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Social network recruitment for *Yo Puedo* - an innovative sexual health intervention in an underserved urban neighborhood: sample and design implications

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Abstract

Most existing evidence-based sexual health interventions focus on individual-level behavior, even though there is substantial evidence that highlights the influential role of social environments in shaping adolescents' behaviors and reproductive health outcomes. We developed *Yo Puedo*, a combined conditional cash transfer (CCT) and life skills intervention for youth to promote educational attainment, job training, and reproductive health wellness that we then evaluated for feasibility among 162 youth aged 16–21 years in a predominantly Latino community in San Francisco, CA. The intervention targeted youth's social networks and involved recruitment and randomization of small social network clusters. In this paper we describe the design of the feasibility study and report participants' baseline characteristics. Furthermore, we examined the sample and design implications of recruiting social network clusters as the unit of randomization. Baseline data provide evidence that we successfully enrolled high risk youth using a social network recruitment approach in community and school-based settings. Nearly all participants (95%) were high risk for adverse educational and reproductive health outcomes based on multiple measures of low socioeconomic status (81%) and/or reported high risk behaviors (e.g., gang affiliation, past pregnancy, recent unprotected sex, frequent substance use) (62%). We achieved variability in the study sample through heterogeneity in recruitment of the index participants, whereas the individuals within the small social networks of close friends demonstrated substantial homogeneity across sociodemographic and risk profile characteristics. Social networks recruitment was feasible and yielded a sample of high risk youth willing to enroll in a randomized study to evaluate a novel sexual health intervention.

INTRODUCTION

Rates of pregnancy and sexually transmitted infections (STIs) among U.S. adolescents aged 15 to 19 remain higher than in any developed nation, with substantial health and socioeconomic consequences (Patel and Sen 2012). Although teen pregnancy rates have declined for all racial or ethnic groups over the last decade, the decrease remains lowest for Latina teens (Vital signs: teen pregnancy - United States, 1991–2009–2011). In California,

which is home to one in eight U.S. adolescents, Latinas maintain the highest teen birth rate, accounting for 73% of teen births in 2010 (California Department of Public Health, California's Teen Births Continue Decline 2011), although they only constitute 48% of the teen population. Likewise, Latino teens are disproportionately affected by STIs; relative to non-Latino whites, rates of STIs in California are three times higher for Latina females and two times higher for Latino males (Sexually Transmitted Diseases in California, 2010 2011).

Substantial evidence highlights the influential role of social environments, including neighborhood characteristics, in shaping adolescents' behaviors and reproductive health outcomes (Dolcini et al. 2013; Dolcini et al. 2010; Jennings et al. 2012). Furthermore, the developmental period of adolescence corresponds with normative transitions (e.g., from high school to post-high school education or employment) as well as social transitions, including the initiation of romantic and sexual relationships, adoption of protective and risky behaviors, and the growing influence of peer networks and neighborhood environments on individual attitudes and behaviors (National Research Council 2009). Social network research has demonstrated empirical support for the social contagion theory (National Research Council 2009; Fowler and Christakis 2008), which suggests that behaviors and attitudes (e.g., obesity, happiness) are "transmitted" through social networks, underscoring the importance of even indirect social links in influencing behavior. Research among adolescents has found that even after adjusting for demographic factors, peer influence increases the likelihood of smoking initiation (Hoffman et al. 2007; Go et al. 2012), marijuana use (Ali et al. 2011), and attitudes regarding alcohol and marijuana among high school friend networks (Coronges et al. 2011). Likewise, a recent study among high school social networks found evidence of the social contagion of academic success (Blansky et al. 2013). Peer influence has been shown to extend beyond close friends to more distal social network connections (e.g., "three degrees of influence") (Christakis and Fowler 2013). However, most existing evidence-based sexual health interventions continue to focus on individual-level behavior and fail to address the influential role of youth's social environments (Cardoza et al. 2012).

In many economically disadvantaged neighborhoods, street gangs constitute a prominent feature of the social environment and assume tremendous influence over social norms and individual behaviors (Voisin et al. 2011; Minnis and vanDommelen-Gonzalez 2011; Marcus 2009). Gang affiliation offers social identity, friendship, protection, and an economically viable direction for some youth with limited socioeconomic opportunities (Kyriacou et al. 1999; Bennett et al. 2002). California ranks among the top five states in the U.S. with gang presence *per capita* (National Gang Threat Assessment: Emerging Trends 2011). Gang-related neighborhood violence has been associated with perpetration of partner violence (Reed et al. 2009) and engagement in risky sex behaviors such as inconsistent condom use, increased number of partners, and partnerships that overlap in time (Voisin et al. 2004; Crosby et al. 2004; Wingood et al. 2002). We have found that having a male partner in a gang increased pregnancy incidence among female adolescents by 90% (Minnis et al. 2008) and that gang norms promoted partner concurrency and substance use as signs of masculinity (Minnis and vanDommelen-Gonzalez 2011).

