Preventing High-Risk Sexual Behavior in Early Adulthood with Family Interventions in Adolescence: Outcomes and Developmental Processes

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Abstract

Adolescent study participants who engaged in a brief, family-centered intervention (the Family Check-Up; FCU) were later assessed for the intervention's effects on high-risk sexual behavior (HRSB) in early adulthood (age 22). Participants ($N = 998$ adolescents and their families) were randomly assigned to a family-centered intervention in 6th grade and were offered a gated, multilevel intervention that included (a) a school-based family resource center, (b) the FCU, and (c) more intensive, family-based treatment. All services were voluntary, but high-risk families were actively recruited into the FCU. Approximately 23% of the intervention families engaged in the FCU and approximately 18% engaged in more intensive treatment. Using an intent-to-treat design, we found that the direct effect of the FCU on HRSB was not significant; however, an analysis of the developmental processes indicated that intervention families demonstrated improved family relationship quality when compared to control families, which in turn resulted in lower levels of HRSB in early adulthood. Further, the significant effect of family relationship quality on HRSB was mediated by differences in parental monitoring and early sexual activity, and these effects varied as a function of gender and ethnicity. Indirect effects of the FCU on HRSB were significant via multiple different pathways. The implications of these findings for enhancing the impact of family-centered interventions are discussed.

Keywords

Family Check-Up; family relationship quality; high-risk sexual behavior; parental monitoring; early sexual activity

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Adolescence and early adulthood are key developmental periods during which the risk for acquiring sexually transmitted infections (STIs) and HIV is quite high. Nearly half of all new cases of STIs each year occur among 15- to 24-year-olds, even though this age group represents only one quarter of the sexually active population (Weinstock, Berman, & Cates, 2004), and young people age 13–24 represented about 20% of new HIV diagnoses in 2009 (Centers for Disease Control & Prevention [CDC], 2010a). Adolescents and young adults are at increased risk for these outcomes for a combination of behavioral, biological, and cultural reasons (CDC, 2010b). Notably, they are more likely than older adults to engage in

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risky sexual behaviors, such as having multiple sex partners, engaging in unprotected sex, and selecting higher risk partners (CDC, 2010a; Mosher, Chandra, & Jones, 2005).

Other problem behaviors, such as substance use and antisocial behavior, also appear to peak during this developmental period (Johnston, O'Malley, Bachman, & Schulenberg, 2011; Moffitt, 1993). According to problem behavior theory (Jessor & Jessor, 1977), they may be part of a single behavioral syndrome such that the existence of one or more maladaptive behaviors might predict or foreshadow other maladaptive behaviors. Indeed, ample research evidence demonstrates a high degree of covariation among high-risk sexual behavior (HRSB), internalizing and externalizing behavior, and substance use (Achenbach, 1991; Ary et al., 1999; Bogart, Collins, Ellickson, & Klein, 2006; Capaldi, Crosby, & Stoolmiller, 1996), and an ecological model intended to predict development of antisocial behavior (Dishion, Patterson, & Kavanagh, 1992; Patterson, DeBaryshe, & Ramsey, 1989) has also been successfully applied to adolescent drug use (Dishion, Patterson, & Reid, 1988), HRSB (Metzler, Noell, Biglan, Ary, & Smolkowski, 1994), and general problem behavior (Metzler, Biglan, Ary, Noell, & Smolkowski, 1993).

Because these problem behaviors appear to be strongly related, to demonstrate overlap in their developmental course, and to share many of the same ecological predictors, particularly those related to parent–child relationships and peer behavior, Capaldi and colleagues (2002) suggested that family-based prevention programs targeting antisocial behavior in childhood may also show effects on other risk behaviors, such as HRSB. The first goal of our study, then, was to test whether one such intervention, the Family Check-Up (FCU), a family-based prevention program originally designed to disrupt growth in adolescent antisocial behavior and substance use, would also reduce rates of HRSB in a community sample of young adults. A second goal was to examine potential mechanisms underlying a possible intervention effect. Our research helps address a critical need in intervention research: despite increasing numbers of longitudinal randomized prevention trials demonstrating the efficacy of prevention programs for various problem behaviors, there is a dearth of research on the mechanisms that account for program effects (Liddle, 2004; Sandler, Schoenfelder, Wolchik, & MacKinnon, 2011). Finally, our third goal was to determine whether gender and race (i.e., European American vs. African American) moderate these effects, given gender and racial differences in mean levels and etiology of HRSB (Doljanac & Zimmerman, 1998; Huebner & Howell, 2003; Rodgers, 1999).

