiences of marginalization due to sexual identity) and the role of tobacco in these situations (e.g., escape). A code was also applied to all discussion regarding sexual identity, and detailed memos were made for each case.

Finally, the first and second authors discussed the quantitative and qualitative findings of the sample and for each case, observing and discussing confirmation of findings and

discrepancies between findings, which the first author noted in memos. Pseudonyms are used and maps of participant data are displayed without georeferencing information to protect participant confidentiality.

3. Findings

3.1. Patterns of tobacco use

The GEMA data provided a sketch of the situations in which the sample as a whole most often smoked (Table 2). Participants contributed a total of 961 cigarette reports (avg. 56.6 per participant). Most of these were reported in the evening or at night, followed by afternoons, and mornings.

Cigarette reports resulted in 445 completed smoking surveys (avg. 26.2 per participant). Most surveys were completed at home. Other frequent locations included other's homes, vehicles, and the workplace. Slightly more than half of smoking situations were reported when the respondent was alone. Other people most frequently present during smoking were friends, (romantic) partners, and co-workers. Participants frequently reported seeing smoking triggers in the environment immediately before smoking. The most common triggers were lighters, cigarettes, cigarette packs, and others smoking. Participants completed 453 daily diary assessments (avg. 26.6 per participant). Smoking cigarettes was reported on almost 80% of sampled days, with 2–5 cigarettes per smoking day reported most frequently. Participants completed 836 randomly prompted surveys (avg. 49.2 per participant).

3.2. Tobacco use experiences and place-embedded practices

The map-led interviews revealed several themes regarding participants' experiences of different smoking contexts and the roles of tobacco use therein. Many of these themes overlap with prior findings regarding young adults' smoking practices (e.g., McQuoid et al., 2018a). These include the role of tobacco use in: 1) helping with the spatio-temporal organization of activities (e.g., smoking as a way to impose a sense of regularity on an otherwise chaotic feeling schedule); 2) marking the beginning, break, or conclusion of an activity (e.g., taking a break from painting in order to have fresh eyes for the creative process); 3) providing protected time or a forced break from an activity (e.g., resting briefly from studying or working); 4) easing social interaction (e.g., bonding with substance abuse treatment program participants; 5) self-soothing (e.g., coping with insomnia or boredom); 6) coping with moments of overwhelming emotion (e.g., receiving bad news); 7) augmenting physical and mental functions (e.g., feeling more in control while drunk or having more energy to study); and 8) experiencing pleasure (e.g., the visual beauty of smoke dissipating into the cold morning air).

Three additional themes regarding smoking contexts and practices appear particularly relevant to experiences of bisexual identities: 1) stepping away from uncomfortable situations related to bisexual identity; 2) facilitating interaction with and signaling belonging to LGBTQ + community; and 3) recovering from bisexual identity perception management. Concrete examples of these arose during interviews with eight participants. Notably, most

took place in work/school and bar/ restaurant locations, with only a few arising within the three most frequently reported smoking locations in GEMA surveys (home, other location [e.g., walking], other's home).

3.2.1. Stepping away from uncomfortable situations

3.2.1. Stepping away from uncomfortable situations—Several participants described using tobacco to escape situations where they felt their bisexual identity, and sometimes other dimensions of their identity, were unwelcome or under interrogation. The vast majority of participants said they had been exposed to stereotypes and stigma associated with bisexual identities by both gay/lesbian and straight individuals (Callis, 2013), such as being inauthentic. For example, Heather (age 23, bisexual/straight, cisgender female, White, non-Hispanic), expressed feelings of illegitimacy about her sexual identity when she said she was unsure if she should participate in a study of LGBTQ+ smokers because she was "just bi". She restated this sentiment when asked if she felt part of the LGBTQ+ community by responding: "I'm just bi. Do I really count?"

Stacey (age 25, bisexual, cisgender woman, White, non-Hispanic) described an everyday context where her sexual identity feels unwelcome and she used smoking as a practice to step away. Her GEMA data indicated that her most frequent smoking locations were home (34%), vehicle (29%), and restaurants (13%), that she most often smokes alone (65%), and in the morning (38%) and afternoon (36%). However, during her interview, she identified an additional important smoking location, noting a smoking report cluster at her community college campus on her GEMA map (Map 1).

She described feeling unwelcome on campus due to "slurs" used by other students about sexuality and race/ethnicity. In contrast to her previous college environment where she was "out and had a really strong presence on the campus," here she feels "I'm not open to sharing anything about who I am." Her discomfort around other students produces feelings of "not wanting to put myself out there, wanting to step back. " She frequently walks out to her car in the college parking lot to smoke a cigarette when the environment is overwhelming and had reported these in the GEMA surveys as smoking in her vehicle. The interview helped illuminate an important nuance about this context which was obscured by the necessarily brief GEMA surveys:

> At school it's like a physical thing, because you have to go into the parking lot [to smoke]. [...] So in that sense, it's a very literal thing of, "I'm done. I'm walking out." [...] It's like "Let me go to my car. Let me leave. I don't want to be a part of this. I don't want to see these people anymore. "

When asked why she thinks many bisexuals smoke, Stacey related smoking to a global feeling of being unwanted and/or invisible in both straight and lesbian/gay communities (Callis, 2013), which results in the desire to self-isolate:

> It's just another added layer of not feeling part of either community, of the queer community or the general straight community. I think it just adds to another layer of feeling othered, feeling like you can't be your true self, because people are always saying things like, "Oh, you're a faker, you're a liar." And so, again, it's like, all right, how can I step back? How can I remove myself from these situations?

