

# Mobilizing young gay and bisexual men for HIV prevention: a two-community study

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**Background:** To develop, implement and evaluate a community-level HIV prevention program (the Mpowerment Project) for young gay men in two US communities.

**Design:** Using a multiple baseline design, a cohort of young gay men was recruited independently of the intervention in each community and surveyed twice (1 year apart) regarding sexual risk behavior and psychosexual variables. The intervention was then implemented sequentially in each community. The cohorts were resurveyed immediately post- and 1-year post-intervention. Since there were few differences between the two communities, data were pooled to increase statistical power.

**Intervention:** The program had four components: peer outreach, whereby young gay men encouraged other men to engage in safer sex; peer-led small groups; a publicity campaign; and a young men's center.

**Results:** Baseline rates of unprotected anal intercourse were stable. Following intervention, the proportion of men who engaged in unprotected anal intercourse decreased from 38.3 to 30.9% (–19.3% relative reduction), with a reduction from 19.2 to 13.6% (–29.2% relative reduction) with non-primary partners, and a reduction from 57.7 to 41.8% (–27.6% relative reduction) with boyfriends. Reductions were sustained 1 year later with non-primary partners, but mixed results were found regarding sex with boyfriends.

**Conclusions:** Mobilizing young gay men to support each other about safer sex is an effective approach to HIV prevention, but programs must be sustained. To reach young gay men, HIV prevention activities must be embedded into the satisfaction of needs for social and community belonging.

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## Introduction

Young gay men are continuing to engage in high levels of sexual risk behavior [1–7] and are contracting HIV at alarming rates. Seroprevalence data from 15- to 22-year-old men from six locations around the U.S. showed that 4–8% were HIV-positive [8] and self-report data from men aged 18 to 29 years in four US locations indicated that 10.5% were HIV-positive [9]. A household proba-

bility sample of 18- to 29-year-old gay men in San Francisco found 17.9% to be HIV-positive, with an estimated 2.6% annual incidence [10] and a similar household probability sample of 18- to 29-year-old gay men in Miami found 17.6% to be HIV-positive [11]. A similar annual seroincidence rate (2%) was found in a cohort of gay men aged 18 to 24 years in New York City, with 9% HIV-positive [12]. Clearly more effective HIV prevention interventions are required for young gay men.

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The sexual risk-taking behavior of young gay men is explained by factors that function at individual, interpersonal and social levels. At the individual level, factors associated with risk-taking behavior are perceptions about vulnerability to HIV [2,13], perceptions that safer sexual activities are less enjoyable than unsafe activities [2,14], being in a negative mood state [15], being depressed [16], and holding cognitive justifications that minimize perceived risk [5]. Interpersonal factors include poor communication skills [2,5,14] and having a boyfriend [2,10,13,14,17,18]. Social level factors include norms about sex [2], lack of social support [16], lack of support for safer sex [7,13], and in some locations, the culture of young gay men and greater integration into their community [18,19]. In addition, frequenting gay bars and public cruising areas, the primary settings that are available to young gay men for meeting each other, is associated with having unprotected sex [2,5,14]. Since young gay men engage in unsafe sexual behaviors for diverse reasons, interventions that focus solely on one level of factors will miss men who engage in high-risk sex for other reasons. An effective HIV prevention program must simultaneously focus on variables at these different levels.

In developing an effective intervention, the question of how to target those variables is critical to the success of the prevention approach. Through extensive formative research, we identified five themes that guided the development of this program's structure and components:

(1) **Social Focus.** By comparison with other pressing issues young gay men confront such as social isolation, coming out in a homophobic society, and establishing personal relationships, HIV prevention is not perceived as very compelling. However, young men often express a desire for fun, social outlets outside the setting of gay bars (which many young gay men are too young to frequent). Therefore, a social focus was adopted as the organizing feature of this project.

(2) **Peer-based.** Underlying all project activities is the use of peers as sources of persuasion. Research with young gay men [2], gay men of all ages [20–25], and heterosexual adolescents [26–28] has shown that perceptions of peer norms about sexual risk behavior are strongly associated with one's own sexual behavior.