The Family Check-Up

The FCU, described in detail by Dishion and Stormshak (2007), was designed to reduce adolescent problem behavior and improve mental health by supporting family engagement and using assessment-driven feedback to motivate parents to improve their parenting practices, particularly in the areas of supervision, involvement, and management of their child's behavior (Dishion & Kavanagh, 2003).The FCU family intervention curriculum emphasizes three domains, namely, positive behavior support, limit setting and monitoring, and relationship building (Dishion, Stormshak, & Kavanagh, 2011). These three domains of family management are assessed by the use of surveys and videotaped observations of family interactions. Parents are then provided feedback and offered support in these domains of parenting as indicated by the family assessment. Across numerous randomized controlled trials, the FCU has been shown to reduce substance use and antisocial behavior, yet has also been effective for reducing depression, teacher-reported risk behavior, and probability of arrest (Connell & Dishion, 2008; Connell, Dishion, Yasui, & Kavanagh, 2007; Dishion, Kavanagh, Schneiger, Nelson, & Kaufman, 2002; Stormshak et al., 2011; Stormshak, Dishion, Light, & Yasui, 2005; Van Ryzin & Dishion, 2012; Van Ryzin, Stormshak, & Dishion, 2012). In previous studies, the highest risk families were most likely to engage in

the FCU, as defined by youth-reported deviant peer involvement, single parent status, and teacher-rated risk prior to engagement (see Connell et al., 2007).

Family Relationships and Youth Sexual Behavior

Despite this strong pattern of FCU effects on various other problem behaviors, the effect of the FCU intervention on HRSB had yet to be examined. However, recent research on family processes and adolescent sexual behavior has supported the hypothesis that the FCU could help reduce HRSB by improving the parent–child relationship. For example, after controlling for sibling differences in age, earlier sexual risk behaviors, and other characteristics, Coley and colleagues (2008) found that in comparison with their siblings, youths who experienced less parental negativity and more shared family activities during midadolescence showed slower growth in risky sexual behaviors through late adolescence. In other studies, youths who perceived their parents to be supportive and involved and who were more satisfied with their relationship with their parents engaged in less risky sexual behavior (Luster & Small, 1994; Scaramella, Conger, Simons, & Whitbeck, 1998). In yet other studies, parent–youth closeness was found to be correlated with a lower frequency of intercourse (Jaccard, Dittus, & Gordon, 1996), with having fewer sex partners (Jaccard et al., 1996; Miller, Forehand, & Kotchick, 1999), and with later age of first intercourse (Danziger, 1995; Upchurch, Aneshensel, Sucoff, & Levy-Storms, 1999). Youths who reported positive, supportive relationships with their parents also reported using contraception more consistently (Jaccard et al., 1996; Miller et al., 1999).

This Study

In the current study, we investigate the potential for the FCU to influence HRSB in early adulthood, both directly and indirectly by means of parent-youth relationship quality and related family processes. Given the established links between parental monitoring, early sexual activity, and HRSB (Rodgers, 1999; Van Ryzin, Johnson, Leve, & Kim, 2011) and the notion that the parent–youth relationship may be linked to higher levels of parental monitoring and lower levels of early sexual activity (Capaldi et al., 1996; Danziger, 1995), we included monitoring and early sexual activity as additional processes of interest. We hypothesized that engagement in the FCU would result in lower levels of HRSB in early adulthood (age 22 in this study) and that changes in family relationship quality across early adolescence would be a key mediating mechanism by which the FCU exerts these effects. We assessed family relationship quality across Waves 1–4 of the study (ages 12–15) and used growth curve modeling to represent change in this relationship across time. We also hypothesized that parental monitoring and early sexual activity (measured at age 17 in this study) would mediate the link between family relationship quality and HRSB. The hypothesized model is presented in Figure 1. Parental monitoring and deviant peer association at age 12 were included as controls to control for any preexisting differences in the intervention and control groups.

To test mediation, we extended the causal-steps approach (Baron & Kenny, 1986; Judd, Kenny, & McClelland, 2001; MacKinnon & Dwyer, 1993). In doing so, we initially tested for the following: (1) a significant direct effect of a predictor on a presumed mediator (e.g., Path A in Figure 1) and (2) on the distal outcome (e.g., HRSB), (3) a significant direct effect of the mediator on the outcome (e.g., Path B) that accounts for the effects of the predictor, and (4) a significant indirect effect of the predictor on the outcome by means of the mediator (e.g., Path A*B). At the same time, however, MacKinnon and colleagues (2002) and others have concluded that this approach is too restrictive and have advocated for a focus on only the joint significance of the paths between the predictor and the outcome by means of the mediator; when the causal-steps approach is not followed, MacKinnon et al. (2002) refer to

the purported mediator as an *intervening variable* rather than a mediator per se; a *mediator* can only be detected using the causal steps approach. Thus, if we were to find direct effects of the intervention on HRSB, we would evaluate parent-youth relationship quality as a mediator; if direct effects were not present, we would evaluate this construct as an intervening variable, or a variable that is affected by the intervention that can, in turn, promote beneficial outcomes. In addition, we would take a similar approach when decomposing the effects of parent-youth relationship quality on HRSB; in this case, we would evaluate parental monitoring and early sexual activity as mediators or intervening variables, depending on the existence of a direct effect.