> I'm going to have a cigarette. I'm going to stand outside. I'm going to leave and be
> outside by myself. I don't feel like I'm part of any sort of community, and no one
> wants me here. And I look straight, you know, to queer people, and I look queer to
> straight people, or whatever it may be. Yeah, so I think it's just another added layer
> of feeling unwanted and othered and wanting to isolate yourself.

Similarly, during her interview, Jocelyn (age 19, bisexual, cisgender woman, White, non-Hispanic) immediately identified her art college as an obvious smoking cluster on her map. Indeed this was her second most frequent smoking location according her GEMA surveys (27%) behind walking/public transit stops (33%). She described experiences at college of "weird biphobia stuff" that make her want to retreat for frequent smoking breaks. She has had experiences when she felt other students were fetishizing her bisexuality or accusing her of pretending to be bisexual to get attention: "This has forever been the case, just about bisexual girls, and implications that it was for attention."

Angie (age 18, queer, cisgender woman, multi-racial) described using outdoor smoking breaks to "isolate" herself during a family visit to extended family. Her aunt had recently disclosed Angie's queer sexual orientation to her nuclear family without her consent. She described her family as "very, very, very conservative" and being outed made the trip particularly uncomfortable. While exploring her map during the interview, she noted the cluster of cigarettes she reported at home where she lives with her family (Map 2). Her GEMA surveys identified home as one of her top three smoking locations: vehicle (32%), workplace (29%), home (18%). While Angie feels loved by her family, they have made it clear that her sexual identity is not accepted: "I don't feel safe because they don't get it. My dad's like, oh, it's ok, you're like going to hell basically. [...] I can still love you."

Angie most often smokes in the evenings according to her GEMA surveys (56%). During her interview she described a nightly smoking ritual where she sits alone on the patio and listens to a "special smoking playlist" on her phone. This ritual provides her with a regular protected time and space apart from her family environment to self-reflect (see also McQuoid et al., 2018a):

> It just became a part of my life to like just take a step back and not do anything. It's
> like taking myself and making myself part of a different world. It's like, okay, cool,
> reality's not - nothing is happening right now. It's all about me. I get to think about
> myself for five seconds. Oh, my god, what am I feeling?

Two final examples of using smoking to step away from uncomfortable environments come from Priya, who identifies as pansexual and uses they/them pronouns (age 24, Asian Indian). During the map-led interview, Priya emphasized the importance of a cluster of smoking reports at work (Map 3). Priya works in retail serving "rich, White folks" and most of their colleagues identify as gay or lesbian. Priya described colleagues as "normy gays" and "Castro kids", in reference to the predominantly wealthy, White, gay male Castro Neighborhood of San Francisco. Priya perceives them as primarily interested in assimilating into heterosexual society and less concerned with other social justice issues, such as those concerning race or wealth inequality. Priya feels cared for by coworkers but not understood. Customers, coworkers, and management frequently mis-gender Priya and coworkers "come

at me with a lot of questions" about their gender, sexual identity and polyamorous relationships. Priya recounted smoking frequently on work breaks, using tobacco to disengage from their work environment. Priya feels that smoking gives the appearance of being less approachable and signals to others a wish not to interact.

Then, while viewing map layers from a sample weekend day (a few days prior to the interview) and retracing the events of that day, Priya described using tobacco to disengage from a "strangely straight" house party (see also Map 3). The party became a "claustrophobic situation" when "a lot of straight, White dudes showed up" and took up a lot of space. Priya was wearing a bindi to celebrate Diwali and felt targeted when the men began loudly criticizing religion: "I feel like they were assuming a lot religious stuff from me." Priya self-isolated with friends by smoking more than usual that night: "I feel like I smoke for enjoyment, but also when I'm super stressed out, or I want to disengage." Reflecting on the higher smoking rates among sexual and gender minorities, Priya said:

> I feel like I can understand, like, why people [are], like, doing the most to exist, but doing also the most to not really be present for it. There's a lot of nasty shit in the world always, like that not really being welcomed in the normy gay community. It's just a lot of disenfranchisement from community to community. But I really think the Bay Area is like a special place, and there's a lot of solidarity here.

Despite the Bay Area being relatively tolerant of sexual and gender diversity, as Priya says, the "disenfranchisement from community to community" that Priya describes eludes to the anticipated rejection that bisexuals may face in differently sexualized spaces. The following section explores the roles that tobacco use plays for participants in coping with the lack of sense of belonging to community that many experience.

3.2.2.   Facilitating interaction and signaling belonging—Tobacco use also comes into play in facilitating interaction with and signaling belonging to the LGBTQ+ community for many participants. While this use of tobacco is not unique to bisexual young adults (Remafedi, 2007), it may be a particularly salient theme for this group given the dual rejection experienced by many bisexual individuals from both the straight and lesbian/gay communities, suggesting that they may frequently anticipate rejection and have a harder time establishing a sense of belonging and connection in LGBTQ+ spaces.

