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## Abstract

A critical period hypothesis linking early experiences with both racial discrimination and conduct disorder (CD) with subsequent drug use was examined in a panel of 889 African American adolescents (age 10.5 at time 1) and their parents. Analyses indicated that these early experiences did predict use by the adolescents at time 3 (T3)–5 years later. These relations were both direct and indirect, being mediated by an increase in affiliation with friends who were using drugs. The relations existed controlling for parents' reports of their use, discrimination experiences, and their socioeconomic status (SES). The impact of these early experiences on African American families is discussed.

## Keywords

Racial discrimination, Conduct disorder, Adolescents, Drug use

## Disciplines

Developmental Psychology | Psychology | Race and Ethnicity | Substance Abuse and Addiction

## Comments

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## Early Experience with Racial Discrimination and Conduct Disorder as Predictors of Subsequent Drug Use: A Critical Period Hypothesis

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### Abstract

A critical period hypothesis linking early experiences with both racial discrimination and conduct disorder (CD) with subsequent drug use was examined in a panel of 889 African American adolescents (age 10.5 at Time 1) and their parents. Analyses indicated that these early experiences did predict use by the adolescents at Time 3--five years later. These relations were both direct and indirect, being mediated by an increase in affiliation with friends who were using drugs. The relations existed controlling for parents' reports of their use, discrimination experiences, and their socioeconomic status (SES). The impact of these early experiences on African American families is discussed.

### Keywords

racial discrimination; conduct disorder; adolescents; drug use

### 1. Introduction

Conduct disorder in early adolescence has been shown to predict early use of substances (Robins & McEvoy, 1990; Windle, 1993), as well as use later in life (Armstrong & Costello, 2002; Brook & Newcomb, 1995). In fact, it is, arguably, the individual difference factor most strongly linked with adolescent drug use (Sung, Erkanli, Angold, & Costello, 2004) and abuse (Crowley & Riggs, 1995; Winters, Latimer, Stinchfield, & Henly, 1999). Most of the studies documenting this relation have involved cross-sectional designs, however, and they have usually relied on older adolescents or young adults' retrospective reports of their earlier

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behavior problems and their use (Windle, 1993). Moreover, the vast majority of studies have focused on European Americans. Consequently, reviews of the literature have concluded with calls for longitudinal studies that include minorities to ascertain absolute levels of use and CD, and also to examine the relation between the two in non-White minority groups (DelBello, Lopez-Larson, Soutullo, & Strakowski, 2001; Schaeffer, Petras, Ialongo, Poduska, & Kellam, 2003).

Although African American adolescents consistently report less substance use and later onset than White adolescents (Johnston, O'Malley, Bachman, & Schulenberg, 2004), self-reported and observed aggressive and externalizing behaviors are more prevalent among Black youths (Achenbach & Rescorla, 2001; Randolph, Koblinsky, Beemer, Roberts, & Letiecq, 2000), which suggests that CD diagnoses are likely to be higher as well (DelBello et al., 2001; Turner & Gil, 2002). Two possible reasons have been suggested as explanations for this apparent disproportional involvement of Black youth in aggressive activities (other than bias in reporting of criminal involvement). One is the fact that Blacks are more likely than Whites to live in lower SES environments (Wallace, 1999; Williams, Yu, Jackson, & Anderson, 1997), which are characterized by greater exposure to aggressive models (Aneshensel & Sucoff, 1996), and higher rates of CD (Brody et al., 2001; Loeber, 1990). A second reason is the fact that Black youths are exposed to an additional source of stress that seldom affects White youths and that is racial discrimination (Williams & Chung, in press). This stress has been linked with both internalizing and externalizing behaviors in adolescents (Kessler, Mickelson, & Williams, 1999). More generally, stress from discrimination has often been suggested as a central factor contributing to the pronounced disparity in health status that exists between Blacks and Whites in the U.S. (Allison, 1998; Good et al., 2003; Krieger, 2000, 2003; Williams, Neighbors, & Jackson, 2003).