Social environments shaped by poverty, socioeconomic disparities, and community violence may constrain youth's perceived future opportunities and are associated with higher rates of teen pregnancy and STIs (Minnis et al. 2013a; Cubbin et al. 2010; Ford and Browning 2013). Impoverished urban neighborhoods often lack structures to support youth through educational development, career mentoring and training, and employment. For Latino immigrants, legal and linguistic barriers further limit access to educational and economic opportunities. Our research in San Francisco over the last 12 years (Doherty et al. 2007; Minnis et al. 2008; Minnis et al. 2010) has highlighted the strong role that the social environment assumes in shaping norms promoting gang affiliation and early childbearing as viable pathways to adulthood. Novel interventions are needed that simultaneously address social network influences and socioeconomic opportunities (Kirby et al. 2007; Fiszbein et al. 2009) to prevent adverse reproductive health outcomes.

The Yo Puedo intervention: conceptual approach and rationale

We developed *Yo Puedo*, a combined conditional cash transfer (CCT) and life skills intervention for youth to promote educational attainment, job training, and reproductive health. Both behavioral economics and social cognitive theory informed the design of *Yo Puedo*. Behavioral economists have adapted the classical microeconomic rational choice theoretical model to accommodate the recognition that many behaviors that appear “irrational,” including adolescents' risky sexual behaviors, do in fact follow predictable patterns shaped by adolescents' cognitive approach to decision-making that weighs present rewards and anticipated future opportunities (O'Donoghue and Rabin 2000). We intended the *Yo Puedo* cash incentives to encourage adolescents to shift their time and risk preferences toward actions that support autonomy and improved future opportunities. For example, the completion of health-promoting actions was rewarded promptly, thereby leveraging biases for both present and positive reinforcement (Higgins et al. 2012). Contingency management theory, which guides this intervention, posits that CCTs stand to provide the “nudge” to alter behavior and, given their relatively modest dollar amount, may facilitate overcoming non-financial barriers related to culture, norms, and stigma (Petty and Simcic 2002). This is well aligned with a developmentally appropriate approach that provides technical and emotional scaffolding during the period of middle to late adolescence when advanced and abstract thinking skills mature (Dahl 2004). Adolescent health research also underscores the important influence of the social environment, particularly peer social networks, in shaping norms, individual behaviors, and sexual partnerships. Thus, intervention activities delivered to groups of social networks can encourage the diffusion of healthy, goal-oriented norms designed to cultivate emotional and social competence to better ensure a healthy and productive transition to adulthood. Bandura's social learning theory (Bandura 1977) addresses cognitive, behavioral, and environmental determinants of health outcomes, and underpins the development of numerous evidence-based reproductive health (Suellentrop 2011) and gang prevention (Best Practices for Youth Violence Prevention 2002) life skills interventions. We hypothesized that the CCTs coupled with life skills education would counteract present-oriented time preferences, encourage present investment in educational and reproductive health activities, and provide positive social support to engage in health promoting behaviors.

Yo Puedo builds on lessons learned from other CCT interventions and aims to address limitations of existing adolescent sexual health interventions. *Yo Puedo* targets social networks directly with small social network clusters (2-3 close friends), which constitute the unit of recruitment and randomization. The six-month intervention consisted of eight, 1-hour life skills sessions delivered weekly during the first two months of the intervention period. Each single-sex life skills group comprised three to four social network clusters. Throughout the six months, participants could receive payments for completed CCT activities. Participants chose their own “pathway of educational activities” (e.g., steps toward completion of a college application, a GED program, or a job training program) for CCT payment. We selected incentivized intervention activities to engage both in- and out-of-school youth and prioritized performance- over participation-based incentives (e.g., completion of educational goals rather than school attendance alone). Life skills groups, then, were heterogeneous in terms of group composition and individuals chose their “paths” independently. We envisioned them as providing a forum for strengthening and modeling positive social support and for addressing adolescent sexual health, with a focus on partnerships and neighborhood norms. Participants could receive up to \$200 for completing goals and participating in life skills sessions (\$160 for goals and \$40 for life skills attendance).

