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Protective Effects of Sports Participation on Girls' Sexual Behavior

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Abstract

Data from female high school students who participated in the in-home survey of the National Longitudinal Study of Adolescent Health were used to (1) examine the net impact of sports participation after controlling for variables known to predict adolescent girls' sexual activity; (2) study whether the impact of sports is similar for girls from different racial and ethnic backgrounds; and (3) separate the testing of the protective effect of sports participation on ever having had sexual intercourse from its effect on engaging in risky sexual activities. The results obtained suggest that the protective effects of sports participation on high school girls' sexual activity are contextual. In general, participation in sports has a small but statistically significant protective effect for delaying becoming sexually active. However, whether sports' protection extends to lower likelihood of engaging in risky sexual behaviors depends in large part on a girl's race/ethnicity and on where she lives.

Protective Effects of Sports Participation on Girls' Sexual Behavior

Reducing sexual health risk behaviors that can result in unintended pregnancies and sexually transmitted diseases (STDs), including HIV, among adolescents is a public health concern in which the federal, state, and local governments as well as non-governmental organizations have already invested considerable resources. The impetus for this study comes from recent findings that participation in sports is associated with lower sexual health risk behaviors among adolescent girls (Miller, Sabo, Farrell, Barnes, & Melnick, 1998; Sabo, Miller, Farrell, Barnes, & Melnick, 1998). The significance of this issue lies not only in a socially desirable public health outcome, which is the reduction of unwanted pregnancy and exposure to STDs, but also in the widespread availability of participation in sports as the probable solution. Elucidating why and for whom the association between sports participation and risky sexual behavior holds can provide the scientific basis for prevention efforts.

To this end, we have examined the protective effects of sports participation on girls becoming sexually active and also on sexually active girls' tendency to engage in risky sexual behaviors in a nationally representative sample of Caucasian, African American, Latina, and Asian American high school students. Studying girls from different racial and ethnic backgrounds is important because known risk factors for sexual activity do not predict sexual health risk behaviors equally well across race/ethnicity (see Moore, Miller, Gleib, & Morrison, 1995; Perkins, Luster, Viaruelle, & Small 1998; Small & Luster, 1994). In this paper we focus on girls' participation in sport because earlier research has shown the protective effect of sports participation to be gender specific. The research of Miller et al. (1998) and Sabo et al. (1998) has shown that participation in sports is associated with lower incidences of risky sexual behaviors for girls but not for boys.

Our goal is to (1) examine the net impact of sports participation after controlling for variables known to predict adolescent girls' sexual activity; (2) study whether the impact of sports is similar for girls from different racial and ethnic backgrounds; and (3) separate the testing of the protective effect of sports participation on ever having had sexual intercourse from its effect on engaging in risky sexual activities.

Sexual Health Risk Behaviors

Risky sexual behaviors are those that increase the two main health risks for girls: unintended pregnancies and STDs. With the growing threat of the spread of HIV, condom use has come to be seen as a first line of defense both for unintended pregnancies and STDs, including HIV. Therefore, anything that increases the likelihood of engaging in sex and/or reducing the likelihood of condom use is a potential risk factor. Multiple sexual partners and co-occurrence of sexual activity with drug or alcohol use reduce the likelihood of using condoms (see Moore, Miller, Gleib, et al., 1995; Moore, Miller, Sugland, et al., 1995). Precocious sexual activity — that is, becoming sexually active at an earlier age than one's peers — increases sexual health risks not only because of longer exposure to sexual activity but also because it predicts the tendency to engage in other problem behaviors such as alcohol consumption as well as the co-occurrence of sex while using drugs and alcohol (Biglan, et al., 1990; Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1999; Small & Luster, 1994). In summary, sexual health risk behaviors are early initiation of sexual activity, multiple sexual partners, frequent sexual activity, having sex while high on drugs or alcohol, and not using contraception consistently.

The relationship between adolescent girls' involvement with sports and lower levels of self-reported risky sexual behaviors was first widely publicized by the Women's Sports Foundation (Sabo et al., 1998). In a nationally representative sample of 11,000 students in grades 9 through 12 who

completed the Youth Risk Behavior (YRB) Survey, female athletes were half as likely to get pregnant, more likely to report that they had never had sexual intercourse, and more likely to have had their first sexual intercourse at a later age than female non-athletes (Sabo et al., 1998). These results were corroborated by a separate investigation, the Family and Adolescent Study, carried out by the New York State Research Institute on Addiction, which collected data from a representative household sample of 611 adolescents from families in Western New York (Miller et al., 1998). Female athletes in Western New York had fewer sex partners and had sexual intercourse less frequently than female non-athletes.

For boys, in the national YRB study, African American male athletes reported earlier onset of intercourse but no other consistent patterns of differences between male athletes and non-athletes emerged in sexual behavior (Sabo et al., 1998). Male athletes in the Western New York study reported significantly earlier onset of sexual intercourse and slightly, but not significantly, higher rates of sexual activity than male non-athletes (Miller et al., 1998). More importantly, Miller and her colleagues report that the protective effect of sports on girls' risky sexual behavior remained, net of the influence of race, age, socioeconomic status, quality of family relations, and participation in other extra-curricular activities. In other words, more frequent sports participation among girls but not among boys was found to be related to lower incidences of risky sexual activity, even when controlling for factors known to be associated with sexual behavior.

One drawback of the YRB and Western New York studies was that their results on the protective effects of sports participation for girls were obtained on all adolescents in the sample, regardless of whether or not they were sexually active. Therefore, it is not possible to know whether the lower rates of risky behavior observed among girls who participated frequently in sports is due to the

fact that they are not sexually active or to sports having a protective effect on sexually active youth, as well. That is, the observed protective effects of sports participation on risky sexual behavior may be an artifact of including in the sample youth who do not engage in sexual activity, risky or otherwise. Since engaging in risky sexual activity implies being sexually active, the possible protective effects of sports participation on such behaviors as early onset of sexual activity, having multiple sexual partners, using alcohol or drugs when having sex, and not using condoms needs to be examined among sexually active youth. These analyses should exclude youth who are not sexually active, which is what we have done in the present study.

Controlling for Variables that have been Shown to Predict Sexual Activity

If sports participation is to be taken seriously as a potential focus of intervention for reducing high-risk sexual activity among girls, we need to examine its impact relative to other known protective factors. In other words, the presence of protective factors and the absence of risk factors need to be controlled for in the examination of the relationship between sports participation and sexual activity.

Risk and protective factors. Moore and her colleagues' (Moore, Miller, Gleib et al., 1995) review of recent research on adolescent sex, contraception, and childbearing provides a summary of what is known about adolescent sexual activity on the basis of research conducted with White and African American adolescents. Age is a known risk factor (National Center for Health Statistics, 1994). It is not that older adolescent girls are necessarily more sexually risk-taking than are younger girls. Rather, sexual activity poses a cumulative risk of unintended pregnancy over time. Being physically more mature than one's peers appears to be a risk factor (Moore, Miller, Gleib et al., 1995). The socioeconomic level of the neighborhood (Billy & Moore, 1992) and the region of the country in which the adolescent resides have also been shown to be risk factors (Moore, Miller, Gleib et al., 1995).