## 1.1. Racial Discrimination

**1.1.1. Internalizing and externalizing behavior**—The association between discrimination and internalizing behavior has been extensively studied, although, again, most of the research has been cross-sectional. In general, the relation is as one would expect: discrimination is correlated with reports of distress, including depression and anxiety (Williams et al., 1997; Kessler et al., 1999; Williams & Williams-Morris, 2000; Simons et al., 2002). Fewer studies have looked at perceived discrimination and delinquency or externalizing behavior, but all of them have found positive relations. Biafora and his colleagues (1993) reported that Black adolescent boys' mistrust of Whites was a significant predictor of their delinquent behavior. Similarly, Taylor, Biafora, and Warheit (1994) found that racial mistrust was related to willingness to break the law among Black adolescents (6<sup>th</sup> and 7<sup>th</sup> grade). That relation existed controlling for SES levels, which were also related to deviance acceptance. Nyborg and Curry (2003) reported a correlation between perceived racism and externalizing behaviors in a sample of 84 African American boys (see also Simons, Simons, Stewart, Chen, & Brody, 2003). Similarly, Whitbeck, Hoyt, McMorrison, Chen, and Stubben (2001) found that perceived discrimination was related to delinquent behavior in a sample of American Indian adolescents (age 9 – 16). That association was both direct and indirect, through the relation of discrimination with anger.

**1.1.2. Substance use**—A possible mediator of the discrimination/health relation is health-impairing behavior, especially substance use and abuse. The study by Whitbeck et al. (2001) included measures of substance use, which were related to reports of both discrimination and delinquent behavior. The study was cross-sectional, but it did provide evidence of a positive relation between racial discrimination and use within a vulnerable population. Among African Americans, significant correlations have also been found between self-reports of discriminatory experience and reports of drug use (Resnicow, Soler, Braithwaite, Selassie, &

Smith, 1999), smoking (Landrine & Klonoff, 1996, 2000), and alcohol use and abuse (Sanders-Phillips, 1999). In general, although based almost exclusively on cross-sectional data, many researchers have claimed that discrimination does promote substance use in Blacks (Curtis-Boles & Jenkins-Moore, 2000; Wright, 2001; see Clark, Anderson, Clark, & Williams, 1999, for a review).

**1.1.3. Predicting use**—Recently, Gibbons, Gerrard, Cleveland, Wills, and Brody (2004) reported evidence of a prospective link between perceptions of racial discrimination and substance use (tobacco, drugs, and alcohol) in Black adults, most of whom were women. Their reports of discriminatory experiences at T1 were related to their current use ( $p < .001$ ) and their reports of use almost two years later ( $p < .01$ ); thus, discrimination predicted change in use over this time period. These relations were both direct and indirect. The latter relation involved mediation by distress (depression and anxiety), as T1 discrimination was associated with both T1 and T2 distress. In other words, those who had had more experience with discrimination at T1 reported more distress and more use at that time, and again at T2, relative to those low in discriminatory experience. This relation existed controlling for SES levels (education and income), which were also related to T1 and T2 distress and discrimination.

**1.1.4. Adolescent use**—A similar relation emerged among the children of the Black women in Gibbons et al. (2004). Perceived discrimination was related directly to their distress and indirectly to their use, with the latter relation being mediated by the former: discrimination → T1 and T2 distress → T2 use. The discrimination to use relation was also mediated by affiliation with “deviant” (using) peers: discrimination → affiliation with deviant peers → use. There was no direct relation between T1 distress and T2 use, in part, because the adolescents reported very little use or distress. Nonetheless, the study did provide evidence of a prospective relation between discrimination and substance use. Given the significance of the issue and the magnitude of the health disparity problem, these authors and many others have called for more studies of the discrimination/use relation (Clark et al., 1999; McCabe, Hough, Wood, & Yeh, 2001).

## 1.2. Early Experience as a Predictor of later Use and Other Problems

**1.2.1. Substance use**—Although most children who experiment with drugs or engage in occasional use at an early age do not develop subsequent abuse problems, early use is a reliable predictor of subsequent abuse and other behavioral problems (Anthony & Petronis, 1995; Hawkins et al., 1997; Kaplan, Martin, & Robbins, 1984; Wills et al., 2001). Similarly, there is some evidence that early experience with mental disorders also increases risk for later drug use and abuse (Christie et al., 1988). The relation has received relatively little attention, however, given the dearth of longitudinal studies that include child psychiatric diagnoses and multiple waves of assessment of substance use.