Objectives

The objectives of this paper are to describe the study community, present our recruitment methods and challenges, and report baseline characteristics of participants recruited for our feasibility study of *Yo Puedo*. A fundamental feasibility question guiding our paper was to examine the study sample and design considerations resulting from the social networks recruitment approach. Other feasibility questions related to study implementation, including intervention uptake, adherence and acceptability, and safety issues related to the direct distribution of cash payments are examined in a separate paper (Minnis et al. 2013b). We compared male and female youth recruited and how their social networks differed, and examined how the social network cluster design affected participant recruitment and the composition of our study population.

METHODS

Setting

Despite gentrification and displacement of Latino and working class families over the last decade, the Mission District (“the Mission”) remains home to the largest Latino community in San Francisco, shaped by immigration from Mexico and Central America (Dahl 2004; Prevention). Whereas 42% of Mission residents identify as Latino (compared to 15% citywide), the public school population ranges from 60–87% Latino, followed by African-American students (San Francisco Department of Public Health 2012). One in three residents is low-income (compared to one in five citywide). Latino youth street gangs also constitute a key feature of the social and physical landscape (See Figure 1). The predominant street gangs in the Mission are *Norteños* and *Sureños*. In a prospective cohort study we conducted during the period 2001–2005 involving 555 Mission District youth aged 14–19, 20% had been pregnant prior to study enrollment, 27% of sexually-active female

participants became pregnant over the two-year study period, and 73% of these pregnancies were unintended (Rocca et al. 2010a). This research highlighted the need to consider characteristics of the social environment that affect educational attainment as well as neighborhood peer norms that influence reproductive health outcomes. Our community partners (see Figure 1) provided input on intervention design, contributed to street-based recruitment, made referrals, served as intervention and interview sites, participated in data interpretation, and will co-develop a community report to disseminate study findings. The partnership has been vital to building rapport with and providing access to vulnerable populations of Mission youth, particularly those who are gang-affiliated.

Study design and target population

Eligible participants were youth aged 16–21 who identified as Latino or Latina, resided in San Francisco and reported that they frequented the Mission District at least four days per week, spoke English or Spanish, and were neither pregnant nor parenting. We asked index participants to recruit up to two same-gender friends who met eligibility criteria, although these friends could be of any racial or ethnic background in recognition of the likely diversity of their social networks. We recruited participants through street- and school-based outreach strategies. Street-based recruitment followed a modified venue-based recruitment model used in our past research in this neighborhood (Auerswald et al. 2004). Recruitment at community venues helped to ensure recruitment of youth from high risk social networks and variation in participant characteristics (e.g., U.S.- vs. foreign-born, gang affiliation). We obtained site agreements from the San Francisco Unified School District to engage in formal partnerships with the two neighborhood high schools and their Wellness Centers. While school personnel referred some students, study staff recruited most youth in the schools' hallways, cafeteria and yards. During recruitment, two bilingual and bicultural interviewers approached youth who appeared to be age eligible, conducted a brief screening interview and, if they were eligible, described the study. We asked eligible participants who expressed interest in

Yo Puedo to provide contact information and staff gave them two referral cards to distribute to friends they considered to be part of their social network. If referred friends were ineligible, we offered participants the opportunity to recruit and refer additional friends. *Yo Puedo* recruitment and enrollment took place during the period June 2011 through January 2012. Though participants enrolled with friends, and social networks constituted the unit of randomization, all data collection occurred through individual interviewer-administered questionnaires in a private space in one of our community partner agencies or high school wellness centers. Randomization to the intervention or observational control group receiving standard community services took place only after baseline data collection was complete for all members of the friend network so as not to bias self-reported data. We used block-group randomization to achieve even distribution between the intervention and control arms at regular intervals to permit life skills groups to be composed and to start on a rolling basis over time. Participants received a \$20 cash payment at the end of their baseline visit. Interviewers completed training in human subjects, securing informed consent and assent, bilingual interviewing, street-based recruitment and screening procedures, and mandatory reporting and safety protocols. The project coordinator accompanied interviewers during

recruitment and made unannounced observations of interviews to ensure that participant interactions and data collection met ethics and quality standards. The institutional review board at RTI International approved all study procedures. We obtained written informed consent or assent from all participants prior to study enrollment. Our IRB granted a waiver of parental consent for minors.