Residents of the South have higher early childbearing; so do adolescents who engage in other forms of risk-taking, associate with peers who are similarly engaged in risky behaviors (Elliott & Morse, 1989; Mott & Haurin, 1988; Serbin, Peters, McAffer, & Schwartzman, 1991), and come from families that received public assistance (Furstenberg, Levine, & Brooks-Gunn, 1990; Zabin, 1994). Factors that have been shown to protect against adolescent childbearing include higher academic ability, participation in supervised activities, being religious, and having parents who provide greater monitoring of the adolescents' activities (Moore, Miller, Sugland et al., 1995). Plotnick (1992) who analyzed longitudinal data from 1,142 White, non-Hispanic girls aged 14–16 in 1979 when first interviewed as part of the National Longitudinal Survey of Youth, found that low self-esteem was one of the variables through which background characteristics influenced premarital pregnancy and childbearing.

Impact of Sports on Sexual Activity across Racial/ethnic Groups

Black adolescent girls have considerably higher rates of childbearing than do Whites girls — 99.3 and 39.3 per 1,000 women respectively (Mathews, Ventura, Curtin, & Martin, 1998). However, Moore and her colleagues report that controlling for relevant social, economic, and family variables on data from the NELS:88 greatly reduced the impact of race (Moore, Miller, Sugland et al., 1995). Haveman and Wolfe (1994) analyzed data from the Panel Study of Income Dynamics of a sample of 873 girls who were 1 to 6 years of age in 1968 to predict non-marital childbearing before age 19. After controlling for family structure, education, religiosity, mother's age at first birth, poverty, unemployment in the neighborhood, level of state welfare benefits, and average per capita family planning expenditure in the state, the Black-White differences in the likelihood of non-marital birth before age 19 were eliminated.

With respect to the association of race and ethnicity with sexual activity, Moore, Miller, Sugland

et al. (1995), report that they tested separate models for Black and White adolescents to examine whether determinants of adolescent childbearing differ by race. They found that some factors (e.g., living in an intact family, having higher grades, changing schools frequently, and being behind in grade) appear to operate in a similar way for Black and for White adolescents. Wu (1994) also found that higher permanent income and changes in family status have a similar impact on Blacks and Whites. Other factors were found to affect Black and White adolescents differently. Moore, Miller, Sugland et al. (1995) found lower childbearing among Black but not White adolescents who report not being popular with their classmates. Similarly, they found that higher standardized test scores were associated with lower risk of non-marital birth for Black adolescents but not for White. Wu (1994) found that inconsistent family income was associated with a higher likelihood of premarital birth among White adolescents but lower likelihood among Black adolescents. Existing literature on the impact of sports participation and sexual activity for girls within or across racial/ethnic groups is sparse. Research on sexual behavior suggests that the relationship between sports participation and sexual activity is not likely to be uniform across race and ethnicity.

Methods

We used data from the National Longitudinal Study of Adolescent Health (Add Health) (Bearman, Jones, & Udry, 1997). These data were collected to assess the health status of adolescents and to explore the causes and consequences of their health-related behaviors. We chose this data set because the data are relatively recent (1994–1996), comprehensive, and include oversampling of minority populations.

The Add Health dataset was based on a clustered sampling design in which 80 high schools and

80 paired “feeder schools” (junior high schools that contributed students to the selected high schools) across the United States yielded a sample of 90,000 adolescents. These students were given the in-school portion of the survey. Then, of this original sample, a sub-sample of students was randomly selected from within strata created by grade and gender combinations and recruited for the in-home portion of the survey.

Sample

Our analyses are based on data taken from the in-home surveys of girls who identified with one racial or ethnic group but excluded those who reported multiple racial/ethnic identifications. This is because we wanted to determine whether or not the protective effects of sports participation hold across racial and ethnic groups and because results from mixed-race groups are hard to interpret. We also excluded Native Americans from the sample because there were too few girls who identified themselves as Native American who did not also list another racial/ethnic identity. We excluded girls who reported having had intercourse before age 11. In addition, in order to compare results across models, we based the analyses on only those respondents with no missing data on the constructs of interest.

Analyses predicting ever having had sexual intercourse are based on 7,768 female adolescents: 4,686 Caucasian, 1,879 African American, 645 Hispanic/Latina, and 558 Asian American girls.

Analyses predicting risky sexual behavior outcomes were conducted using the data from a subsample of girls who reporting having had sexual intercourse more than once. This was because we reasoned that having had intercourse only once might not qualify a girl as being sexually “active.” The sexually active subsample is restricted to girls who were at least 15 years old because younger adolescents were not asked the detailed sexual behavior questions. The sexually active subsample included 1,624 girls: 975

Caucasian, 468 Black, 116 Hispanic/Latina, and 65 Asian.

Constructs and Their Operational Definitions

Dependent Variables

Self-reported sexual behaviors were the key dependent variables. Specifically, these were whether the respondent had ever had sexual intercourse, age of first sexual intercourse, co-occurrence of drugs and sex, having had multiple sexual partners, and use of birth control. The operational definitions of these and other study variables are described in Table 1.

Independent Variables

Sports participation was the key independent variable. It was operationalized as the frequency of participation in sports per week. Other independent variables — race/ethnicity, neighborhood condition (a proxy for neighborhood level SES), family poverty, timing of physical maturity, importance of religion, social age, cognitive ability, parental control, exposure to deviant peers, self-esteem, mother's education (as a proxy for family SES), and urbanization (see Table 1) — had been identified in the research literature as risk or protective factors for adolescent sexual activity. These independent variables were modeled as having both direct effects on their own and interaction effects with sports participation on sexual behavior.²

Control Variables

Several variables were included in the analyses because we thought they might affect both reports of sports participation and sexual behavior. However, since we didn't hypothesize that difference in level on these variables would affect the strength of the relationship between sports and sex, we did not include interaction terms for these variables. These control variables included a marker for whether school was in session during the assessment period, the level of participation in non-athletic

extracurricular activities, and a marker for social desirability bias (see Table 1).

Results

Most of our dependent variables were dichotomous and so were analyzed by means of a series of logistic regressions. The exception to this was the variable assessing the age of first sexual intercourse, which was analyzed by means of linear regressions.³

Model fitting proceeded in several steps. In the first step, a model was fit to test the overall effect of sports when no other predictors were included in the model. In the second step, we added control variables and the direct effects of other predictors (the independent variables). The third step was to introduce two-way interaction terms to the model to test for moderated effects of sports. A fourth step included independent variable by sports participation by ethnic group interactions to examine whether moderator effects of independent variables differed across ethnic groups. This fourth step was carried out only for the model predicting the probability of ever having had sex because subsamples of sexually active girls used in the other analyses lacked adequate statistical power for testing three-way interactions. The sports-related effects for each of these models is shown in Table 2.

Sports Effects on Sexual Behavior

We used data from the full sample to predict the probability of girls reporting ever having had sex. When sports alone was used to predict the probability of ever having had sex, its effect was strong and in the direction hypothesized. The strength of this effect, however, dropped substantially when other predictors were added to the model. When interaction effects were included in the model, sports participation was associated with lower probabilities of having sexual experience only for girls from neighborhoods in serious disrepair (see Figure 1). When the three-way interactions were added to the

model, neighborhood influence on the effect of sports on sexual behavior operated differently for Asians than for Caucasians (and presumably African Americans and Hispanics, since these groups did not differ significantly from the Caucasian group). While greater participation in sports was associated with a steep decrease in probabilities of engaging in sex that most girls from poor neighborhoods experience, sports participation slightly increased the initially very low risk for Asian girls from neighborhoods in serious disrepair (see Figure 2). We must be cautious in assigning meaning to this effect, however. Despite its strength, the parameter associated with this effect is widely variable as a result of having been estimated on data from so few Asian adolescents (only 65 Asian girls met the criterion for being sexually active).