Method

Participants

Participants included 998 adolescents and their families recruited in sixth grade from three middle schools in an ethnically diverse metropolitan community in the northwestern United States. Parents of all sixth grade students in two cohorts were approached for participation, and 90% consented. The sample included 526 males (52.7%) and 472 females (47.3%). By youth self-report, the sample was composed of 423 European Americans (42.3%), 291 African Americans (29.2%), 68 Latinos (6.8%), 52 Asian Americans (5.2%), and 164 (16.4%) youths of other ethnicities, including biracial. Biological fathers were present in 585 families (58.6%). Annual family income ranged from $5,000 to more than $90,000, with the median family earning between $30,000 and $40,000. Youths were randomly assigned at the individual level to either control ($n = 498$) or intervention ($n = 500$) conditions during the sixth grade. Approximately 80% of youths were retained across the study span (sixth grade through age 22).

Intervention Protocol

The FCU is an adaptive intervention program that comprehensively links universal, selected, and indicated family interventions in a way that titrates the intervention intensity to the needs and motivation of the family. The first level of the program, a universal intervention, established a family resource center (FRC) in each of the three middle schools. The services of the FRC were available to the entire intervention group and were designed to support positive parenting practices and to engage parents of high-risk youth in the selected intervention. FRC services included brief consultations with parents, feedback about students' behavior at school, and access to videotapes and books about parenting. FRC services were discontinued when the students moved on to high school.

The selected intervention was the FCU, a brief, three-session intervention modeled on the Drinker's Check-Up (Miller & Rollnick, 2002) and designed to motivate parents to improve parenting practices. Although all families in the intervention condition could receive the FCU, families of high-risk youth (as determined by teacher ratings) were specifically offered the FCU in seventh and eighth grades. During the first session, the initial interview, a therapist explored parent concerns and encouraged participation in a family assessment. During the second session, family members completed surveys in a one-on-one interview format and were videotaped in the home while engaging in discussion tasks designed to help evaluate parent–child interactions. The third session consisted of strengths-based feedback, during which the therapist summarized results of the assessment using motivational interviewing strategies (Miller & Rollnick, 2002). An essential objective of this session was to explore intervention services that could provide additional support to parents in changing family management practices. Students who left the targeted schools were offered services if they remained in the county.

In the intervention condition, 115 families (23%) elected to receive the FCU, and 88 of these families received further intervention services after the FCU. For Cohort 1, 46% of FCUs were completed following the seventh grade family assessment, 53% were completed following the eighth grade family assessment, and 1% were completed following the ninth grade family assessment. For Cohort 2, 93% of FCUs were completed following the seventh grade family assessment, and 7% were completed following the eighth grade family assessment. Engagement in the FCU for Cohort 2 was disrupted by a hiatus in grant funding, so we were unable to provide the FCU in the ninth grade. All intervention condition families were offered the FCU again following the assessment at age 16, and 34% elected to receive it. Overall, families had an average of 8.9 hours of direct contact with the intervention staff during the course of the study ($SD = 9.42$). Contrary to expectations, most families elected to receive brief consultations and periodic FCU meetings rather than more intensive forms of treatment.

Measures

Family relationship quality—Youth reports of family relationship quality across sixth–ninth grades (ages 12–15) were measured by averaging across six items assessing the amount of trust and positive regard in the parent–youth relationship over the past month (e.g., "I really enjoyed being with my parent(s)"). Responses ranged from 1 (*never true*) to 5 (*always true*). Scale reliability ranged between $\alpha = .89$ and .90.

Parental monitoring (knowledge)—Mother- and father-reported monitoring was measured when the youths were age 17 via four items; parents reported the degree to which they were aware of the youth's location and activities (e.g., "How often did you know what your teen was doing when he was away from home?"). Responses ranged from 0 (*never or almost never*) to 5 (*always or almost always*). Scale reliability was $\alpha = .89$ for mothers and $\alpha = .88$ for fathers.

Observers also rated families for the quality of parental monitoring. After interview data were collected, families completed a set of discussion tasks while being videotaped. To assess parental monitoring, the child was asked to talk about a time in the past month when he or she spent at least 1 hour with friends outside of adult supervision; the caregiver was then asked to comment or ask questions. Videotapes of these 5-minute interactions were later coded by undergraduate research assistants using the Macro Ratings of Family Management Process (Dishion, Hogansen, & Winter, 2000). Coders were trained to a kappa criterion of .70, and coder drift was addressed through regular random reliability checks on 20% of the final data to ensure interrater agreement of 85% or more. A Lack of Parental Monitoring scale was based on 7 macroratings of family behavior during the monitoring task and reflected the coder's impression that the child was lacking adult supervision, involvement, structure, and rules. Each macrorating was made on a scale ranging from 1 (*not at all*) to 9 (*very much*). Items were averaged to arrive at the composite score ($\alpha = .77$). To be comparable with child and parent reports of monitoring, coder ratings were reverse scored so that higher scores would reflect more parental monitoring.

The interviewers who administered this wave of data collection were also asked to rate families for the quality of parental monitoring. They responded to six items regarding amount of structure and limit setting, knowledge of the child's whereabouts, and level of authority projected by the parent. Responses ranged from 0 (*not at all*) to 5 (*very much*). Scale reliability was $\alpha = .79$.

The mother-report, father-report, interviewer-report, and observational measures of parental monitoring at age 17 were moderately correlated (*rs* between .19 and .46, all $p < .001$). These variables were standardized and averaged to create a single variable representing

parental monitoring at age 17 such that higher scores reflected more effective parental monitoring.