Sofia (age 18, bisexual, cisgender woman, Hispanic) described the queer co-op on her university campus as an "outcast group [...] doing outcast things" like smoking tobacco and cannabis and drinking. Sofia referred to smoking among young queer people as part of a performance of an "I don't give a fuck kind of attitude." Smoking and other high risk behaviors can be used, consciously or unconsciously, by socially alienated members of society to send a message that the dominant group's control over their lives is not without bounds (Factor et al., 2013). As Thompson et al. (2007) have observed among socioeconomically disadvantaged smokers in New Zealand, the strong culture of tobacco denormalization in California may lend smoking to serve as an act of resistance for individuals with stigmatized identities, such as bisexuals and other sexual minority people.

Several participants noted that smoking is more common at LGBTQ + bars than straight bars (see also Fallin et al., 2014). For example, Alvina (age 26, bisexual/straight, cisgender woman, multi-racial) noted during the interview that smoking is much more acceptable in LGBTQ + spaces:

When you're smoking outside like, in the Castro, at some dive bar, or whatever, they don't look at you like, "Oh, you're smoking here." They don't give you that pretentious look.

Rather than attributing high bisexual smoking rates to permissive smoking norms in LGBTQ + spaces, Alvina explains them with the absence of any normative demands due to alienation from all sexual communities:

They feel they don't have a community. They don't feel limited by what a community thinks they should or shouldn't do.

The majority of participants expressed an ambivalence to, or out-right rejection from, the LGBTQ+ community. Alvina has framed her lack of community as a type of personal liberation:

I don't feel like I have a limit on what I can do or what I can be. So I just do whatever I want, and I just smoke wherever I want.

Smoking practices are a powerful tool for helping initiate interactions and strengthen relationships between smokers (McQuoid et al., 2018a). Many participants described leveraging smoking in this way within LGBTQ+ settings to have "conversations I otherwise would not have" (Priya). Dusty (age 21, bisexual/queer; gender queer; multi-racial), for example, smoked slightly more often around others (54%), in the afternoon (50%) and evening (36%), and wrote in 'party' as at least one of their 'other' smoking locations. Dusty described borrowing a lighter from a barista at a queer open mic event:

I can make connections with people over a cigarette, you know. Like, it's kind of like one of those times where you can be, like, really intimate with someone. [...] So I got to go outside with this person and smoke a cigarette with them and got to talk to them. And I never would have talked to them or gotten to know them if it hadn't been for us, like, sharing a cigarette together.

Adrian (age 22, bisexual, cisgender man, Latino) specifically discussed using smoking as a way to express romantic interest to the same sex. Adrian's GEMA surveys over-sampled morning/early afternoon smoking situations due to his surge in smoking frequency in the final two weeks of data collection, which he attributed to a romantic breakup and university deadlines (see McQuoid et al., 2018b). His interview, however, provided insight into his evening smoking situations where he is most likely to be in social settings with potential romantic partners (Map 4).

Communicating romantic or sexual interest to unknown men is challenging for him, in contrast with his interactions with women, where he finds that the "heteronormativity frame that society operates under" dictates that women assume that any man approaching them may have a sexual or romantic interest in mind. While discussing the dispersed cluster of

cigarette reports at bars near his university, Adrian described an example of using tobacco as a tool to communicate interest to a man and establish a sense of intimacy:

> So, the last time I approached someone through sort of smoking, it was at a bar, and so I had gone out for, like, a smoke break. And I was with a group of friends. So, we were outside smoking, and so the individual was also outside. [...] And so I just turned to him and sort of offered to see if he needed a lighter or needed a match or anything. And so I lit the cigarette. And he sort of - that allowed me to sort of gain physical closeness and sort of diminish that physical space between us and then sort of allowed for interaction and sort of, you know, "We're friendly here," what have you. But there was sort of that - there was the intention of me wanting to sort of light it and just facilitating that space [that] allowed for a closeness and sort of an interaction.

Adrian contrasted this example to a time he tried to indicate interest to another man when it was not possible to use smoking to facilitate interaction:

> Whereas I remember there was an incidence where I approached someone, another male, in a sort of campus coffee shop, and I – you know, trying to sort of signal interest. And so we were both waiting for our order. And so I tried to spark up conversation. But he sort of - it was difficult to sort of convey what the reason behind it was, because it just seemed so happenstance. There wasn't anything - there is no other form of exchange being given besides just sort of shooting the breeze. Where, I think that smoking allows for a certain facilitation of exchange, either between the actual, like, partaking part of some of that ritual of, like, offering a cigarette, giving a cigarette, or lighting the cigarette or smoking together.

The absence of the ritualized exchange of cigarette smoking that allows for physical proximity and a gesture of friendliness made communicating romantic interest to the same sex much more difficult.

3.2.3. Recovering from sexual identity perception management—Finally, more than half of participants described regularly trying to manage how their sexual identity is perceived in different contexts (see also Callis, 2014: on self-policing). Most participants described sometimes altering their dress, language, or voice in different contexts to avoid appearing 'too straight' (and risk rejection from lesbian and gay individuals), or appearing 'too gay' (and face rejection from straight individuals) (Shokeid, 2002). Sometimes participants feel they must verbally assert, defend, or hide their non-binary sexual identity when feeling unwelcome in predominantly straight or gay and lesbian spaces.

