Project Relate: Rationale and design of a remote online daily diary study examining sexual minority stress, relationship factors, and alcohol use in same-sex female couples across the United States

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Abstract

**Background:** The Healthy People 2020 initiative aims to reduce health disparities, including alcohol use, among sexual minority women (SMW; e.g., lesbian, bisexual, queer, pansexual). Compared to heterosexual women, SMW engage in more hazardous drinking and report more alcohol-related problems. Sexual minority stress (i.e., the unique experiences associated with stigmatization and marginalization) has been associated with alcohol use among SMW. Among heterosexuals, relationship factors (e.g., partner violence, drinking apart vs. together) have also been associated with alcohol use. Negative affect has also been identified as a contributor to alcohol use. To date, most studies examining alcohol use among SMW have used cross-sectional or coarse longitudinal designs.

**Objective:** Project Relate was designed to increase our understanding of alcohol use among young SMW who are at-risk for alcohol problems. Using a daily diary methodology, information about the daily experiences of alcohol use, sexual minority stress, relationship interactions, and mood are being collected entirely remotely from women across the United States. These data permit us to answer questions regarding what factors are associated with daily alcohol use in SMW. Between-person characteristics will also be examined as potential risk and protective factors.

**Method:** Both partners of a female same-sex couple (age 18-35 years; \( n = 150 \) couples) are being enrolled in the study following preliminary screening by an online market research firm that specializes in recruiting sexual minority individuals. Each member of eligible couples completes a baseline survey and then 14 days of daily surveys each morning.

**Results:** To date, 208 women (i.e., 104 couples) were successfully screened and enrolled into the study. In total, 164 women have completed the 14-day daily protocol. Compliance with completing the daily diaries has been excellent, with participants on average completing 92% of the daily diaries.

**Conclusions:** Project Relate is designed to increase our understanding of between- and within-person processes underlying hazardous drinking in understudied, at-risk SMW. The study includes a remote daily diary methodology to provide insight into variables that may be associated with daily hazardous alcohol use. Prior to the development of programs that address hazardous alcohol use among young SMW, there is a need for better understanding of individual and dyadic variables that contribute to risk in this population. The unique challenges of recruiting and enrolling SMW from across the United States in a daily diary study are discussed.

**Keywords:** sexual minority women; couples; sexual minority stress; alcohol use; daily diary
Introduction

One of the goals of Healthy People 2020 [1] is to improve the health and well-being of lesbian, gay, bisexual, and transgender (LGBT) individuals. Compared to heterosexual women, sexual minority women (SMW; e.g., lesbian, bisexual, queer, pansexual) engage in more heavy drinking and have lower rates of abstention from drinking [2-4]. SMW also experience more negative alcohol-related consequences than heterosexual women, such as driving under the influence of alcohol, having unplanned sex, suicidal ideation, fighting or arguing with someone, and engaging in sexual harassment [5, 6]. Much remains to be learned regarding why some SMW are at risk. The current study, Project Relate, was designed to increase understanding of hazardous drinking among SMW using an entirely remote online data collection procedure, including a daily diary component. This approach permits examination of both between-person (i.e., person-level) characteristics (answering the question: who drinks more) and within-person (i.e., daily level) processes (answering the question: when does one drinks more). It also explores the daily associations between hazardous alcohol use, and sexual minority stress, affect, and relationship factors among young same-sex female couples. The theoretical framework and existing empirical evidence that contributed to the development of this study are described below.

Sexual Minority Stress and Alcohol Use

It has been argued that minorities in general experience unique stressors related to their stigmatized and marginalized social status in society and sexual minorities are no exception [7, 8]. This experience has become known as sexual minority stress. Specifically, Meyer’s [8] model of sexual minority stress involves experiences of harassment or discrimination, the expectation of and vigilance toward these events, concealment of sexual identity, and the internalization of negative societal attitudes (e.g., internalized heterosexism). Together, these experiences create additional stressors beyond those experienced by majority individuals. There is ample evidence that sexual minority stress is associated with negative health behaviors, such as alcohol use, through emotion regulation and coping strategies [9-14], as well as through less perceived social support [12], and more social constraints and social isolation [13]. Although these studies provide important information regarding how minority stress is associated with negative affect and alcohol use at the between-person level, it is important to note that these studies
used primarily cross sectional and coarse longitudinal designs. These types of designs limit our understanding of within-person processes by either studying processes as a between-person variable (i.e., using cross-sectional designs), or by studying long-term within-person differences (i.e., using traditional longitudinal designs). However, the question of how daily experiences of sexual minority stress and negative affect contribute to SMW’s hazardous drinking remains. In the current study, we will test whether greater daily sexual minority stress is directly associated with more alcohol use and associated problems as well as examine indirect associations through negative affect.

