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Reducing Risk for Substance Use by Economically Disadvantaged Young Men: Positive Family Environments and Pathways to Educational Attainment

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Abstract

Using prospective, longitudinal data spanning 10 years (age 10 to 20) from a study of 295 economically disadvantaged males, the current investigation evaluated a developmental model that links early family environment and later educational aspirations, extracurricular activities, and educational attainment to substance use in early adulthood. The results indicate that a positive family environment during adolescence (low family conflict, high family warmth, and effective child management) predicted educational involvements during adolescence that promoted educational attainment during early adulthood. Finally, higher levels of educational attainment were associated with less substance use in early adulthood, even after controlling for adolescent substance use. These findings suggest that positive parenting promotes educational achievements that increase resilience to substance use for economically disadvantaged males.

Keywords

substance use; ATOD; educational attainment; social control theory; family environment

Young men from socioeconomically disadvantaged families are at high risk for substance use, especially during the period from late adolescence to early adulthood (Barbeau, Krieger, & Soobader, 2004; Reinherz, Giaconia, Hauf, Wasserman, & Paradis, 2000). Moreover,

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youth living with economically stressed parents often experience less adequate parenting (Conger, Conger, & Martin, 2010) and are less likely to receive an education beyond high school (Aud et al., 2010). Despite these difficulties associated with early economic disadvantage, many young people do prove to be resilient and avoid serious involvement with substances. In the present study we propose that when parents are able to maintain a more positive family environment that promotes educational achievement despite their economic disadvantage, then young men from economically disadvantaged backgrounds will be more resilient to their disadvantaged circumstances in terms of their involvement with alcohol, tobacco, and other drugs (ATODs). In the current report we evaluate these hypotheses using data from the Pittsburgh Mother & Child Project (PMCP), a prospective, longitudinal study of risk and resilience among an ethnically diverse sample of low-income males (Shaw, Gilliom, Ingoldsby, & Nagin 2003).

Prior research indicates that the quality of the family environment, beginning in early childhood (Sitnick, Shaw, & Hyde, 2014), may be one of the most significant influences on risk for substance use (see Vakalahi, 2001 for a review). Although not as well documented, the family environment during childhood and adolescence also appears to impact substance use in adulthood (Engels, Vermulst, Dubas, Bot, & Gerris, 2005; Guo, Hawkins, Hill, & Abbot, 2001). For example, Engels and colleagues (2005) found that poor family functioning in early adolescence (mean age 12 years) predicted greater levels of problem drinking in young adulthood (mean age 22). A separate body of research has consistently demonstrated that educational attainment is negatively associated with substance use during both adolescence and adulthood (Breslau, Lane, Sampson, & Kessler, 2008; Hawkins, Catalano, & Miler, 1992; Merline, O'Malley, Schulenberg, Bachman, & Johnston, 2004; Substance Abuse and Mental Health Services Administration (SAMHSA), 2010). Yet, little research has attempted to tie these two domains of research together. Schulenberg and Maggs (2002) argue, "A quarter century of empirical work has yielded a large and sometimes overwhelming array of substance use risk and protective factors The task now for scientists is to understand more fully how risk and protective factors are linked with substance use within individuals over time and across contexts" (p. 57). The current study takes this approach by evaluating a conceptual model that integrates these two bodies of research and proposes that family and educational factors combine in a developmental process to increase the resilience of economically disadvantaged young men to later substance use.

Economically Disadvantaged Males: Educational Attainment and Substance Use

The current study fills a need for research examining processes that foster resilience to involvement with ATODs and promote educational attainment among economically disadvantaged young men. In the past few decades there has been a dramatic shift in gender differences in educational attainment in the United States. Males now lag behind females in rates of high school graduation, college enrollment, and obtaining bachelor degrees (Buchmann, DiPrete, & McDaniel, 2008). For instance, in 2009 9.1% of males age 16–24 were not enrolled in school and had not completed a high school program, compared to

7.0% of females (National Center for Education Statistics (NCES), 2012). The gender gap has become especially pronounced for college graduates. Prior to 1982 a greater proportion of males received bachelor degrees than females; however, since then the proportion of women completing college has steadily increased, and in the 2010–11 academic year 57.2% of all bachelor's degrees were awarded to women (NCES, 2012).

Surprisingly little research has addressed the causes of the growing gender disparity in educational attainment. The research that does exist suggests that males may be more vulnerable to socioeconomic disadvantage than females. For instance, Buchmann and DiPrete (2006) found that changes in educational attainment by gender are at least partially attributable to the vulnerability of males from families with relatively less educated or absent fathers. Research by Entwisle, Alexander, and Olson (2007) suggests that these vulnerabilities may begin early. They found larger gender disparities in reading during elementary school for boys compared to girls from socioeconomically disadvantaged than non-disadvantaged backgrounds. Although the causes of this gender disparity remain unclear, the gender divide in educational attainment appears to vary by economic status and race. White, middle class males appear to achieve similar levels of educational attainment as their female counterparts; however, low-income males lag behind their female peers in terms of educational attainment (King, 2000). Previous research suggests that parental socioeconomic status (SES) is a strong predictor of the SES of the next generation (Bowles, Gintis, & Osbourne, 2001; Cameron & Heckman, 2001); thus, on the one hand, lower educational attainment of low SES males is not surprising. However, the relative educational success of their female counterparts suggests that economic disadvantage disproportionately affects males' educational opportunities. Thus, the research suggests that economically disadvantaged males are particularly vulnerable and at risk for low educational attainment.

Males are also at greater risk for substance use than are females and young men from socioeconomically disadvantaged families are especially at risk (Barbeau et al., 2004; Reinherz et al., 2000; Swendsen et al., 2012). For instance, Reinherz and colleagues (2000) found that males were twice as likely as females to develop substance use disorders by age 21, and that early family environments characterized by lower SES were associated with greater likelihood of developing a substance use disorder by age 21. Similarly, Swendsen and colleagues (2012) used data from the National Comorbidity Survey and found that, among adolescents aged 13 to 14, males had higher rates of regular alcohol use, alcohol abuse, and illicit drug use than females and that these gender differences became more pronounced as the adolescents aged.

Thus, males, and particularly socioeconomically disadvantaged males, appear to be at risk for both lower educational attainment and substance use. As such they warrant closer examination in studies that focus on factors that may both promote educational attainment and reduce risk for substance use for this high risk group. The current study does just this. The participants in our study are drawn from an ongoing longitudinal study of vulnerability and resilience among boys from low-income families (Shaw et al., 2003); thus, this group is likely to demonstrate an above average prevalence of risk factors and substance use. We use these data to evaluate a conceptual model that proposes that earlier family environment and

educational factors combine in a developmental process to promote educational attainment and the resilience of economically disadvantaged young men to later substance use.

A Social Control Model of Substance Use

The conceptual model (Figure 1) guiding the present study represents an adaptation of Sampson and Laub's (1993, 2005) age-graded theory of informal social control, which proposes that the informal social control exerted by social institutions such as family and school inhibits problem behaviors. Social control is generated through bonds with conventional institutions that increase attachment and commitment to the values and priorities of those institutions. Although Sampson and Laub's work has focused on crime and delinquency, their theory is a general model that applies to other related forms of problem behavior such as involvement with legal and illegal substances which often have long-term adverse health consequences.

Our model focuses on three social control processes – the family during late childhood and adolescence (Box 1 in Figure 1), extracurricular activities and educational aspirations during adolescence (Box 2), and educational attainment during young adulthood (Box 3). Specifically, we examine three aspects of the family environment during childhood and adolescence related to informal social control – family conflict and warmth, which are barometers of the strength of ties between parents and children, and effective child management by parents, which is a direct source of informal social control. We also examine two factors related to social control and the institution of school during adolescence – educational aspirations and extracurricular activities. These factors assess attachment and commitment to the value of education and engagement with the institution of school. Finally, we examine educational attainment at age 20, and expect that higher levels of educational attainment reflect greater commitment to social norms and conventional activities and goals.