Kelsie (age 23, bisexual, cisgender woman, White, non-Latino), for example, is currently dating a woman and a man and will change how she dresses depending on whether she anticipates going into a heterosexually or homosexually normative space:

> I feel like sometimes in, like, queer spaces I will, you know, not dress as feminine, but there will be more fun outfits. But, like, in, like, super-straight-oriented spaces, I feel like I kind of tone down my fashion sense. You know, I'll wear just plain-

colored T-shirts, you know, single, like, one pattern and nothing too crazy. (age 23, bisexual, cisgender woman, White, non-Hispanic)

Recovery from these efforts appears to be another way that tobacco use can interplay with bisexual identities in everyday life. While bisexual identity perception management was described by most participants, Adrian was the only participant who perceived a direct link between his efforts to manage how his bisexual identity is perceived by others and his own smoking. He described bisexuality as a sometimes tiring "trapeze line walk," noting that "my performance changes a lot during the day." Adrian has become close to several other university students who identify as lesbian or gay. While they were initially welcoming of his bisexual identity, they often "forget" he is bisexual, and act surprised when he mentions dating a woman, appearing to have defaulted to an assumption that he is gay. These situations often involve an effort on Adrian's part to respond to the "interrogation of what bisexuality means," defending the legitimacy of his attraction to multiple genders.

Adrian does not want to be misread as gay in straight settings, due to his attraction to men, nor does he want to be perceived as a threat or illegitimate in queer spaces, due to his attraction to women. In straight settings he tries to maintain a "queerness" in subtle ways but avoids wearing bold prints or other signs of "the more flamboyant male," pitches his voice lower than usual, and avoids using words like "partner" that may be associated with the LGBTQ+ community. In his organizing work in the LGBTQ+ community, he fears being perceived as "voyeuristic and like I am more interested in women." He attempts to moderate his mannerisms and speech to be "more palatable" to lesbian and gay individuals, and frequently responds to questions about his sexual identity or to 'offers' from others to accept his 'true' identity as a gay man. In either setting, Adrian cannot risk being perceived as too gay or too straight as this would delegitimize his bisexuality; hence the trapeze line walk of his bisexual identity:

> It grows tiring to sort of always have to deconstruct this for people. I think there have been instances throughout the year where I just get tired of having to go through the motions with the same people over and over.

Using tobacco provides a way to calm down and recover from the ongoing tensions of managing and legitimizing Adrian's identity in different settings:

> If I sort of get really, really tired or sort of really just exhausted from performing, just like emotional/mental labor. Then it's very easy for me to just be like, "Oh yea, I can go out and get a smoke break in." Like change the environment, change projects, and sort of regroup myself before going back in.

This use of smoking to cope with bisexual identity management is similar to the first theme on using smoking to physically step away from acutely uncomfortable situations as they emerge. However, it is distinct in that it may speak to the use of smoking to cope with the accrual of emotional and mental fatigue that is associated with chronic, on-going, and anticipated management of bisexual identity over time. In addition to "prejudice events," sexual minorities also live with expectations of rejection, hiding and concealing, internalized homophobia, and ameliorative coping processes (Meyer, 2003) that are less easily located within discrete events.

4. Discussion

This study offers initial insight into the mechanisms driving high tobacco use rates among people with bisexual identities by examining the everyday smoking contexts and practices of a group of bisexual, pansexual, and queer-identified young adults in the San Francisco Bay Area. The geographically explicit ecological momentary assessment (GEMA) mixed method (McQuoid et al., 2018b) allowed us to 'accompany' participants as they moved through space and time in their everyday routines and provided rich insight into the sense they make of their own smoking practices and their experiences with bisexual identity within everyday contexts (Poland et al., 2006; Blue et al., 2016; Frohlich et al., 2002; Thompson et al., 2007). These findings add to the overwhelmingly quantitative research on bisexual tobacco use disparities (Boehmer et al., 2012; Corliss et al., 2013; Dai, 2017; Fallin et al., 2015a, 2015b; Johnson et al., 2016; Livingston et al., 2017; Marshal et al., 2012; Nguyen et al., 2018; Watson et al., 2018), and advance understandings of why bisexuals have such elevated rates of smoking, as well as other forms of substance use and adverse mental health outcomes, as compared to their gay and lesbian counterparts who are themselves at elevated risk compared to the heterosexual population.

Sexual orientation has remained under-researched in geographic studies of health inequalities (Davies et al., 2018; Lewis, 2018). Methodological innovations, such as the pilot described here, are needed to help bridge health geography and LGBTQ studies and integrate sexual and gender subjectivities into quantitative models of socio-spatial determinants of health (Davies et al., 2018). Geographic studies on sexual and gender minority health may be enriched by focusing on everyday mobility. Attending to everyday mobility reveals how spaces and places that are often the focus of geographies of sexualities (e.g., gay bars; gay neighborhoods) intersect with broader LGBTQ life-worlds, which include other settings like workplaces, home, and public transit (Davies et al., 2018). Taking this more holistic approach to studying relationships between place and health for LGBTQ people helps avoid focusing disproportionately on the role of 'queer places' like gay bars in LGBTQ health, which can result in unintentionally labelling them as inherently risky or dangerous places (Davies et al., 2018).