**1.2.2. Anti-social behavior**—Moffitt’s theory of antisocial behavior (Moffitt, 1993) also focuses on early experiences. She distinguishes between early onset of anti-social behavior, generally prior to age 11, and adolescence-onset, which usually occurs between ages 12 and 16. Those in the former category are more prone to behavioral problems later in life, including aggressive behavior (White, Moffitt, Earls, Robins, & Silva, 1990), arrests (Moffitt & Silva, 1988), long-term criminal offending (Loeber, 1982), and adult anti-social personality disorder (Robins, 1978). In contrast, Moffitt maintains that manifestation of conduct problems in adolescence is actually fairly common (“normative”) and much less predictive of problems later in life.

**1.2.3. Discrimination**—The Black adolescents in Gibbons et al. (2004) were only 10.5 at Wave 1. Nonetheless, 91% of them reported they had experienced some racial discrimination

by that age. Although it was not a frequent occurrence for most (usually limited to a few incidents), it did appear to have a significant impact on them, in terms of later distress and use. This impact led the authors to suggest that experiences with racial discrimination at an early age are especially aversive and may lead to behavioral problems later in life (a similar conclusion was drawn by Whitbeck et al., 2001, with regard to American Indians).

### 1.3. The Critical Period Hypothesis

**1.3.1. Identity**—The current study examines a critical period hypothesis, which maintains that aversive experiences in late childhood (age 8 – 11), such as racial discrimination, are especially impactful with regard to later substance use and other behavior problems. There are two reasons for this. First, this is a time of development during which identity is forming and changing, largely as a result of increasing awareness of self vis a vis others, as well as an internalization of others' opinions and standards (Harter, 1999). This is true for both self- and ethnic identity (Phinney, 1989). More generally, socially-based information emphasizing *distinction* from the majority group-- i.e., one of the messages that comes with discrimination-- is likely to have greater impact on identity formation than is information suggesting similarity to the group (see Blanton & Christie's, 2003, *deviance regulation theory*; and Williams-Morris, 1996).

**1.3.2. Affiliation**—A second element of the early-experience hypothesis is that children who experience discrimination *or* manifest CD at an early age are likely to gravitate toward other adolescents who have had similar experiences (homophily) and are deviance-prone. This is consistent with Caspi, Elder, and Bem's (1987; Caspi, Bem, & Elder, 1989) concept of cumulative continuity: i.e., anti-social children seek out environments that foster additional development of anti-social behaviors (see also Tarter et al., 1999). Moreover, others have also suggested that affiliation with deviant peers may mediate the effects of early CD on behavior (Barnow, Schuckit, Lucht, John, & Freyberger, 2002; Robins & McEvoy, 1990). Consistent with this idea, Sung, Erkanli, Angold, and Costello (2004) recently found that the CD → use relation was mediated by affiliation with deviant peers through age 13. In the current study, we assumed that children who experience a lot of discrimination *or* show signs of CD should be more likely to "accept" deviance—by affiliating with others who are using and by using themselves; maximum use should be reported by those with both early CD *and* early discriminatory experience.

### 1.4. The Current Study

The current study continued the examination of the discrimination/substance use relation initiated in Gibbons et al. (2004). As in that study, the current sample also came from the Family and Community Health Study (FACHS), which is a panel study of environmental factors associated with health (mental and physical) in African American families. This time, a third wave of data was available (age 15.5), and so there was considerably more use than in Gibbons et al. (2004) when the adolescents were only age 10 and 12. A number of control variables were included, most of them coming from the parents, e.g., their discriminatory experiences, substance use, and distress. Other variables, besides CD diagnosis, that were not in Gibbons et al. (2004) were also included in the analyses. The following specific hypotheses were tested, each based on previous research.

