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The Relationship between Neighborhood Characteristics and Recruitment into Adolescent Family-Based Substance Use Prevention Programs

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Abstract

Youth in disadvantaged neighborhoods are at risk for poor health outcomes. Characteristics of these neighborhoods may translate into intensified risk due to barriers utilizing preventive care, such as substance use prevention programs. While family-level risks affect recruitment into prevention programs, few studies have addressed the influence of neighborhood risks. This study consists of 744 families with an 11-12 year old child recruited for a family-based substance use prevention program. Using U.S. Census data, logistic regressions showed neighborhoods were related to recruitment, beyond individual characteristics. Greater neighborhood unemployment was related to decreased agreement to participate in the study and lower rates of high school graduation were related to lower levels of actual enrollment. Conversely, higher rates of single-female headed households were related to increased agreement. Recruitment procedures may need to recognize the variety of barriers and enabling forces within the neighborhood in developing different strategies for the recruitment of youth and their families.

Keywords

neighborhoods; prevention program recruitment; adolescent substance use; health care utilization

Beyond the effects of individual background characteristics, certain neighborhood characteristics can place adolescents at increased risk for poorer health outcomes, such as delinquency and substance use.¹⁻⁴ Some neighborhood characteristics may make access to health care difficult, intensifying risk for problem behaviors. Neighborhood characteristics may impact not only utilization of treatment services, but also for prevention of disease.

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Ability to utilize prevention services is critical because of the potential to decrease costs for individuals and communities from treatment and delinquent activity.

There are several plausible explanations for the association between neighborhood characteristics and poor youth outcomes. According to theoretical models, social disorganization, a characteristic of the neighborhood context, makes it difficult for residents to control their environments.⁵ Both physical (e.g., abandoned buildings, vandalism) and social (e.g., public drinking, unsupervised children) characteristics of neighborhoods have previously been used to indicate neighborhood disorganization.⁶ Census variables linked to families' addresses through geocoding are also often used to indicate disorganization, because demographic characteristics like ethnic heterogeneity may interfere with residents' abilities to create stable social networks and impose shared norms in their community.⁷ Disorganization can disrupt healthy behavior for both adults and youth in the neighborhood. In contrast, neighborhoods with high social organization are more likely to have stronger social ties and informal social controls, which help spread and healthy behavior among residents.^{8,9}

Disorganization may lead to negative adolescent outcomes by interfering with neighbors' ability to develop stable social networks and to enforce shared values,⁷ as well as higher crime rates and lack of positive role models.¹⁰ Further, Sampson, et al.⁸ suggest that the potential for shared norm enforcement is less available to residents through lower levels of social capital in such neighborhoods. For example, neighborhoods with greater concentrated disadvantage had less child-centered social control,⁸ which puts more of a burden on individual parents.

High levels of disorganization and low levels of social capital in a neighborhood could intensify the risk of adolescent problem behaviors by making health care utilization particularly difficult. Disorganization may create barriers through lowered availability of medical facilities, less knowledge or means to use available services,^{11,12} and stressors that may require families to only deal with immediate needs rather than less urgent needs, such as prevention. Low social capital in these neighborhoods could also affect utilization of preventive services, as residents would not be able to use social ties and shared norms available through social capital to spread information and values for healthy behavior and use of available services. This may be intensified for low-income families who are already facing greater difficulties in utilizing health care.

Neighborhood Characteristics and Utilization of Treatment Health Care Services

Prior neighborhood studies have focused on utilization of treatment services, or medical services in general, rather than specifically on preventive services. However, these studies are informative for understanding how neighborhood characteristics may pose particular barriers to utilizing preventive health care. Residents of disorganized neighborhoods are less likely to use treatment and medical services,¹³ independent of residents' own demographic characteristics. Specifically, areas with higher rates of unemployment are related to less health care utilization, while areas with higher income and more health centers are related to increased utilization.¹⁴

There are several barriers to utilization of health care services in disorganized neighborhoods. For example, neighborhood characteristics are associated with availability of health care services and the lack of knowledge or means to use such services.^{11,12} This is demonstrated in the history of lower supplies of medical services in low-income and inner-city neighborhoods,^{15,16} although typically a greater demand exists in these areas due to

higher density populations and greater health problems.^{12,17} These difficulties often translate into longer waits for patients and poorer quality care in disorganized neighborhoods.¹⁸⁻²⁰ Some families in these neighborhoods resort to the use of the emergency room for non-emergency health care, adding to their likelihood of long waits and lack of preventive care.²¹ For families wishing to avoid these hassles and receive quality care, they must travel outside of their neighborhoods; however transportation can be a problem for residents of these areas, making location extremely important to health care utilization for these residents.¹²