Geographies of sexualities have often emphasized identity, performativity, and power in understanding relationships between space, place, and sexuality. Similar to the few existing studies on the place experiences of bisexual individuals (Weier, 2018; Hemmings, 2002; Maliepaard, 2015; McLean, 2003; Callis, 2014), our participants recounted the tensions and discomforts of navigating differently sexualized spaces wherein identity and ownership of space are contested. Our participants described how smoking can be mobilized to physically remove themselves, engage with, or recover from the complexities of navigating a binary sexual landscape as a non-binary individual. These accounts echo Thompson et al.'s (2007) understanding of the sometimes counterintuitive use of tobacco as a 'technology of the self (Foucault, 1988) in which marginalized individuals can exercise a taking control of their experience of situations through smoking. Public health efforts to engage with socially marginalized individuals about tobacco use should further grapple with these 'unreasonable' dimensions of smoking, and acknowledge the motivations of those who use smoking to enhance their capacity to act in everyday situations (see also Tan, 2013). Acknowledging

these motivations for smoking may enhance socially marginalized smokers' trust in tobacco use prevention and cessation efforts and could be acknowledged through a variety of channels, including targeted social media outreach campaigns and cessation group counseling curricula.

In many ways, participants' smoking patterns and predictors were largely similar to those of other young adults, in that they were predominantly light smokers whose smoking was substantially predicted by social situations (Thrul et al., 2014; Glenn et al., 2017; Nichter et al.,2010). The GEMA survey data revealed that they smoked around others about half the time, often reported seeing other people smoking and tobacco paraphernalia prior to smoking, and frequently smoked in the evening. Frequent smoking locations were at home, in 'other' locations like walking or waiting for the bus, in another person's home, or in a vehicle.

Many aspects of participants' narratives of smoking experiences provided during map-led interviews were similar to other qualitative accounts of young adult smoking (McQuoid et al., 2018a; Glenn et al., 2017; Nichter et al., 2010). However, three themes appear especially relevant to experiences of bisexual identities: 1) stepping away from uncomfortable situations related to bisexual identity; 2) facilitating interaction with and signaling belonging to LGBTQ+ community; and 3) recovering from bisexual identity perception management. Notably, examples relating to these themes took place mostly in participants' work/ educational settings and bars/restaurants, with only a few examples coming from participants' most frequent smoking locations reported in the GEMA surveys. It is unsurprising that most smoking episodes would occur in the places where participants spent the most time (e.g., home, in transit). Yet, tobacco may be most likely to play a role in negotiating sexual identity within places like work/school and bars/ restaurants that are less frequent smoking locations, but are intensely public and relational, as these are the settings where sexual identities are performed and contested. Valentine and Skelton (2003), for example, have emphasized the desire to belong and willingness to conform to the normative expectations of lesbian and gay spaces (e.g., house parties, lesbian/gay bars) for young LGBTQ+ individuals as they transition from adolescence to adulthood.

While the public places emphasized in participant smoking accounts may not have the highest frequency of smoking, they are nevertheless key to understanding the unique experiences and drivers of smoking for groups with stigmatized and contested identities, like bisexuals. Longitudinal studies are needed to investigate how stress-related smoking among bisexual smokers may be related to the development of nicotine dependence. Furthermore, the findings presented here speak to experiences of navigating bisexual identity. However, they may also relate more broadly to themes of intragroup marginalization (Castillo et al., 2007) that are experienced by those who inhabit other identity 'borderlands,' such as individuals with multi-racial or multi-ethnic identities, and may translate to helping understand the high rates of tobacco and other substance use for these groups (Holmes et al., 2016; Llamas et al., 2017).

Public health efforts to reduce smoking among bisexual young adults should take into consideration these unique experiences and uses of tobacco in negotiating bisexual identity

when tailoring anti-tobacco campaign messaging and smoking cessation interventions, such as online groups (e.g., on Facebook) that can be used to reach young bisexual young adults on a large scale. Broad umbrella LGBTQ+ interventions (e.g., Fallin et al., 2015a, 2015b) may not reach bisexual, pansexual, queer and other non-binary young people who feel ambivalence toward or outright rejection from the LGBTQ+ community. Future research should measure the success of engaging bisexual individuals with generalized LGBTQ+ interventions.

4.1. Limitations

This pilot study was limited by a small sample of bisexual young adults in the San Francisco Bay Area, most of whom were cisgender women. Our participants' accounts may not speak adequately to the experiences of cisgender men and transgender and gender non-conforming individuals who identify as bisexual. Future studies should further explore the intersections of bisexuality with other facets of identity, including race/ethnicity, gender, socioeconomic status, and disability (Brown, 2012). However, this study does provide in-depth insight into the experiences of bisexual women, an important and understudied group. We also did not include comparison groups (e.g., lesbian/gay, heterosexual). Second, our GEMA smoking surveys did not include measures of experiences of sexual identity discrimination (Livingston et al., 2017), which may better triangulate between the GEMA surveys and map-led interviews. Third, our analysis did not examine differences between participants by interest in quitting smoking, which may yield differences in smoking patterns and practices. Finally, the San Francisco Bay Area is a uniquely tolerant social context for sexual and gender minority individuals and findings may not be transferable to other contexts.

5. Conclusion

Tobacco use appears to play a unique role in navigating everyday journeys through space and time for many young bisexually-identified people. This study is among the first to work toward explaining and contextualizing bisexual smoking disparities. Future research should further examine the interplay between place-embedded tobacco use practices and sexual identity in other settings, compare bisexual tobacco use experiences and patterns with those of heterosexuals and gays/lesbians to better identify the drivers of smoking that are unique to bisexuals versus those which are shared among all young adults, and, lastly, better address the diversity of individuals who identify as bisexual. This study's geographically-explicit insights into the everyday processes of tobacco use indicates promise for using this type of mixed method for understanding tobacco and other substance use within the context of other stigmatized identities, such as those concerning poverty, gender, race/ethnicity, and mental health.