Sexual activity—In 11th grade (age 17) youths reported their degree of sexual experience, which was categorized as none (coded 0); some, but without intercourse (coded 1); intercourse (coded 2); and intercourse with multiple partners (coded 3). Of the 790 youths responding to this question, 323 (40.9%) had no experience, 133 (16.8%) had some experience, 186 (23.5%) had experienced intercourse, and 148 (18.7%) had experienced intercourse with multiple partners.

High-risk sexual behavior—At age 22, participants reported the degree to which they engaged in five types of high-risk sexual behavior. Two items requested counts of how many times over the past 3 months they had sex with people who "were also having sexual intercourse with other people" and "who you didn't know very well"; these items were dichotomized such that any response other than "0" was considered to be high-risk behavior (23.2% and 12.9% of the respondents, respectively, indicated high-risk behavior). One item asked about the propensity to use condoms; this item was dichotomized such that "never" and "sometimes" indicated high-risk behavior (36.8% of the respondents indicated high-risk behavior). The final two items asked whether the youth had ever contracted a sexually transmitted disease (0 = no, 1 = yes; 20.8% of the respondents said yes), or gotten someone pregnant or become pregnant (0 = no, 1 = yes; 39.6% of the respondents said yes). These five dichotomous items were averaged to arrive at a final score ranging between 0 and 1, with higher scores indicating more high-risk behavior.

Controls—Because we did not have parent-report or observational measures of parental monitoring at the initiation of the study and we did not ask youths about sexual experience at age 12, we could not determine with certainty whether there were any preexisting differences in parental monitoring or youth sexual activity in the experimental and the control groups. Thus, when predicting parental monitoring and early sexual experience at age 17, we controlled for youth-reported parental monitoring and deviant peer association at age 12. For parental monitoring (five items), youths reported the degree to which parents were aware of their location, activities, and companions during free time (e.g., "How often does at least one of your parents know where you are after school?"). Responses ranged from 0 (*never or almost never*) to 5 (*always or almost always*). Scale reliability was $\alpha = .85$. For deviant peer involvement (four items), youths reported the number of times in the past week they had spent time with peers who got into trouble, fought a lot, took things that did not belong to them, and smoked cigarettes or chewed tobacco. Responses ranged from 0 (*never*) to 7 (*more than seven times*). Scale reliability was $\alpha = .80$. We found no preexisting group differences in these variables or in baseline family relationship quality (*Fs* < 1.00, *ns*).

Analysis Plan

Our first step was to determine whether the FCU exerted a direct effect on HRSB at age 22. We then examined the effect of the FCU on change in family relationship quality from ages 12 to 15 (Path A, Figure 1) and the effect of this change on HRSB at age 22 (Path B); we labeled this Model 1. We then calculated the indirect effect of the FCU on HRSB via the change in family relationship quality (Path A*B). This calculation controls for the direct effect of the FCU and the growth curve intercept on HRSB (to facilitate readability, these paths were not included in Figure 1).

We then evaluated the ability of parental monitoring and early sexual experience to mediate any effect of parent–youth relationship quality on HRSB; we labeled this Model 2. We calculated the indirect effects of the change (i.e., slope) in family relationship quality on

HRSB via parental monitoring (Path C*D) and early sexual activity (Path E*F) while controlling for direct effects. In this analysis, youth-reported parental monitoring and deviant peer association at age 12 were controlled to account for preexisting differences between the treatment and control groups. HRSB was also regressed on these variables, but the paths were not included in Figure 1.

Finally, we evaluated whether gender and race (i.e., European American vs. African American) moderated these effects. A model in which the paths of interest (Paths A–F) were freely estimated was compared using a chi-square difference test to a model in which the paths of interest were constrained to be equal across gender and race. If the freely estimated model demonstrated significantly better fit when compared with the constrained model, then we concluded that the magnitude of the paths was different for males and for females or for European Americans and for African Americans.

All modeling was conducted using structural equation modeling with Mplus (Muthén & Muthén, 2008), which uses the delta method (MacKinnon, 2008) to calculate indirect effects. We used maximum likelihood analysis, which can provide unbiased estimates in the presence of missing data. Standard measures of fit are reported, including chi-square (χ^2), comparative fit index (CFI), nonnormed or Tucker-Lewis index (TLI), and root-mean squared error of approximation (RMSEA). CFI/TLI values greater than .95, RMSEA values less than .05, and a nonsignificant χ^2 (or a ratio of $\chi^2/df < 3.0$) indicate good fit (Hu & Bentler, 1999).

Finally, we initially evaluated the ability of other variables at age 17 to predict variance in HRSB at age 22, including tobacco, alcohol, and marijuana use, depression, and deviant peer association, because other investigators have found that these variables had an impact on adolescent sexual behavior (Scaramella et al., 1998; Whitbeck, Hoyt, Miller, & Kao, 1992). However, none was significant, so they were dropped from the analysis.