In addition to difficulties utilizing health care, stressors in disorganized neighborhoods may force families to focus on immediate needs (e.g., food, clothes, shelter) rather than on non-emergency health care, such as prevention services. For these families, expenses for regular preventive medical care may be seen as appropriate only when there is discretionary income. Preventive care and non-emergency care are often delayed until a problem becomes so severe that it requires hospitalization.^{17,22}

Neighborhood Influences on Utilization of Preventive Health Care

Although studies have not examined the relationship between disorganized neighborhoods and utilization of preventive health services for adolescent substance use in particular, data suggest that families in disorganized neighborhoods are less likely to utilize services to prevent a variety of health-related problems. For example, residents of disorganized neighborhoods are less likely to use preventive services for themselves, such as dental services^{23,24} and prenatal care,²⁵ controlling for individual characteristics. Similarly, residents of areas with higher median education are about 1-½ to 2 times more likely to have received a mammogram, while residents of areas with more Hispanic residents, low income, higher rates of poverty, and higher proportions of immigrants are about 1-½ times less likely to seek mammograms, breast exams, or pap smears.²⁶ Residents of disorganized neighborhoods are also less likely to use preventive services for their children, such as immunizations.²³ Lower levels of preventive care utilization could be due to less availability in inner-city doctor's offices,¹⁵ long waiting times, transportation barriers,^{23,25} and competing priorities.²⁷ Disorganized neighborhoods may also have fewer preventive resources and attract less well-educated doctors that may not recommend preventive care.²⁰

Family-based Prevention Programs

Most youth substance use prevention programs solely target the individual youth, such as in school-based approaches.²⁸ While youth-only approaches are effective, effect sizes are generally very small. Since substance use is influenced by family factors,²⁹ substance use prevention tends to be most effective when programs focus on family strengthening activities.²⁸ On average, effect sizes for family-based prevention strategies have been reported as two to nine times larger than child-only approaches.^{30,31}

As family-based approaches have been shown to be more effective than other types of approaches, it is important to determine factors that are related to participant engagement, including recruitment, into such programs. This is especially important to examine, as engagement into family-based prevention programs is very challenging, particularly when the target population is not “captive”, as with school-based programs.³²⁻³⁴

Although neighborhood-level factors have been associated with less use of other medical preventive health care services,^{26,35} few studies have examined the impact of neighborhood-level risk factors in family-based prevention programs for addressing adolescent risky behaviors such as alcohol and other drug use. Neighborhood disorganization could impact the success of family-based substance use prevention programs indirectly by affecting who

is recruited. Although studies have not examined neighborhood level risks for utilization of family-based prevention, family-level risk factors have been shown to affect recruitment.³⁴

Specifically, for family components of multi-component prevention programs, families that are two-parent, have higher SES, or are White or Hispanic, are more likely to attend.³⁶⁻³⁹ However, findings from these multi-component interventions may not generalize to freestanding family-based interventions, as the length and organization of the two types of interventions may be quite different.³⁴ Findings from freestanding family-based prevention programs show that parent education is related to participation,⁴⁰ although family income is generally not related.³⁴ Despite these studies demonstrating family-level effects on participation in family-based prevention programs, studies have not examined the role of neighborhood-level risks not accounted for by these family-level effects.

Hypotheses

The goals of this study were to examine the association between neighborhood disorganization (i.e., low socioeconomic status and residential instability) and recruitment, as measured by agreement to participate and actual enrollment, into family-based adolescent prevention programs focusing on substance use and the promotion of healthy behaviors. Consistent with neighborhood disorganization theory⁵ and prior studies showing that neighborhood disorganization is associated with less use of treatment and preventive health care services,^{13,35} hypotheses were that families residing in disorganized neighborhoods would be less likely to be recruited into family-based prevention programs focused on adolescent alcohol and other drug use (AOD). These relationships were examined while controlling for individual-level factors in order to determine the relationships of neighborhood disorganization above and beyond individual characteristics. Researchers suggest that it is the concentration of individual characteristics (e.g., low income neighborhood) that causes problems for residents outside of effects of individual or family characteristics (e.g., low-income household). For example, Wilson⁴¹ postulated that the concentration of disadvantage (e.g., poverty, unemployment in a neighborhood) resulted from fewer unskilled job opportunities and the middle-class leaving the inner-city after World War II; these changes led to social isolation and changes in neighborhood norms and behavior for those remaining.