Our model (Figure 1) predicts that the family environment (Box 1) will influence the educational aspirations and extracurricular activities of the child during adolescence, increasing commitment to the educational environment (Box 2). Like other parents, mothers and fathers living in high risk environments want their children to succeed academically and this message is more likely to be received if parenting is warm and effective (Amato & Fowler, 2002; Chavkin & Williams, 1989). In turn, these aspirations and activities are expected to influence educational attainment during early adulthood (Box 3). Finally, consistent with a social control approach, we expect that educational attainment reflects commitment to conventional activities and social norms and goals and, thus, will be associated with lower levels of substance use in early adulthood (Box 4). Thus, we expect that early family environments will affect later substance use through the promotion or inhibition of conventional activities and aspirations involving education. In addition to the theoretical roots of the model, earlier research (reviewed below) provides some support for the hypothesized pathways in the model.

Family Environment (Box 1)

Social control theory suggests that strong family bonds promote conformity to broader social norms. Consistent with this idea, an extensive body of research has demonstrated the importance of the family environment for adolescent substance use and problems with substances (e.g., Duncan, Duncan, Biglan, & Ary, 1998; Habib et al., 2010; Wang, Dishion, Stormshak, & Willet, 2011). Child management [generally including monitoring, discipline, problem solving skills and positive reinforcement (Patterson & Stouthamer-Loeber, 1984)], and monitoring in particular, have been consistently linked to lower levels of substance use during adolescence (Habib et al., 2010; Wang et al., 2011). Research also has shown that warm and supportive parent-child relationships predict lower levels of subsequent substance use (e.g., Wang et al., 2011). Conversely, negative environments with high hostility and conflict between parents and children have been associated with greater levels of substance use (Duncan et al., 1998).

Although not as expansive as the research on family environment and substance use during adolescence, research has also linked the quality of the family environment during childhood and adolescence to substance use in early adulthood or later (Guo et al., 2001; Herrenkohl, Jungeun, Kosterman, & Hawkins, 2012). For instance, using data from a cohort of participants followed since fifth grade, Herrenkohl and colleagues (2012) found that family conflict and effective child management (a measure which included six indicators of parental monitoring, parents' use of punishments and rewards for behavior, and the clarity of rules within the family) during adolescence predicted adult (age 27) substance use disorder symptoms, modeled as a latent class. In addition, Guo and colleagues (2001) found that aspects of child management at age 16 predicted decreased risk of alcohol abuse and dependence at age 21 using prospective longitudinal data from an ethnically diverse sample of urban students.

Extracurricular Activities and Educational Aspirations (Box 2)

The theoretical model (Figure 1) proposes that early family environments that are low in conflict and high in warmth and effective child management practices will affect later substance use through the promotion of conventional activities and aspirations involving education. Previous research has shown that the family environment is associated with a number of attitudinal and behavioral indicators of academic orientation during adolescence, including involvement in extracurricular activities and educational aspirations (Astone & McLanahan, 1991; Dubow, Boxer, & Huesmann, 2009). For instance, using data from a sample of youth with a broad range of socioeconomic backgrounds from 38 third grade classrooms in a semi-rural county in New York, Dubow and colleagues (2009) found that negative family interactions at age 8 predicted lower educational aspirations at age 19. In turn, educational aspirations and involvement in extracurricular activities have been associated with both lower levels of substance use (Darling, 2005; Eccles & Barber, 1999) and greater educational attainment (Beal & Crockett, 2010; Sewell & Hauser, 1972). For instance, Darling (2005) analyzed data from a 3-year longitudinal study of an ethnically diverse sample of high school students and found that adolescents reported lower levels of smoking, marijuana use, and other drug use during years when they were involved in extracurricular activities. Relatedly, Sewell and Hauser (1972) demonstrated that

educational aspirations of high school seniors predicted their educational attainment at age 25.

Educational Attainment and Substance Use (Box 3 and 4)

Educational commitment, success in school, and high school completion have consistently been found to be negatively associated with substance use during adolescence (Breslau et al., 2008; Hawkins et al., 1992; Zimmerman & Schmeelk-Cone, 2003). Likewise, much research has demonstrated that educational attainment is negatively associated with substance use in adulthood (Merline et al., 2004; SAMHSA, 2010). The relationship between education and substance use during early adulthood is less clear. Research in this area has generally focused on either documenting the extent and predictors of substance use on college campuses (e.g., Caldeira, Arria, O'Grady, Vincent, & Wish, 2008; Harford & Muthén, 2001; Meichun, Lee, & Wechsler, 2003) or comparing the substance use of young adults who attend college and those who do not (e.g., Dawson, Grant, Stinson, & Chou, 2004; White, Labouvie, & Papadaratsakis, 2005). Yet, nearly 60% of 18 to 24 year olds are not college students (NCES, 2010) and, thus, these lines of research tell us little about how education affects substance use for these young adults. For instance, the effect of education on substance use may be substantial for young adults who do not complete high school compared to those who obtain post high school technical training, but these distinctions are lost when all young adults who do not attend a 4-year college or university are lumped into one category. Simple comparisons between college students and all other young adults do not capture the extent of variation in the educational attainment of young adults and thus, such research provides little information on the degree to which involvement in a variety of educational options is associated with substance use for the majority of young adults.

Especially important, disadvantaged groups such as ethnic minorities and individuals from low-income families are less likely to attend college (Aud et al., 2010) and are thus under-represented in research involving only college students. As many of these same groups are at greater risk for substance use (Barbeau et al., 2004; Reinherz et al., 2000), this issue is even more critical. It is important to determine whether educational attainment that does not involve attending a 4- year university or college (e.g., high school completion, entry into trade school) decreases the risk of substance involvement during this developmental period as proposed by social control theory.

The Present Study

The current study addresses the need for integrative research on educational attainment and positive parenting behaviors as possible sources of resilience to ATOD use by economically disadvantaged young men. We evaluate an analytic model (Figure 2) that includes three important barometers of the family environment during childhood and adolescence: family conflict, family warmth, and child management. We expect stability in each of these variables from late childhood to adolescence. For example, we expect that child management at age 12 will be significantly and robustly associated with child management at age 17. Drawing on social control theory and the research previously reviewed, we expect each of these family environment variables at age 17 to predict educational aspirations and extracurricular activities during adolescence. Specifically, we expect that family conflict

will be negatively associated with educational aspirations and extracurricular activities, and that family warmth and child management will be positively related to educational aspirations and involvement in extracurricular activities. In turn, we expect that adolescent educational aspirations and extracurricular activities will predict higher levels of educational attainment in early adulthood. Consistent with previous research and a social control approach, we expect educational attainment to be negatively related to substance use during early adulthood. In the analyses we also control for the adolescent's race and socioeconomic background (family income and primary caregiver's education) because groups such as racial minorities and individuals from low-income families are less likely to attend college and at greater risk for substance use.

The model we evaluate proposes a developmental process in which early family environment promotes educational involvements that reduce risk for substance use over time. We expect that the effect of the antecedent variables on education and substance use will not be direct, but instead operate indirectly through the more proximate variables in the model, as depicted in Figure 2. For instance, extracurricular activities and educational aspirations will not have direct effects on substance use, but instead operate indirectly through educational attainment.

Method

Participants and Procedures

Data for the present study were drawn from the PMCP, an ongoing longitudinal study of vulnerability and resilience among boys from low-income families (Shaw et al., 2003). The study has been approved by the University of Pittsburgh IRB (protocol #PRO09020252). The sample was recruited from low-income families who were participants in the Women, Infants, and Children (WIC) Nutritional Supplement Program in the Pittsburgh metropolitan area over a two year period beginning in 1991. The WIC program provides monetary supplements to purchase food for income-eligible families from pregnancy until children are 5 years old. Because the original intent of the project was to examine precursors of antisocial behavior, and funding did not permit recruitment of a sufficiently large sample of girls (who were expected to show lower levels of serious antisocial activity), the sample was restricted to boys. During the course of recruitment, 421 families were approached at WIC sites. Of the families who were approached 310 (73.6%) participated in the first assessment (3.3% declined to participate at the time of recruitment and an additional 23.0% declined before the first assessment). At the time of the first assessment when infants were 1.5 years old, mothers ranged in age from 17 to 43 years ($M = 27.9$). The sample consisted of approximately 53% European American, 36% African American, 6% Hispanic American, and 5% biracial families. Sixty-five percent of mothers were married or living with partners, 28% were never married, and 7% were separated, divorced, or widowed. Mean per capita family income was \$241 per month (\$2,892 per year; \$4,947 adjusting for the 2013 Bureau of Labor Statistics' Consumer Price Index). The PMCP involved regular laboratory and home visits during childhood and adolescence. Each home visit lasted approximately two to three hours and consisted of trained examiners administering standardized questionnaires. All home examiners were trained to administer each of the questionnaires before being

certified to reliably administer the protocol independently. Interviewers were not demographically matched with participants -- during most years of assessment the majority of these interviewers were white and more were female than male, whereas the sample was 48% non-white and exclusively male. However, interviewers were trained to be culturally sensitive when rating participants.