(3) **Mobilization.** Behavior change is more lasting when individuals are actively involved in finding and implementing solutions to their problems [29,30]. Therefore, the project sought to mobilize and facilitate the empowerment of young gay men. Providing men with mechanisms for designing and running the intervention activities themselves seemed most likely to foster a sense of personal commitment to the project, a sense of ownership of the prevention activities, and a desire to carry out the project's activities.

(4) **Diffusion through social networks.** The prevention program sought to develop a process by which young gay men actively communicate with and encourage each other about the need to practice safer sex so that safer sex becomes the mutually accepted norm. Based on the theory of diffusion of innovations [31], diffusion of support for safer sex throughout social networks is a critical way of reaching young gay men who may not avail themselves of other program activities.

(5) **Multifaceted program.** A multifaceted program is required, not only to target variables which function at different levels, but also because not all young gay men will be attracted to or reached by any one type of intervention activity. Furthermore, a message that reaches young gay men via multiple channels and multiple sources is most likely to be internalized [32].

The development of this HIV prevention program was based in a number of different literatures: our initial research in understanding young gay men's sexual risk behavior [2] (much additional research has been conducted regarding young gay men since we began developing, implementing and evaluating this project [2,4–7,10,13–18]); theories about risk-taking behavior (including sexual risk behavior) [33–35]; research on diffusion of innovations [31]; concepts about personal and community empowerment [30, 36–38], and social marketing [39].

We previously published an evaluation of the effectiveness of the Mpowerment Project in reducing unprotected anal sex among young gay men in an intervention community by comparison with a control community [40]. This investigation replicates and extends our previous work in two ways. First, the Mpowerment Project was implemented in the community previously used as the comparison site. Second, we now examine naturally occurring trends in sexual risk behavior and psychosexual variables in the two communities during the year before the Mpowerment Project was implemented in each community (using multiple baselines), post-intervention effects, and the maintenance of changes 1 year post-intervention.

## Methods

### Study sites and design

Two west-coast US communities served as study sites: Eugene, Oregon and Santa Barbara, California. The study communities are similar in many respects, including: (1) population sizes (113 090 in Eugene and 85 763 in Santa Barbara in 1990); (2) each were a 1- to 2-h drive away from the nearest large city and were therefore relatively isolated from the effects of other HIV prevention efforts; (3) each had an AIDS organization, but no HIV prevention programs specifically for

young gay men prior to our intervention; (4) each had a large state university; (5) each attracted many young people from surrounding areas for social activities. Although no systematic HIV seroprevalence data have been collected in these communities, the number of AIDS cases are lower than is found in larger epicenters.

Independent of the intervention, young gay men (aged 18–27 years at recruitment) from Eugene and Santa Barbara were recruited into a longitudinal cohort (‘The Young Men’s Survey’). They were recruited by teams of local young gay men who distributed surveys at settings frequented by young gay men, including bars, university and community settings and through their informal social networks. Survey respondents were paid US\$10 each time they completed the survey. After the initial recruitment into the survey, they were assessed via mail-back surveys sent out yearly by mail. An extensive tracking system was developed to retain the cohort over time.

This study used a time-lagged multiple baseline design [41]; see Fig. 1. Men in each community were assessed twice, 1 year apart, prior to the intervention. Many young men moved from the communities before the interventions began. To continue having younger-aged gay men in the cohort and to increase statistical power, additional younger men were recruited into the cohort at the second baseline. The Mpowerment Project was implemented for 8 months in each community (first in Eugene and 1 year later, in Santa Barbara). A post-intervention assessment and a 1-year follow-up were then conducted in each community. With multiple baseline assessments, it is possible to observe the extent to which ‘secular trends’ (naturally occurring changes) in behavioral and psychosexual variables were occurring prior to implementation of the interventions. If such trends occur, changes in behavior and psychosexual variables cannot be attributed solely to the impact of the intervention.

## Study variables

### Sexual behavior

Respondents indicated the frequency with which they had engaged in various sexual activities during the

previous 2 months with boyfriends and with non-primary partners on a checklist of sexual behaviors. The outcome variable is whether or not they engaged in unprotected anal intercourse, the behavior most risky for HIV transmission. Participants were also asked the number of males with whom they had sex and the number of times they had sex with men in public sex environments such as bathhouses, sex clubs, parks or cruising areas in the past 2 months.