Methods

Sample and Procedures

This study utilizes data from the first wave of an ongoing longitudinal study designed to examine the impact of choice on prevention program recruitment and participation as well as adolescent outcomes. For this paper, families identified from two Kaiser Permanente (KP) medical centers (Oakland and Vallejo) in the San Francisco Bay Area were included in analyses. Families from these centers represent a diversity of socioeconomic statuses, ethnicities, and neighborhoods. Study procedures were approved by the Institutional Review Boards at the Pacific Institute for Research and Evaluation (PIRE), Kaiser Foundation Research Institute (KFRI), and University of California, Berkeley.

Eligibility criteria were that at least one family member must be a member of KP at the time the sample was drawn, and that there must be an 11-12 year old child. Families with an 11-12 year old were targeted because the programs are designed for the prevention of adolescent substance use and the promotion of healthy behaviors, prior to the age which most adolescents have initiated use. A large increase in alcohol use is seen after this age, from approximately 3.4% of 12-13 year olds currently drinking alcohol (past month use) to 13.1% among 14-15 year olds.⁴²

KP provided a list of families who met these eligibility criteria ($N = 1,983$). Then families were assigned to one of two conditions: 1) Random Control Trial (RCT), in which families were randomly assigned to one of two programs or a control condition and 2) Choice condition, in which families chose between the two programs. Families were sent letters on KP letterhead inviting participation in the study, signed by the Chief of Pediatrics. Families were invited to call to schedule an enrollment interview, and also given the option to “opt-out” of the study by calling a number to be placed on a no-contact list. Trained recruiters, representing diverse ethnic backgrounds, then called families to confirm eligibility (families were excluded if the child did not live with his/her parents, if the family did not speak English, or if the child was currently participating in ATOD treatment) and to schedule enrollment interviews if the family agreed to participate in the study. The scripts used during these recruitment calls are available upon request. If contact information was incorrect, KP was usually able to provide corrected information. However, for a few cases (5% of attempted contacts) where address information was correct but phone numbers were not, KP was not able to provide new telephone contact information. In these cases, correspondence was conducted via mail. Recruiter contacts confirmed that 823 families were eligible. Of the 823 eligible families, the addresses of 79 families were not able to be geocoded to allow for the collection of archival neighborhood data from the census, either due to incorrect addresses or due to residences in new subdivisions/streets that were not reflected in current maps.

Of the remaining 744 families, 351 families agreed to participate in the study. Of these, 214 families came to the health care facility to enroll in the study and completed the first interview (mothers/female caregivers and youth completed separate face-to-face baseline enrollment interviews). Parent and youth each received \$30 for interview completion.

Age and gender data were available for the entire sample. About half (47.4%) of the youth were female. Per study criteria, youth were 11 or 12 years of age at recruitment ($\bar{x} = 11.5$; $SD = .50$). Mothers' ages ranged from 24 to 69 ($M = 41.93$; $SD = 7.05$). Ethnicity and education information was available for a smaller sample. Mothers provided ethnicity information, and were allowed to endorse multiple ethnicities, resulting in the following racial breakdown: 37.8% White, 32.3% African-American, 17.1% Hispanic, 16.8% Asian, 3.1% American Indian/Alaskan Native, and 1.0% Pacific Islander. Nearly half (45.2%) of mothers had graduated from college.

Programs

The programs offered in the study were: Strengthening Families Program: For Parents and Youth 10-14 (SFP)⁴³ and Family Matters (FM).⁴⁴ Both are theory-based universal programs, not targeted at specific groups, and focus on similar risk and protective factors for adolescent substance use and the promotion of healthy behaviors. Both have been evaluated in rigorous randomized experimental designs and shown to be effective in preventing adolescent ATOD.⁴⁵⁻⁴⁸ The programs have substantial differences in their structure and time investment for families.