The current study uses data from four waves of assessment (at age 10, 12, 17, and 20) and thus is restricted to the 295 target youth who participated during any of those assessments (i.e., 95% of the 310 families who participated at the initial assessment when children were 1.5 years old). At the age 10 assessment the median family income was \$27,890 and the average household size was 4.78 people (SD = 1.58). At the age 17 assessment (information from the PC was no longer collected at the age 20 assessment) the median family income was \$31,200 and the average household size was 4.16 (SD = 1.42). The mean for the primary caregiver education variable (1 = less than 10th grade, 2 = 10th or 11th grade, 3 = High school graduate or GED, 4 = some college or trade school, 5 = completed 4 years college, and 6 = completed graduate or professional school) was 3.77 (SD = 1.63) at the age 10 assessment and it was 3.78 (SD = .86) at the age 17 assessment. Approximately 45% of the primary caregivers were married at both the age 10 and age 17 assessments; however, these were not necessarily the same married couples. Nearly 36% of the primary caregivers had a change in marital status from the age 10 to the age 17 assessment (e.g., from married to separated or divorced, but also from living together to married, from divorced to remarried, etc.). Participants received compensation for their involvement in the study. The primary caregivers received \$50, \$100, and \$150 at the age 10, 15, and 17 assessments, respectively. The target youth received a \$10 gift certificate at the age 10 assessment, \$20 at the age 15 assessment, and \$150 at the age 20 assessment.

Measures

Family conflict and warmth—Relationship quality between the primary caregiver and target youth was assessed using the Adult-Child Relationship Scale (ACRS) at age 10 and 17. The ACRS was adapted for use with parents and children from the Student-Teacher Relationship Scale (STRS; Pianta & Steinberg, 1991), which was designed to assess multiple characteristics of their relationship. Two factors were included in the ACRS adaptation of the STRS: conflict and warmth. *Family conflict* assesses the frequency of conflict between the primary caregiver and the target youth and consists of six target reported items (e.g., “We always seem to be struggling with each another.”) rated on a 5 point scale (1=definitely not to 5=definitely). The conflict scale demonstrated adequate to good internal reliability ($\alpha=.71$ at age 10 and $\alpha=.80$ age 17). Exploratory factor analyses of the age 10 conflict items indicated a single dimension, and the same was true for the age 17 conflict items. We randomly parceled the six items into three indicators of the latent construct at each age. Parcels offer three advantages over the use of individual items: They typically produce more stable solutions, they are less likely to share specific sources of variance that may not be of primary interest, and they reduce the likelihood of spurious correlations (Little, Cunningham, Shahar, & Widaman, 2002; Little, Rhemtulla, Gibson, & Schoemann, 2013).

The *family warmth* scale reflects the extent to which the target views the relationship between the parent and target youth as positive and open, especially regarding the child's emotional needs (e.g., "It is easy for my parent to be in tune with what I am feeling."). The scale ($\alpha = .62$ at age 10 and $\alpha = .81$ age 17) consists of 4 target report items which were rated on a 5-point Likert scale (1 = definitely not to 5 = definitely). The number of items precluded parceling, thus the individual items were used as indicators of the latent construct at each age.

Effective child management practices were assessed by interviewer reports from the home visits at age 12 and 17. Interviewers rated the primary caregiver's child management behaviors following the home assessment using a 5-point Likert scale (1 = very inaccurate to 5 = very accurate) on four items describing appropriate parenting: "This parent supervises the child carefully (knows where and what the child is up to.)," "This parent disciplines the child appropriately," "This parent has good family problem solving skills," and "This parent positively reinforces the child." The scale demonstrated good internal reliability ($\alpha = .83$ at age 12 and $\alpha = .89$ age 17). The four items were used as indicators of the latent construct at each age.

Educational aspirations were assessed at age 17 with a target report item indicating the level of schooling the target planned to complete [1 = do not plan to complete high school or obtain GED to 5 = graduate school (including medical, law, or business school)].

Extracurricular activities—Targets reported on their involvement in after-school activities/sports and volunteer work at age 17. This information was used to create a measure of extracurricular activities (0 = no volunteer work or after-school activities/sports, 1 = volunteer work or after-school activities/sports, 2 = volunteer work and after-school activities/sports). We include both school activities and volunteer work in our measure of extracurricular activities because previous research suggests that volunteer work has similar benefits to other extracurricular activities. For instance, Rose-Krasnor, Busseri, Willoughby, and Chalmers (2006) investigated the associations between 8 different types of extracurricular activities and 4 developmental indicators (risk behavior, well-being, academic orientation, and social relations). Of the 8 extracurricular activities investigated, only school clubs and volunteering were consistently associated with all 4 developmental outcomes.

Educational attainment was assessed at age 20 with the target's report of the highest level of education he had completed (1 = 9th grade or less, 2 = 11th grade or less, 3 = Obtained GED, 4 = high school graduate, 5 = 1 year of college, 6 = 2 years of college, 7 = Completion of Associate's degree or trade school, 8 = 3 years of college). We note that, by age 20, none of the participants had completed a college degree. In addition, by age 20, approximately 64% of these young men completed no more than a high school education and almost 14% did not finish high school or obtain a GED. About 25% of them had completed one year of college and 11% had completed 2 years or received an AA degree. Thus, the educational course of these economically disadvantaged young men falls well below the national average in terms of educational attainment for 20 year olds (Aud et al., 2010); however, they do vary in their degree of educational accomplishments.

Substance use—During the age 20 assessment targets completed the Alcohol and Drug Consumption Questionnaire (ADCQ; Cahalan, Cisin, & Crossley, 1969) which measures the frequency (0 = have never tried/no use in the last year to 7 = every day) with which participants used 12 different classes of substances. We examined three of those substances in this report: alcohol, marijuana or hashish, and tobacco. These three items were used as indicators for our age 20 substance use latent construct. Exploratory factor analyses of the 12 substances included in the ADCQ revealed that alcohol, tobacco and marijuana all loaded on a single factor which none of the other substances loaded on. There was also much overlap in the use of these three substances across time. For instance, alcohol use at age 17 correlated almost as strongly with marijuana use at age 20 ($r = .25, p < .001$) as it did with alcohol use at age 20 ($r = .26, p < .001$). Thus, empirically, there is good reason to examine the three substances together as a latent factor. We also examined the three substances together based on theory and previous research. For instance, serious health consequences are associated with the use of all three substances and all three substances involve a risk of addiction. Alcohol, tobacco and marijuana use also commonly co-occur (Lynskey, Fergusson, & Horwood, 1998; SAMHSA, 2012) and also share common risk and protective factors. For instance, child management, and monitoring in particular, has been consistently linked to lower levels of alcohol use, binge drinking, and tobacco and marijuana use (e.g., Habib et al., 2010).

In addition to our age 20 measure, our study also includes a measure of substance use during adolescence. At age 17 targets completed the Self Report of Delinquency (SRD; Elliot, Huizinga, & Ageton, 1985). The SRD is a self-report questionnaire that assesses the frequency (0 = never, 1 = once or twice, 2 = more often) of antisocial behavior. For the purposes of this study, responses pertaining to the participant's use of alcohol, marijuana, and tobacco were utilized. Participants reported on three items that indicated the frequency of alcohol consumption (beer, wine, and hard liquor). These three items were averaged together to create an indicator of alcohol use. This indicator was then averaged with the marijuana and tobacco items (3 items total) to create a measure of substance use during adolescence ($\alpha = .64$).

Control variables—The family's household income from all sources in thousands of dollars (i.e., income divided by 1000) and the primary caregiver's educational attainment (1 = less than 10th grade, 2 = 10th or 11th grade, 3 = High school graduate or GED, 4 = some college or trade school, 5 = completed 4 years college, and 6 = completed graduate or professional school) were assessed during adolescence and included in the analyses as control variables. Change in family structure from the age 10 assessment through the age 17 assessment (0 = no change, 1 = change) was also included as a control variable, as was a variable representing the participant's race (1 = white, 0 = other racial/ethnic group). Examination of the target's self-reported race revealed that nearly 52% of the sample reported being white, almost 39% of the sample reported being African American, and the remaining 8–9% reported a variety of categories (0.4% Mexican American, 0.4% Hispanic, 0.4% Native Hawaiian/Pacific Islander, 6.6% biracial, and 1.6% of participants selected the "Other" category). Because of power issues dealing with these small groups and because we believed the most important distinction was the privilege associated with being white

compared to being a member of an ethnic or racial minority, we collapsed the categories into white versus other groups.