Acknowledgements

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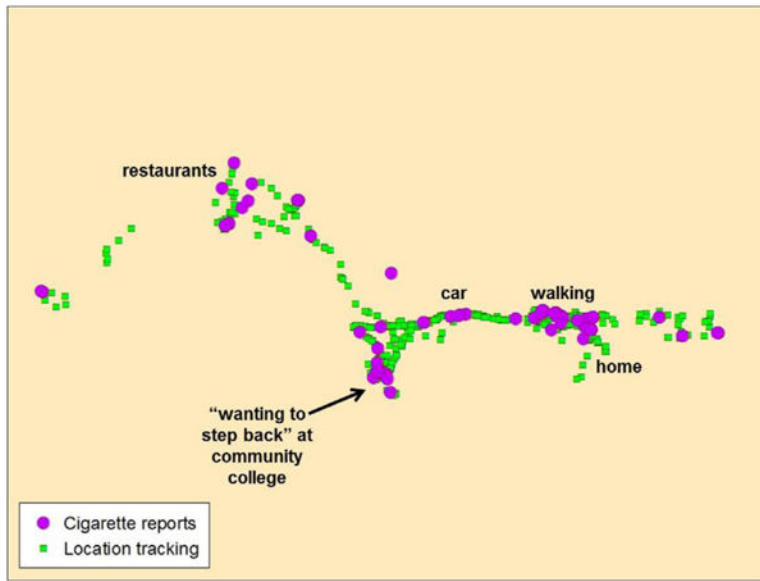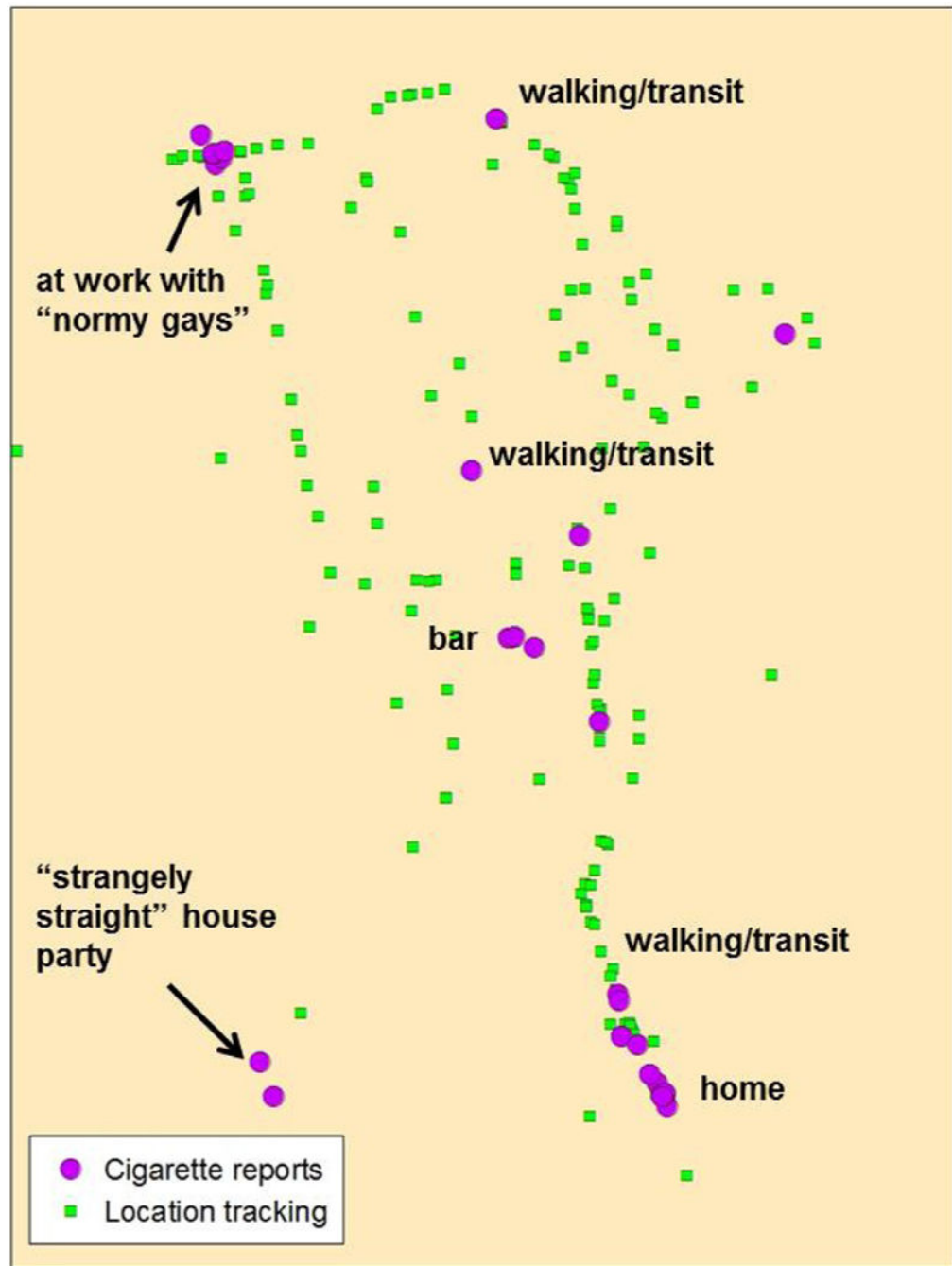
Map 1.
Stacey, cigarette reports and location tracking, 30 days, (labels