### Psychosexual factors

A series of brief scales (two to five items per scale, rated on a 6-point Likert scale which ranged from ‘strongly disagree’ to ‘strongly agree’) were used to assess the following attitudes: condom barriers (the perception of undesirable consequences of attempting to engage in safer sex; Cronbach’s  $\alpha = 0.68$ ); enjoyment of unsafe sex (mean enjoyment of various unsafe sexual activities;  $\alpha = 0.78$ ); enjoyment of safer sex (mean enjoyment of various safer sexual activities;  $\alpha = 0.54$ ); sexual communication skills (perceptions that one can effectively communicate about safer sex with partners;  $\alpha = 0.83$ ); social norms (perceptions that one’s friends support safer sex;  $\alpha = 0.66$ ); misperceptions about safer sex (erroneous beliefs about safer sex and HIV transmission; since this scale was very skewed, it was dichotomized into those reporting only ‘slight’ disagreement or any degree of agreement with the items versus ‘strong’ or ‘somewhat’ disagreement with all items). The misperceptions scale was dropped from the final assessment because of space limitations and lack of variance. Single items assessed support from friends (friends suggest ways of avoiding unsafe sex) and self-efficacy (ability to avoid unsafe sex when aroused). The communication skills and social norms scales and the support from friends and self-efficacy items were not included until the second assessment and therefore data on secular trends for them are not available.

### Other personal characteristics

We collected data on age, ethnic/racial background, if the respondent was a college student, and years of education. Respondents were asked if they had a boyfriend/lover, which was defined as ‘a male you feel committed to and who you have sex with’.

	Data collection wave 1	Data collection wave 2	Data collection wave 3	Data collection wave 4	Data collection wave 5
Community 1 (Eugene)	A	B [Intervention]	C	D	
Community 2 (Santa Barbara)		A	B [Intervention]	C	D

**Fig. 1.** Time-lagged multiple baseline design of study. Each wave represents a data collection time point, approximately 1 year apart. Assessment A occurred 1 year prior to implementation of the intervention in each community and forms Baseline 1. Assessment B occurred immediately pre-intervention and forms Baseline 2. Assessment C was the post-intervention evaluation and forms the Post-Intervention. Time D assessment occurred 1 year post-intervention and forms Follow-up.

A variety of sexual orientation/comfort variables were assessed, including sexual identity (gay, bisexual or heterosexual), comfort with feelings of attraction to men (rated on a 6-point scale ranging from 'very uncomfortable' to 'very comfortable'), and the degree to which the individual was open or 'out' about his sexual orientation to other people (rated on a 5-point scale ranging from 'not out to anyone' to 'out to almost everyone').

Gay community involvement was assessed by asking men to indicate from a checklist of gay organizations, events, or activities those they had participated in during the previous 6 months. Respondents were also asked what proportion of their friends are gay (rated on a 5-point scale ranging from 'almost none' to 'almost all').

Finally, respondents were asked if they had sought HIV antibody testing and if so, what was their HIV serostatus.

A copy of the survey instrument may be obtained from the authors.

### **The prevention program**

Four young gay or bisexual men were employed part-time in each community as project coordinators. They and other young gay men who were volunteers designed and carried out all of the project activities in each community. Although the structure and content of the program were the same in both communities (both communities had core groups and community advisory boards and the same program components described below), the prevention program activities were adapted by the young men to their own community's setting and culture. Overall, the basic elements of the interventions in the two communities were very similar. A full description of the program can be obtained from the investigators.

#### *Program structure*

A core group of 12 to 15 young gay men served as the decision-making body of the project in each community. They determined the projects' names and logos; how to conduct outreach at bars, community events, and the social events they developed; what social events would be created; and designed all outreach materials. It was intended that core group members and other volunteers would gain a sense of ownership of the project and the project's goals through their decision-making about the project, having access to resources with which to implement their decisions, and then implementing their decisions.