Results

Measurement Model

Structural equation models were estimated using Mplus 6.12 (Muthén & Muthén, 1998–2011) and Full Information Maximum Likelihood (FIML). The latter provides more consistent, less biased estimates than ad hoc procedures for dealing with missing data such as listwise deletion, pairwise deletion, or imputation of means (Allison, 2003; Arbuckle, 1996). The first step in our analyses was to confirm that the indicators loaded as expected on the proposed constructs (e.g., that the three conflict parcels loaded well on the family conflict construct). We then tested for invariance over time in the factor loadings of the family conflict, family warmth, and child management constructs. The factor loadings for all three constructs were invariant across ages 10/12 and 17. Factor loadings are presented in Table 1. All factor loadings were in the expected direction, of acceptable magnitude, and statistically significant, affirming the usefulness of the variables selected to measure our latent constructs. The confirmatory factor analysis fit the data reasonably well ($\chi^2 = 423.074$, $df = 334$, Root Mean Square Error of Approximation (RMSEA) = .030, Comparative Fit Index (CFI) = .959).

Next we examined the correlations among the variables used in model testing (presented in Table 2). The correlations provided partial support for the predictions derived from the model in Figure 2. Each childhood family variable was positively and significantly associated with the same construct during adolescence [e.g., the correlation between conflict at age 10 and conflict at age 17 is .22 ($p < .05$)]. Warmth and child management at age 17 were both positively and significantly associated with extracurricular activities. Child management at age 17 was positively and significantly associated with educational aspirations; however, warmth was not significantly associated with educational aspirations (although the correlation was in the direction predicted). Family conflict at age 17 was negatively and significantly associated with educational aspirations; however, it was not significantly associated with extracurricular activities (although the correlation was in the direction predicted). Extracurricular activities and educational aspirations were also both positively and significantly associated with educational attainment. Finally, educational attainment and substance use at age 20 were negatively and significantly associated with one another.

Structural Models

We next estimated the hypothesized model (RMSEA = .032; CFI = .943; $\chi^2 = 538.138$; $df = 414$). We then tested whether paths not suggested by our analytic model were significant by testing all other possible paths from antecedent variables to later variables individually (i.e., one at a time). When a path was significant it was retained, and when not significant, the path was dropped. Testing continued in this manner until all possible paths had been tested resulting in the model presented in Figure 3 (RMSEA = .029; CFI = .952; $\chi^2 = 515.341$; $df = 411$). The fit of this model was significantly improved over the hypothesized model ($\chi^2 =$

22.797; $df = 3$; $p = .000$) and fit the data well: The RMSEA was less than .06 and the CFI was greater than .95 (Hu & Bentler, 1999).

As shown in Figure 3, each of the childhood family environment constructs was positively and significantly associated with the same construct at age 17, indicating a degree of stability in the family environment over time. For instance, the standardized coefficient for the path from child management at age 12 to child management at age 17 was .44 ($p = .05$). Consistent with our expectations, family conflict at age 17 predicted lower educational aspirations, whereas child management at age 17 was positively associated with educational aspirations. Contrary to our expectations, neither family conflict nor child management was significantly associated with extracurricular activities. However, family warmth positively and significantly predicted extracurricular activities, although it did not predict educational aspirations. These results suggest different family processes are important for promoting educational aspirations than for encouraging involvement in extracurricular activities. As expected, educational aspirations and extracurricular activities at age 17 both positively and significantly predicted educational attainment at age 20. Indeed, the coefficient for the path from educational aspirations to educational attainment was quite robust ($\beta = .44$). In turn, educational attainment predicted less substance use at age 20, and this effect was also quite robust ($\beta = -.35$).

The results thus far provide general support for the model; however, analyses revealed three significant pathways that were not hypothesized in our analytic model, all of which involved child management. Effective child management practices at age 12 significantly and negatively predicted family conflict at age 17 ($\beta = -.27$), indicating that higher levels of child management at age 12 were associated with relative decreases in family conflict by age 17. Contrary to our expectations that child management would operate only indirectly on later educational attainment and substance use, effective child management practices at age 17 directly predicted both educational attainment ($\beta = .19$) and substance use ($\beta = -.20$) at age 20, suggesting the importance of effective child management strategies for both later educational attainment and deterring subsequent substance use. Control variables, including race, family income, and primary caregiver's education, were significant in one of 21 cases: non-white families were more warm and supportive than white families at age 17.

As a further test of the model, we added substance use during adolescence to the model, as shown in Figure 4. Educational aspirations, extracurricular activities, educational attainment, and substance use at age 20 were regressed on substance use at age 17 to control for its effects. Substance use at age 17 was allowed to covary with the remaining variables in the model. Fit indices affirm that the model fit the data reasonably well (RMSEA = .033; CFI = .939; $\chi^2 = 568.618$; $df = 432$); however, model fit for the model in Figure 3 is significantly better than that for the model in Figure 4 ($\chi^2 = 53.277$; $df = 21$; $p = .000$). Remarkably, substance use at age 17 did not significantly predict educational aspirations, extracurricular activities, or educational attainment. However, as expected, substance use at age 17 was strongly associated with substance use at age 20 ($\beta = .47$). Notably, the path from child management at age 17 to substance use at age 20 was no longer significant with the addition of prior substance use to the model; however, all other paths that were significant prior to the inclusion of substance use at age 17 remained significant and showed only very small

changes in magnitude. These results indicate that educational attainment predicts a relative decrease in substance use from adolescence to early adulthood.

We now turn to the indirect effects displayed in Table 3 to evaluate our expectation that the family environment during late childhood and adolescence, adolescent extracurricular activities and educational aspirations would operate indirectly through the more proximate variables included in the model to affect ATOD use. Table 3 includes indirect effects for both Model 1 and Model 2. Notably, with the exception of the indirect path from management at age 12 to management at age 17 predicting substance use at age 20, the same indirect paths are significant in both models. Examination of Table 3 reveals that, contrary to our expectations, family conflict at age 10 and warmth at age 10 and 17 did not have significant indirect effects on substance use at age 20. However, consistent with our hypothesis, there were significant indirect effects of child management during late childhood on substance use during early adulthood. Family conflict and child management in adolescence also had significant indirect effects on substance use in early adulthood. For these family variables, indirect effects on substance use operated primarily through educational aspirations and attainment. Both educational aspirations and extracurricular activities also had significant indirect effects on substance use through educational attainment.

To investigate the possible benefits of different categorical levels of educational attainment (e.g., high school completion rather than years of education), we created a set of four educational attainment dummy variables (i.e., the participant receives a score of one on the variable representing the highest educational level he attained among the four possibilities and receives a score of zero for the other three dummy variables) representing participants who: 1) did not complete high school or a GED; 2) completed a GED; 3) completed high school, 4) completed one or more years of college (includes completing trade school and receiving an Associate's degree; the number of participants in these categories were small and precluded the creation of a fifth dummy variable). We then estimated a model with the latter three dummy variables (less than high school was the excluded category) predicting the substance use latent construct. The coefficient for the GED group was negative, but not significant ($\beta = -.11$; $p = .193$). The coefficients for the high school group and the college group were both negative and significant indicating a reduced risk of substance use for those who completed high school and those who attended college compared to those with less than high school education. The coefficient for the college group ($\beta = -.62$) was larger than the coefficient for the high school group ($\beta = -.56$) suggesting additional benefits to education beyond high school.

Discussion

Previous research suggests that males, and particularly socioeconomically disadvantaged males, are at risk of both lower educational attainment and greater substance use (Barbeau et al., 2004; Buchmann et al., 2008; NCES, 2012; Reinherz et al., 2000). Thus, studies are needed that examine the factors that may promote educational attainment and reduce risk for substance use for this high risk group. The current investigation evaluated a developmental model linking earlier family environment and educational factors to later educational

attainment and resilience to substance use using data drawn from an ongoing longitudinal study of vulnerability and resilience among males from low-income families. Thus, the current study fills this need for research examining processes that foster resilience to involvement with ATODs and promote educational attainment among economically disadvantaged young men. The conceptual model that was evaluated takes a social control approach and proposes that earlier characteristics of the family environment influence later educational aspirations and extracurricular activities during adolescence, which in turn promote educational attainment and resilience to substance use in early adulthood for economically disadvantaged young men. The findings from the study and implications of those findings are detailed in the following sections.