Using data from the subsample of sexually active girls, we first fit a model predicting the age of first intercourse using sports participation alone as the predictor. The effect of sports participation was not statistically significant in this model. However, when the effects of other predictors were controlled in step two, the sports effect became stronger and was in the direction hypothesized. The predicted age of first intercourse was 14.34 years for girls with no sports participation and 14.67 years for those in the highest category of sports participation (see Figure 3). No interaction effects were found to be significant in predicting girls' age of first intercourse.

Sports participation was not a significant predictor of having had multiple sexual partners, either alone as a predictor, in combination with other predictors, or in interaction with any of the independent variables. On the other hand, the interaction model predicting the co-occurrence of drug use and sexual activity revealed several significant interaction effects. Figure 4 shows that African American girls were just as likely as Caucasian girls to combine drugs and sex when they did not participate in sports, but that this risk dropped significantly for African American girls who participated in sports while it

increased slightly for athletically active Caucasian girls. We also found an interaction effect of urbanicity and sports participation on having sex while using drugs or alcohol. It showed that greater sports participation can protect urban girls somewhat while placing rural girls at a slight risk (see Figure 5). There was also an interaction effect of sports participation and neighborhood condition on the risk for combining drugs and sex. Figure 6 shows that the risk of combining sex with drug or alcohol use decreases significantly with higher levels of sports participation only among girls from neighborhoods that are in serious disrepair.

We found no sports effects, either direct or moderated, in predicting the probability of using birth control at least once with each partner. However, we did find a significant interaction of sports with neighborhood condition in predicting the probability of using birth control during every sexual encounter. This interaction effect showed that sports participation increases the risk of unprotected sex, but only for girls from poorly kept neighborhoods (see Figure 7).

Discussion

The results showed that frequent sports participation is associated with fewer girls' reporting they have ever had heterosexual intercourse. The strength of this bivariate relationship is reduced but remains significant when the impact of other influences such as age, race/ethnicity, poverty, religiosity, having deviant peers, being physically mature relative to peers, standardized test scores, self-esteem, urbanization, mothers' education and having parents who have firm control over the adolescent's activities are controlled for. It appears that girls who frequently participate in sports are likely to become sexually active at a later age than their peers who do not get as much exercise. The analyses with sexually active girls also support this interpretation in that we found that girls who are currently sexually

active and participate in sports frequently reported a later age of onset of sexual activity than their sexually active peers who do not participate in sports. This finding regarding the delaying effect of sports participation confirms the national YRB data (Miller et al., 1998) and the Western New York study (Sabo, et al., 1998) results, which showed that girls who participate in sports are likely to have had their first sexual intercourse at a later age than female non-athletes.

Because the present study is a cross-sectional examination, we cannot make claims regarding causality. We have merely demonstrated the association of sports participation with sexual activity by itself and in interaction with other variables. The language of “sports having a protective effect” implies that sports participation has causal priority. However, the relationship between sports and sexual behavior needs to be viewed within the context of variables that are correlated at one point in time. It may well be that girls who are not sexually active are more likely to engage in sports, rather than the other way around. In that case one would have to talk about lack of sexual activity being an inducement to participate in sports frequently.. Longitudinal analyses of sports participation are necessary to help solve these questions regarding the direction of causality.

Our results showed neighborhood poverty is a powerful moderator that interacted with sports participation. Girls who live in neighborhoods judged by trained interviewers to be run down were much more likely to be sexually active if they did not participate in sports than girls from similar neighborhoods who reported frequent sports involvement. This finding confirms the results of the study by Ramirez-Valles, Zimmerman, and Newcomb (1998), which showed that neighborhood poverty plays an important mediating role in adolescent sexual risk behavior. One possible explanation of our results is that in impoverished neighborhoods, which probably lack the recreational facilities of better kept neighborhoods, sports can play the role of an important diversion from becoming sexually active.

Another possible explanation is that in better-kept neighborhoods a multitude of other protective factors (such as educated mothers, high family income, extracurricular activities) are associated with lower sexual activity, so that participation in sports does not have a significant additional protective effect. Future research needs to examine the processes whereby sports participation is related to not being sexually active in run-down neighborhoods and why this protective effect does not hold in better-kept neighborhoods.

The analyses by race and ethnicity also showed that neighborhood poverty plays a role in whether sports participation has a protective effect. We found a three-way interaction among sports participation, race/ethnicity, and neighborhood poverty. Compared to Caucasian girls, Asian girls who lived in poor neighborhoods and participated in sports frequently had sexual activity status that was higher than Asian girls who lived in neighborhoods that were not in disrepair. The sexual activity level of athletically active Asian girls who lived in neighborhoods in serious disrepair were as high as that of Caucasian girls who participated in sports but lived in neighborhoods that were not in disrepair. The opposite effect was observed for athletically active Caucasian girls who lived in poor neighborhoods. The athletically active Caucasian girls who lived in neighborhoods needing repair had very low probability of being sexually active.

While the protective effect of sports participation on Caucasian girls who live in run down neighborhoods can be viewed as a further manifestation of the positive role of sports in poor neighborhood, the greater level of sexual activity observed among athletically active Asian girls who live in run down neighborhoods was unexpected. We suggest that one explanation of the paradoxical effect of sports participation on this subgroup of Asian girls may be related to normative definitions of what an Asian girl's life ought to be like and the ability of Asian families to enforce that definition on the lives of

their daughters. In racial/ethnic groups that are protective of girls, as is the case in many Asian American cultures (Bradshaw, 1994; Ginorio, Gutierrez, Cauce, & Acosta, 1995; Reid, Haritos, Kelly, & Holland, 1995), sports participation may have the effect of removing the girls from parental control and exposing them to the elements from which the parents wanted to protect them. It is likely that compared to Asian families who live in middle-class neighborhoods, those in run-down areas are less able to protect their daughters from mainstream influences that come with participation in sports. This neighborhood-based finding on the increased risk of Asian girls' sports participation needs to be placed in the context of the overall low incidence of sexual activity among girls of Asian descent relative to Caucasian girls. Asian girls had the lowest sexual activity rates of all racial and ethnic groups of high school girls. It is possible that participation in sports may make Asian girls more like Caucasian girls with respect to ever having had sexual intercourse, and this is more likely to happen to athletically active Asian girls who live in neighborhoods that are in disrepair.

With respect to the protective effects of sports participation on girls' probability of engaging in risky sexual behaviors, the only protective main effect we documented was in terms of the early onset of sexual activity. We did not find a main effect of sports participation among girls who are already sexually active in terms of having multiple partners, having sex while under the influence of alcohol or drugs, or engaging in unprotected sex. These findings contradict the results obtained in the national YRB and Western New York studies, which had shown that girls who engage in sports frequently are less likely to engage in frequent sexual activity and more likely to use contraceptives. Our results show that it is necessary to examine the subset of sexually active girls separately to investigate if sports participation has a protective effect among them.

We did find that sports participation can protect sexually active girls from engaging in sexual

health risk behaviors but this protection does not extend to all; it depends on girls' race/ethnicity and where they live. Regarding race/ethnicity, African American girls who participate in sports were less likely than Caucasian female athletes to have intercourse when drunk or high on drugs. This finding may be attributable to the possibly greater importance sports plays in African American girls' lives. Further research is needed to examine if African American girls who have high levels of sports participation take sports more seriously as a route to an athletic scholarship which they would not want to jeopardize by having sex while high on alcohol or drugs.