A community advisory board (CAB) in each community served as an informational resource and provided advice to the core group about project activities. The CABs were made up of men and women from the local AIDS, gay and lesbian, public health, and university communities. The CABs met bi-monthly with the core groups.

#### *Program components*

**Peer outreach:** We sought to change social norms by having young gay men speak with and encourage other young men about the need to have safer sex, thereby diffusing the safer sex message throughout the community. Peer outreach was also designed to recruit additional young gay men into the project. It was intended that as young gay men joined the project (by volunteering or attending a small group), they would adopt the safer sex message as their own, spread the message throughout their social networks, and then recruit other young gay men to become involved with the project, resulting in an ever widening diffusion process. Formal and informal outreach were used.

In formal outreach, an outreach team of young gay men in each community went to locations where young gay men congregated (e.g., bars, community events, social events the project created) to encourage other young gay men about the need for safer sex. Outreach was conducted through the use of fun, entertaining approaches (e.g., using performances and/or costumes), and the outreach teams distributed interesting, appealing safer sex materials that they and other volunteers had developed. Young gay men at these locations were invited to attend other project activities.

Since there were few social settings for young gay men in these communities, the project created additional social settings and events that would attract young gay men, thereby increasing the opportunities for safer sex promotion and recruitment into other project activities. A young men's center was set up in each community, which was particularly effective for attracting young gay men. The centers had weekly events (small groups, core group meetings, video parties, discussion groups and drop-in hours) where men could meet and socialize. Safer sex posters were on display, and safer sex materials were available free of charge. The programs sponsored a wide variety of social events designed and created by the core groups to appeal to different segments of the young gay men's community. In addition to the weekly events, these also included large dance parties, open-house parties, picnics, hikes and bicycle rides. Men were recruited at the social events to attend small groups. The largest dance parties in Eugene attracted 200–300 young gay men, and in Santa Barbara attracted 100 young gay men. The social activities were very strong draws for the young men, and we estimate that at least 500 young gay men in each community attended one or more of the project activities.

Informal outreach involved young men speaking with and encouraging their friends in casual conversations about the need to engage in safer sex. Men were trained and encouraged to conduct informal outreach in the small groups. As part of conducting informal

outreach to their friends, young men were asked to give their friends invitations to attend a small group and join the project, safer sex promotional materials and condoms.

**Small groups:** These were peer-led one-time meetings which lasted approximately 3 h, and were attended by 8 to 10 young gay men. The groups focused on ways to mitigate factors that our earlier research had identified as contributors to unsafe sex among young gay men [2], including eroticizing safer sex, how to use condoms, clarifying misperceptions, sexual communication and nonverbal negotiation skills. The groups also emphasized the need for participants to take the message about safer sex back to their friends by conducting informal outreach. Participants were encouraged to become 'agents of change' by supporting their friends and striving to ensure that their generation survived beyond the AIDS epidemic. The group was designed to be enjoyable and interactive, and used carefully developed structured exercises, informal discussions, and role-plays with scenarios relevant to each community. The groups were promoted as a fun way to meet other young gay men, find out about the project, and hear how other young men were dealing with issues of importance to them, such as sex, dating and relationships. Men interested in being involved with the project were encouraged to attend a group as a first step.

Diffusion theory posits that if 15 to 20% of a given population adopts an innovation, then the innovation can be conveyed through natural social networks and cause a community-wide change [31]. We sought to recruit 15% of the young gay men in each community into the small groups. Groups were attended by 168 young gay men in Eugene and 151 young gay men in Santa Barbara. Based on census data and our best estimate of the prevalence of young gay men in the population [42], we estimated that this represented 15% of the young gay men in each community. Although 15% of each community's young gay men participated in the small groups, it is possible that not all adopted the innovation of consistently having safer sex.

**Publicity campaign:** There was an ongoing small-scale publicity campaign within the gay community designed by the young men. The publicity campaign included articles and advertisements in the gay newspapers, outreach materials distributed in settings frequented by young gay men, and 'word of mouth' among core group members and within their social networks.