Late Childhood to Adolescence: Findings and Implications

The social control model evaluated in the current study includes three aspects of the family environment during late childhood and adolescence that are closely related to informal social control: family warmth, family conflict, and child management. The results were consistent with our expectation that each of the childhood family environment constructs during late childhood would be positively and significantly associated with the same construct during adolescence, indicating a degree of stability in the family environment over time for these economically disadvantaged males. However, the stabilities for warmth and conflict were not very large in magnitude, thus indicating change, as well as stability, in these constructs across the period. It is important to remember that there is a seven year span between these assessments, with a great deal of developmental change occurring during that time. Additionally, previous research suggests that conflict increases during the teenage years (Paikoff & Brooks-Gunn, 1991). It also seems likely parents may exhibit more warmth toward a 10 year old boy than a 17 year old male. Given these factors, it is perhaps unsurprising that the stabilities for these constructs were not very large across this developmental period. Perhaps more surprising is the robust association ($\beta = .44$) in child management across this seven year period. Taken together these results suggest that although aspects of the parent-child bond as indicated by family conflict and warmth may change across this period, these economically disadvantaged parents remain relatively consistent in the direct informal social control they exert on their offspring through their child management practices.

Adolescence: Findings and Implications

The model evaluated in the current study links family conflict, family warmth, and child management-- aspects of parental informal social control-- to specific conventional activities and aspirations related to education during adolescence. Based on social control theory and earlier research, we expected family conflict to be negatively associated with educational aspirations and extracurricular activities. For these same reasons, we expected that family warmth and child management would be positively related to educational aspirations and involvement in extracurricular activities for these economically disadvantaged families. Consistent with these expectations, family conflict at age 17 predicted lower educational aspirations, whereas child management at age 17 was positively associated with educational aspirations; however, neither family conflict nor child management was significantly associated with extracurricular activities. Yet, family warmth positively and significantly

predicted extracurricular activities, but not educational aspirations. These results suggest different aspects of familial informal social control are important for promoting educational aspirations than for encouraging involvement in extracurricular activities for low-income boys. Specifically, the results suggest that weak ties between parent and child erode conventional aspirations regarding education (the negative path from family conflict at age 17 to educational aspirations), whereas direct informal social control of parents through practices such as careful supervision, appropriate discipline, and positive reinforcement bolster normative educational aspirations such as planning to attend college. On the other hand, strong ties between parents and children, as indicated by familial warmth, appear to increase the involvement of these economically disadvantaged males in extracurricular activities during adolescence. Parental warmth may model sociability and social sensitivity that may promote the ability to be successful in extracurricular settings, like volunteer work, which often requires good social skills. Taken together the results for this portion of the model suggest that parental informal social control influences these economically disadvantaged young men's conventional aspirations and activities related to education.

These results are especially important because of the growing gender disparity in educational outcomes in the United States (Buchmann et al., 2008), which is particularly pronounced for males from low-SES backgrounds (King, 2000). Research suggests that these gender differences may be due in part to the greater vulnerability of males to socioeconomic disadvantage compared to females (e.g., Buchamann & DiPrete, 2006). Findings from the current study suggest that warm parental interactions and effective parental management practices may help alleviate these difficulties for economically disadvantaged males by promoting involvement in extracurricular activities and encouraging greater educational aspirations, thereby improving educational outcomes for this vulnerable population.

Adolescence to Young Adulthood: Findings and Implications

The results for the final portion of the model were consistent with our expectations: educational aspirations and extracurricular activities during adolescence positively predicted educational attainment during young adulthood, and greater educational attainment was in turn associated with lower levels of substance use during young adulthood. The results of this study are consistent with the tenets of social control theory; attachment and commitment to the value of education and engagement with the institution of school during adolescence as indicated by educational aspirations and extracurricular activities were associated with later educational attainment. Greater levels of educational attainment reflect a commitment to social norms and conventional activities and goals, and this attachment generated informal social control which inhibited the problem behavior of substance use. Thus, the results suggest that the informal social control generated through educational institutions during both adolescence and young adulthood may be a source of resilience to ATOD use in young adulthood for economically disadvantaged males. These results are especially important because compared to females, males are at greater risk for substance use and the serious health consequences associated with their use (e.g., Minino, Heron, Murphy, & Kochanek, 2007; Swendsen et al., 2012), yet adolescent and young adult male health receive little empirical attention (Bell, Breland, & Ott, 2013). Research also suggests that these

gender differences in substance use increase with age (Swendsen et al., 2012). Thus, early interventions aimed at increasing male participation in extracurricular activities and bolstering their educational aspirations may be especially important for improving the educational attainment of males, and in turn reducing male substance use.

The results are also important because, despite the extensive body of research comparing the substance use of college students to other young adults (e.g., Dawson et al., 2004; White et al., 2005), relatively little is known about the association between educational attainment and substance involvement for the majority of young adults who do not attend college. The present study builds on the extant literature on college education and substance use by providing evidence that educational attainment that does not involve attending a 4-year college or university (e.g., high school completion, entry into trade school) also influences the risk of substance use. The negative association between educational attainment and substance use suggests that young men from economically disadvantaged backgrounds with the highest levels of educational attainment will have the lowest risk for substance use. At the same time this association also suggests that smaller increments of educational attainment (e.g., high school dropouts completing high school) are also beneficial and may enhance disadvantaged young men's resilience to substance use. These findings also highlight the need to reduce educational disparities and suggest education as an important focus for interventions aimed at reducing substance use. Specifically, interventions that focus on improving rates of high school completion and improving access to and support during postsecondary education of many types may be particularly beneficial in reducing substance use during young adulthood, especially for socioeconomically disadvantaged adolescent and young adult males. Interventions that empower adolescents to complete high school and young adults to attain postsecondary degrees are not only important for reducing substance use, but also more generally for improving life opportunities and the general quality of the workforce.

Unexpected Findings

We expected that the quality of the family environment during childhood and adolescence would influence outcomes in early adulthood *indirectly* through the more proximate variables in our model. However, unlike family conflict and warmth, effective child management at age 17 *directly* predicted educational attainment and substance use at age 20, although the latter effect was reduced to non-significance when prior substance use was controlled. Additionally, effective child management practices at age 12 predicted relative decreases in family conflict from age 10 to 17, suggesting that effective child management practices during late childhood can help assuage conflict in parent-adolescent relationships.

The findings suggest that the use of effective child management practices may play an especially important role in promoting resilience to substance use, as well as promoting educational attainment and reducing family conflict for socioeconomically disadvantaged males. Criminology research has indicated that among several different aspects of parenting (including discipline, parental warmth, parental hostility, and parental involvement) supervision is generally most consistently and strongly associated with delinquency (Farrington & Lober, 1999). Substance use and delinquency are closely related problem

behaviors; indeed many measures of delinquency include indicators of substance use. Thus, it is not that surprising that child management (which includes supervision) should be more strongly tied to substance use than the other aspects of the family environment. However, effective child management also directly predicted educational attainment and was likewise associated with later family conflict in our models, suggesting its importance in other areas, as well. Effective child management practices include careful supervision, appropriate discipline, good family problem solving skills, and the use of positive reinforcement, and thus represent direct social control exerted upon the child. Whereas, family warmth and conflict represent the strength of ties between parent and child and these ties are more intangible than practices such as positive reinforcement and appropriate discipline. It appears that this direct control of boys during childhood and adolescence may be more effectual than the more affective aspects of the parent-child bond.