Another interaction effect points to the role of urbanization. Girls from urban areas who participate in sports frequently were less likely to mix sex with drinking and doing drugs but girls from partly rural areas are more likely to do that. Perhaps sports participation expands the relatively limited opportunities for recreational sex and substance use for girls from rural areas. More research is needed to examine other concomitants for an adequate explanation of this finding.

Neighborhood conditions, which played a role in the probability of ever engaging in sex, had a similar protective effect on not combining sex and drugs. Athletically active girls who lived in poor neighborhoods were less likely to combine sex with drugs and alcohol. It appears that sports participation has more significance in the lives of girls who live in neighborhoods where most of the houses are in need of repair. Based on the assumption that run-down neighborhoods also lack adequate recreational facilities for youth, perhaps with little else going on in the neighborhood, sports can provide girls with an attractive alternative to sexual activity. Unfortunately, this protective effect did not generalize to consistent use of contraceptives. Athletically active girls who lived in impoverished neighborhoods were less likely to report using birth control in every sexual encounter than girls who lived in similarly run-down neighborhoods but were not athletically active. Future research needs to

examine why female athletes in impoverished neighborhoods are less likely to be consistent users of contraception than their neighbors who do not participate in sports.

Brooks-Gunn, Klebanov, Liaw, and Duncan (1995) have underscored the importance of identifying which aspects of neighborhood poverty influence child outcomes and through what mechanisms. In the present study neighborhood condition had a significant effect above and beyond the impact of such family-based SES variables as family receiving public assistance and mother's education. We believe that the protective effect of sports is due to being one of the few opportunities for diversion that engages young girls in poor neighborhoods. It may be having something to do that is engaging that delays high school girls from becoming sexually active early and also protects them from some forms of risky sexual activity. Because well-to-do neighborhoods often provide a myriad of engaging diversions, sports may not emerge as a significant protective factor. This interpretation is in line with previous findings that showed urbanization and race/ethnicity and SES interactions on reporting sports as the activity that makes girls feel good about themselves in a study of 362 girls from different racial and ethnic backgrounds (Erkut, Fields, Sing, & Marx, 1996). This study found that what was available in the environment was likely to be a source of self-esteem. Native American girls in rural reservations who came from mostly low SES families were most likely to report that an athletic activity made them feel good about themselves, whereas Asian American girls from middle class urban families were most likely to report that artistic activities were the source of their self-esteem. Future research needs to examine whether the uneven distribution of the availability of diversions across neighborhoods is the key protective element of the neighborhood condition effect.

In summary, the results we have obtained point out that the protective effects of sports participation on high school girls' sexual activity is contextual. In general, participating in sports is a

factor in delaying becoming sexually active but whether this protection extends to a reduced likelihood of engaging in risky sexual behaviors depends in large part on where the girl lives and on her race/ethnicity.

That sports participation can have a protective effect on becoming sexually active and, among sexually active girls, a reduced tendency to engage in such risky sexual behaviors as combining sex with being high on drugs and alcohol for girls who live in impoverished neighborhoods has immediate implications for programming. If future research shows that the protective effect of sports is related to the absence of other recreational outlets, locating sports facilities for girls in run down neighborhoods may provide a high return in terms of the socially desirable effects of reducing risky sexual behavior.

In this paper we have examined whether sports participation is associated with sexual activity. We found that it is, and that its impact can differ depending on where the girls live and on their racial and ethnic backgrounds. Future research should examine the processes through which sports participation can serve as a protective or risk factor for different groups of girls' sexual behaviors. Future research should also examine which factors can account for the observed gender difference in the impact of sports participation and whether sports can be protective of at least some groups of boys' sexual activity.

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Endnotes

¹ An earlier version of this paper was presented at the 1999 meeting of the American Psychological Association in Boston.

² Direct effects refer to a monotonic association. For example, as age increases, so does sexual activity, or as mother's education increases, sexual activity declines. Interaction effects, on the other hand, imply a conditional relationship. If there is a sports by poverty interaction, the relationship between sports and sexual activity is conditioned (or moderated) by whether SES is low or high. An example of a sports by family SES interaction effect is that sports may be unrelated to sexual activity among girls from high SES families but have a protective effect on girls from low SES families.

³ In order to adjust the parameter estimates for unequal probabilities of inclusion, we used a software package designed to handle the analysis of data from complex sampling frames (SUDAAN 7.5: Shah, Barnwell, & Bieler, 1997).

Figure 1. Sports participation by neighborhood condition interaction effect on the probability of reporting having ever had sex.