## Results

There was low statistical power with which to detect secular changes and short- and long-term effects of the prevention programs separately by community. To

determine if we could combine the samples, we examined if there were differences between the two communities in sexual risk behavior and psychosexual variables at the various assessment points. We pooled the data from the two communities since there were few differences between the samples at any of the time points (see Table 1). There was, however, a significant difference between the two communities with respect to unprotected anal sex with boyfriends at the follow-up assessment and therefore these data were not combined.

### Sample characteristics

The sample was comprised of 137 men from Eugene and 110 men from Santa Barbara at the 1 year pre-intervention assessment. The mean age of the men was 23.2 years. The median education level was 'some college' and 54% were students. Most men (86%) self-identified as gay and 14% as bisexual. The majority (68%) had sought antibody testing and 5% were HIV-positive. One-third (32%) had a boyfriend.

### Analyses of bias from attrition and recruitment of additional subjects

Between the two baseline assessments, 12% of the sample was lost to attrition. There were no significant differences on any variables between men retained and men lost to attrition, nor differential loss by community ( $\chi^2$ , *t* tests and Mann-Whitney U tests were used).

There were no significant differences in sexual risk behavior between the original group and the respondents recruited at the second baseline. However, the new respondents were less 'out', less comfortable with their feelings of attraction to men, had fewer gay friends, were more likely to have obtained HIV-antibody testing, and a larger proportion were students.

There were two sources of loss to follow-up between the second baseline and the post-intervention assessments. Twenty percent of the men no longer lived in the communities when the interventions were implemented and 25% of the second baseline was lost to attrition. There were no significant differences between men retained and lost (for either reason) by community or in sexual risk behaviors, and very few other differences. The 'lost' men were less likely to have had sex in public sex environments and were less involved with the gay community.

Between the post-intervention and follow-up assessments, there was differential attrition by community: 10% of Eugene men and 20% of Santa Barbara men were lost, but no other significant differences were obtained between men retained and men lost to attrition.

### Changes in sexual risk behavior

Confidence intervals with standard errors that took into account partial overlap were calculated to examine

**Table 1.** Differences at each time period between Eugene and Santa Barbara cohort participants<sup>a</sup>

	Baseline 1		Baseline 2		Post-Intervention		Follow-up	
	E	SB	E	SB	E	SB	E	SB
<b>Background Variables</b>								
Ethnic/racial background								
European-American: %	88	75	87	78	87	81	86	80
non-European-American: %	12	25***	13	22**	13	19	14	20
Student: %	61	46**	44	46	39	40	32	28
Have been tested for HIV: %	67	79**	69	82****	73	86**	81	91*
Have tested HIV+ (number)	6	6	7	7	4	6	3	5
highest grade completed when recruited to study: mean (SD)	4.10 (1.11)	4.22 (1.02)	4.06 (1.20)	4.23 (1.13)	4.09 (1.13)	4.10 (1.14)	4.11 (1.16)	4.13 (1.13)
Number of friends gay: mean (SD)	3.42 (1.10)	3.36 (1.13)	2.75 (1.13)	2.89 (1.06)	3.28 (1.22)	3.51 (0.99)	3.47 (1.18)	3.44 (1.01)
Open re. sexual orient: mean (SD)	2.71 (1.07)	2.76 (1.09)	3.29 (1.14)	3.29 (1.12)	2.88 (1.10)	3.20 (0.89)**	2.97 (1.01)	3.27 (0.89)**
<b>Sexual Behavior</b>								
In past 2 months had:								
primary partner/boyfriend: %	37	36	39	37	45	49	54	51
unprotected anal intercourse with:								
men: %	39	36	39	37	31	31	38	31
non-primary partners: %	19	24	18	21	12	16	11	11
primary partner: % <sup>b</sup>	52	57	60	55	45	39	58	39
n	137	110	192	150	105	89	95	71

\*P < 0.10; \*\*P < 0.05; \*\*\*P < 0.01; \*\*\*\*P < 0.001. <sup>a</sup>Differences were tested via chi-square and t tests. <sup>b</sup>This analysis only includes men who had a primary partner at that point in time. Percentage indicates proportion of men with boyfriends who have had unprotected anal intercourse.