Measures

We derived our primary measures of feasibility directly from study implementation: our team's ability to efficiently enroll small social networks of youth, which included both youth's capacity to locate eligible friends willing to join a randomized study and our ability to enroll the social group. Our comparisons of index and social network members, as well as of the social networks of males and females, was based on quantitative data collected at baseline. Through an interviewer-administered structured questionnaire, participants reported their socio-demographic characteristics, educational aspirations, risk and protective behaviors (both for themselves and for their close friends), gang affiliation, alcohol and drug use, sexual and reproductive health history, relationship and gender dynamics, contraceptive self-efficacy, and immigrant adaptation and acculturation. We selected most measures from validated measures used in national surveys. For example, we used the Pulerwitz Sexual Relationship Power Scale to measure power in sexual relationships and to investigate the role of relationship power in sexual decision-making (Pulerwitz et al. 2000). We measured contraceptive self-efficacy and birth control motivations with items from the National Longitudinal Study of Adolescent Health (Add Health). High scores on this continuous scale represented high efficacy or motivation. We obtained multiple measures of immigrant status and timing of immigration, and specified meaningful developmental cut-points, such as having attended middle school in the United States.

Analysis

We used descriptive statistics (chi-square and t-tests) to examine participant characteristics, stratified by gender. To assess differences between the index participants and the friends with whom they enrolled in the study, we compared baseline demographic and behavioral characteristics using chi-square and t-tests to test for statistical differences between the overall index and network populations, and paired t-tests to compare index participants directly with their networks. To assess the clustering of baseline characteristics within networks, we used random effects models (xtmixed for continuous measures and xtlogit for dichotomous measures) to calculate intra-class correlation coefficients (ICC) (i.e., the strength of association within networks) (Rabe-Hesketh and Skrondal 2008). We had very little missing data; for only four measures reported in this paper were more than three observations missing and none exceeded 10%. We performed all analyses using Stata MP version 12.1.

RESULTS

Recruitment

A total of 309 participants screened for eligibility were recruited as index participants or referred as friends; of these 56% were eligible (n=172) and 94% (n=162) of eligible youth

enrolled. The primary reasons screened youth were ineligible included being outside of the age range (69%); lack of interest in completing screening (11%); currently pregnant or parenting (7%); and not identifying as Latino (6%). Overall, nearly all participants thought that it was important that they could join the study with a friend (48% stated that it was “very important” and 46% “somewhat important”). When asked whether they would have enrolled in *Yo Puedo* on their own, 20% of participants reported “definitely no”. Eighty-five percent reported that it was “very easy” to find one friend to join with them.

Recruitment challenges with implications for design and implementation—

Despite widespread willingness to engage friends in enrolling in *Yo Puedo*, several months into our recruitment period we found that some youth experienced difficulty finding two close friends to join and that we were “losing” youth who were ideal candidates for participation (see Table 1 for complete enumeration of challenges and solutions). For example, a youth involved in drug sales approached our recruiters (he had been previously screened during a street recruitment session) stating that he wanted to enroll, but had not been able to identify two close friends willing to “join a program.” As we experienced similar scenarios we altered our eligibility criteria to reduce our minimum requirement to one close friend. Although *Yo Puedo* was designed for non-pregnant and non-parenting youth, recruitment of females meeting this eligibility criterion through street-based recruitment at venues predominated by gang-affiliated youth proved challenging. Many of the gang-affiliated females identified through street recruitment already had children and/or experienced substantial marginalization. Young women were also far less visible in the street and, when present, were often the minority in a group dominated by male peers. Thus, our community partners served a critical role in connecting us with non-parenting, high risk female youth who used drop-in services at community agencies.

Study population characteristics

The *Yo Puedo* feasibility study included 162 youth aged 16–21, 51% of whom were female (Table 2). Approximately 85% identified as Latino/a, one-third were foreign-born, and 40% reported that their mother had not completed a high school education. We recruited one-third of the sample through community venues (e.g., street locations, parks). Most participants were in school, although 32% of males and 16% of females reported skipping school on more than four days in the previous month. All participants expected to graduate from high school, and two-thirds reported they planned to graduate from college or beyond.