- a. *Antecedents of CD.* Early (i.e., T1) discriminatory experiences are positively related to an early diagnosis of CD. In addition to discrimination, other anticipated correlates and predictors of CD were parental use and distress (Kazdin, 1987; Wickramaratne & Weissman, 1998).
- b. *Critical period.* Early experience with discrimination and early-onset CD will both be associated with earlier use of drugs and subsequent drug use; the two together will

predict the most use. These relations will exist controlling for SES, which has typically been confounded with ethnicity in previous studies of both use and CD (Schaeffer et al., 2003). In this regard, an advantage of the FACHS is that it includes a diverse sample of Black families, with a considerable range of SES; thus, race/ethnic group and SES are not confounded.

- c. *Mediation of the relations between CD and discrimination and T3 drug use.* In addition to the direct relations mentioned above, discrimination and CD will both have indirect relations with use, through their direct relations with affiliation with friends who are using.
- d. *CD and affiliation.* Finally, the longitudinal design of the current study also allowed for an estimation of causal priority, or ordering, of the anticipated relation between CD and affiliation at T1 and T2. As suggested earlier, the prediction was that early-onset CD would be a stronger predictor of change in affiliation (i.e., homophily) than vice-versa.

## 2. Method

### 2.1. Participants

A total of 889 families, 467 in Iowa, 422 in Georgia, participated at T1 in the FACHS. Each family had a target child between the ages of 10 and 12 (Mean = 10.5) and a primary caregiver (parent), defined as a person living in the same household who was primarily responsible for the target's care. Among the 889 families, 779 (88%) remained in the panel at T2; 767 (86%) continued their participation at T3, with 559 families providing complete data across all three waves. Participants who had missing values on less than 1/3 of the total number of items for a construct were identified, and the missing values were imputed with means. After imputation, 606 families (79% of T3) were included in the present analyses. Mean age of the parents was 37 (range: 23 to 80). Most of the parents (85%) were the targets' biological mothers; 6% were biological fathers; the rest were grandmothers (5%) or someone else (4%). Almost all of the parents identified themselves as African American (99% of the sample used in the analyses); 52% reported being single parents. Their educational backgrounds were diverse, ranging from less than a high school diploma (19%) to a Bachelor's or advanced degree (10%).

### 2.2. Sampling Strategy and Recruitment

**2.2.1. Sampling**—Families were enumerated from lists of families with African American children compiled by community coordinators in Georgia and by school officials in Iowa. Families lived in neighborhoods that varied considerably on demographic characteristics, such as racial composition and economic level. Relevant neighborhood characteristics of the sample from census data were: poverty rates (percent of families with children living below the poverty line) ranged from below 20% to more than 50%; across all neighborhoods, 25% of the residents were below the poverty line; average male unemployment was 52% (range = 30% to 75%); mean proportion of single parents was 19% (range = 3% to 57%); and mean proportion who were African American was 44% (range = 1% to 100%).

**2.2.2. Recruitment**—Potential participant families, chosen randomly from the lists, received an introductory letter, followed by a recruitment phone call. In case a phone was not available, the letter included a toll-free number. Seventy-two percent of the families on the recruitment lists agreed to participate. Those who refused usually cited the amount of time the interviews took as the reason--up to 2.5 hours for each visit at each wave (see Cutrona, Russell, Hessling, & Brown, 2000; Gerrard, Gibbons, Stock, Vande Lune, & Cleveland., 2005; Simons et al., 2002; or Wills, Gibbons, Gerrard, & Brody, 2000, for further description of the FACHS sample and recruitment).

### 2.3. Interview Procedure

Prior to initiating data collection, sections of the interviews were examined and critiqued by focus groups comprising African Americans families living in Iowa and Georgia, each with a 10- or 11-year-old child. All interviewers were African American; most resided in the communities where the study took place. They received extensive training, beginning with a 3-day workshop, followed by periodic refresher meetings. Interviews were conducted in participants' homes, or nearby locations (e.g., a library or school). The interview required two separate visits with two interviewers. Each visit lasted about 90 min and included a computer-assisted personal interview (CAPI) and a structured psychiatric diagnostic assessment also presented by computer: the Diagnostic Interview Schedule for Children, Version 4 (DISC-IV; Shaffer et al., 1993), and the University of Michigan Composite International Diagnostic Instrument (UM-CIDI; Kessler, 1991; Kessler et al., 1994) for the parents. Interview questions appeared on the computer screen and, when necessary, were read aloud to the participant. For their participation at each wave, parents received \$100 and targets received \$70. The second wave of data was collected approximately two years after the first wave; the third wave occurred about three years after the second wave. The procedure employed at each wave was the same.