**Table 2.** Changes in proportion of men who reported unprotected anal intercourse in past 2 months<sup>a</sup>

	Time period									
	Baseline 1	Baseline 2	Post-Intervention	Follow-up	Baseline changes	Long-term outcomes				
					Difference	% change	Difference	% change		
% with men (n)	37.2 (242)	38.3 (337)	30.9 (191)	35.2 (165)	+1.1	+3.0	-7.4*	-19.3	-3.1	-8.1
% with non-primary partners (n)	21.4 (238)	19.2 (334)	13.6 (191)	11.0 (164)	-2.2	-10.3	-5.6*	-29.2	-8.2*	-42.7
with boyfriend/lover <sup>b</sup> (n)	54.5 (88)	57.7 (130)	41.8 (91)	50.0 (86)	+3.2	+5.9	-15.9*	-27.6	-7.7	-13.3

\*P < 0.05. <sup>a</sup>Confidence intervals for the difference in proportions with the standard error term adjusted for partially overlapping samples were used; one-tailed tests were used. <sup>b</sup>The denominator used for boyfriend analyses was the number of men who were in primary relationships at that time point.

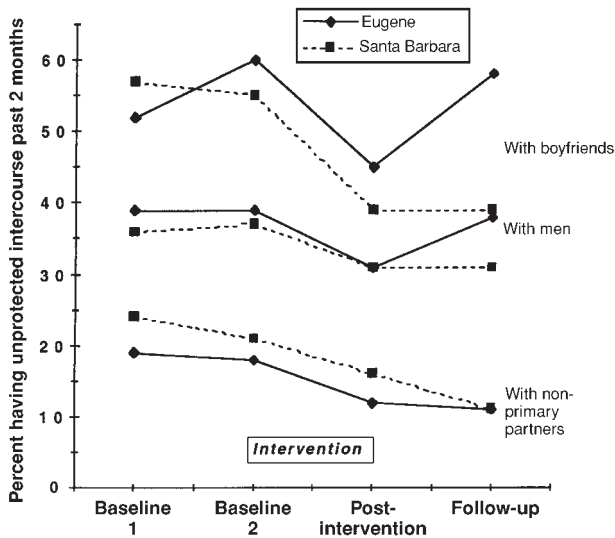


Fig. 2. Changes in unprotected anal intercourse in two study communities.

differences in proportions of men having unprotected anal intercourse at various time points [36]; the formula for this can be obtained from the authors. Figure 2 depicts the time trends for unprotected anal intercourse separately for Eugene and Santa Barbara (the data are in Table 1). Table 2 presents the pooled data. Sexual risk behavior was stable between the two baseline assessments. However, from pre- to post-intervention there were significant reductions in the proportions of young gay men reporting unprotected anal intercourse in the past 2 months with men in general, with boyfriends, and with non-primary partners. Analyses of unprotected anal sex with boyfriends included respondents involved in a primary relationship at each particular assessment and were not restricted to men who had

boyfriends at all time points since this would limit analyses to men in long-term relationships.

The rates of unprotected intercourse with non-primary partners continued to decline after the intervention ended. With respect to boyfriends, there was a sharp reduction in unprotected intercourse after the intervention, but in Eugene the rates returned to pre-intervention levels by follow-up, whereas in Santa Barbara risk reduction with boyfriends was sustained over the year (this difference influenced the changes in unprotected intercourse with men in general).

### Changes in psychosexual variables

To determine if psychosexual variables showed changes over time, confidence intervals with standard errors which took into account partial overlap were used to examine for differences in means and proportions [43]. There appears to have been few naturally occurring secular changes in psychosexual variables prior to intervention implementation (see Table 3). The intervention did not have an influence on the perceived enjoyment of unsafe sexual practices, which remained stable at all time points. However, this seems to have been countered by a significant increase in enjoyment of safer sexual practices, which was maintained 1 year after the intervention. There was a trend for perceived barriers to using condoms to decrease after the intervention, which also appeared to have been maintained 1 year later. The proportion of young men who held misperceptions about the safety of various sexual practices dropped significantly post-intervention. It appears that the intervention led to an increase in sexual communication skills, and an increased perception that peer social norms favored safer sex. After the intervention, men reported that their friends were more likely to support them about having safer sex and reported being more able to avoid unsafe sex when aroused.