derived from map-led interview).
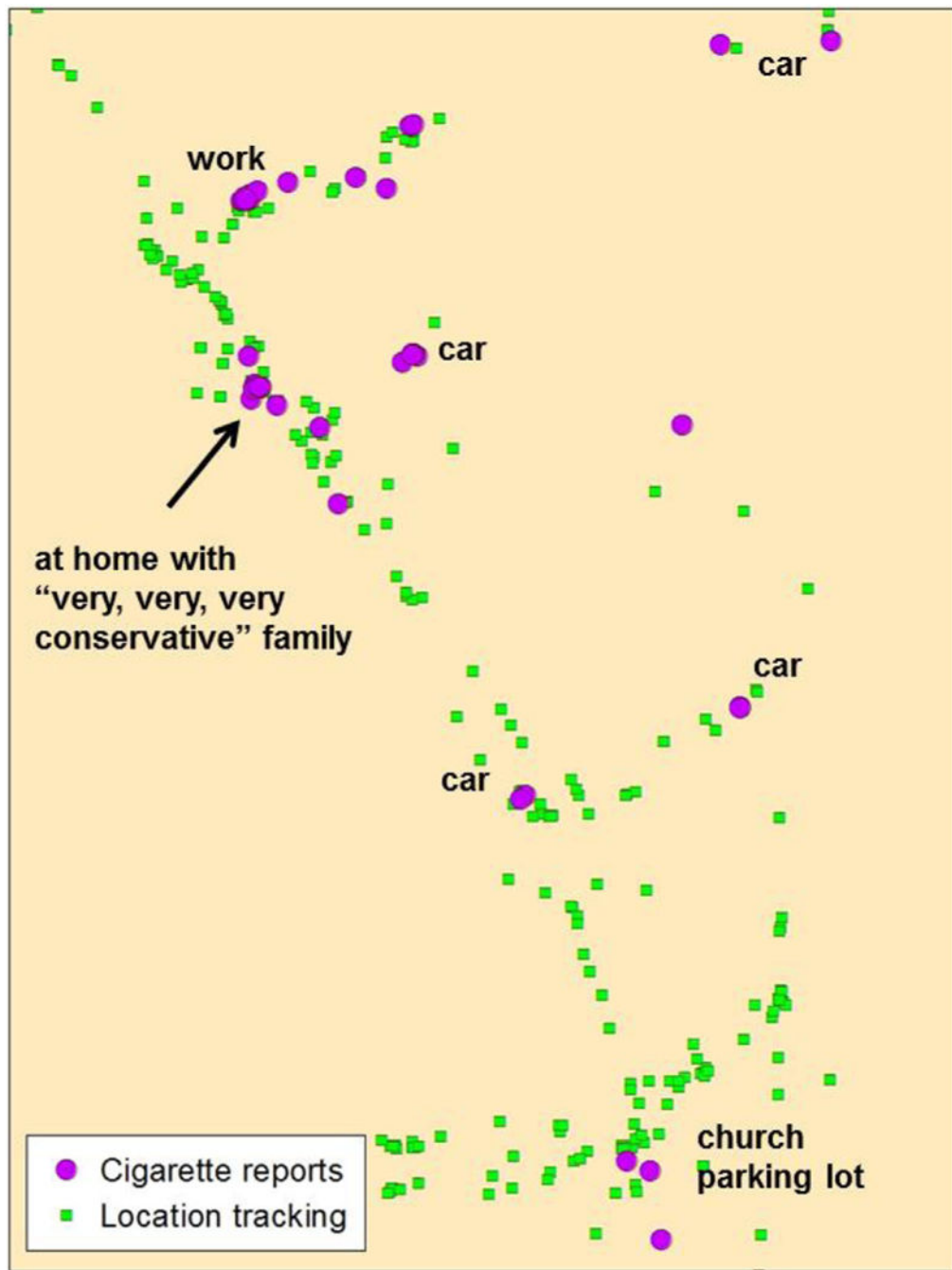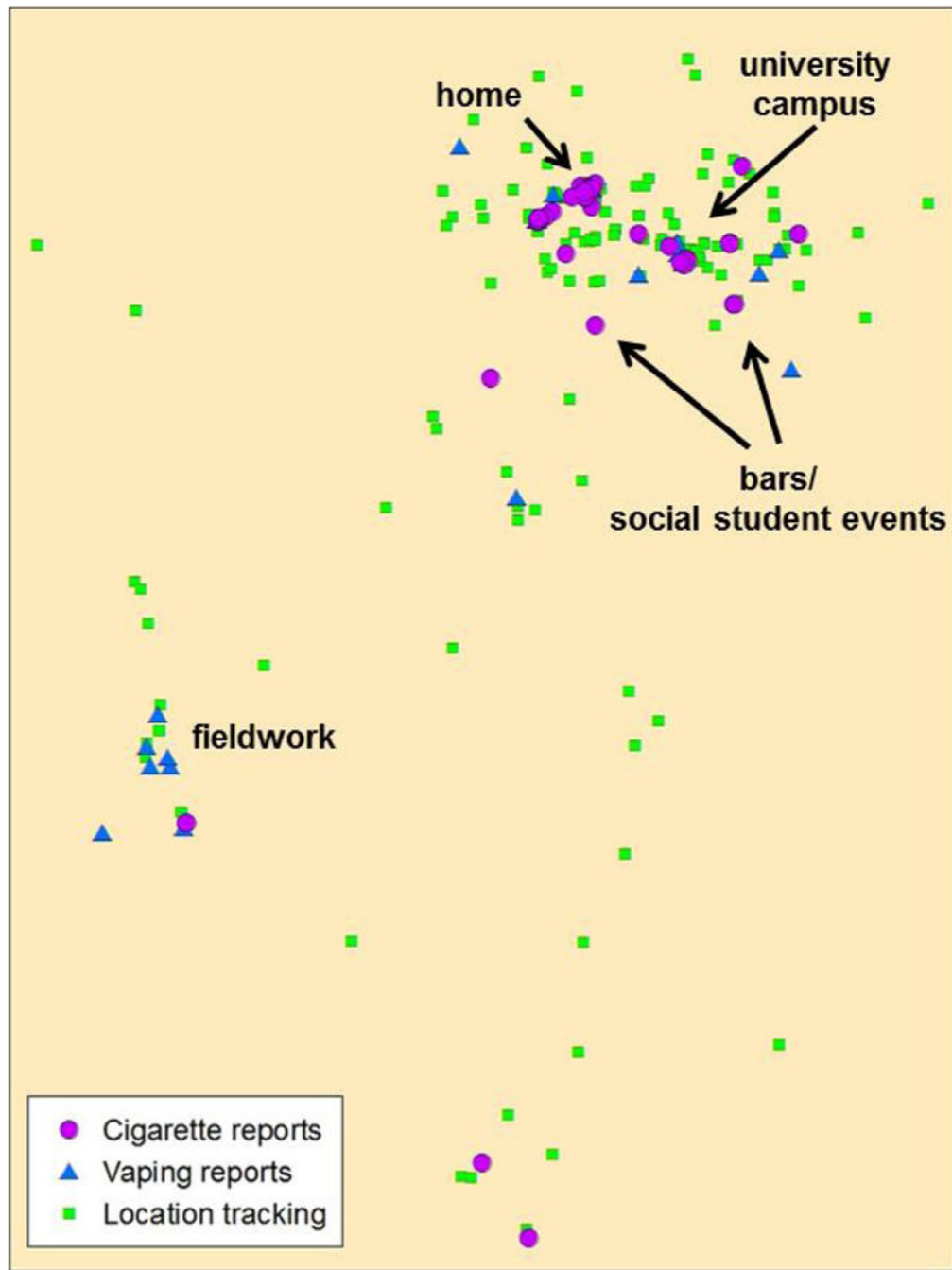
Map 2.
Angie, cigarette reports and location tracking, 30 days (labels derived from map-led interview).