### 2.4. Measures

Most measures were adapted from previous research with families. Scale structure was verified using factor analysis and internal consistency analysis, and a few low-loading items were deleted. Items were coded such that a higher value indicates more of the construct. Measures and the waves from which they were drawn for the structural equation model (SEM) are listed below.

**2.4.1. SES (T1)**—SES was assessed via measures of the family's annual income and the parent's level of education (10-points, from less than a high school diploma to an advanced degree). The two items were standardized and then combined into an overall measure ( $\alpha = .63$ )

**2.4.2. Perceived discrimination (T1)**—A revised version of the Schedule of Racist Events (Landrine & Klonoff, 1996) was used to assess *perceived* racial discrimination for the parent and the child. Like most (though certainly not all) discrimination scales, this one assessed the subjective experience of *perceived* racial discrimination (McNeilly et al., 1996). The scale contains 13 items concerning negative experiences with others that the respondent had, or observed a family member have, that *they attributed* to the fact that they (or their family) were African American (e.g., "How often have you been treated unfairly because you are African American?" rated from 1 = *never* to 4 = *several times*). In order to make the scale more appropriate for younger respondents, the revision included somewhat simpler language than the original, and the workplace discrimination items were replaced with items about general experiences in the community. Again, feedback from focus groups comprising African American parents and 10-year old children was used to check on and improve the wording of the items (see Brody et al., in press, for further discussion). The result was a single-factor scale with good internal reliability ( $\alpha$ s: parents = .92, targets = .86). The 13 items were divided into three randomly-generated parcels (Little, Cunningham, Shahar, & Widaman, 2002) that were used as indicators of latent discrimination constructs in the SEM.

**2.4.3. Parents' distress (T1)**—Distress for the parents was assessed with eight items (Clark & Watson, 1997). There were five *depression* items: "During the past week, how much have you felt... [hopeless/depressed/discouraged/a failure/worthless]?" and three *anxiety* items: "... [tense/uneasy/keyed up]?" Each item was followed by a 3-point scale (from *not at all* to *extremely*). The two scales were used as indicators of the latent distress construct ( $\alpha = .86$ ).

**2.4.4. Targets' CD (T1 and T2)**—The CD module of the DISC-IV (Shaffer et al., 1993) was administered to the targets and the parents. A CD case was counted as present (yes-no) if behaviors endorsed by either the parent or the target met the DISC-IV criteria for a CD diagnosis (Kazdin, 1987), which was three or more behaviors in the past year (at least one in the past 6 months), such as vandalism, shoplifting, arson, physical abuse, and burglary.

**2.4.5. Friends' drug use (T2)**—Target friends' use (i.e., affiliation with users) was assessed with six items; the first five were: “During the past 12 months, how many of your close friends have used [illegal drugs/prescription drugs/inhalants/nonprescription drugs/drugs to get high]?” each with 3-point scales from *none of them* to *all of them*. The sixth item was: “How many of your friends think using drugs is OK for kids your age?” with a 4-pt. scale from *none* to *a lot*. The 6 items were standardized and then their mean was used as an index of friends' drug use ( $\alpha = .72$ ).

**2.4.6. Parents' substance use (T1)**—The adult diagnostic included four measures of problematic alcohol use (e.g., “Have you ever been arrested for DWI?”), and a list of 21 different drugs, plus a general use item (“any other drugs”), asking parents to indicate any that they had used *more than five times* (yes/no). The 26 items were combined into a use index (overall  $\alpha = .86$ ).