**Relationship Factors and Alcohol Use**

In addition to the link between sexual minority stressors, negative affect, and alcohol use, it is important to consider the connection between relationship factors and alcohol use. Several studies have demonstrated associations between partner violence and alcohol use and related problems in samples of SMW. For example, in a study of lesbian couples who experienced intimate partner violence, approximately 64% of both batterers and victims report using alcohol or drugs prior to the violent incidents [15]. Alcohol use was also associated with SMW’s nonphysical domestic violence (e.g., verbal threats, damage to property) [16]. Research also suggests that intimate partner violence among SMW is associated with hazardous alcohol use [17], which may stem from emotional distress [18] or sexual minority stressors [19].

Another characteristic that has been considered when studying relationships and hazardous alcohol use is the degree to which partner’s drink together vs. separately. Among heterosexuals, drinking together has been associated with more intimacy and fewer negative partner behaviors than drinking apart [20]. Conversely, drinking apart is associated with more negative relationship events [20] as well as less satisfaction, more conflict, and marital dissolution [21, 22]. Among lesbian women, when controlling for physical and psychological aggression, discrepant drinking (i.e., differences in partners’ drinking quantity) is associated with poorer relationship adjustment [23]. Also, in a longitudinal examination of discrepant drinking and intimate partner violence among lesbian partners, a cyclical pattern of alcohol use and violence occurred -- discrepant drinking predicted psychological aggression six months later which in turn predicted later discrepant drinking. Physical violence also predicted subsequent discrepant drinking
six months later [24]. Considering the small body of work connecting alcohol use to relationship variables in SMW, in this study we will examine how instances of partners drinking together vs. apart and discrepant drinking are associated with relationship functioning on the same day and subsequent days, and in turn, how relationship functioning may then be associated with drinking on subsequent days.

**Protective Factors**

The impact of minority stress and negative relationship factors may be modifiable by individual, social, or group resources [25,8], but more information is needed to understand what factors may protect SMW from problematic alcohol use [26]. Therefore, the final aim of this research is to investigate person-level characteristics that could be associated with daily experiences of sexual minority stress, relationship quality, and drinking, or that may strengthen or weaken the associations among them. For example, connection to the sexual minority community, a stronger sexual minority identity, and social support may all protect against the deleterious effects of sexual minority stress and related negative mental and behavioral outcomes [27-29]. Similarly, being in a legally recognized relationship may also be a protective factor against sexual minority stress and negative health outcomes [30-32]. For example, in a study published in 2014, sexual minority individuals who lived in states without protections for sexual minorities (e.g., in housing, employment benefits) and that banned same sex marriage had a higher prevalence of psychiatric disorders than those who lived in states with such protections [33]. Although marriage between same-sex individuals is now legal in all states in the U.S., other protections (e.g., housing, employment, healthcare benefits) are not federally mandated, and thus, vary by state. In the present study, we will assess a variety of potential factors that may protect against hazardous drinking. Identification of potentially modifiable individual risk and protective factors can facilitate development of culturally-tailored inventions to reduce hazardous drinking. Furthermore, identification of structural (societal) risk and protective factors may suggest important directions for advocacy efforts.

**Study Objectives**

Project Relate was designed to increase our understanding of hazardous drinking among SMW. Using a daily diary methodology, this project investigates the associations among sexual minority stress, affect, relationship factors, and alcohol use. The development of this study was guided by minority stress theories [7, 8] which offer a way to understand the unique stressors that SMW experience related to their
marginalized societal status. In addition, because relationship factors are important correlates of alcohol use among heterosexual couples [21], we consider how relationship characteristics are associated with alcohol use among young adult same-sex female couples. Finally, we also look at potential protective factors. Collecting information on sexual minority stressors, emotional functioning, relationship experiences, and alcohol use from both partners will allow us to assess the interactions among these variables as they enhance or reduce the quality of life of sexual minority women. Extensive background information, including personality characteristics, social support, history of discrimination, and community context, will provide information on personal and contextual factors that moderate these associations. The opportunity to examine daily-, individual-, and couple-level effects is a particular strength of the proposed methodology.

Method

Project Overview

Project Relate is an ongoing daily diary study of same-sex female couples. Young adult SMW (age 18-35 years) are the target sample for this study because in community samples they frequently endorse indicators of hazardous drinking [3]. Both partners of the romantic relationship are enrolled in order to capture information about the relationship from both members’ perspectives. Participants are recruited from across the U.S., and data collection occurs remotely via online surveys. Both women in each couple complete a comprehensive baseline survey, and then a brief daily survey each morning for the following 14 days. Each member of the couple begins the daily surveys on the same day to ensure we have corresponding daily data for each couple.