SFP—SFP is a group program led by health educators in seven weekly sessions at KP medical centers. The first hour involves separate groups for parents and adolescents, while the second hour involves a combined session for families to practice skills learned in the first hour. Based on the biopsychosocial model, SFP targets family risk and protective factors that are related to adolescent problem behavior.^{49,50,51} For example, risk factors such as poor parental discipline and poor parent-adolescent relations and protective factors including parental empathy and parent-adolescent bonding are emphasized in the program.^{52,53}

FM—FM is a program that parents lead for their family at home using four booklets mailed to them one at a time. Health educators call to provide encouragement and discuss any issues parents have with the program. FM development was guided by key concepts in public health and health promotion practice, including the targeting of environmental or ecological risk and protective factors.^{54,55}

Measures

Neighborhood Disorganization—Census data was gathered from the 2000 *Census of Population and Housing*, publicly available from the U.S. Census Bureau to assess neighborhood characteristics for the census block groups in which the participating families live. Families' addresses were geocoded to determine block group membership so that families could be linked to census data for their block group. All census data are presented in proportions (i.e., the number of people who make up each characteristic divided by the total population of the neighborhood block group). Items were standardized prior to analyses.

Low Socioeconomic status (SES)—Low SES variables are the most commonly examined census variables used in neighborhood studies.² Five items commonly used to reflect low SES were used, including the rates of overall unemployment, persons below the poverty line, households receiving public assistance, high school dropouts, and female-headed households. Items were standardized and high scores indicate the existence of a greater proportion of low-income residents.

Residential Instability—Residential instability is also a frequently used indicator of neighborhood characteristics.² The proportion of residents who have moved in the past 5 years was used to indicate residential instability. This item was standardized and high scores indicate higher levels of residential instability.

Recruitment—Two variables were used as indicators of recruitment into the study: 1) whether the mother agreed to participate in the study (indicated by scheduling an appointment for a baseline enrollment interview), and 2) whether the family actually enrolled in the study, indicated by signing the consent forms and completing the face-to-face baseline interview at the KP Medical Center.

Individual variables—Background variables include mothers' reports of her ethnicity (White = 1) and family SES, as indicated by mothers' education level (college graduate = 1). Mothers' age and youths' gender (male = 1) were also obtained through KP patient records.

Data Analysis—Descriptive analyses provided an overview of neighborhood characteristics and average recruitment rates. To determine if non-independence among observations sampled from the same block group might bias statistical tests, an intraclass correlation coefficient (ICC) was computed for agreeing to participate and enrolling in the study. Results showed low ICC values ($p = 0.02$ and 0.03 , respectively) indicating that non-independence at the neighborhood level was negligible. It is also worth noting that, on average, each block group had fewer than 2 families each (1.58 families per block group). Using the formula provided by Kish,⁵⁶ the design effect was estimated at 1.01, resulting in an effective N for these analyses of 737, which differs only trivially from the total sample of 744. Given that the observations were essentially independent and that a large proportion of the block groups had only 1 family, family was treated as the highest level unit of analysis. Accordingly, standard logistic regression analyses were used to examine relationships between neighborhood characteristics and recruitment rather than a multilevel regression approach.

Agreeing to Participate—First we examined predictors of agreeing to participate in the study. Within this set of analyses, logistic regressions were conducted for two groups: 1) Sample 1, which was the full sample of 744 families, and 2) Sample 2 (N = 456), which includes only those families from Sample 1 providing complete demographic information in order to control for individual SES and ethnicity in the models. Even parents who refused to participate in the study were asked for demographic information at the initial contact for recruitment. Missing demographic data was not refused to be provided, however, many of the families who did not agree to participate ended the call before demographic questions were asked and so did not provide complete demographic information (N = 288). In these cases, responses were supplemented with two variables considered to be non-identifying, parent age (not date of birth) and child gender, obtained through KP records. KP did not provide information regarding any other variables. At the time of enrollment into KP, members were informed that their demographic information may be used in research studies. However, members could request to be placed on a no-contact list. This list was used to exclude some individuals from any contact for our study.

For analyses with Sample 1, controls were the available demographic variables, parent age and child gender. Sample 2 was included in analyses so that it would be possible to determine neighborhood effects above and beyond any effects of similar characteristics at the individual level. For example, a low-SES family might experience very different outcomes living in a low-SES neighborhood as compared to a high-SES neighborhood based on differing resources in the neighborhood.

Enrolling in the Study—The second set of analyses examined neighborhood predictors of enrolling in the study. Again, within this set of analyses, logistic regressions were conducted for two groups: 1) Sample 3, including all of the families who agreed to participate in the study (N = 351), and 2) Sample 4 (N = 341), including only those families who agreed to participate that provided complete demographic information in order to control for individual SES and ethnicity in the models.