Most participants were sexually active, with a mean age at first sex of 14.5 years. Males reported a higher number of lifetime sexual partners (mean 5.9 for males vs. 3.1 for females, $p = 0.006$). Sexual relationships in the past six months differed between males and females; males were more likely to report sex with casual partners or to have both main and casual partnerships, whereas females were more likely to report sex with only main partners ($p = 0.01$). Over one-quarter of sexually active participants reported having a sexual partner who had concurrent partnerships. Nearly all participants reported that they did not want to become pregnant (females) or for their partner to become pregnant (males) in the next six months, and both males and females reported a mean age of 25 years (median 25, interquartile range: 22–28) as the ideal age for a first child. Despite these pregnancy

intentions, levels of reported unprotected sex were high; 32% of sexually active males and 40% of sexually active females reported unprotected sex in the past six months. Half of participants (52.5%) had accessed reproductive health services within this period. Sixty percent had a close friend who had been pregnant, and 13% reported a past pregnancy themselves. Nearly half (48.1%) had close friends in gangs, and 52.5% reported having family members in gangs, percentages that did not vary by gender. Very few (11% of males and no females) reported being in a gang themselves.

Social network clusters

The 162 youth in the study comprised 70 small social network clusters (36 female and 34 male). The population of index recruits did not differ from the population of social network members with respect to sociodemographic characteristics except in regards to Latino ethnicity, which reflects the eligibility requirement that index participants identify as Latino but that they could recruit friends of any racial or ethnic background. In addition, a higher proportion of index participants were foreign-born (42% of index vs. 30% of social network members). Similarly, the risk profile of the index and social network members was quite comparable, which indicated that the population of close friends recruited into the study by index participants was not inherently more risky than the index youth recruited by research staff.

Though the overall populations of index youth and social network recruits were similar, we found considerable heterogeneity among networks across a number of sociodemographic and behavioral measures. As presented in Table 3, networks clustered around age, foreign birth, and attendance at middle school in the U.S. Though the strength of the clustering for having attended middle school in the U.S. was high for both males and females, the ICC for females (0.94, $p<0.001$) was significantly higher, suggesting this migration measure clustered quite strongly within females' social networks. In other words, females who had immigrated to the U.S. after middle school almost exclusively enrolled with friends who were also recent immigrants, whereas male networks were less concentrated around this factor. Likewise, low maternal education was significantly correlated for females but not males (ICC 0.33, $p=0.04$), suggesting homogeneity within female clusters based on low maternal education. Both school enrollment and attendance frequency clustered within social networks, for which all ICCs ranged from 0.50 to 0.95. Youth who skipped school at least four days in the previous month, for example, were likely to enroll with youth who also skipped school frequently. Females also had significant, though more modest, network correlation in regard to educational expectations (ICC 0.22, $p=0.05$).

In examining sexual behaviors and other risk measures, we found some evidence of clustering within networks. Young age at first sex (under age 15) was the one sexual risk measure that clustered for both males and females (ICC=0.38, $p=0.03$; ICC=0.44, $p=0.02$), meaning that within cluster variation was far less than variation between clusters. Reporting both main and casual sexual relationships in the past 6 months clustered significantly within networks for males (ICC 0.75, $p=0.001$): males reporting both main and casual partners tended to recruit friends with a similar sexual history. Having accessed reproductive health services in the past 6 months clustered significantly within network for both males and

females (ICCs 0.31 and 0.38, respectively, $p<0.05$). Gang and substance use behaviors clustered within networks as well: having close friends in gangs was significant for female networks (ICC 0.38, $p=0.02$); having close friends who had been incarcerated was strongly correlated in male networks (ICC 0.65, $p=0.001$); and frequent marijuana use (at least weekly) was strongly correlated in both male and female networks.

DISCUSSION

Baseline data from this feasibility study of *Yo Puedo* provide evidence that we could successfully enroll high risk youth using a social network recruitment approach in community- and school-based settings. Nearly all participants (95%) met the criteria of high risk for adverse educational and reproductive health outcomes based on their low socioeconomic status (81%) and/or reported risk behaviors (e.g., past pregnancy, recent unprotected sex, frequent substance use) (62%). Half of participants reported having a close friend who had been incarcerated and half had close friends in a gang. Nearly all eligible youth were able to identify at least one friend with whom to enroll. We achieved variability through heterogeneity in recruitment of the index participants, whereas the individuals within the small social networks of close friends demonstrated substantial homogeneity. Despite high stated educational aspirations and nearly unanimous desire to avoid pregnancy in the short term, sexually active youth reported a fairly high median number of lifetime sexual partners and one-third reported having had unprotected sex in the previous six months.