Power Analysis

A power analysis to determine the sample size needed for planned analyses was conducted in two steps. First, a power analysis was conducted for traditional structural equation modeling using Monte Carlo simulation methods [34], focusing on powering the hardest effects to detect (the small indirect effects [β=.10]). Similar models were conducted incorporating a small-to-medium effect moderating
variable ($\beta=.20$). Monte Carlo simulation methods indicated that for the effect size expected, a sample size of $n = 200$ “cases” yields sufficient power (.808) to detect the relevant effects. This, however, assumes no correlation among residuals, which we know is not true in nested designs. To determine how to appropriately account for the correlated observations and identify the minimum number of participants needed for power of .8 in the multilevel design, a formula taking into account the expected intraclass correlations (ICC), or degree of relatedness within couple, for key variables was used [35]. Assuming an average of 11 days of assessments (80% response rate for to account for attrition), and 150 couples, an ICC up to approximately .70 would yield the necessary number of “cases” to maintain a power of .80. Previous daily diary alcohol research suggests we can expect to see lower ICCs coefficients, likely ranging from .4 to .7 [36], yielding more power. Therefore, recruiting 150 couples ($N = 300$ people) is more than adequate to provide sufficient power.

**Participant Selection**

Recruiting large samples of sexual minorities is difficult to do in many localities, and therefore, we are recruiting participants from across the U.S. We partnered with Community Marketing and Insights (CMI; https://communitymarketinginc.com/), a leading market research firm specializing in online research with the LGBT community. CMI maintains a proprietary research-only panel of over 90,000 individuals who identify as sexual minorities and regularly take part in market research and health research (although psychological research studies are less common). CMI recruits participants to take part in this study from their existing panel and potential new panel members who may be interested in participating in research studies. CMI is consistently recruiting new research panel members through LGBT print, digital and event outreach activities, as well as LGBT-specific outreach on social media sites (e.g., Facebook, Craigslist, sexual minority-specific social media).

In order to be eligible for the study, both partners have to meet the following eligibility criteria: (1) age 18-35 years old; (2) self-identify as a cisgender woman (meaning self-identify as a woman and was assigned female at birth, i.e., she is not transgender); (3) currently in a romantic relationship with a woman for at least three months; (4) see partner in person at least once per week; and (5) able to respond
to daily surveys between 6am and 12pm for 2 weeks. In addition to these five criteria that must be met by all participants, at least one person in the couple must also meet the following three criteria: (6) only or mostly attracted to women; (7) drank alcohol at least 3 days in the previous 2 weeks; (8) drank 4 or more standard alcoholic drinks in one sitting at least once in the previous 2 weeks (i.e., met criteria for a binge drinking episode).

These inclusion criteria were developed for several reasons. First, individuals with different gender (i.e., male, female, transgender) and sexual identities (e.g., gay, lesbian, bisexual, etc.) likely experience stressors that differ from one another [26]; in other words, a transgender and cisgender woman’s daily experiences might differ from each other. Thus, the present study focuses solely on women who identify as cisgender female. Second, we require the couples to see each other in-person at least once a week to avoid potential confounds related to being in a long-distance relationship. Third, although one participant has to report only or mostly attracted to women, her partner can describe her attraction in other ways (e.g., attracted to men and women equally); this criteria was used both to obtain a sample size large enough to test study aims, and to have some variability in attraction and identity that can be explored statistically. Finally, the alcohol inclusion criteria for one participant is used to identify participants belonging to the desired at-risk alcohol use population of interest, and to increase the likelihood of enrolling couples in which at least one partner drinks with some frequency resulting in occurrence of drinking during the 14-day daily diary reporting period.

**Study Procedures**

**Recruitment.** CMI initiates the recruitment process by contacting potential participants (hereafter noted as the “index participant”) via email and providing them with a link to an online screening survey. The index participant is also asked if she thinks her partner would be interested in participating, and if so, to provide her email address. CMI then screens her partner for interest and eligibility, and once potentially eligible couples are identified, CMI then provides the researchers with the email addresses of potential participants and their partners. Upon receiving contact information for potentially eligible couples, the
researchers conduct a second set of screening assessments (using the criteria described above) to ensure eligibility of the couple.