Notably, child management was assessed through interviewer's reports on the primary caregiver's parenting while other constructs were assessed through target reports, which reduces the likelihood that effects involving child management are the result of same reporter bias. Previous research has linked child management to later substance use and abuse (e.g., Herrenkohl et al., 2012; Guo et al., 2001), as well as to educational outcomes such as high school completion (e.g., Astone & McLanahan, 1991). Consistent with this, the results of this study indicate that child management is an important predictor of educational *and* substance use outcomes for low-SES males. This is especially important given research suggesting that parents monitor their female children more closely than male children (Dishion & McMahan, 1998; Pettit, Laird, Dodge, Bates, & Criss, 2001) and that monitoring may be more effective in the parenting of female children compared to males (e.g., Pettit et al., 2001). Yet, the current study suggests that effective child management practices that include monitoring are also effective for low-income males. Thus, findings from the present study suggest that family-based intervention efforts that focus on promoting child management practices such as monitoring and positive reinforcement may help to promote economically disadvantaged males' functioning in many domains by reducing future family conflict and risk for substance use and by promoting educational attainment.

Another unexpected finding from the current study is that adolescent substance use (age 17) had no significant effects on educational aspirations, extracurricular activities, or later educational attainment. These results are unusual given previous research findings of a negative association between adolescent substance use and educational outcomes (e.g., Gotham, Sher, & Wood, 2003; Lynskey & Hall, 2000). However, it is important to note that the bivariate relationship between adolescent substance use and educational attainment at age 20 was negative and significant ($r = -.19, p = .006$). Thus, it appears that although adolescent substance use was associated with educational attainment at the bivariate level, the other variables in the model (educational aspirations, in particular) were stronger predictors of educational attainment. This may be due in part to the high rates of substance use in this low-income sample of males. For instance, approximately 37% of the sample reported any marijuana use at age 17 and this rose to 58% at age 20; comparatively, results from the 2011 National Survey on Drug Use and Health indicate that approximately 8% of youths aged 12 to 17 and 19% of young adults aged 18 to 25 were current users of marijuana

(SAMHSA, 2012). Thus, substance use appears much more normative in this sample and thus it may be a less discriminating factor in our study compared to other samples in which substance use is less common.

Limitations, Future Research and Concluding Remarks

Of course, this study also has limitations. First, the sample used in the current research was restricted to low-income males from urban communities and thus, the findings may not be generalizable to females, individuals with higher SES backgrounds, or to nonurban settings. Second, the participants were approximately 20 years of age at the last assessment included in the current research. Thus, they had not yet reached an age where they were likely to have attained a Bachelor or Graduate degree and consequently, our measure of educational attainment was truncated. Future research should attempt to replicate these findings with samples that are more diverse in terms of SES, gender, and locality, as well as age, which would allow for greater variation in educational attainment. Third, most of our measures are self-reports. Issues with self-reports include the tendency of respondents to acquiesce and the propensity of participants to give socially desirable responses. The latter issue may be particularly troublesome given our measure of substance use relied on self-reports, and thus, may underestimate the true level of substance use in our sample. Future research should investigate the proposed model using measures from a variety of sources. Fourth, our measure of extracurricular activities includes a very restricted range of activities. Specifically, participants indicated whether they had participated in “Volunteer Work,” and “After-school Activities/Sports.” Notably, these limited categories do not allow us to distinguish between punitive activities (e.g., after-school detention) and more prosocial activities. However, the direction of the associations between extracurricular activities and other variables in the model (e.g., extracurricular activities was positively associated with family warmth and educational attainment) suggest that the majority of respondents were reporting prosocial activities. Additionally, the likely effect of more punitive activities being included in the measure would be to attenuate these results, thereby decreasing the likelihood of a Type I error. Future research should examine the associations between family environment, extracurricular activities, and educational attainment using more nuanced measures of extracurricular activities. Additionally, existing research suggests that males’ extracurricular activities are more likely to include school sports, while girls are more likely to participate in school performing groups and clubs (Darling, 2005). Thus, one avenue for future research would be to examine whether particular activities are more beneficial for educational outcomes and whether the effects of these various activities differ by gender. Fifth, as noted in the method section, interviewers were not matched to participants on demographics such as gender and ethnicity and this may have influenced data collection. Sixth, and related to the preceding limitation, the measure of effective child management practices was assessed using interviewer reports. Previous research suggests that how parental monitoring and discipline are expressed and perceived differs across cultures (see Peterson & Bush, 2013 for a review); thus, the interviewers’ assessments of child management practices may be biased in this manner. However, this measure demonstrated much higher internal consistency and predictive validity than the adolescent reported parenting measure, suggesting that, despite any relevant ethnic differences, the interviewers were making quite valid and reliable ratings of child management for the parents in this

study. Seventh, socialization is a transactional process, and just as parents influence children, children's temperament and behavior influence parent's treatment of the child; however, our model did not include these bi-directional effects. Future research would benefit by examining child effects on the family environment in addition to the parent's influence on the child. Finally, we note that educational aspirations and extracurricular activities do not represent the full range of social control exerted by schools. Future research should examine other important aspects of social control that are generated in school and through education to determine whether they have similar influences on educational attainment.

Despite these limitations, we believe the current study makes an important contribution to our understanding of the ways in which family environment and educational involvement are linked to risk for substance use among economically disadvantaged males. The results of the study indicate that early positive family environments and educational involvements promote later educational attainment, which in turn appears to deter substance use during young adulthood, and that this developmental process may increase the resilience of economically disadvantaged young men to later substance use. Longitudinal effects of child and adolescent risk and protective factors on adult substance use are generally null or small in magnitude (e.g., Sartor, Lynskey, Heath, Jacob, & True, 2007; Schulenberg & Maggs, 2002), but these factors are still important for later substance use in that they have significant effects on more proximate predictors of adult substance use. Our study makes an important contribution to the literature in identifying educational aspirations, extracurricular activities, and educational attainment as factors that link these early childhood family factors to later adult substance use among economically disadvantaged males. Notably the findings suggest that educational attainment is an important source of resilience for substance use among economically disadvantaged young males and highlight the need to reduce educational disparities. The results of the study also support predictions from a social control perspective which argues that stronger bonds to conventional institutions such as family and school reduce involvement in risky activities like substance use that may jeopardize those bonds. The findings suggest that these processes may promote educational attainment and foster resilience to involvement with ATODs among economically disadvantaged young men.

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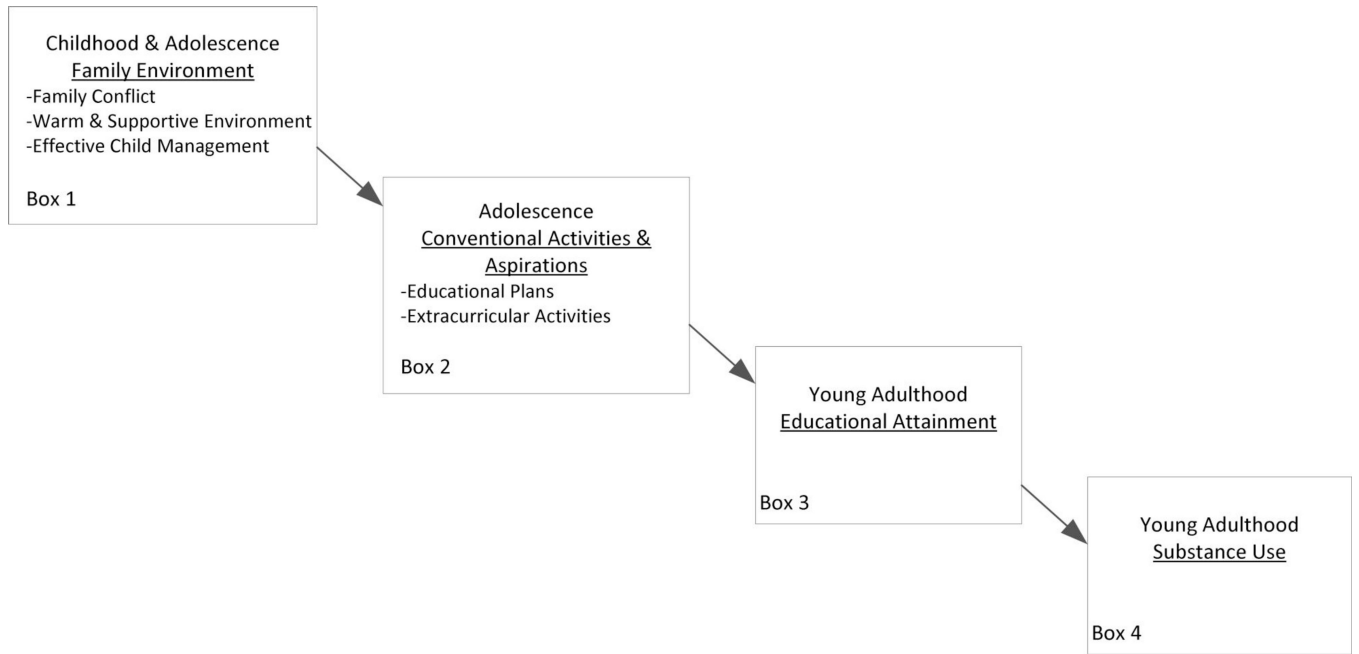


Figure 1.
The conceptual model.