**2.4.7. Targets' drug use (T3)**—At T1, the DISC-IV included dichotomous (0 = *no*, 1 = *yes*) measures for past year use of marijuana as well as other types of substances including stimulants, cocaine, heroin, and inhalants. Only 2% of the sample ( $N = 13$ ) reported use of marijuana at T1, while only three (0.5%) of the targets reported use of any of the other drugs. Therefore, T1 use was not included in the model. At T3, targets' drug use was assessed with five items in the interview: “During the past 12 months, how often have you used... [Marijuana/Ecstasy/Cocaine/Methamphetamines (meth, speed, crank, ice, crystal)/a needle to inject drugs] ... in order to get high?” followed by 6-point scales (*never*, *1–2 times*, *about 3–11 times*, *about 1–2 times per month*, *about 3–4 times per month*, *more than once a week*). Because marijuana was by far the most commonly used substance, it was included as a separate indicator. The other four drugs were summed together to form the second indicator. In both cases, use was categorized at three levels: none, minimal, and more than minimal.<sup>1</sup> Minimal use of marijuana was defined as up to 1–2 times per month (score of 3 on original scale) and more than minimal use as at least 3–4 times per month (score of 4 on original scale). Minimal use of the other drugs was defined by a summed score across the four original measures of less than or equal to 4; summed scores of 6 or higher were categorized as more than minimal use. Finally, targets were also asked how old they were when they first used marijuana.

### 3. Results

#### 3.1. Overview

There were three different types of analyses. SEM was conducted to examine hypotheses *a*, *b*, and *c*—i.e., the relations among the exogenous, endogenous, and outcome (T3 drug use) measures. ANOVAs were conducted to assess amount of use as a function of CD diagnosis and T1 perceived discrimination (hypothesis *b*). Finally, cross-lag analyses were conducted to examine the relation between CD and affiliation with deviant peers across the two waves of data collection (hypothesis *d*).

<sup>1</sup>A decision was made to focus on targets' drug use. However, the results look similar when a more general substance use index—alcohol, cigarettes, and drugs—was used. Similarly, replacing parents' problematic use (i.e., drugs and alcohol problems) with a general substance use construct made little difference in the results.

### 3.2 Means and Correlations

**3.2.1. Percentages and frequencies**—Percentages of parents and targets reporting drug use, target CD, and targets' reports of friends' use are presented in Table 1. The Table also includes mean values for parent and target discrimination. Categorical frequencies of amount of substance use by covariates of interest (e.g., parental use, target CD) are presented in Table 2. Correlations among the variables are presented in Table 3. At T3, 10.4% of targets reported low drug use (i.e., had used some drugs fewer than once per month in the past year); 5.6% reported high drug use (i.e., drug use more than once per month in the past year). Marijuana was the most commonly reported drug used. Among the parents, 12% reported some lifetime alcohol problems at T1 (getting hurt while under the influence of alcohol was the most common problem). Lifetime drug use was reported by 18.2% at T1 (marijuana was again the most common); 24% reported lifetime drug use and/or alcohol problems. Reports of discrimination are the same as in Gibbons et al. (2004). There were 26 CD cases at T1 (4.3%) and 42 (6.9%) at T2; 10 of these had diagnoses at both waves. The T2 CD percentages are above national norms (i.e., 1% to 4% for 9–17 year olds; USDHHS/NIMH, 1999). In contrast, the use percentages are low, but in line with norms for African American women and adolescents (Johnston, O'Malley, Bachman, & Schulenberg, 2003). Finally, Means for the parental distress scale (depression and anxiety) are also presented in Table 1. Fewer than 2% of the parents reported extreme distress at T1; 27% reported no distress.

**3.2.2. Age of onset**—The correlations between first use of marijuana and both T1 CD status ( $r = -.21, p < .001$ ) and discrimination ( $r = -.14, p < .001$ ) were significant. Thus, first use occurred earlier for those with T1 CD or more T1 discrimination (Hypothesis b).