Table 3. Changes in psychosexual variables [mean (SD) except where indicated]<sup>a</sup>

	Baseline assessments <sup>b</sup>		Immediate outcomes <sup>c</sup> Post-Intervention	Long-term outcomes <sup>d</sup> Follow-up
	Baseline 1	Baseline 2		
Enjoy safer sex	4.80 (0.91)	4.83 (0.91)	4.98 (0.87)**	4.96 (0.94)*
Enjoy unsafe sex	3.63 (1.57)	3.62 (1.60)	3.54 (1.69)	3.66 (1.60)
Condom Barriers	2.19 (0.99)	2.15 (0.94)	2.03 (0.92)*	2.04 (0.89)
Communication Skills <sup>e</sup>	–	4.61 (1.26)	4.82 (1.18)**	4.86 (1.12)**
Social Norms <sup>e</sup>	–	4.61 (0.99)	4.84 (0.88)**	4.86 (0.86)**
Friends Support <sup>e</sup>	–	3.05 (1.84)	3.45 (1.75)**	3.01 (1.78)
Self-Efficacy <sup>e</sup>	–	3.31 (1.78)	2.82 (1.70)**	3.10 (1.70)
Misperceptions <sup>f</sup>	10.5%	13.5%	5.7%**	–
n	244–247	331–342	192–194	161–166

<sup>a</sup>Confidence Intervals for the differences in means and proportions with the standard error term adjusted for partially overlapping samples were used. All tests were two-tailed. <sup>b</sup>Differences between the two baseline assessments were examined. <sup>c</sup>Differences between second baseline and post-intervention assessments were examined. <sup>d</sup>Differences between second baseline and follow-up assessments were examined. <sup>e</sup>These scales/items were not administered until the second wave of data collection. <sup>f</sup>Since the misperceptions scale was very skewed, it was dichotomized into those reporting only 'slight' disagreement or any degree of agreement with the items versus 'strong' or 'somewhat' disagreement with all items; this scale was dropped from the final assessment. \*P < 0.10; \*\*P < 0.05.

## Discussion

Prior to the implementation of the Mpowerment Project, rates of unsafe sex were high and remained so among young gay men in these communities. Following the implementation of the Mpowerment Project, there were substantial reductions in unprotected anal intercourse among young gay men, the sexual behavior most risky for HIV transmission [44]. These changes were sustained 1 year post-intervention in both communities with non-primary partners, but mixed results were obtained with respect to boyfriend relationships.

The Mpowerment Project led to changes in a variety of psychosocial variables found in previous research to be associated with risk-taking behavior [2,5,7,13,14, 18,19]. In outreach activities and in the small groups, the project's messages about safer activities were very sex-positive, and included suggesting and eroticizing a large variety of safer sexual activities, not solely condom use. Evidence of the effectiveness of this approach is the increase in ratings of perceived enjoyment of safer activities post-intervention, as well as the decreased perception of barriers to using condoms. Eroticizing safer sex and encouraging young men to think of new, fun and satisfying ways of having low-risk sex is particularly important given the frequency of findings showing that the more one believes that safe sex is associated with diminished enjoyment, the less one engages in it [45]. The Mpowerment Project also was effective in correcting erroneous beliefs about safer sex and HIV transmission that some of the young men held before the program. The program also influenced interpersonal and social factors. Young men increased their sexual communication skills, increased their perception that their peers were having safer sex and felt more supported by their friends about having safer sex.

This program rests on the assumption that since young gay men are most effective in influencing other young gay men, as many young men as possible should be mobilized to go back to their social networks to support their friends in adopting and maintaining safer sex. Hence, attracting as many young men as possible to the program was an important objective. Every young man who became involved in the project by attending a social event or a small group, or by volunteering in any capacity became a potential agent of change among his social network. We attempted to engage the entire social system of young gay men to encourage and support each other about the need for safer sex.