**Study description and informed consent.** Once eligibility and interest are verified for both the index participant and partner, they are emailed separately with introductory information about the study. Given that data collection is occurring entirely remotely, and daily assessment procedures are likely new to these participants, we developed detailed written and video materials describing the study purpose, procedures, risks, and benefits. The professionally developed videos consist of five brief (1-3 minute) videos of the study investigators and research assistants describing the study. Corresponding written materials were also developed. Given that developing these videos took additional time and resources above what was required to develop the written materials, we built in a design feature to assess the video utility. Specifically, couples were randomized in blocks of six to one of two introductory information groups: (1) videos plus written materials (video+written), or (2) written materials only (written-only). Couples are randomized (instead of individual participants) to limit contamination between partners. Those in the video+written group receive a Qualtrics survey web link that guides participants through the series of five videos explaining the purpose and procedures of the study; the written material are also available below the video. Couples assigned to the written-only group receive a similar Qualtrics survey link where they review the same information presented in the videos, but in text form only. The length of time participants spend reviewing the materials (including time spent on each individual video and corresponding written text) is automatically tracked. Immediately after reviewing the study information, participants are presented with the informed consent document. Both women in the couple have to provide consent before either can begin the study.

**Baseline survey.** After both members of the couple provide consent, the couple is enrolled in the study. At that time, each participant receives an email via Qualtrics with an individual link to her baseline survey. The survey takes approximately 30 minutes to complete. In the email, participants are asked to complete the baseline survey within three days. Both members of the couple must complete the baseline
survey in order to move on to the daily survey. If a participant does not complete the baseline survey within 2-3 days, email reminders are sent.

Daily surveys. Once both members of the couple complete the baseline survey, they are notified separately via email of the starting date of the daily survey (which ideally occurs the day after they complete the baseline survey). The index participant and partner are sent separate automated emails with an individual link to their brief daily survey each morning at 6:00am for the following 14 days. Each daily survey takes approximately 5 minutes to complete. Participants are instructed to complete the survey independently from their partner using their own personal computer, tablet, or mobile device by 12:00pm each day. The participants receive a reminder email after two consecutive days of missing and/or incomplete surveys.

End of study survey. On the day after the final daily survey, participants receive an email with a link to take a survey specifically designed for this study about their reactions as a study participant. This survey contains questions concerning whether the participant felt her experience was captured by the questions asked (e.g., “While answering questions related to your gender and/or sexual identity, did you think that the questions you answered were inclusive of the way you describe yourself?”) as well as what was her preferred method of accessing the survey materials (i.e., computer, tablet, or smartphone). Participants are also asked about their motivation to improve their health and whether they would be comfortable using mobile technology to monitor their physical and mental health. The feedback gathered from the end of study survey will be used to gauge the participant experience in the present study as well as provide an opportunity to improve future studies and survey materials. In addition, the end of study survey allows participants to reflect upon their experience as a participant, as well as provide their email address if they would like to learn about the results of the study and/or be considered for future research projects.

Compensation. Each participant and her partner receives $25 for completing the baseline survey and $3 each for each daily survey with a $10 bonus for completing at least 80% of the daily surveys (i.e., 11+ days). Thus, each participant can earn a maximum of $77 via their choice of check or gift card.
Measures

All measures included in the baseline survey are described in Table 1. The measures are organized by those designed to test the primary study aims described above, and secondary measures that will supplement testing of the primary aims. For each measure, we provide a brief description of the construct assessed. In addition, several modifications to measures were made and are worth noting. First, most measures in the baseline survey referencing a specific time frame were adapted to 3 months to be consistent throughout the survey and ensure we could examine these constructs during similar time periods. The time frames of the following measures were not adapted: the Conflict Tactics Scale (CTS2) [37], the Psychological Maltreatment of Women Inventory (PMWI) [38], the physical health questions (SF-20) [39], the Daily Heterosexist Experience Questionnaire (DHEQ) [40], and the Modified Eating Disorder Examination Questionnaire (EDEQ) [41, 42]. These measures were not changed to a 3-month timeframe because their original timeframes (e.g., last year, last month) were more appropriate for addressing the study aims. Second, changes were made to several of the measures to be appropriate for same-sex female couples. These adaptions included changing male or gender-neutral pronouns to female pronouns and modifying sexual behavior items that require male partners. Finally, due to the length of the baseline survey, attention check items were added to ensure that participants are paying attention and selecting their answers carefully. Attention check items are included as items in some of the longer measures, as well as stand-alone questions. Rationale for inclusion of these items is discussed in more detail in the Discussion section below.