We designed *Yo Puedo* to engage small social networks of youth to achieve improved sexual health outcomes through the completion of educational and reproductive health and wellness goals and participation in life skills groups. We intended *Yo Puedo* to influence participants' social environment through changes in norms and behaviors within their immediate social network and through building and strengthening positive social ties. Therefore, critical to the evaluation of this intervention approach is the ability to enroll and randomize small social networks. Observational network studies involving multiple generations of adolescents' friends and/or sexual partners (i.e. partners of the index participant's partners) suggest that individuals, particularly males, tend to nominate contacts with higher risk profiles than their own; they also may be particularly influential within their social networks (Fichtenberg et al. 2009). In this study we did not find evidence supporting the recruitment of higher-risk individuals; rather, youth recruited individuals who had sociodemographic and risk profiles like themselves. This was particularly the case for females whose networks had high levels of homogeneity across measures of low SES and timing of U.S. immigration. This pattern may result from our longstanding research partnership with community agencies trusted by youth; their involvement, and our team's knowledge of the community, permitted us to recruit high risk youth directly as initial index "seeds". The relatively homogeneous social network clusters suggest that our recruitment approach yielded a study sample that supports the social network-based intervention model.

Pregnancy intentions, including the short-term desire not to get pregnant and childbearing expectations expressed as the ideal age at first birth, were not aligned with reported contraceptive behavior. Most sexually active youth used condoms intermittently.

Furthermore, as evidenced by the differing relationship types reported by males and females (e.g., males were more likely to report both casual and main partnerships during the previous six months), there is a need to address contraceptive choices in different types of relationships, including periodic abstinence, that occurs both within ongoing relationships and between relationships. This variability in sexual activity and inconsistent contraceptive use, together with a pregnancy incidence rate of 166/1000 that we documented in this neighborhood in past research (Minnis et al. 2008), underscores the importance of interventions to better align contraceptive behavior with intentions, particularly given that most adolescent pregnancy is unintended (Rocca et al. 2010b; Finer and Zolna 2011). This points to the need both to ensure access and linkage to comprehensive adolescent-friendly reproductive health services, and to strengthen a sense of future opportunity for education and employment so that stated goals can be realized and that youth sustain the motivation and competence to delay childbearing (Minnis et al. 2013a).

Limitations

This manuscript reports baseline findings of a feasibility study intentionally conducted in a single community, which presents limitations to the study's external validity. For this feasibility stage, we restricted the network size to no more than three youth and also included only a single generation of friends; thus, our conclusions about how network recruitment affected our study sample characteristics may have differed had we enrolled larger networks or multiple generations of friends. Since social networks constituted the unit of randomization, including multiple generations would have complicated the design considerably. The homogeneity we found within networks, alongside high risk behavior overall in the study population, underscores that our community-based recruitment strategies successfully engaged networks of youth who are directly and indirectly exposed to a high risk social environment. A future evaluation of this intervention model might consider recruiting a broader network of friends linked to the core group enrolled (either by expanding the number of youth recruited by the index participant or by permitting multiple generations of recruitment). Finally, because of the feasibility objective and the short follow-up period, this study relied on self-reported behaviors and attitudes, which are subject to social desirability bias (Gribble 1999; Minnis et al. 2009).

Conclusion

There is increasing recognition that we need alternative sexual health prevention interventions that address contextual influences on risk-taking and resilience. Engaging youth through their sexual networks offers one promising approach. Social networks recruitment was feasible and yielded a sample of high risk youth willing to enroll in a study to evaluate a novel sexual health intervention. Sociodemographic and risk profile characteristics were homogeneous within small networks of close friends, suggesting the potential for influencing norms and outcomes both for the youth directly involved in the intervention and, through diffusion over a sustained intervention period, for other members of their social network.

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Figure 1.**Mission District Neighborhood Map**

Map developed with input from youth and community partners, and data from the following sources: Sustainable Communities Index (<http://www.sustainablecommunitiesindex.org/neighborhoods/view/17>); Office of the City Attorney, City and County of San Francisco: Mission Civil Gang Injunction (<http://www.sfcityattorney.org/index.aspx?page=20>); Smith, H. & Raygoza OL, Gangs and Cupcakes, *Mission Loc@l*, March 3, 2011 (<http://missionlocal.org/2011/03/gangs-and-cupcakes/>); and Solnit, R. The Mission: North of Home, South of Safe. In *Infinite City: A San Francisco Atlas*. Berkeley, CA: University of California Press, 2010.