We believe that there were two primary motivations why young gay men became involved with the project. First, the young men had a sense of ownership of the program, without which it is doubtful that they would have felt as motivated to work on the project, consider

the safer sex message to be their own, and spread the message to their peers. The second motivation was to have a sense of community, which the project seemed to provide. They wanted more friendships, more opportunities to engage in various social activities with other young men, and a social space in which to relax and be themselves.

Several limitations to this field study should be noted. First, insufficient statistical power led to problems in analyzing the communities separately and to relatively unstable estimates. One reason for low statistical power was the result of studying this intervention approach in mid-sized rather than large communities. Mid-sized communities were chosen because these were our first attempts to target and mobilize entire communities of young gay men; deal with the complexity of community dynamics, political situations, and cultural factors; and run a multifaceted program long-distance. A second reason for low statistical power was the result of attrition. Young gay men are highly mobile, and many moved from the communities before the intervention was conducted. In addition, despite complex tracking procedures, it was difficult to maintain this longitudinal cohort. The alternative of using cross-sectional samples would not have sufficed however, given the desire to study changes in psychosexual variables and because substantial time would have been required to recruit a new sample at every time point. The entire sample could not be recruited from bars, for example, because this would have missed many segments of young gay men. The attrition analyses indicated few differences between those maintained and those lost for various reasons.

An additional limitation of this study concerns the analysis of change in psychosocial variables. Despite effort to refine the psychosexual scales, there remained considerable measurement error in some, but not all of the scales. This may have differentially impacted our ability to find significant changes in the various psychosexual factors.

It is possible that an effect of the intervention was to increase the respondents' desire to answer questions in socially desirable ways. To minimize this, the Young Men's Survey (YMS) and the intervention program strived to have separate identities, with different names and logos, and the YMS was identified as a University of California activity, whereas the prevention program was locally identified. In addition, there is always a concern about bias in self-reported behavior. Various studies have established the reliability and validity of self-report procedures [46-48], and we followed suggestions that we use a 2-month retrospective time period [49].

The extent to which the findings from these mid-sized, relatively homogeneous communities can be general-

ized to larger, more complex and diverse communities is not clear. In addition, the cohort was primarily comprised of relatively 'out' self-identified gay men. Future research should focus on determining how this intervention approach works in larger, more complex, more heterogeneous communities, and focusing on more diverse groups of young gay and bisexual men.

It would have been preferable to have had an additional comparison community with which to compare the impact of the program in Santa Barbara, rather than relying on an examination of secular changes prior to intervention implementation. In this study, we wanted to determine if the project would replicate in a new community. As community-based organizations and health departments are attempting to implement effective programs, it is important to observe whether the program appears successful in more than one community. The results presented here suggest that this is the case.

Much work remains if we are to eliminate HIV transmission among young gay men. After the intervention many young gay men were continuing to engage in risky behavior. Additional research is needed to determine how to increase the quantity and persuasiveness of informal and formal outreach efforts, how to increase young gay men's motivation to speak with and encourage each other, and how to develop more supportive social networks.

The largest absolute reductions in unprotected anal intercourse occurred in boyfriend relationships, where the majority of unprotected intercourse occurs [2,10,13,14,17,18]. Yet over 40% of the men with boyfriends were having unprotected intercourse post-intervention. Furthermore, although reductions in risky behavior with non-primary partners were sustained at the 1-year follow-up, there were unclear trends with respect to boyfriend relationships (we are uncertain why changes were sustained in one community and not in the other). Given the rapid changes in primary partnerships among young gay men and that relatively few of their relationships successfully employ 'negotiated safety' [14,50], it is critical that HIV prevention efforts for young gay men target risk-taking behavior within primary relationships.

Sustained interventions are more likely to lead to sustained behavior change [51]. The communities attempted to continue the programs after the research monies funding the young men's programs ended, but at much reduced levels. It would have been preferable to maintain the programs at the previous levels. The fully funded program is a cost-effective approach to HIV prevention with young gay men (JG Kahn, SM Kegeles, R Hays, N Beltzer, manuscript submitted). Many young gay men had new boyfriends by 1-year post-intervention and needed ongoing support to

maintain risk reduction in these new relationships. Furthermore, young men come out every day, and HIV prevention programs need to be in place so that they too do not get infected.

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