Table 1. Baseline measures.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Description</th>
<th>Measure Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic Information</td>
<td>Age, ethnicity, race, sexual orientation (identity, susceptibility)</td>
<td>Developed for this study</td>
</tr>
<tr>
<td>Relationship</td>
<td>attraction, behavior), gender, height, weight</td>
<td>Developed for this study</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------------</td>
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</tr>
<tr>
<td>Context</td>
<td>Employment status, education, income, residence</td>
<td>Developed for this study</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Primary Measures</th>
<th>Relationship Functioning</th>
<th>Secondary Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological and physical attacks on or from a partner</td>
<td>Conflict Tactics Scale (CTS2)- Physical assault and sexual coercion subscales (modified to be appropriate for same-sex relationships) [37]</td>
<td>Physical Health</td>
</tr>
<tr>
<td>Maltreatment in an intimate relationship (emotional/verbal, domination/isolation)</td>
<td>Psychological Maltreatment of Women Inventory (PMWI)- Short version [38]</td>
<td>Mental Health</td>
</tr>
<tr>
<td>Satisfaction with the relationship and perceptions about partner’s satisfaction, commitment, and security with the relationship</td>
<td>No scale name [56]</td>
<td>Suicidal behaviors and thoughts</td>
</tr>
<tr>
<td>Report of partner’s behavior (hostile, jealous, and emotionally supportive)</td>
<td>Reports of Partner’s Behavior [56]</td>
<td>Inventory of Depression and Anxiety Symptoms (IDAS)- Suicidality Subscale [73]</td>
</tr>
<tr>
<td>Commitment to romantic relationship</td>
<td>Commitment Subscale from the Investment Model [57]</td>
<td></td>
</tr>
<tr>
<td>Feelings of jealousy towards romantic partner</td>
<td>Multidimensional Jealousy Scale- Cognitive Subscale [58]</td>
<td></td>
</tr>
<tr>
<td>Anxious expectations of potential rejection from others, generally</td>
<td>Adult Rejection Sensitivity Scale [59]</td>
<td></td>
</tr>
<tr>
<td>Identification of at-risk drinkers (hazardous alcohol use, dependence symptoms, harmful alcohol use)</td>
<td>Alcohol Use Disorders Identification Test (AUDIT) [60]</td>
<td>Social Support/Resilience</td>
</tr>
<tr>
<td>Typical weekly alcohol consumption</td>
<td>Daily Drinking Questionnaire (DDQ) [61]</td>
<td>Support from family, friends, and significant others</td>
</tr>
<tr>
<td>Importance of certain reasons in someone’s decision not to drink</td>
<td>Reasons for Not Drinking (RND) [62]</td>
<td>Multidimensional Scale of Perceived Social Support (MSPSS) [69]</td>
</tr>
<tr>
<td>Alcohol consequences experienced by young adult drinkers</td>
<td>Brief Young Adult Alcohol Consequences Questionnaire [63]</td>
<td>Ability to recover from stress or “bounce back”</td>
</tr>
<tr>
<td>Drinking behavior related to partner interaction</td>
<td>Partner Drinking Questions [64]</td>
<td>Brief Resilience Scale (BRS) [70]</td>
</tr>
<tr>
<td>Drinking motives (social, coping, enhancement, conformity)</td>
<td>Drinking Motives Questionnaire [65]</td>
<td></td>
</tr>
<tr>
<td>Sexual minority identity and psychosocial functioning</td>
<td>Lesbian, Gay, Bisexual Identity Scale (LGBIS) [66]</td>
<td></td>
</tr>
<tr>
<td>Openness about sexual identity and orientation</td>
<td>Single item openness question [67]</td>
<td></td>
</tr>
<tr>
<td>Anxious expectations of potential rejection from others, as a result of sexual minority identity</td>
<td>Sexual Minority Women Rejection Sensitivity (SMW-RS) [68]</td>
<td></td>
</tr>
<tr>
<td>Experiences of sexual stigma</td>
<td>Daily Heterosexist Experiences Questionnaire (DHEQ) - all subscales except Parenting and HIV/AIDS [40]</td>
<td></td>
</tr>
<tr>
<td>Social Support/Resilience</td>
<td>Support from family, friends, and significant others</td>
<td></td>
</tr>
<tr>
<td>Ability to recover from stress or “bounce back”</td>
<td>Multidimensional Scale of Perceived Social Support (MSPSS) [69]</td>
<td></td>
</tr>
</tbody>
</table>
The daily survey measures are described in Table 2 and are similarly organized by primary and secondary constructs of interest. Most of the primary and secondary measures included in the daily survey were adapted from existing daily diary or ecological momentary assessment studies or were developed for this study in order to assess daily behaviors, particularly drinking behaviors. In order to balance the survey length on days when a participant did not drink or interact with her partner, filler items regarding media use, time management, and general social interactions were developed and administered on non-drinking/non-interaction days. Finally, the format of the survey was optimized for mobile delivery. For example, visual analog slider scales were used instead of matrix tables in some cases so that all response options are visible to the participant when using a smaller screen (e.g., on a smartphone). Additional details regarding the daily survey measures can be found in Table 2.