Results

Means, standard deviations, and intercorrelations are provided in Table 1. Youth reports of family relationship quality demonstrate moderate stability across time, and most other variables present theoretically consistent correlations (e.g., parental monitoring was negatively correlated with early sexual experience and HRSB). There was a degree of missing data across time, but we conducted an attrition analysis and found that families who did not provide data at ages 17 or 22 were not systematically different from those who did in terms of intervention condition, ethnicity (χ^2 values < 3.10, *ns*), or baseline family relationship quality (*Fs* < 2.75, *ns*). There were systematic differences in attrition based upon socioeconomic status (SES; *Fs* between 4.0 and 6.0, $p < .05$), suggesting that lower SES families tended to drop out of the study; however, the interaction of intervention condition and SES did not predict missingness at ages 17 or 22, so the attrition among low-SES families was not systematically different across intervention condition. As can be seen in Table 1, the FCU had no direct effect on HRSB (i.e., the correlation was not significant); thus, we evaluated parent-youth relationship quality as an intervening variable rather than as a mediator.

Model 1 fit the data well, $\chi^2(10) = 15.07$, *ns*, CFI = .99, TLI = .99, RMSEA = .02 (.00|.05); path coefficients are presented in Table 2. The FCU predicted significant positive change in family relationship quality, and this significantly reduced HRSB. The indirect effect of the FCU on HRSB was significant (Path A*B), indicating that change in family relationship quality acted as an intervening variable between the FCU and HRSB.

Model 2 fit the data well, $\chi^2(16) = 19.62$, *ns*, CFI = .99, TLI = .99, RMSEA = .02 (.00|.04); path coefficients are presented in Table 2. Positive change in family relationship quality predicted greater levels of parental monitoring and reduced levels of sexual activity at age 17; in turn, monitoring predicted lower levels of HRSB, and early sexual activity predicted higher levels of HRSB. The indirect effect of the change in family relationship quality on HRSB was significant via parental monitoring (Path C*D) and early sexual activity (Path E*F), but the direct effect of family relationship quality on HRSB was still significant, so parental monitoring and early sexual experience can be considered partial mediators of this link. We found that the indirect effects of the FCU on HRSB via parental monitoring (Path A*C*D) and early sexual experience (Path A*E*F) were significant, indicating that these constructs can also be considered intervening variables between the FCU and HRSB.

Finally, we analyzed whether gender and race were significant moderators of the pathways identified in the model. A model in which all model paths were constrained to be equal for males and for females fit significantly worse than the freely estimated model, $\chi^2 (6) = 16.30$, $p < .05$, suggesting systematic differences. The path coefficients for males and for females are presented in Table 2, as are individual chi-square tests and indirect effects. The main differences in the coefficients were related to effects of the FCU on the change in family relationship quality; males reported smaller effects than did females. The other paths were not significantly different, but the tests of indirect effects suggest that the mediational paths were different: for males, the change in family relationship quality on HRSB was mediated by early sexual experience and parental monitoring, whereas effects for females were mediated by monitoring only.

A model in which all paths were constrained to be equal for European Americans and for African Americans also fit significantly worse than the freely estimated model, $\chi^2 (6) = 17.11$, $p < .05$, suggesting systematic differences. Path coefficients are presented in Table 2, as are individual chi-square tests and indirect effects. The main differences were in the mechanisms by which the FCU exerts effects on HRSB. For African Americans, family relationship quality was the primary intervening variable, whereas for European-Americans, indirect effects of the FCU on HRSB were only significant once parental monitoring and early sexual experience were included in the model.

Discussion

Given the gravity of negative outcomes associated with HRSB, prevention and intervention practitioners are seeking low-cost, high-impact methods to reduce youths' risk for STIs and HIV. Many interventions designed to prevent these negative outcomes focus on individual-level factors directly related to sexual behavior, such as contraceptive knowledge, assertiveness, self-efficacy, and decision making (Meschke, Bartholmae, & Zentall, 2002).

The FCU model takes a different approach in that it focuses on the social ecologies in which adolescents form their sexual attitudes, intentions, and values rather than on factors specific to sexual behavior. This focus includes enhancing family communication and improving parents' monitoring and supervision. These factors have been linked to reductions in a variety of problem behaviors, including HRSB (Markham et al., 2010; Miller, Benson, & Galbraith, 2001), but we had not systematically examined the effects of the FCU on HRSB prior to this study. Results indicated that the FCU did not have a direct effect on HRSB at age 22 but did exert significant indirect effects, and that these effects were prompted by change in family relationship quality from age 12 to 15. Also, parental monitoring and sexual activity at age 17 partially mediated the significant impact of family relationship quality on HRSB.

The longitudinal nature of our data and use of multimethod, multireporter variables add strength to these results. Also notable, our results were obtained within an intention-to-treat design, which was used to examine the entire treatment group regardless of whether they actually received the FCU or any additional interventions. Thus, the fact that we found effects, when less than half of the treatment group actually was treated, is a testament to the strength of the FCU.