Results

Overall Recruitment Rates

Of eligible families who were able to be contacted, about half (47.2%) agreed to participate in the study, and more than half (61.0%) of those families enrolled in the study. Analyses indicate few demographic differences between families who agreed to participate as compared to those who refused, as well as between those who enrolled and those who did not (See Tables I and II). Specifically, African-Americans were significantly more likely to agree to participate, while Asians were less likely. Caucasians, Asians, college graduates, and older parents were more likely to enroll, whereas African-Americans were less likely.

Neighborhood Disorganization

Neighborhoods of residence for families in the sample reflected a diversity of neighborhood conditions. Table III presents descriptive statistics of neighborhood variables, including means, standard deviations, and ranges.

Sample Differences

Analyses were conducted to determine demographic differences between the samples providing all demographic information (Samples 2 and 4) and the remaining families (Samples 1 and 3) on the variables available in all samples: child gender and parent age. No significant differences between these sets of samples existed for child gender ($\chi^2 = 0.68$, $p = 0.41$) or parent age ($t = .44$, $p = 0.66$).

Logistic Regressions

Results from logistic regression analyses are presented in Tables IV and V, and are described separately below for agreeing to participate and enrolling in the study, and for each sample. Logistic regression analyses allow for the calculation of odds ratios, which provide information regarding the risk of a certain outcome occurring.⁵⁷ Odds ratios equal to one suggest that the outcome is as likely to happen as not. If the odds ratio is greater than one, the outcome is more likely to happen than not, and if the odds ratio is less than one, the outcome is less likely to happen than not.

Agreeing to Participate

Sample 1—For Sample 1, the individual variables included in the model were parent age and child gender (see Table IV). Higher levels of neighborhood unemployment (OR = 0.73, $p < .01$) were related to decreased agreement to participate, such that the odds of agreeing were decreased by 27% for each percentage point increase in neighborhood unemployment.

Sample 2—Table IV also presents findings for Sample 2. Among the neighborhood effects tested, only higher rates of single-female headed households were related to increased agreement to participate (OR = 1.43, $p < .05$). The odds of agreeing to participate were 43% greater for each percentage point increase in neighborhood single-female headed households.

Enrolling in the Study

Sample 3—As shown in Table V, for Sample 3, the odds of enrolling decreased by 44% for each percentage point increase in neighborhood high school dropouts (OR = 0.56, $p < .01$). Parent age was related to increased levels of enrollment (OR = 1.04, $p < .05$) so that the odds of enrolling increased 4% for each year of parent age.

Sample 4—No neighborhood variables were related to enrollment for Sample 4 (see Table V). However, two personal characteristics, ethnicity and education, were related to enrollment, so that the odds of enrolling were about 100% higher for White parents than for non-White parents (OR = 2.08, $p < .05$) as well as for college graduates than for those not completing college (OR = 2.09, $p < .01$).

Discussion

Study findings suggest that families residing in disorganized neighborhoods may experience both forces for and barriers against recruitment into family-based prevention programs focused on substance use and promotion of healthy behaviors, independent of the effects of individual characteristics. In contrast to prior research that has primarily emphasized the barriers to utilizing health care, findings from this research suggest that there are some neighborhood forces encouraging recruitment into prevention programs. Specifically, families in neighborhoods with more single mothers were more likely to agree to participate in the study, controlling for individual and other neighborhood characteristics. Neighborhoods with many single mothers may be characterized by a lack of support and resources for youth in particular, both within each family and by the lack of collective supervision and resources available from other neighborhood adults to ease the burden on individual families.⁵⁸ These neighborhoods are characterized by families with only one working adult (females), and may provide fewer neighborhood role models for youth, as well as few resources remaining to help provide collective resources to other neighborhood youth. Involvement in prevention programs may be seen as a way to gain the additional parenting-specific resources lacking in the neighborhood.

Consistent with study hypotheses and neighborhood disorganization theory,⁵ neighborhood barriers to recruitment were also found. Families in neighborhoods with higher rates of general unemployment were less likely to agree to participate in the study, and those in neighborhoods with more high school dropouts were less likely to enroll in the study. These findings are consistent with prior studies showing that neighborhood disadvantage is associated with less use of treatment services,^{13,14} suggesting that the effects of neighborhoods on treatment seeking may parallel effects on prevention seeking. As such, results are also consistent with studies finding that neighborhood disadvantage is related to less use of other preventive health services.^{23,24,26} For example, Andersen and colleagues¹⁴ found that in areas with higher rates of unemployment, both adults and children were less likely to utilize health care services. Similarly, increased neighborhood levels of education have been associated with increased use of mammograms.²⁶