Table 2. Daily Measures.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Description</th>
<th>Measure Name and/or Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary Measures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily Relationship Functioning</td>
<td>Relationship Quality and Satisfaction</td>
<td>Items adapted from the Daily Positive Relationship Quality Composite [77, 78]</td>
</tr>
<tr>
<td></td>
<td>Intimacy and Conflict</td>
<td>Items adapted [79]</td>
</tr>
<tr>
<td></td>
<td>Positive and Negative Partner Behaviors</td>
<td>Items adapted from the Interpersonal Qualities scale [80]</td>
</tr>
<tr>
<td></td>
<td>Partner Aggression</td>
<td>Items adapted [81]</td>
</tr>
<tr>
<td>Daily Alcohol Use</td>
<td>Quantity, duration, interactions, and location</td>
<td>Items developed for the study to assess daily drinking behaviors</td>
</tr>
<tr>
<td></td>
<td>Daily alcohol consequences</td>
<td>Items adapted from the Brief Young Adult Consequences Questionnaire (B-YACCQ) for daily administration [82]</td>
</tr>
<tr>
<td></td>
<td>Drinking motives (social, coping, enhancement, conformity)</td>
<td>Items adapted from the Drinking Motives Questionnaire (DMQ)- Social, enhancement, and conformity were combined to a single item per factor [65]</td>
</tr>
<tr>
<td></td>
<td>Non-drinking questions</td>
<td>Items developed for the study to balance drinking questions</td>
</tr>
<tr>
<td></td>
<td>Daily- level reasons for not drinking</td>
<td>Items adapted for the daily level from the Reasons for</td>
</tr>
<tr>
<td><strong>Drinking Intentions</strong></td>
<td>Item developed for the study to assess drinking likelihood in the next 24 hours</td>
<td></td>
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<tr>
<td>-------------------------</td>
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<td></td>
</tr>
<tr>
<td><strong>Partner Drinking</strong></td>
<td>Items developed for the study to assess partner drinking</td>
<td></td>
</tr>
<tr>
<td><strong>Daily Sexual Minority Stressors</strong></td>
<td>Lesbian Women’s Daily Sexual Minority Stressors Scale [55]</td>
<td></td>
</tr>
<tr>
<td><strong>Sexual Minority Discrimination</strong></td>
<td>Items adapted from the Heterosexist Harassment, Rejection, and Discrimination Scale [84]</td>
<td></td>
</tr>
<tr>
<td><strong>Sexual Identity Concealment</strong></td>
<td>Nebraska Outness Scale [85]</td>
<td></td>
</tr>
<tr>
<td><strong>Affect</strong></td>
<td>Positive and Negative Affect Items adapted from different versions of the Positive and Negative Affect Schedule</td>
<td></td>
</tr>
<tr>
<td><strong>Secondary Measures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drug Use</strong></td>
<td>Smoking and Marijuana Use</td>
<td>Items adapted from questions used in the ADAPS study [74]</td>
</tr>
<tr>
<td><strong>Eating and Body Image</strong></td>
<td>Disordered Eating</td>
<td>Items adapted from the Eating Attitudes Test [86] and the Eating Disorder Examination Questionnaire [41,42]</td>
</tr>
<tr>
<td><strong>Body Dissatisfaction</strong></td>
<td></td>
<td>Items developed to assess current satisfaction with body</td>
</tr>
<tr>
<td><strong>General Stress &amp; Coping</strong></td>
<td>Stressful or unpleasant experiences</td>
<td>Items adapted from the Daily Inventory of Stressful Events (DISE) [87]</td>
</tr>
<tr>
<td><strong>Physical Activity</strong></td>
<td>Sitting, walking, moderate activities, vigorous activities</td>
<td>Items adapted from the International Physical Activity Questionnaire [88]</td>
</tr>
<tr>
<td><strong>About the Survey</strong></td>
<td>Location of survey completion, type of device used, and perceived privacy</td>
<td>Items developed for the study to improve future research</td>
</tr>
<tr>
<td><strong>Filler Items</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>General Social Interactions</strong></td>
<td>Importance and pleasantness of social interactions</td>
<td>Items developed for the study to balance questions about partner interactions</td>
</tr>
<tr>
<td><strong>Positive social exchanges</strong></td>
<td></td>
<td>Items adapted from the Daily social exchanges checklist [89]</td>
</tr>
<tr>
<td><strong>Media Use</strong></td>
<td>Television, internet and social media use</td>
<td>Items developed for the study to balance drinking questions</td>
</tr>
<tr>
<td><strong>Time Management</strong></td>
<td>Short-range planning and time attitudes</td>
<td>Items adapted from the Time-Management Questionnaire [90]</td>
</tr>
</tbody>
</table>

**Results**

To date, 208 women (i.e., 104 couples) have been successfully screened and enrolled into the study. Six participants discontinued participation prior to beginning the 14-day daily diary surveys. Of the remaining 202 participants, 44 are actively completing the daily surveys and 164 have completed the study. Of those participants who have completed, compliance with the daily diaries has been excellent; on average participants have completed 92% of the surveys (or 13 of 14 days). Individual compliance rates are also very high, with 98% (n = 160) of completed participants having done at least half of the daily surveys. Data collection and enrollment is ongoing and expected to conclude in fall 2018.