Some readers may find it surprising that we found an indirect effect of the FCU on HRSB in early adulthood given that the intervention occurred so many years earlier. Because of the elapsed time between intervention and outcome, it is reasonable to question the source of these effects. Data from our study suggest that participation in the FCU may have fostered improvements in family relationship quality in midadolescence that were carried forward across development, enabling parents to maintain a positive connection with their adult child. The early-adulthood period is characterized by change and instability, yet the parent–child relationship represents a kind of permanency not present in social bonds with peers (Grusec & Davidov, 2007). A basic feeling of parental support in the form of guidance, advice, and positive regard may be particularly salient to the young adult and may shape current behavior. This conclusion is merely speculative, however, in that we had no measures of parenting behaviors at age 22 with which to assess the long-term effects of the FCU on family processes. Future research would be well advised to gather parenting data across the transition to adulthood.

We also found that gender was a significant moderator; the effect of the FCU on change in family relationship quality was smaller for males than for females, and the effect of change in family relationship quality on HRSB was mediated by sexual activity and parental monitoring for males, whereas it was mediated only by monitoring for females. Regarding the first gender difference, research suggests that the quality of the parent–child relationship declines moderately but consistently across early to middle adolescence (McGue, Elkins, Walden, & Iacono, 2005), with conflict increasing in intensity (Laursen, Coy, & Collins, 1998). Adolescent daughters engage in significantly more conflict with parents than do sons (Chung, Flook, & Fuligni, 2009), and this conflict is more intense for females who are dating (Dowdy & Kliewer, 1998) and youths who are sexually active (Ream & Savin-Williams, 2005). Perhaps the FCU had a greater impact on parent–daughter relationships, then, because there was more room for improvement between ages 12 and 15. Alternatively, by focusing on improving family communication, the FCU may have fostered more positive perceptions of family relationship quality among girls.

The second gender difference related to monitoring and early sexual activity is more unusual. In contrast to our study, previous research suggests that males' sexual behavior may be *less* responsive to parenting than that of females, not more (Coley, Votruba-Drzal, & Schindler, 2009; Dilorio, Pluhar, & Belcher, 2003; Luster & Small, 1994). When it comes to the association between parent–child relationship quality and age of sexual debut, most studies report either no gender differences (e.g., Bingham & Crockett, 1996) or associations only for females (e.g., McNeely et al., 2002). We located only one study with findings similar to ours: Sieving, McNeely, and Blum (2000) found that high mother–child connectedness was significantly related to delay of first sexual intercourse among males in 10th and 11th grades, but not for females of the same age. The link between gender and parenting effects on sexual behavior is clearly not straightforward, suggesting a need for continued analysis of gender differences.

Race was also a significant moderator of the pathways in our model, in that the mechanisms by which the FCU exerted effects on HRSB differed for African American and for European American youths. For African Americans, the effects of the FCU were transmitted by means

of change in family relationship quality, whereas the effects for European Americans were transmitted by means of parental monitoring and early experience. It may be that constructs not included in our study are responsible for these effects. One potential construct to consider is general psychological adjustment. Prior research on samples of African American youths has linked aspects of community disadvantage and racial discrimination to early sexual activity, unprotected intercourse, and STI prevalence (Brooks-Gunn, Duncan, Klebanov, & Sealand, 1993; Moore & Chase-Lansdale, 2001), and some evidence suggests that African American youths may engage in risky behaviors such as HRSB as a response to such stress (Stevens-Watkins, Brown-Wright, & Tyler, 2011). The improvements in family relationship quality that were facilitated by participation in the FCU may have helped parents provide much-needed emotional support to their children, thereby buffering the effects of this stress and enhancing general psychological adjustment. Preliminary support for this premise is found in two studies in which supportive relationships with parents (Kogan, Brody, Chen, & DiClemente, 2011) and with peers (Brady, Dolcini, Harper, & Pollack, 2009) moderated the association between life stress and risky sexual behavior among African American youths.

A second factor to consider is the quality and content of parent–adolescent communication about sex. Epstein and Ward (2008) found that parents of African American boys talked to them more about sex than did parents of European American boys, and a review of effects of parent–adolescent communication about sex found a protective association with various indices of adolescent sexual behavior, especially for African American girls (Markham et al., 2010). In general, the literature on family communication about sexual behavior indicates that the interaction between closeness and values is what matters, in that teens who report feeling close to their parents are more likely to adopt their sexual values (Miller et al., 2001). Thus, it seems likely that supportive parent–youth relationships facilitate positive and open communication about sexual behavior and that this communication is linked with reductions in HRSB. Unfortunately, communication about sexual behavior was not assessed in our study.

The other interesting racial difference was the link between family relationship quality and the timing of sexual debut. We found that improvement in family relationship quality between ages 12 and 15 was linked with reductions in HRSB at age 22 by way of delayed sexual activity at age 17 for European Americans but not for African Americans. This racial difference may be attributed to differences in what is considered normative behavior in each community. Results from several studies indicate that African American youths may engage in sexual intercourse at earlier ages than European American youths. According to the CDC's 2009 National Youth Risk Behavior Survey of a nationally representative sample of youths enrolled in public and private high schools, African American youths were significantly more likely than European American youths to have had sexual intercourse at each grade level between Grades 9 and 12 (CDC, 2009). In another study conducted on a population-based sample of Los Angeles County in the early 1990s, African American boys began engaging in intercourse around age 15, whereas the sexual debut of African American girls and European American girls and boys occurred roughly 1.5 years later (Upchurch, Levy-Storms, Sucoff, & Aneshensel, 1998). Our sample was slightly older at age of sexual debut but followed a similar trend: at age 17, 39% of European American youth and 59% of African American youth had engaged in sexual intercourse, increasing to 69% and 77%, respectively, at age 18. If sexual activity was considered normative during midadolescence in our African American subsample, parents may not have felt as strongly about preventing sexual debut and instead chose to target other behaviors that prevent the spread of STIs and HIV, such as limiting number of partners, consistent condom use, and regular tests for disease. Positive parent–youth relationships may have facilitated communication about these topics, and this closeness may have prompted youths to engage in less HRSB.