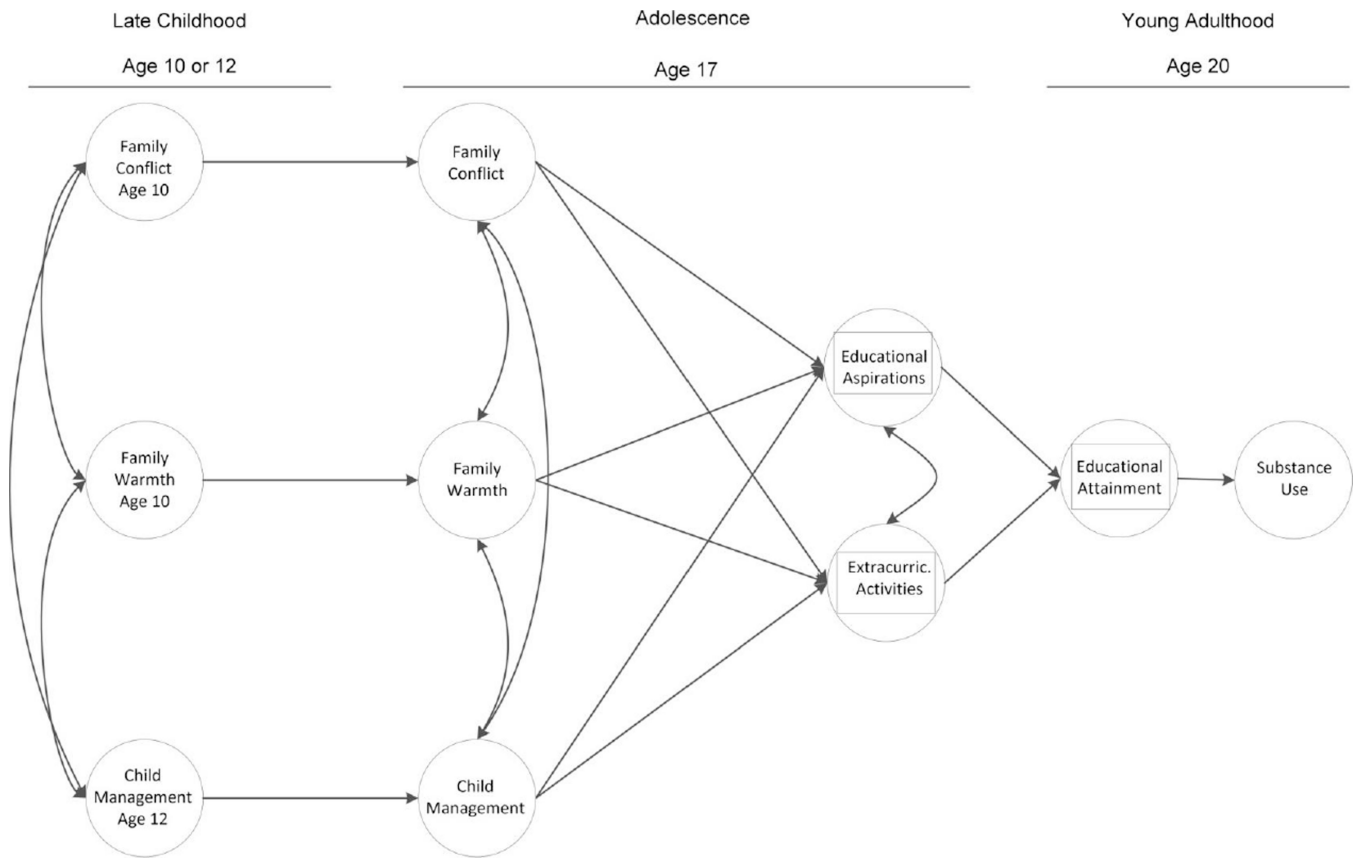


Figure 2.
The analytic model.

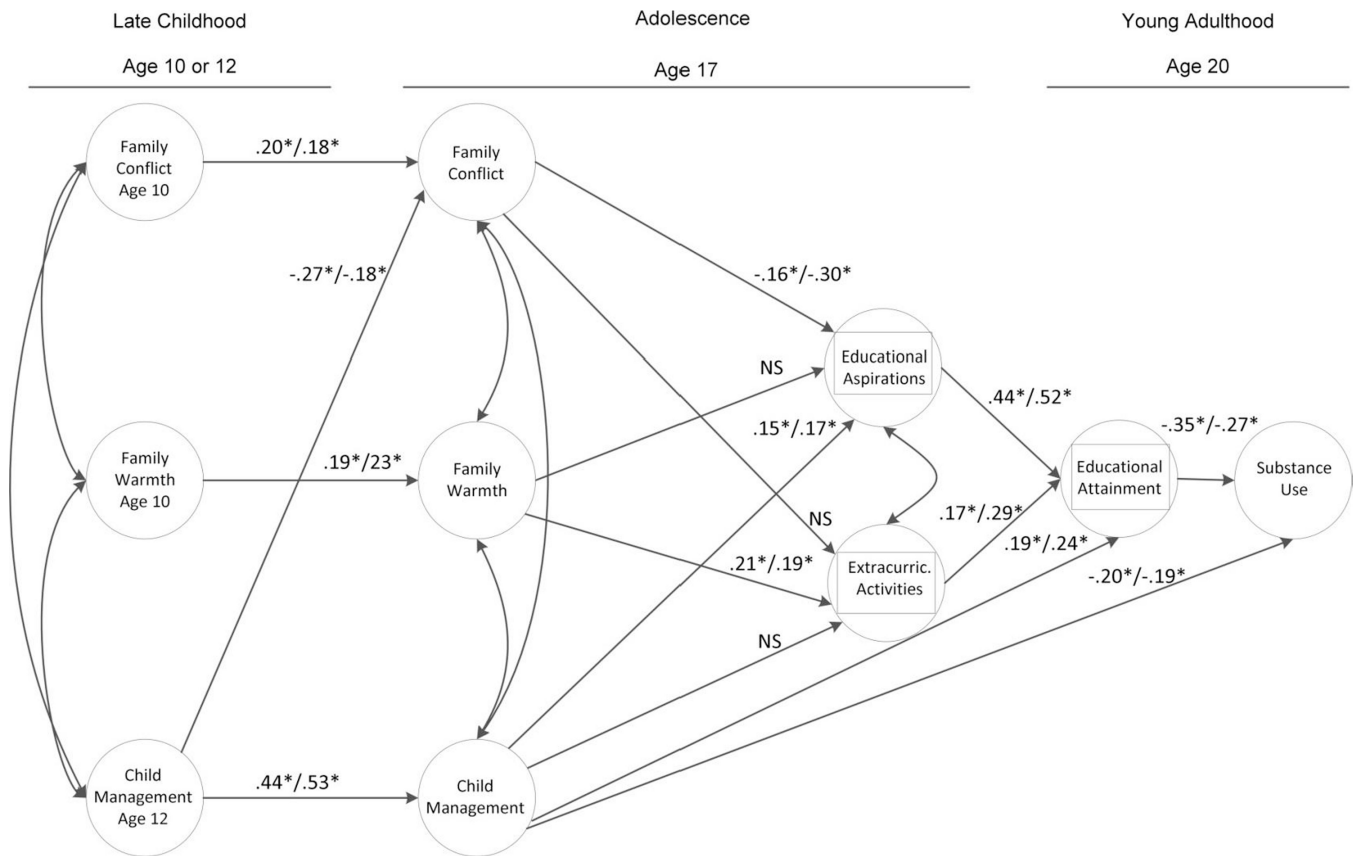


Figure 3. Model 1 estimates (standardized/unstandardized) controlling for the target’s race, changes in family structure, family income and mother’s education ($\chi^2 = 515.341$, $df = 411$, $RMSEA = .029$, $CFI = .952$). NS: not significant. * $p < .05$.