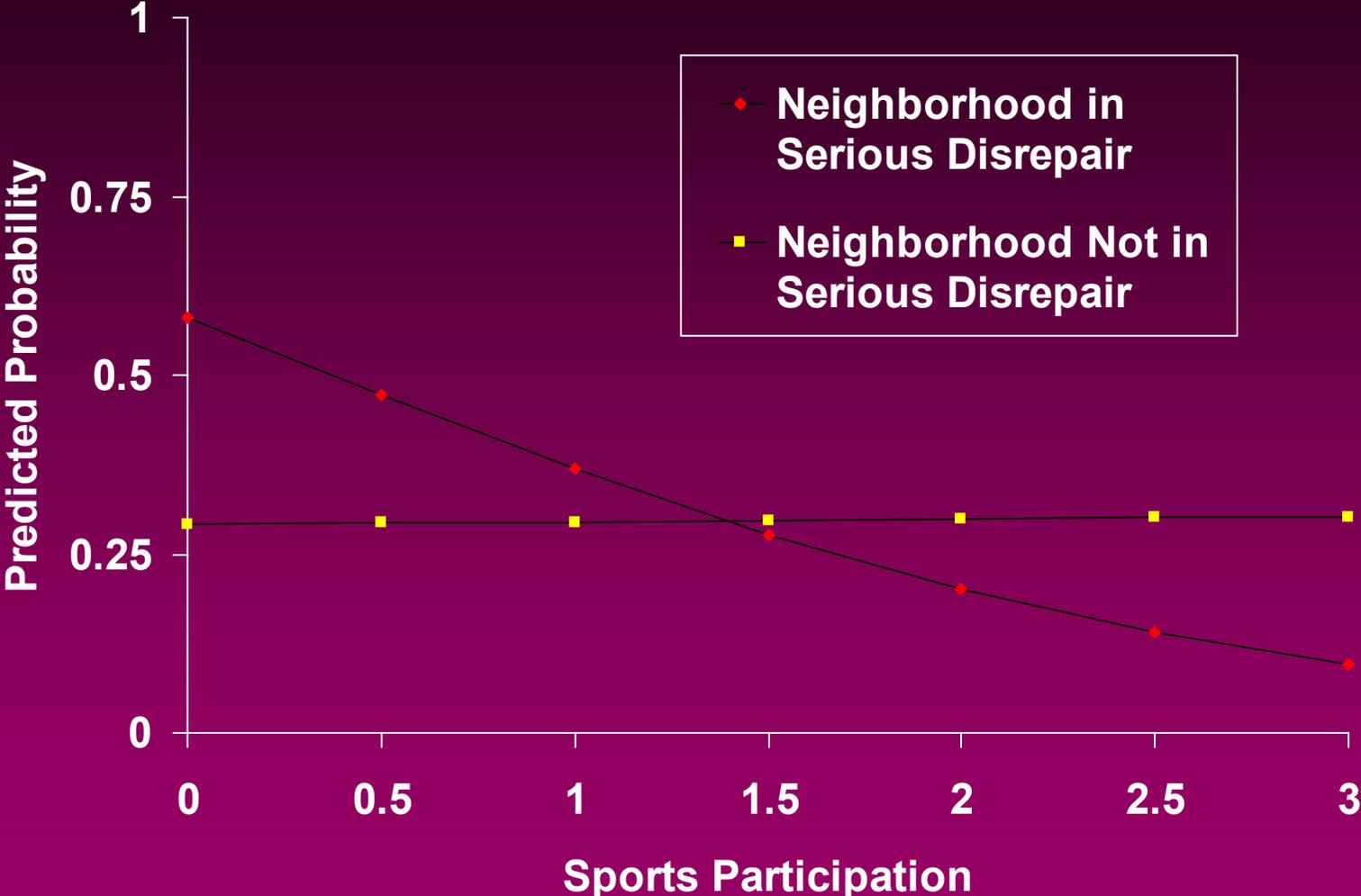


Figure 2. Sports participation by neighborhood condition by Asian interaction effect on the probability of reporting having ever had sex.

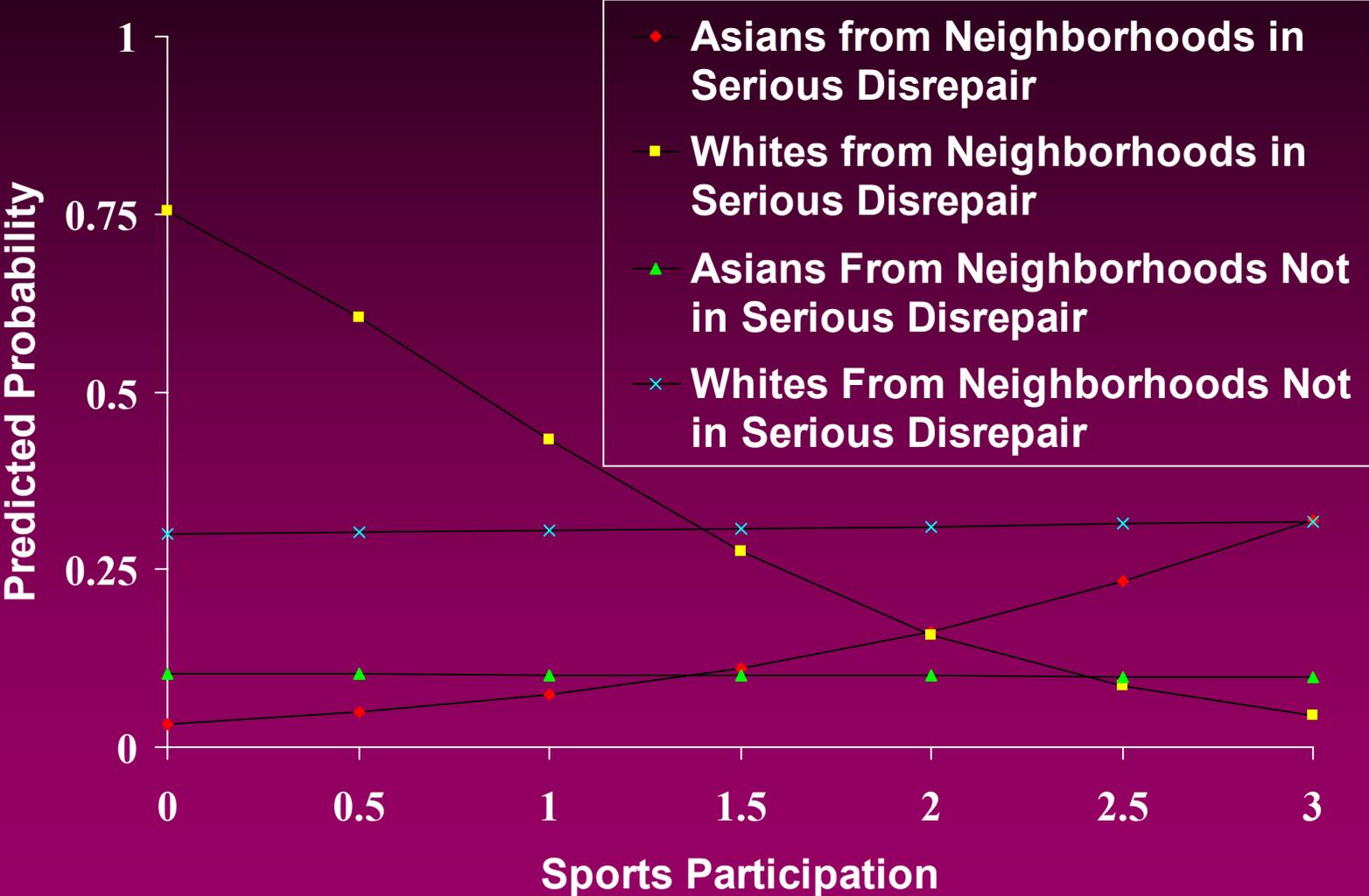


Figure 3. Sports participation effect on the age of first intercourse.