Limitations and Future Directions

Several limitations apply to this study. First, with a "gated" intervention such as the FCU, one may not know with certainty the components most likely to promote change. Observed effects could have been driven by the universal intervention (FRC), the selected intervention (FCU), or the more intensive indicated interventions. However, previous analyses of intervention outcomes revealed that when the FCU is defined as the basic unit of compliance in mixture modeling (Jo, 2002), long-term effects on antisocial behavior, drug use, and depression are noteworthy (Connell & Dishion, 2008; Connell et al., 2007). Thus, the observed effects are most likely driven by participation in the selected intervention, but future analyses will further explore this possibility. Second, an ITT approach revealed no direct effects of the FCU on HRSB, so we refer to factors such as family relationship quality and parental monitoring as intervening variables rather than mediators (MacKinnon et al., 2002), which are still considered to be theoretically and clinically significant (Sandler et al., 2011). We did find a direct effect of change in family relationship quality on HRSB, so we were able to conduct a test of mediation in that case. Finally, although retention was high across the study, we also had a degree of missing data, and attrition was highest among low-SES families, indicating potential issues with external validity. However, we did not have differential attrition between the intervention and control conditions, so our results likely are not significantly biased.

Although much is known about family-level predictors of adolescent problem behavior, much less is known about the family processes that influence problem behavior during early adulthood. The social ecological context changes dramatically for many youths during the transition to adulthood, as many young people move out of the home and reduce contact with parents. Thus, parents may need to rely on different techniques to help guide their adult child's behavior. Our findings suggest that parents can influence HRSB during early adulthood by addressing risk factors earlier in adolescence by means of parental monitoring and a positive, warm relationship with open lines of communication. The FCU helped strengthen parent–child relationships in adolescence by improving parental communication skills and by encouraging parents to spend quality time with their children. These skills are likely to be maintained over many years and may, in turn, facilitate closer, more positive relationships in early adulthood. Future interventions aimed at reducing HRSB could target both individual-level and distal risk factors. Interventions similar to the FCU that are designed to reduce a number of problem behaviors could efficiently add sexuality-specific content to the services available to parents to enhance effects already seen on HRSB. For example, helping parents clarify their values regarding adolescent sexuality could empower them to more effectively communicate these values to their child. Further, parent–child communication about sexual values and expectations could be enhanced by providing parents with open-ended prompts designed to encourage positive and open communication about a topic many find difficult to broach. Still, our study findings are exciting in that they demonstrate that an intervention without sexuality-specific content, aimed at reducing other problem behavior, can be effective in reducing HRSB in early adulthood. These findings should encourage prevention scientists to consider the potential for program effects across multiple domains of youth behavior.