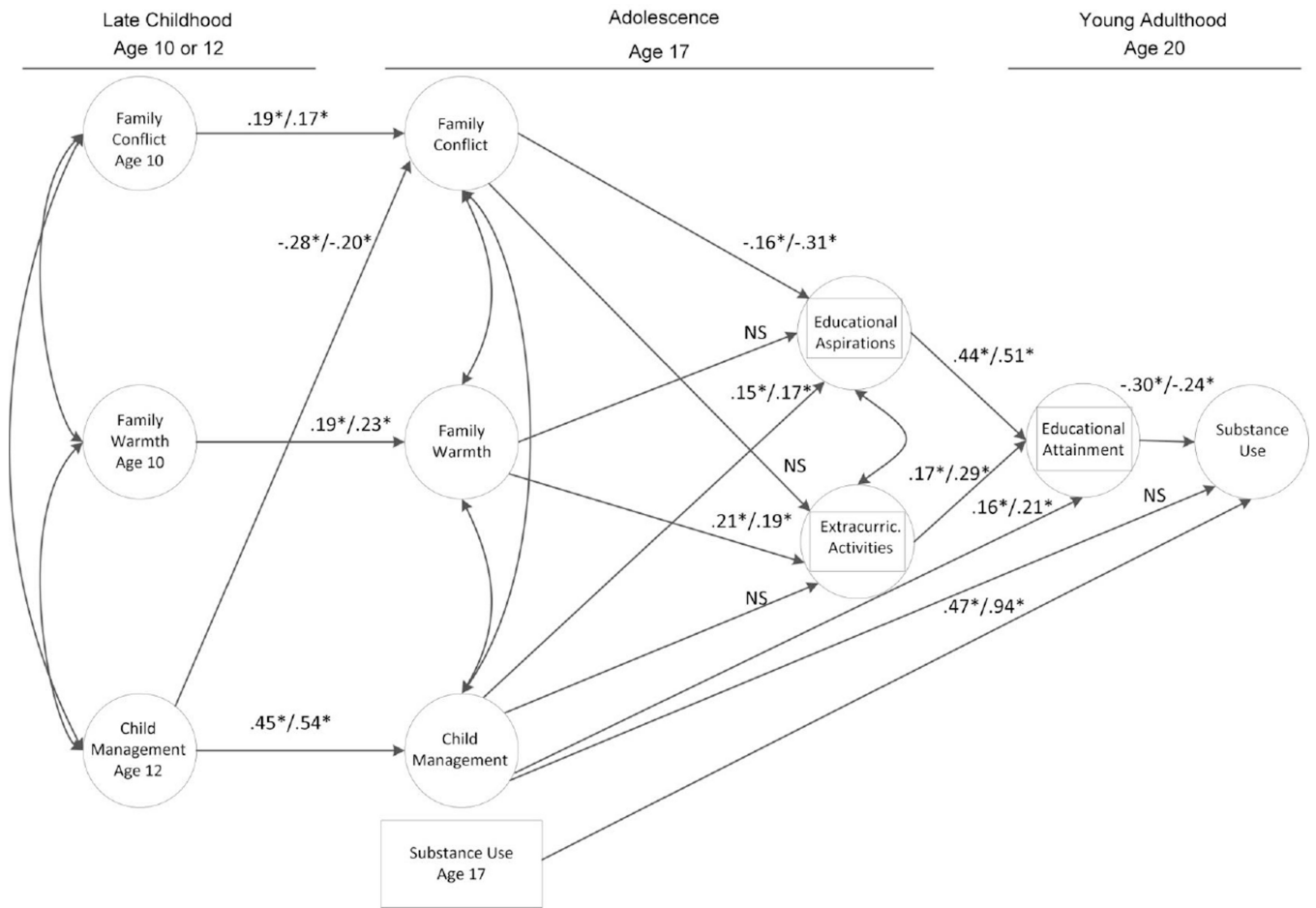


Figure 4. Model 2 estimates (standardized/unstandardized) controlling for substance use at age 17 on extracurricular activities, educational aspirations, educational attainment, and substance use at age 20 ($\chi^2 = 568.618$, $df = 432$, $RMSEA = .033$, $CFI = .939$). Substance use at age 17 was allowed to covary with the other variables in the model. Age 17 substance use does not significantly predict extracurricular activities, educational aspirations, or educational attainment (paths not shown for clarity). Model also includes controls for the target’s race, changes in family structure, family income and mother’s education. NS: not significant. * $p < .05$.

Table 1

Standardized Factor Loadings (FL) for Study Constructs.

Measure	Indicator	FL
Conflict age 10	parcel 1	0.50
	parcel 2	0.67
	parcel 3	0.78
Conflict age 17	parcel 1	0.71
	parcel 2	0.78
	parcel 3	0.87
Warmth age 10	item 1	0.50
	item 2	0.59
	item 3	0.51
	item 4	0.59
Warmth age 17	item 1	0.66
	item 2	0.86
	item 3	0.68
	item 4	0.68
Child management age 12	item 1	0.69
	item 2	0.84
	item 3	0.89
	item 4	0.66
Child management age 17	item 1	0.78
	item 2	0.92
	item 3	0.89
	item 4	0.67
Educational aspirations age 17	single item	1.00
Extracurricular activities age 17	single item	1.00
Educational attainment age 20	single item	1.00
Substance use age 17	single item	1.00
Substance use age 20	alcohol	0.47
	marijuana	0.64
	tobacco	0.64

Table 2

Correlations and Descriptive Statistics for Study Constructs.

		1	2	3	4	5	6	7	8	9	10	<i>M</i>	<i>SD</i>
1	Conflict age 10	1										21.62	7.20
2	Warmth age 10	-.29*	1									14.93	3.61
3	Management age 12	-.05	.13	1								4.06	.86
4	Conflict age 17	.22*	-.01	-.26*	1							19.19	6.49
5	Warmth age 17	.14	.21*	-.04	-.02	1						14.18	4.73
6	Management age 17	-.05	-.03	.49*	-.12	.18*	1					3.56	1.05
7	Substance use age 17	-.03	-.09	-.01	.26*	.01	-.27*	1				.42	.51
8	Educational aspirations	-.08	-.04	.20*	-.17*	.09	.22*	-.10 ⁺	1			4.27	1.09
9	Extracurricular activities	-.12	.16 ⁺	.10	-.07	.25*	.13*	-.09	.17*	1		.88	.73
10	Educational attainment	-.07	.09	.23*	-.20*	.13 ⁺	.30*	-.19*	.50*	.26*	1	4.16	1.27
11	Substance use age 20	-.12	-.09	-.02	.01	-.02	-.26*	.54*	-.21*	-.19*	-.39*	2.85	2.07

* *p* .05 (2-tailed test),⁺ *p* .05 (1-tailed test)

Table 3

Standardized Estimates for Indirect Paths to Substance Use at Age 20.

Indirect effect	Model 1	Model 2
Conflict (age 10) to Conflict (age 17) to Aspirations to Education	.005	.004
Conflict (age 10) to Conflict (age 17) to Activities to Education	.001	.001
Warmth (age 10) to Warmth (age 17) to Aspirations to Education	-.002	-.002
Warmth (age 10) to Warmth (age 17) to Activities to Education	-.002	-.002
Manage (age 12) to Manage (age 17)	-.086*	-.029
Manage (age 12) to Manage (age 17) to Education	-.028*	-.022*
Manage (age 12) to Manage (age 17) to Aspirations to Education	-.010 ⁺	-.009 ⁺
Manage (age 12) to Manage (age 17) to Activities to Education	-.003	-.003
Manage (age 12) to Conflict (age 17) to Aspirations to Education	-.007 ⁺	-.006 ⁺
Manage (age 12) to Conflict (age 17) to Activities to Education	-.001	-.001
Conflict (age 17) to Aspirations to Education	.024*	.022*
Conflict (age 17) to Activities to Education	.003	.003
Warmth (age 17) to Aspirations to Education	-.010	-.008
Warmth (age 17) to Activities to Education	-.012 ⁺	-.010 ⁺
Manage (age 17) to Education	-.065*	-.050*
Manage (age 17) to Aspirations to Education	-.023 ⁺	-.020 ⁺
Manage (age 17) to Activities to Education	-.007	-.006
Aspirations to Education	-.154*	-.134*
Activities to Education	-.059*	-.050*

* $p < .05$;⁺ $p < .10$