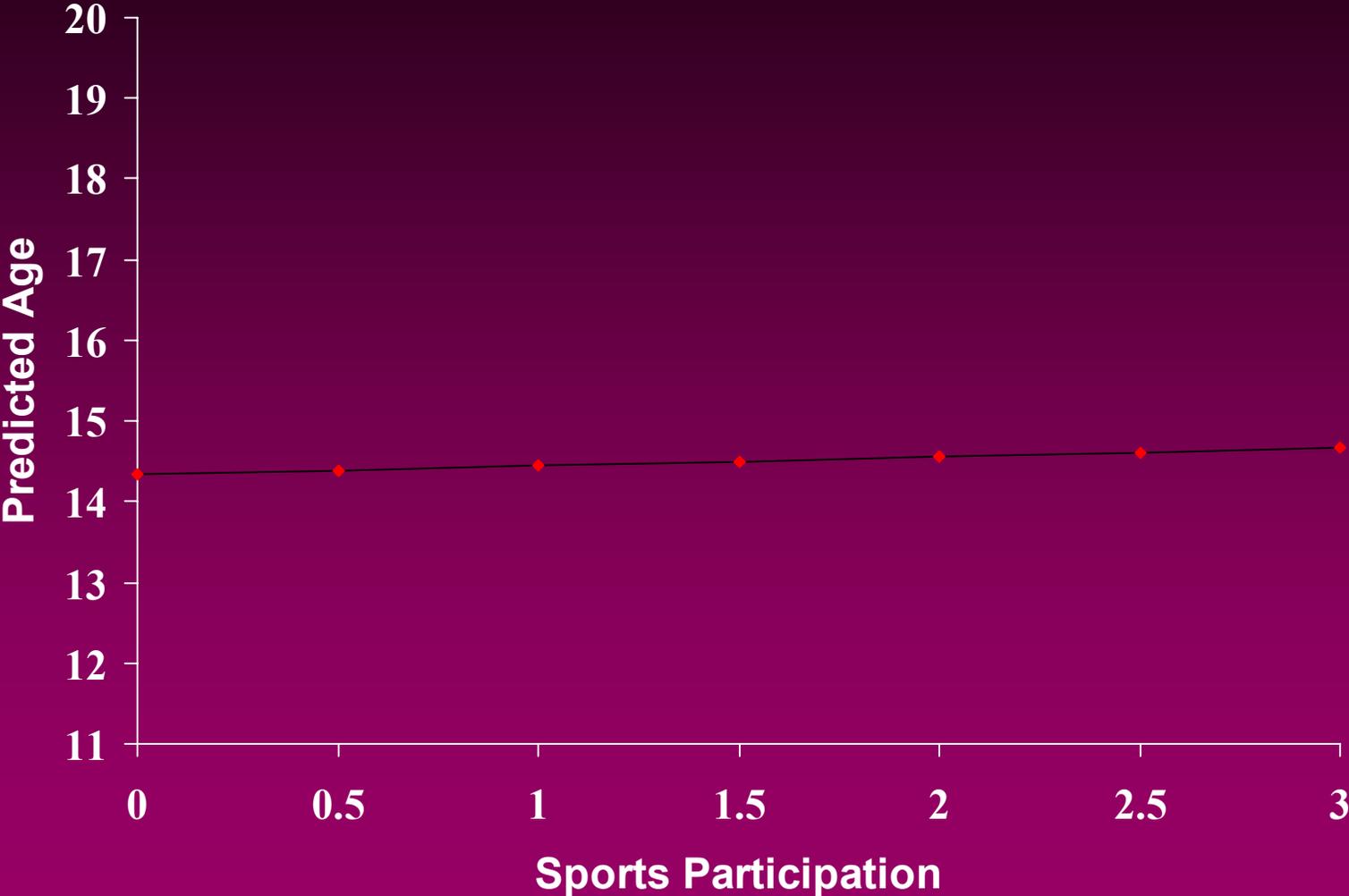


Figure 4. Sports participation by Black interaction effect on the probability of reporting having combined drug use and sex.

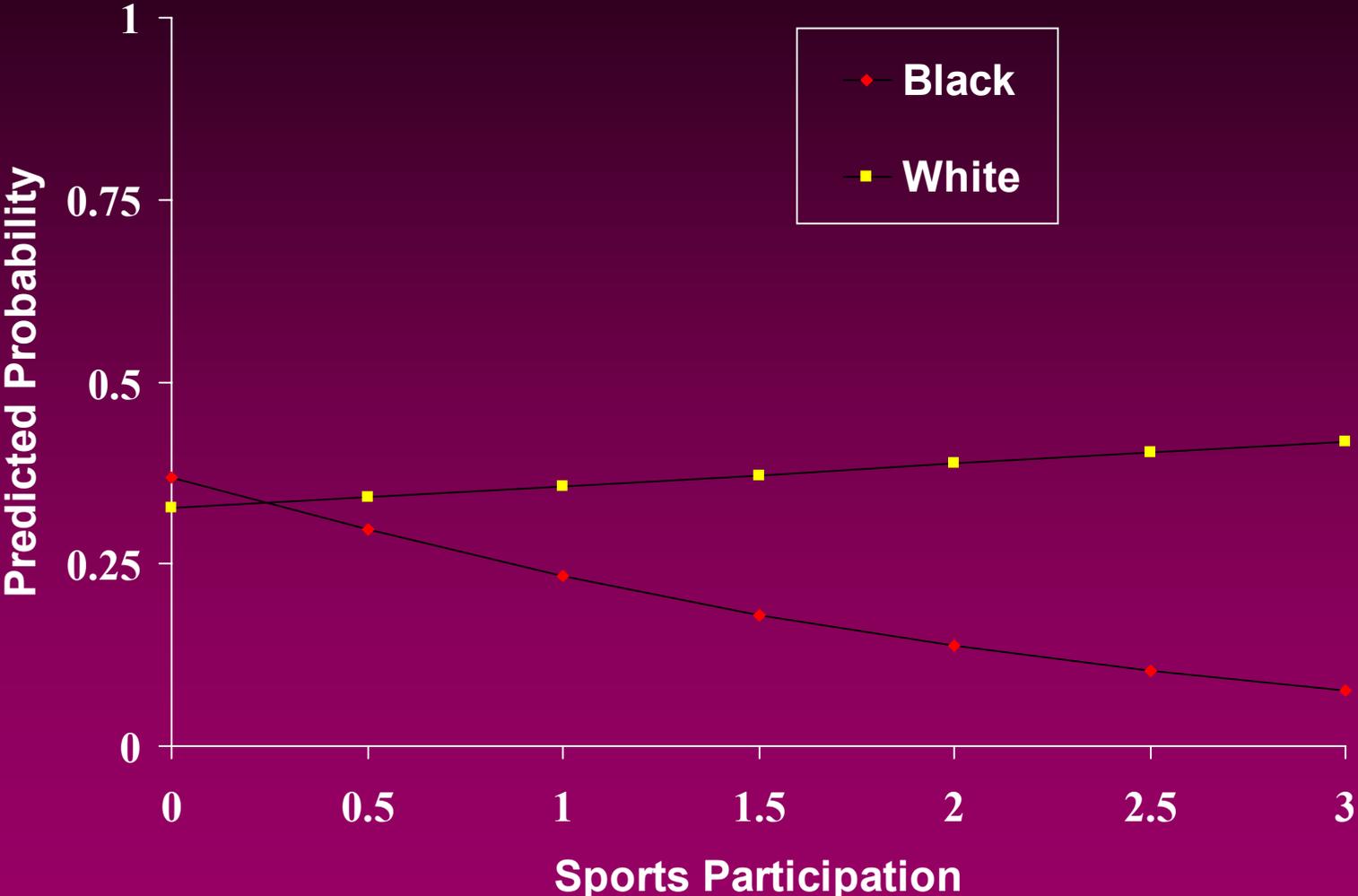


Figure 5. Sports participation by urbanicity interaction effect on the probability of reporting having combined drug use and sex.