Table 1

Yo Puedo

Recruitment Challenges and Adopted Solutions

Challenge	Solution
Street venues	
Building rapport with affiliated youth on the street	Frequent, repeated contact (time) necessary and joint recruitment with community partners
Streets empty (few or no youth hanging out) due to police sweeps strong police presence. <i>and</i>	Persistence and communication with community agencies regarding when community incidents occurred, which resulted in heightened police presence.
Safety concerns for study staff due to gang and police activity.	We would redirect recruiters to alternative venues.
Youth unable to commit to extended participation in an intervention due to: <ul style="list-style-type: none"> • Erratic work schedules • Probation, which restricted mobility 	Held intervention groups at geographically diverse sites within the neighborhood to accommodate limited mobility due to gang involvement and/or probation.
	Held groups during afternoon and early evening times on multiple days of the week.
Young women found hanging out with friends who were parenting presented awkwardness since parenting youth were ineligible.	Sensitivity training for interviewers; referral options to programs for parenting youth were offered.
Young women not as present on street and a minority in male groups hanging out	Community agency ties to gang-involved young women who were not parenting proved essential and an appropriate recruitment strategy for future studies needs further development.
Substance use: participants too high to recruit	Study staff trained on identifying whether participants were using substances at the time of the contact and how to manage the exchange.
School venues	
Competing after-school obligations interfered with ability to recruit and with intervention eligibility. These included: <ul style="list-style-type: none"> • School credit recovery programs. • Sports team obligations. • English Language Learners taking English classes. 	Held groups at school sites in wellness centers to facilitate youth participation in other activities.
Truancy/poor school attendance.	Recruitment of truant youth through street-based venues.
General challenges	
Often, youth are not alone, with implications for individual-based screening, including sensitive questions.	Pairing study recruiters so two can assess eligibility simultaneously. Training of recruiters to skillfully assess eligibility in a private manner with each member of the group.
Reliance on cell phones that are often out of service makes it necessary to "find" youth again.	Extensive alternative contact information, including multiple direct contact methods, ascertained once eligibility determined.

Table 2Background Characteristics of *Yo Puedo* Study Participants, San Francisco, CA.

	Overall N = 162 N (%)	Male N=79 N (%)	Female N=83 N (%)
<i>Sociodemographic Characteristics</i>			
Age (in years)	16.89	17.06	16.72
Latino/a	139 (85.8)	67 (84.8)	72 (86.8)
Foreign-born	57 (35.2)	30 (38.0)	27 (32.5)
Attended middle school in the U.S.	121 (74.7)	58 (73.4)	63 (75.9)
Low maternal education (<high school)	69 (42.6)	31 (39.2)	38 (45.8)
Crowded housing conditions	77 (47.5)	40 (50.6)	37 (44.6)
Household social service use past 6 months	92 (56.8)	42 (53.2)	50 (60.2)
Maternal first birth <=18 years	49 (30.3)	23 (29.1)	26 (31.3)
Interview Location			
Mission High School	67 (42.4)	29 (36.7)	38 (45.8)
John O'Connell High School	42 (25.9)	18 (22.8)	24 (28.9)
Other Location	53 (32.7)	32 (40.5)	21 (25.3)
<i>School and Future Education</i>			
In school now **	146 (90.1)	66 (83.5)	80 (90.4)
Skipped school >4 days in past month *	38 (23.5)	25 (31.7)	13 (15.7)
Educational Expectations			
High School or Equivalent	14 (8.6)	9 (11.4)	5 (6.0)
Trade School, Vocational School, or Some College	40 (24.7)	20 (25.3)	20 (24.1)
College Graduate or Beyond	107 (66.1)	49 (62.0)	58 (69.9)
<i>Relationship and Sexual History</i>			
Sexually active (ever)	118 (72.8)	64 (81.0)	54 (65.1)
Mean age at first sex	14.46	14.28	14.66
Mean no. lifetime sexual partners *** ^a	4.56	5.85	3.14
Past pregnancy ^d	15 (12.7)	8 (12.5)	7 (13.0)
Sexual relationships in the past 6 months **			
None	63 (38.9)	28 (35.4)	35 (42.2)
Main only	52 (32.1)	19 (24.1)	33 (39.8)
Casual only	29 (17.9)	22 (27.9)	7 (8.4)
Both main and casual	16 (9.9)	9 (11.4)	7 (8.4)
Current contraceptive method use ^b			
Condoms **	85 (87.6)	48 (96.0)	37 (78.7)
Oral contraceptive pills	23 (23.7)	10 (20.0)	13 (27.7)
Other hormonal method	19 (19.6)	6 (12.0)	13 (27.7)
Unprotected sex in the past 6 months ^b	35 (36.1)	16 (32.0)	19 (40.4)
Used emergency contraception past 6 months ^b	25 (25.8)	9 (18.0)	16 (34.0)