**Discussion**
Drawing from the literatures on sexual minority specific processes (e.g. sexual minority stress) and general processes (negative affect, relationship factors), Project Relate is designed to increase our understanding of between- and within-person processes underlying hazardous drinking in the understudied, at-risk population of SMW. A daily diary methodology is used to gain insight into the affective, behavioral, and relationship experiences of female same-sex couples working toward the goal of reducing health disparities and improving the health of SMW.

**Methodological Challenges and Considerations**

Recruitment of couples into research endeavors is always a challenge, and recruiting same-sex couples creates additional challenges. Consequently, we devoted substantial effort to developing and refining processes for recruitment and retention of couples. Below we discuss several of the challenges faced when designing and implementing Project Relate.

**Participant recruitment decisions and issues.** Several challenges emerged when designing and implementing this study regarding identifying and enrolling participants. First, working with a market research firm to recruit has numerous advantages, but also presents challenges. They have a large SMW panel who regularly complete online surveys and access to other recruitment resources. The CMI employees are knowledgeable about best practices for online recruitment and survey completion and contribute important ideas to assist with recruitment and retention of participants (e.g., length of survey, compensation, and phrasing). At the same time, because CMI does relatively less social science research (compared to traditional market research for products), it was necessary to figure out how to “speak the same language” so that we could be faithful to best social science practices (e.g., measurement fidelity, human subjects’ protections).

Second, early in the study recruitment process, we observed a trend in the way in which young sexual minority women label their sexual identity, which seemed to suggest that they were not identifying as lesbian as frequently as we had expected. In consultation with CMI, we learned that younger sexual minority women whose attraction and behavior are consistent with the traditional definition of the “lesbian” label (i.e., attracted to women, romantically involved with women), are either choosing to
identify in other ways (e.g., queer, pansexual) or are resisting labels all together. Our initial planned inclusion criteria required at least one partner to identify as lesbian, but as a result of this consultation with CMI as well as internal discussions among our investigators, within the first month of recruitment we changed this inclusionary criteria to the “only or mostly attracted to women” criterion described in the Method section above. As researchers, our drive toward internal validity encourages us to recruit a homogeneous sample of one type of SMW (i.e., lesbian women) that we can describe clearly, yet this group may not accurately represent the larger population of SMW, which is quite heterogeneous. In other words, our desire to ensure internal validity may inadvertently limit the external validity of our sample. Thus, for the purposes of the present study, we defined our sample based on their reported attraction (to women) and behavior (in a romantic relationship with a woman), instead of relying on self-reported sexual identity labels. This issue of how to appropriately define and describe sexual minority individuals is not new [43-45], and will likely continue to be a challenge for researchers as labels evolve over time.

Third, given that we are recruiting couples, we were very intentional in our protocol design regarding how and when we contacted participants to ensure privacy, confidentiality, and data fidelity. For example, when communicating with participants we always contact individuals, never both people in the couple together (e.g., in the same email). It is important that no participants feel coerced to participate because of her partner’s interest in the project. Thus, although both partners must consent and complete the baseline survey before moving on and beginning the daily diaries on the same day, in the rare instances when one partner does not wish to continue, we simply thank the other partner for her participation and compensate her for the portions of the study she completed. In addition, in order to try to ensure we are getting independent responses from each participant, in all of our enrollment materials we explicitly instructed participants not to complete the surveys together, we send them individualized survey links daily, and at the end of the daily survey we enquire about the level of privacy each individual had when completing the survey. These privacy and data fidelity challenges are not unique to studies with sexual minorities, but are experienced by researchers studying couples, and the concerns about collecting
independent reports are likely more apparent in daily diary or EMA studies due to the frequent, repeated assessments in daily life.

**Informational and training videos.** To our knowledge, this study is one of the first to recruit same-sex couples for a completely remote online daily diary collections, and thus, we decided to develop a series of videos to explain the research. To evaluate the efficacy of these videos, couples were randomized to either a written-only or a written+video group, to examine whether the videos improve recruitment, attrition, and/or compliance. The videos are considered part of the informed consent process, and thus, are presented prior to the consent form, allowing us to examine whether consent rates, study attrition, and compliance with the study protocol differ by group. Evaluating the added utility (or lack thereof) of the video instructions for participants in this way can help to inform the design of future daily diary or EMA studies that use remote data collection methods with young adult participants.