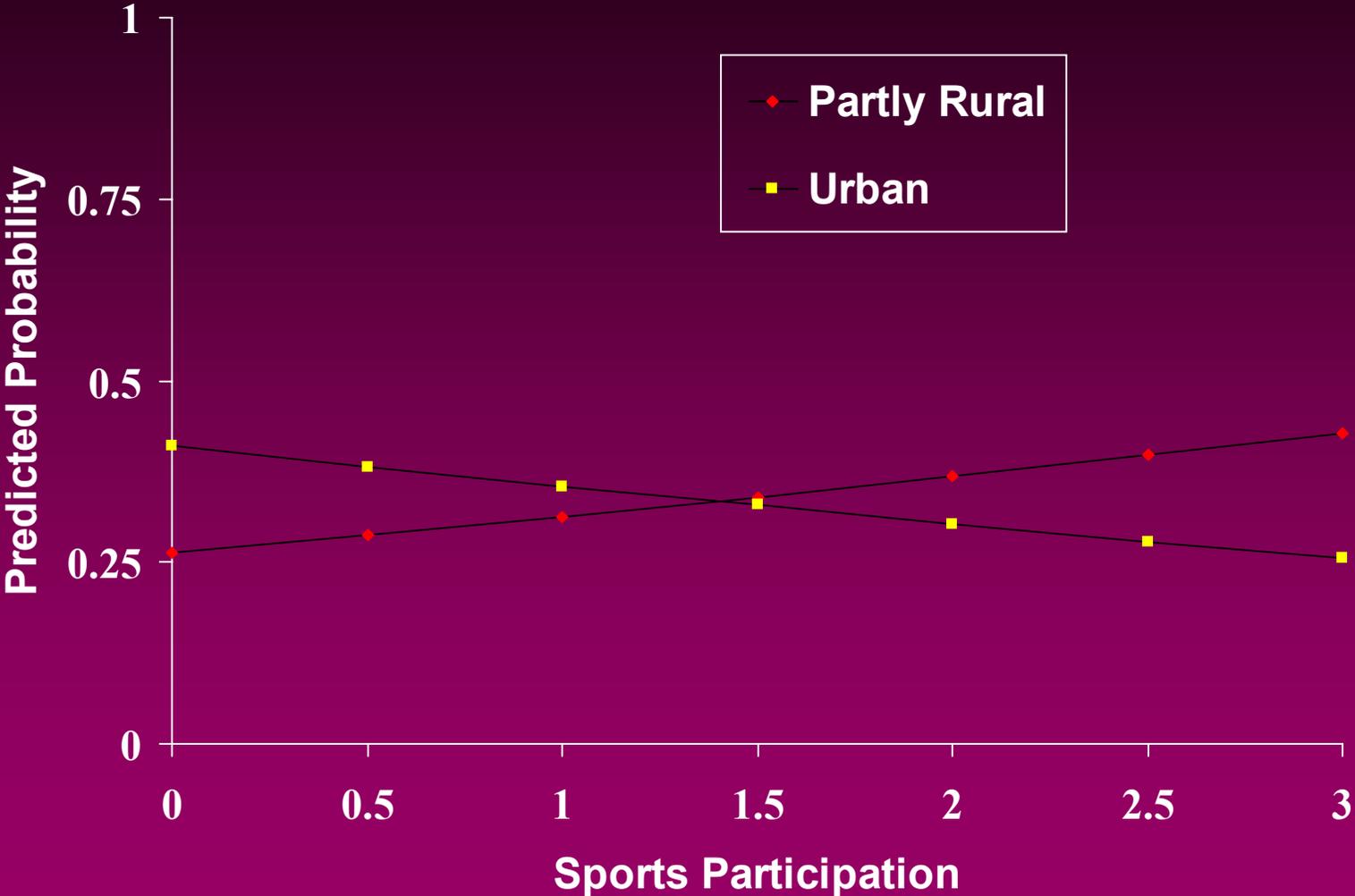


Figure 6. Sports participation by neighborhood condition interaction effect on the probability of reporting having combined drug use and sex.

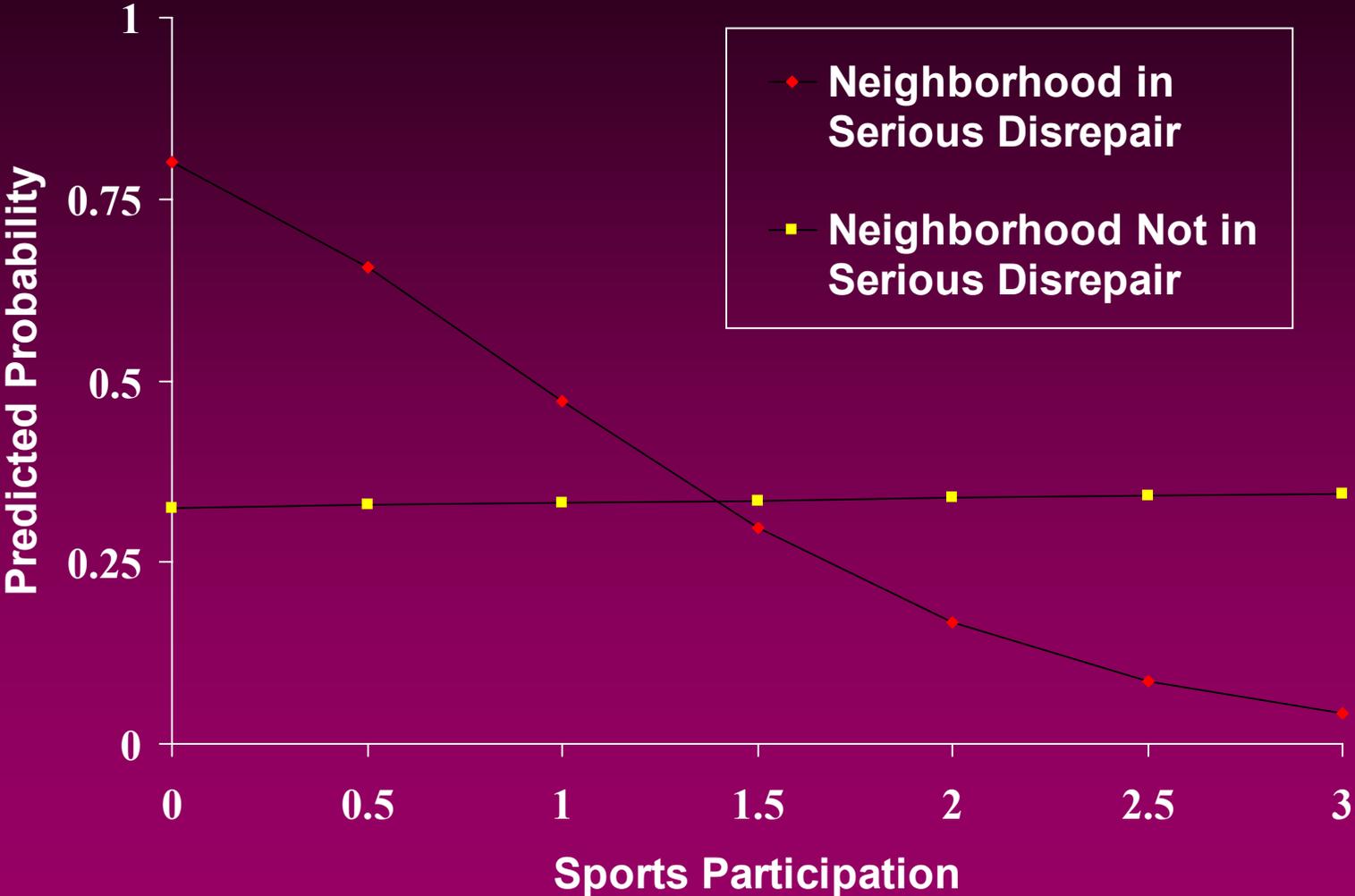


Figure 7. Sports participation by neighborhood condition interaction effect on the probability of reporting using birth control every sexual encounter.