There are several possible explanations why neighborhood disorganization may make recruitment into prevention programs less likely. Prior studies show that certain characteristics of these neighborhoods may lower utilization of health services. For example, families in more disorganized neighborhoods typically receive lower quality health services and face more hassles such as long waits.^{15,18-20} Families experiencing these problems may be less willing to participate in prevention programs, anticipating similar difficulties. In addition to problems utilizing care, stressors in disorganized neighborhoods may force families to concentrate on immediate pressures instead of on prevention.^{27,59} However, determining the reason families do not participate in programs is difficult because many families do not state a reason even if probed and may not explicitly think of neighborhood influences as reasons. Future research should explore whether families see an association between their neighborhood contexts and their ability to participate in family programs (e.g., fewer services available).

Results differed across samples. Specifically, findings using samples that included families regardless of whether they provided demographic information (Samples 1 and 3) were consistent with hypotheses that neighborhood disorganization appears to be a barrier to recruitment, while findings using the samples including only those families providing complete demographic information (Samples 2 and 4) pointed to features that encourage families to participate in programs. Descriptive analyses showed that the families providing complete demographic information (Samples 2 and 4) did not differ from the remaining families (Samples 1 and 3) on the available demographic variables, child gender and parent age. However, it is possible that differing findings may result from group differences on other characteristics, such as a general tendency to seek help or problems the family may already be experiencing, as these may be related to greater participation.

One sample difference is that when individual-level SES variables are added to the model for Sample 4, neighborhood effects are no longer related to actual enrollment. Individual characteristics may be more important in determining enrollment for this sample. White parents and college graduates were much more likely to enroll in the program than were nonwhites and those with less education. However, these groups were not any more likely to agree to participate during recruitment, indicating that these variables may influence the ability to follow through and actually participate, possibly due to greater resources and fewer stressors allowing them the luxury to focus on prevention. However, regarding the decision to agree to participate, with individual SES included, the neighborhood context still remains an important positive influence. Specifically, families in neighborhoods with higher rates of single female headed households were more likely to agree to participate, while controlling for these individual variables. These findings point to the importance of neighborhood features not accounted for by individual level characteristics.

Bivariate findings also showed that individual characteristics remain important in influencing recruitment into such programs. Interestingly, African-American parents were more likely to agree to participate but less likely to actually enroll than other groups, while the opposite was found for Asian parents. It may be that African-Americans wanted to participate, and so agreed, but barriers prevented them from actually enrolling in the study. This is consistent with prior studies showing barriers to recruiting African-Americans, such as underutilization of health services and distrust of the medical/scientific community.^{60,61} However, although Asian families are more likely to follow through with enrollment once they agree to participate, they are less likely to agree in the first place than other groups. Asian families might worry that the program will be culturally inappropriate or not relevant to their needs.⁶⁰ This might suggest that mail and phone recruitment alone may not be the most effective recruitment strategy for Asian families. Some studies suggest that including initial community involvement in recruitment efforts, such as involving health professionals or community based organizations in the targeted ethnic communities, can increase recruitment in minority populations.⁶¹ In addition, culturally competent interventions may also be effective in attracting minority populations.

Both the advantages and limitations of telephone recruitment over other recruitment methods should be noted. A substantial advantage is its relative low cost and effectiveness in contacting a large number of families,⁶² and its efficiency in determining the eligibility of potential participants.⁶³ The inability to include families without phones and difficulty contacting families with missing or changed phone numbers present limitations.⁶² Although refusal rates are often higher for phone recruitment as compared to in-person recruitment,⁶⁴ in-person recruitment can be very expensive and time-consuming. In addition, phone recruitment tends to have lower refusal rates than does mail recruitment.⁶³ A combination of methods is often recommended as more effective than any single method.⁶²

One limitation of this study is the cross-sectional nature of the study, meaning that causality cannot be determined. Additionally, census boundaries may not match residents' perceptions of their own neighborhood boundaries,⁶⁵ and perceptions of neighborhood features may be important to residents' behaviors. For example, both adult and youth perceptions of lower social cohesion are related to increased levels of neighborhood alcohol and drug use among youth.⁶⁶ In the current study, neighborhood perceptions were assessed, but only after recruitment into the program, thus limiting the current analyses to census data only. Future studies will examine the role of neighborhood perceptions on level of participation in prevention programs among those recruited. It is also possible that other individual variables not examined could be related to recruitment. However, since the purpose of the paper was to examine the relation of neighborhood variables with recruitment, we focused on individual variables that are commonly included in neighborhood studies as controls.