	Overall N = 162	Male N=79	Female N=83
	N (%)	N (%)	N (%)
Partner gang affiliated ^b	13 (13.4)	6 (12.0)	7 (14.9)
Partner has concurrent partners ^{b,c}	26 (26.8)	14 (28.0)	12 (25.5)
Pregnancy Intentions			
Definitely do not want pregnancy in the next 6 months	152 (93.8)	73 (92.4)	79 (95.2)
Partner definitely does not want pregnancy in next 6 months	126 (77.8)	58 (73.4)	68 (81.9)
Ideal age for a first child (in years)	25.51	25.27	25.29
Self-efficacy and relationship power			
High contraceptive self-efficacy	73 (45.1)	32 (40.5)	41 (49.4)
High relationship control ^d	-	-	44 (77.2)
Accessed reproductive health services in the past 6 months	85 (52.5)	37 (46.8)	48 (57.8)
<i>Risk Profile</i>			
Gang affiliation			
Individual	9 (5.6)	9 (11.4)	0 (0)
Close friends	78 (48.2)	39 (49.4)	39 (47.0)
Family	85 (52.5)	44 (55.7)	41 (49.4)
Close friends incarcerated	81 (50.0)	43 (54.4)	38 (45.8)
Close friends pregnancy	96 (59.3)	52 (65.8)	44 (53.0)
Frequent alcohol use	34 (21.0)	19 (24.1)	15 (18.1)
Frequent marijuana use	51 (31.5)	26 (32.9)	25 (30.1)

* P<0.05;

** P<0.01.

^a Among those who have ever had sex.

^b Among those who reported having sex in the previous six months.

^c We excluded 5 individuals because they did not know if their partner had concurrent partners.

^d We measured relationship control among females only as part of the Sexual Relationship Power Scale.

Table 3Intraclass Correlation Coefficients Evaluating Social Network Clustering, *Yo Puedo* Feasibility Study.

	Males		Females	
	ICC	95% CI	ICC	95% CI
<i>Sociodemographic Characteristics</i>				
Age	0.44 ***	(0.24, 0.67)	0.51 ***	(0.31, 0.71)
Foreign-born	0.83 ***	(0.52, 0.96)	0.57 **	(0.22, 0.86)
Attended middle school in the U.S.	0.73 ***	(0.63, 0.82)	0.94 ***	(0.82, 0.98)
Low maternal education (<high school)	0.47	(0.00, 0.96)	0.33 *	(0.08, 0.75)
<i>School & Future Education</i>				
In school now	0.95 ***	(0.88, 0.98)	0.80 *	(0.33, 0.97)
Skipped school >4 days in past month	0.63 ***	(0.28, 0.88)	0.50 *	(0.12, 0.88)
Educational Expectations	0.06	(0.00, 0.88)	0.22 *	(0.06, 0.56)
<i>Relationship and Sexual History</i>				
Young first sex	0.38 *	(0.09, 0.78)	0.44 *	(0.13, 0.81)
Mean age at first sex	0.18	(0.03, 0.59)	0.03	(0.00, 1.00)
Sexual relationships in the past 6 months				
None	0.00	(0.00, 1.00)	0.30	(0.06, 0.74)
Main only	0.00	(0.00, 1.00)	0.05	(0.00, 0.98)
Casual only	0.16	(0.01, 0.86)	0.00	(0.00, 1.00)
Both main and casual	0.75 **	(0.39, 0.94)	0.00	(0.00, 1.00)
Accessed reproductive health services in the past 6 months	0.31 *	(0.06, 0.75)	0.38 *	(0.10, 0.77)
<i>Risk Profile</i>				
Gang affiliation				
Individual	0.47	(0.08, 0.90)	-	-
Close friends	0.22	(0.03, 0.74)	0.38 *	(0.10, 0.77)
Family	0.29	(0.05, 0.75)	0.27	(0.05, 0.72)
Close friend incarcerated	0.65 ***	(0.29, 0.89)	0.26	(0.04, 0.72)
Close friend pregnancy	0.03	(0.00, 1.00)	0.36 *	(0.09, 0.76)
Frequent marijuana use	0.67 ***	(0.31, 0.90)	0.61 ***	(0.26, 0.88)

*
p 0.05**
p 0.01***
p 0.001