Map 3.
Priya, cigarette reports and location tracking, 30 days, select geography (labels derived from map-led interview).

Map 4.
Adrian, cigarette and vaping reports and location tracking, 30 days, select geography (labels derived from map-led interview).

Table 1:

Participant characteristics (n = 17).

	n	%		n	%
Age			**Race/ethnicity**[a]		
18–20	5	29%	White, Non-Hispanic	7	41%
21–23	5	29%	Hispanic/Latino	6	35%
24–26	7	41%	Asian American	3	18%
Sexual identity[a]			African American	1	6%
Bisexual	13	76%	Native American	1	6%
Pansexual	4	24%	Southeast Asian/Pacific Islander	1	6%
Queer	2	12%	**Mother's highest education**		
Straight (in combination with above)	2	12%	High school or less	5	29%
Gender identity			Some college or Associate degree	4	24%
Cisgender female	12	71%	Bachelor's degree or higher	8	47%
Cisgender male	2	12%			
Gender queer (born female)	3	18%			
Gender queer (born male)	0	0%			
Transgender (male or female)	0	0%			

[a]Participants selected multiple categories.

Table 2:

Smartphone app administered surveys, 30 day sample, 17 participants.

	n	*%*		*n*	*%*
Daily diary (N = 453)			Smoking surveys (N =445)		
No. of cigarettes per day			**Location**		
0	93	20.5%	Home	161	36.2%
1	53	11.7%	Other location	69	15.5%
2–5	246	54.3%	Other's home	68	15.3%
6–10	56	12.4%	Vehicle	57	12.8%
11–15	4	0.9%	Workplace	47	10.6%
16–20	1	0.2%	Restaurant	26	5.8%
			Bar	17	3.8%
Cigarette reports (N = 961)			**Smoking alone**	244	54.8%
Time of day			**Smoking with others (N = 445)**		
Morning (6 a.m. to 12 p.m.)	228	23.7%	Friends	97	21.8%
Afternoon (1–6 p.m.)	322	33.5%	Partner	66	14.8%
Evening (7 p.m. to 5 a.m.)	411	42.8%	Coworkers	26	5.8%
Day of week			Acquaintances	22	4.9%
Mon	128	13.3%	Family members	16	3.6%
Tue	159	16.6%	Unknown persons	9	2.0%
Wed	134	13.9%	**Smoking triggers (N = 445)**		
Thu	153	15.9%	Lighter	152	34.2%
Fri	136	14.2%	Cigarette	125	28.1%
Sat	136	14.2%	Cigarette pack	104	23.4%
Sun	115	12.0%	Ashtray	73	16.4%
			Smoking	59	13.3%
			Other	20	4.5%
			Media	8	1.8%
			Ads	7	1.6%