The low recruitment rate of the study also presents a limitation in generalizing results to a wider population. However, the engagement of participants in prevention programs, especially, universal family-based programs, is a considerable challenge.³²⁻³⁴ As such, recruitment rates for programs that target both youth and parents are typically very low.³² Our recruitment rate of 47% is comparable to other family-based prevention programs, such as that reported by Heinrichs et al.³² for a universal family program (31%) and Bronstein et al.⁶⁷ for a parent program (38%).

Another issue is that recruiters were not matched to families based on race/ethnicity. It is possible that being recruited by an individual of a different race or ethnicity may lessen families' interest in participating. However, as recruiters were from diverse racial/ethnic backgrounds, and only spoke to families over the phone, it is unlikely that this posed a substantial barrier to recruitment.

Implications for Behavioral Health

This study indicates the importance of neighborhood characteristics for recruitment into family-based prevention programs. Findings suggest that recruitment procedures may need to emphasize different strategies according to specific neighborhood conditions to ensure recruitment of families who are at risk. For example, programs provided in disorganized areas may need to be altered in order to make them more accessible, such as providing transportation vouchers, childcare, or meals,⁶⁸ and emphasizing these additional features during recruitment. These strategies may be less important in more socially organized neighborhoods. In addition, when recruiting in neighborhoods with high rates of single-female headed households, recruitment may be boosted by using protocols that emphasize the potential of the program to help mothers gain parenting-specific resources and support of other community adults.

Overall, findings from this study contribute a better understanding of neighborhood characteristics that may indirectly put adolescents at risk for poor health outcomes, through lowered participation in family-based prevention programs. As family-based programs have been shown to be effective in reducing problem behaviors and strengthening family protective factors,^{30,31} it is important to determine specific challenges to the engagement of families in such programs. For example, transportation challenges may be addressed through providing transportation vouchers. Addressing the challenge of busy schedules may be addressed by providing meals so that families do not have to fit in mealtime around program attendance. Future studies should extend these findings to adolescent outcomes in order to confirm whether neighborhoods indirectly affect adolescent substance use and other problem behaviors by first affecting program recruitment and participation. Findings from this work have important implications for the development of prevention programs in the field of adolescent substance abuse and other problem behaviors and help determine whether health promotion messages are reaching families in at-risk areas.

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Table I
Parent and Child Characteristics by Agreement to Participate in the Study

Variables	All families (N = 744)	Agreed to participate (n = 351)	Did not agree to participate (n = 393)	Statistics
<i>Parent</i>				
Average Age <i>M</i> (<i>SD</i>)	41.93 (7.05)	41.40 (7.38)	42.40 (6.73)	$t=1.789$
% Graduated from College	45.2	44.4	47.8	$\chi^2=0.414$
Ethnicity (%)				
White	37.8	39.5	33.3	$\chi^2=1.502$
African American	32.3	36.9	20.2	$\chi^2=11.950^{**}$
Asian	16.8	13.8	24.8	$\chi^2=8.178^{**}$
Hispanic	17.1	16.8	17.8	$\chi^2=0.075$
Pacific Islander	1.0	0.9	1.6	$\chi^2=0.430$
American/Alaskan Native	3.1	4.0	0.8	$\chi^2=3.259$
<i>Child</i>				
% Female	47.4	49.6	45.5	$\chi^2=1.205$

^{**}
 $p < .01$

Table II
Parent and Child Characteristics by Enrollment

Variables	All families (N = 351)	Enrolled (n = 214)	Did not enroll (n = 137)	Statistics
<i>Parent</i>				
Average Age <i>M</i> (<i>SD</i>)	41.40 (7.38)	42.39 (7.16)	39.89 (7.48)	$t=-2.901^{**}$
% Graduated from College	44.4	53.7	29.3	$\chi^2=19.808^{***}$
Ethnicity (%)				
White	39.5	48.6	25.4	$\chi^2=18.335^{***}$
African American	36.9	30.7	46.3	$\chi^2=8.404^{**}$
Asian	13.8	16.8	9.0	$\chi^2=4.289^*$
Hispanic	16.8	14.1	20.9	$\chi^2=2.704$
Pacific Islander	0.9	0.9	0.7	$\chi^2=0.034$
American/Alaskan Native	4.0	4.2	3.7	$\chi^2=0.048$
<i>Child</i>				
% Female	49.6	50.9	47.4	$\chi^2=0.407$