Acknowledgments

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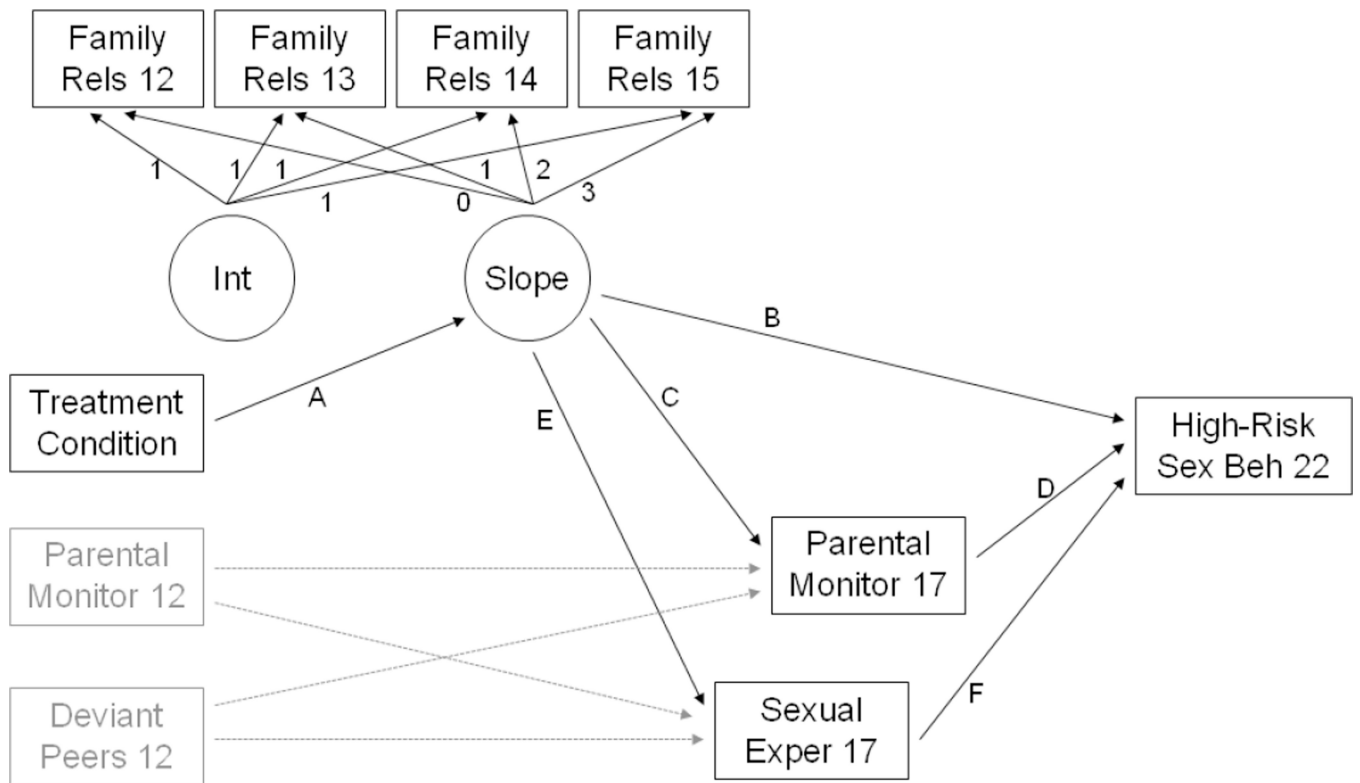
Figure 1.
Hypothesized model. In this model, the direct effect of the FCU, the growth curve intercept, and parental monitoring and deviant peer association at age 12 on HRSB at age 22 are controlled; these paths not included in the figure to facilitate readability.

Table 1

Correlations and Sample Descriptive Data

Variable	1	2	3	4	5	6	7	8	9	10
1. Intervention condition	—									
2. Family relationship (age 12)	.04	—								
3. Family relationship (age 13)	-.01	.47***	—							
4. Family relationship (age 14)	-.02	.40***	.54***	—						
5. Family relationship (age 15)	-.05	.35***	.45***	.57***	—					
6. Parental monitoring (age 12)	.03	.45***	.21***	.21***	.21***	—				
7. Deviant peers (age 12)	.01	-.20***	-.12***	-.09**	-.07	-.31***	—			
8. Parental monitoring (age 17)	.00	.17***	.19***	.19***	.28***	.22***	-.16***	—		
9. Sexual activity (age 17)	-.01	-.14***	-.17***	-.21***	-.19**	-.11**	.11**	-.31***	—	
10. High-risk sexual beh. (age 22)	.04	-.08*	-.08*	-.16***	-.18***	-.15***	.12***	-.33***	.31***	—
N	993	989	855	829	819	989	991	702	790	815
M	1.50	3.58	3.45	3.34	3.27	4.00	.75	-.03	1.20	.25
SD	.50	1.20	.99	1.01	.99	.96	1.11	.76	1.16	.25

*
$p < .05$.

**
$p < .01$.

***
$p < .001$

Table 2

Model Coefficients for Full Sample, for Gender Comparison, and for Racial Comparison (European American [EA] vs. African American [AA])

Model path	Model 1	Model 2	Males only	Females only	Diff. Test	EA only	AA only	Diff. test
A: FCU-Slope	.16**	.16**	.11*	.21**	$\chi^2(1)= 14.86$***	.16*	.15	$\chi^2(1)=19$
B: Slope-HRSB	-.25***	-.16**	-.16*	-.12	$\chi^2(1)=13$	-.04	-.38***	$\chi^2(1)= 3.95$*
C: Slope-Monitor	—	.29***	.21*	.39***	$\chi^2(1)= 2.37$	.27***	.37***	$\chi^2(1)=155$
D: Monitor-HRSB	—	-.22***	-.25***	-.22***	$\chi^2(1)=.01$	-.31***	-.06	$\chi^2(1)= 2.31$
E: Slope-Sex Exp	—	-.17***	-.22**	-.14	$\chi^2(1)=1.54$	-.37***	-.02	$\chi^2(1)= 8.07$*
F: Sex Exp-HRSB	—	.22***	.25***	.21**	$\chi^2(1)=24$	.25***	.22	$\chi^2(1)=97$
R^2(HRSB age 22)	.06	.21	.23	.18		.26	.21	
A*B	-.04*	-.03*	-.02	-.02		-.01	-.06*	
C*D	—	-.06*	-.05*	-.09*		-.08*	-.02	
E*F	—	-.04*	-.05*	-.03		-.09*	<-.01	
A*C*D	—	-.01*	.01†	-.02*		-.01*	<-.01	
A*E*F	—	-.01*	-.01*	-.01		-.01*	<-.01	

Note. FCU = Intervention condition.

†
 $p < .06$;

*
 $p < .05$;

**
 $p < .01$;

***
 $p < .001$.