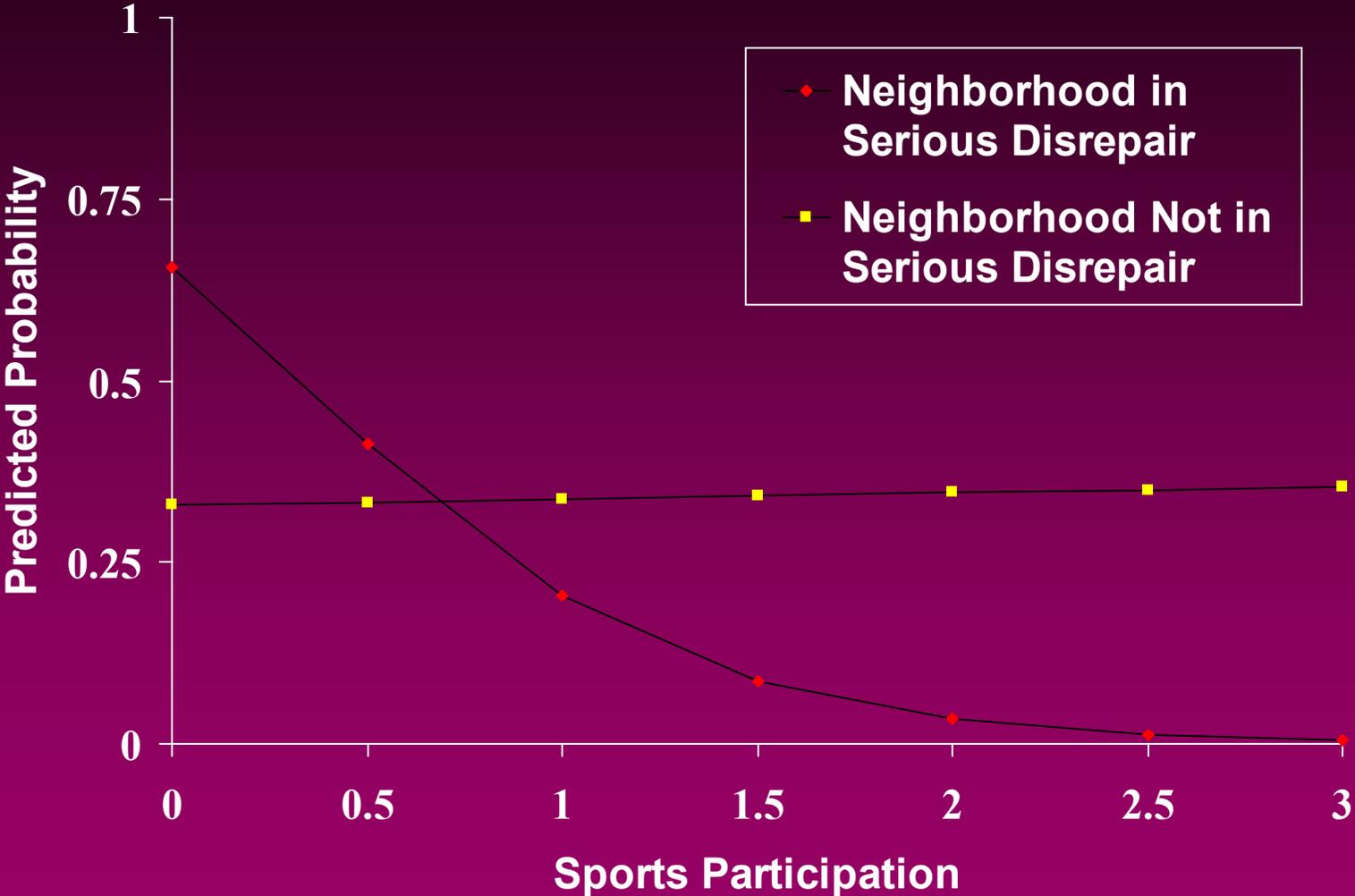


Table 1. Study variables and how they were measured.

Dependent Variables

Sexual experience	<i>R's report of ever having had heterosexual vaginal intercourse</i>
Age of onset	<i>Date of first intercourse minus date of birth</i>
Co-occurrence of drugs and sex	<i>Coded "1" if R reported she had gotten into a sexual situation which she later regretted because she had been drinking, she had been drinking the first or most recent time she had intercourse, or she had been using drugs the first or most recent time she had intercourse</i>
Multiple sexual partners	<i>Coded "1" if the count of nominated partners (up to 6) with whom the R had intercourse exceeded 1.</i>
Use of birth control at least once	<i>Coded "1" if the R reported using some form of birth control at least once with each sexual partner</i>
Use of birth control every time	<i>Coded "1" if the R reported using some form of birth control each time she had intercourse with each partner</i>

Independent Variables

Sports participation	<i>Mean of two items (4 pt scale) measuring frequency of R's participation in active sports per week</i>
Race/Ethnicity	<i>4 dichotomous items: R reported being Caucasian, African American, Hispanic/Latina, or Asian</i>
Neighborhood condition	<i>Coded "1" if interviewer rated buildings to be in serious disrepair</i>
Family poverty	<i>Coded "1" if either residential parent received public assistance</i>
Timing of physical maturity	<i>Mean of interviewer's and R's assessments (each 5 pt scale) of how old R looked in relation to her agemates</i>
Importance of religion	<i>Single item (3 pt scale) measuring R's rating of how important she feels religion is to her</i>
Social age	<i>Grade in school at time of assessment</i>
Standardized test score	<i>Score on the Add Health Picture Vocabulary Test</i>
Parental control	<i>Mean of 7 dichotomous items measuring R's rating of whether she or her parents had relatively more control over various aspects of R's daily activities</i>
Exposure to deviant peers	<i>Sum of 4 dichotomous variables measuring R's report that friends would increase their respect if R engaged in sex and that at least one of R's three best friends smoke cigarettes, drink alcohol, or use marijuana</i>
Self-esteem	<i>Revised Rosenberg's Self Esteem scale (4 items, 5 pt scale)</i>
Socioeconomic status	<i>Level of mother's education</i>
Urbanization	<i>Coded "1" if partly rural</i>

Control Variables

Currently attending school	<i>Coded "1" if R was attending school during the in-home assessment</i>
Non-athletic activities	<i>Single item (4 pt scale) measuring R's participation in non-sports hobbies per week</i>
Social desirability	<i>Coded "1" if R reported she never argued, never got sad, or never criticized others</i>

Table 2. The effects of sports participation on sexual behavior outcomes (*all ethnic groups*).

	Model Fitting Step^a	Effect	b	SE	Odds Ratio
Probability of ever having had sex ^c	Step 1	Sports	-.44**	.04	.64
	Step 2	Sports	-.08	.05	.93
	Step 3	Sports X N'hood Poverty	-.87*	.35	.42
	Step 4	Sports X N'hood Poverty X Asian	2.33	1.14	10.24
Age of first intercourse ^{d, e}	Step 1	Sports	-.06	.06	
	Step 2	Sports	.11*	.05	
	Step 3	No Sports Interactions			
Probability of having multiple partners	Step 1	Sports	-.02	.08	.98
	Step 2	Sports	.02	.09	1.02
	Step 3	No Sports Interactions			
Probability of combining drugs and sex	Step 1	Sports	-.02	.09	.98
	Step 2	Sports	-.01	.11	.99
	Step 3	Sports X Black	-.78**	.25	.46
		Sports X Rural	.48*	.19	1.61
		Sports X N'hood Poverty	-1.53*	.72	.22
Probability of using birth control with each partner	Step 1	Sports	.07	.08	1.07
	Step 2	Sports	.08	.10	1.08
	Step 3	No Sports Interactions			
Probability of using birth control every time	Step 1	Sports	.13	.09	1.14
	Step 2	Sports	.10	.11	1.10
	Step 3	Sports X N'hood Poverty	-2.04*	.91	.13

^aStep 1. Sports participation only as a predictor. Step 2. Sports participation, all other predictors, and covariates. Step 3. Sports participation, all other predictors, covariates, and two-way interactions with moderators. Step 4. Sports participation, all other predictors, covariates, two-way interactions, and three-way interactions (sports by moderator by ethnicity). Only Model 1 had enough power to test the three-way interactions. Only significant effects are shown.

^b n=7,768

^c n=1.624 for all other analyses

* $p < .05$ ** $p < .01$