*
 $p < .05$,

**
 $p < .01$,

 $p < .001$

Table III
Neighborhood Characteristics: Mean Percentages across Census Block Groups

Variables	All families (N = 744)	Range
<i>Low SES M (SD)</i>		
Unemployment	6.44 (5.40)	0.00 - 43.54
Below poverty line	10.45 (10.00)	0.00 - 61.64
On Public assistance ^a	4.73 (5.99)	0.00 - 40.10
High school dropout	17.55 (14.22)	0.00 - 72.77
Female headed households ^a	11.35 (9.12)	0.00 - 55.80
<i>Residential Instability M (SD)</i>		
Moved past 5 years	17.22 (8.62)	0.00 - 69.80

^aVariable refers to percentage of *households* in neighborhood, whereas other variables refer to percentage of *persons*.

Table IV
Associations between Neighborhood Disorganization and Agreement to Participate

<i>Sample 1</i>	β	<i>SE</i> β	Wald's χ^2	<i>p</i>	<i>e</i> β (odds ratio)
<i>Individual</i>					
Child Gender	-0.20	0.16	1.50	0.221	.82
Parent age	-0.02	0.01	2.90	0.089	0.98
Parent white	--	--	--	--	--
College graduate	--	--	--	--	--
<i>Neighborhood</i>					
% Unemployment	-0.31	0.12	6.75	0.009	0.73**
% below poverty line	0.17	0.16	1.17	0.279	1.18
% on Public assistance	-0.23	0.14	2.58	0.108	0.80
% High school dropout	0.20	0.14	2.03	0.154	1.22
% Female headed	0.19	0.12	2.56	0.109	1.21
% moved past 5 years	-0.03	0.09	0.12	0.724	0.97
<i>Sample 2</i>					
<i>Individual</i>					
Child Gender	-0.07	0.24	0.09	0.758	0.93
Parent age	-0.02	0.02	1.77	0.183	0.98
Parent white	0.31	0.27	1.34	0.248	1.36
College graduate	-0.03	0.26	0.01	0.904	0.97
<i>Neighborhood</i>					
% Unemployment	-0.28	0.16	2.81	0.094	0.76
% below poverty line	0.11	0.24	0.22	0.641	1.12
% on Public assistance	-0.27	0.22	1.52	0.218	0.76
% High school dropout	0.33	0.23	2.11	0.147	1.39
% Female headed	0.36	0.18	4.20	0.040	1.43*
% moved past 5 years	-0.11	0.12	0.80	0.370	0.90

* $p < .05$,

$10 > d$
**

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Table V
Associations between Neighborhood Disorganization and Enrollment

<i>Sample 3</i>	β	<i>SE</i> β	Wald's χ^2	<i>p</i>	<i>e</i> β (odds ratio)
<i>Individual</i>					
Child Gender	-0.26	0.25	1.08	0.298	.772
Parent age	0.04	0.02	4.35	0.037	1.04*
Parent white	--	--	--	--	--
College graduate	--	--	--	--	--
<i>Neighborhood</i>					
% Unemployment	0.12	0.17	0.49	0.485	1.13
% below poverty line	0.08	0.25	0.11	0.743	1.09
% on Public assistance	0.31	0.22	1.92	0.165	1.36
% High school dropout	-0.58	0.21	7.57	0.006	0.56**
% Female headed	-0.16	0.16	1.00	0.317	0.85
% moved past 5 years	0.08	0.14	0.34	0.561	1.09
<i>Sample 4</i>					
<i>Individual</i>					
Child Gender	-0.20	0.26	0.61	0.436	0.82
Parent age	0.01	0.02	0.57	0.448	1.01
Parent white	0.73	0.30	6.07	0.014	2.08*
College graduate	0.74	0.28	6.88	0.009	2.09**
<i>Neighborhood</i>					
% Unemployment	0.12	0.18	0.47	0.493	1.13
% below poverty line	-0.09	0.26	0.11	0.736	0.92
% on Public assistance	0.41	0.23	3.25	0.071	1.51
% High school dropout	-0.38	0.22	3.09	0.079	0.68
% Female headed	-0.10	0.17	0.34	0.562	0.91
% moved past 5 years	0.13	0.15	0.84	0.361	1.14

$10' > d'$
**
 $p < .05$
*

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