**Inclusion of attention check items.** Because this project relies completely on remote online data collection, we were concerned that for the longer baseline survey, participants could begin to respond randomly, without fully reading each question. In order to attempt to identify if this is occurring, in the baseline survey we included a series of attention check items, sometimes called “ instructional manipulation checks” [46]. These are items embedded in the larger survey with instructions to select a particular answer (e.g., “Please choose “Frequently”) or questions that have factual answers (e.g., “Which of the following is the largest number?”), and are similar in format to other items in the survey. If participants are not fully reading instructions or items in the survey, then their responses may add noise to the survey rather than truly reflecting the constructs assessed. Studies have shown that including participants who fail these attention checks leads to reduced power to detect study aims [46]. Although some have questioned if the inclusion of attention checks can adversely affect scale validity, recent studies have shown that they do not [47, 48], and in fact the inclusion of attention checks can improve performance on subsequent survey items [49]. For the current study, we are not interested in eliminating participants who are inattentive, but rather helping them to become attentive. Thus, we introduce to participants in the survey instructions (and videos) that these attention checks are embedded to help
maintain their attention. Moreover, after failing an attention check, the survey automatically provides feedback stating that we detected the participant was not fully reading the instructions, and asking her to respond again. This feedback is repeated as necessary until she answers correctly. This type of real-time feedback on attention checks has been shown to improve subsequent performance [46].

The attention checks were only included in the baseline survey, given its length (~30 minutes). Research suggests attention is often higher in more naturally motivated populations [50, 46], and in populations with sufficient incentive/compensation [49]. The population we recruited from for the present study may be more motivated for participation than some samples, given that the survey focuses on the health and wellness of a minority population of which they are members, and given that they are well compensated for their participation. This level of high motivation, coupled with feedback on attention to items on the baseline survey, increased our confidence that participants would sustain adequate attention for the longer ~30 minute baseline survey. The daily surveys are much shorter (~5 minutes), so we were less concerned about maintaining attention, and worried including attention check items every day would be excessively burdensome and irritating for participants.

**Future Research Areas**

Daily diary studies of health behaviors [50], as well as in couples or families [51], are rapidly increasing in popularity because they can examine more nuanced associations that consider individual, dyadic, and contextual variables that may influence behavior within people and couples, over time. Despite growing interest in daily health factors and related stressors, such as minority stress and alcohol use, research on daily experiences of sexual minority individuals lags far behind [53]. There are two important challenges that researchers are facing when conducting this work. First, as has been discussed at length elsewhere with respect to health behavior theories [54], existing theories may need to be refined or redeveloped in order to be able to guide our understanding of within-person processes that occur over relatively short time frames (e.g., minutes, days, weeks). Minority stress theories, including those that guided the development of Project Relate [7, 8], at times suggest predictions that involve within-person processes that may occur over short timeframes, but have largely been tested using cross-sectional
designs (testing between-person processes) or traditional longitudinal designs (testing longer-term within-person processes). Project Relate is designed such that it will be able to test aspects of minority stress theories, and presents an opportunity to extend and refine these theories to further understanding of within-person processes in daily life.

A second challenge we encountered when designing Project Relate is the relative lack of well-established, validated measures that are appropriate for daily assessments. In Table 2 we provide a description of where we adapted measures from, based on either previous daily diary research with heterosexual couples (e.g., the daily relationship functioning questions), or from existing retrospective measures (e.g., several alcohol use questionnaires). Importantly for Project Relate, we were unable to identify a measure of sexual minority stress that was appropriate for daily administration, and thus, created a daily sexual minority stressor measure [55] to use in this study. The lack of validated measures that are appropriate for daily or ecological momentary assessment (EMA) studies highlights the importance for future work in this area to create new measures.

At present, the ability to provide education, mental health counseling, and interventions that are optimally effective for SMW is limited by our lack of understanding of key variables to incorporate in these efforts. Further, the limited data that are available about relationship factors and alcohol use among SMW are typically derived from one respondent who provides information about herself and her partner. To address this limitation, our approach requiring both partners to participate is generating higher quality data on both partners’ affective, behavioral, and relationship experiences. In addition, we considered the potential contribution of sexual minority stress to SMW’s daily experiences. We carefully considered other variables both specific to SMW and heterosexual couples that may impact hazardous alcohol use. We believe it is critical to consider how couple-level dynamics/variables (that is, a dyadic approach to couples) may impact hazardous alcohol use and related issues. In addition, we believe that understanding both daily and between-subjects’ mechanisms that may increase risk for hazardous alcohol is critical, as is identifying protective factors that may attenuate this risk. By testing an empirically-informed model that articulates probable within- and between-person factors, and relationship variables that increase
hazardous alcohol use, we believe this work will provide a necessary intermediary step toward informing culturally-tailored prevention and intervention studies for SWM, and contribute to a goal of the Healthy People 2020 initiative to improve the health, safety, and well-being of sexual minority women.
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