### 3.3. SEM: Measurement Model

Because a categorical endogenous construct (T2 CD) was involved, Mplus (version 4.0; Muthen & Muthen, 1998–2004) with the mean- and variance-adjusted weighted least square (WLSMV) was used to estimate the SEM. First, a confirmatory factor analysis (CFA) was conducted on nine constructs, to determine if the indicators loaded on the latent constructs as expected. SES, T1 parent use, T1 and T2 CD diagnosis, and T2 friends' use were specified as manifest variables; the other four constructs were specified as latent. The CFA provided a good fit to the data:  $\chi^2(16, N = 606) = 28.54, p < .03$ ; Tucker-Lewis Index (TLI) = .96; comparative fit index (CFI) = .98; root-mean-square error of approximation (RMSEA) < .04. All but one factor loading was  $\geq .50$  ( $ps < .001$ ; for target "other drug," the loading was .22,  $p < .01$ ).

### 3.4. SEM: The Structural Model

Paths were specified according to hypotheses and previous research (see Fig. 1). Lagrangian Modification Indexes were used to identify significant paths that were not specified. The structural model fit the data well:  $\chi^2(24, N = 606) = 35.39, p > .06$ ; TLI and CFI both > .97; RMSEA < .03.

**3.4.1. Correlations among exogenous constructs**—Several correlations among the exogenous (T1) constructs are worth noting (see Fig. 1). First, lower SES was associated with more parent distress ( $p < .003$ ) and less parent discrimination ( $p < .001$ ; Kessler et al., 1999; Williams & Chung, in press). Parents' use was positively associated with their level of distress ( $p < .003$ ) and their reports of discrimination ( $p < .001$ ). Parent distress was positively associated with their children's reports of discrimination ( $p < .001$ ). Targets' early-onset CD was positively associated with their parents' use ( $p < .001$ ), and, as anticipated (Hypothesis a), it was strongly associated with their own T1 discriminatory experiences ( $p < .001$ ).

**3.4.2. Predicting T2 friends' use and target CD**—Higher parent distress at T1 was associated with an increase in targets' CD diagnoses by T2 ( $p = .04$ ). The relations between both T1 CD and T1 discrimination and T2 friends' use also emerged as expected; in both cases, the relation was positive (for T1 CD,  $p < .001$ ; for T1 discrimination,  $p < .002$ ; cf., Gibbons et al., 2004)<sup>2</sup>.

**3.4.3. Predicting T3 use**—For the *adolescents*, 42% of the variance in T3 use was explained in the model. Parents' use at T1 predicted their child's use five years later ( $\beta = .31$ ,  $t = 2.10$ ,  $p < .04$ ). Both parts of Hypothesis b were supported: T1 CD was a direct predictor of T3 use ( $\beta = .30$ ,  $z = 2.41$ ,  $p < .02$ ), as was T1 target discrimination ( $\beta = .17$ ,  $z = 2.29$ ,  $p < .02$ ). Hypothesis c was also supported: T2 friends' use predicted T3 drug use ( $\beta = .19$ ,  $t = 3.35$ ,  $p < .001$ ). As a result, the *indirect* effect of T1 discrimination, through T2 friends' use, was significant ( $z = 2.33$ ,  $p < .02$ ), as was the total effect of T1 discrimination ( $z = 2.59$ ,  $p < .01$ ); similarly, the indirect effect of T1 CD (through T2 friends' use) was also significant:  $z = 2.53$ ,  $p = .01$

**3.4.4 Contextual risk**—An additional model was run that included neighborhood risk as an exogenous construct at T1. This construct comprised items shown previously to be related to drug use (e.g., crime, gang presence, and drug availability in the neighborhood). The construct was positively related to T1 CD ( $p = .009$ ), but it was not related to any of the endogenous constructs, and it did not alter the pattern of the SEM.

### 3.5. Amount of Use

**3.5.1. Amount by CD category**—To get a better sense of amount of use by the targets, two separate pairs of ANOVAs were conducted, one on mean amount of drug use, the other on percent reporting use (see Table 4). In each case, those with no CD diagnosis were compared with those with CD diagnoses. These analyses are informative; however, caution is warranted in interpreting them due to the low Ns in the CD groups. The first ANOVA pair (see measures marked *Analysis 1* in the Table) compared no diagnosis targets with those with T1 CD diagnosis ( $N = 26$ ) and those with T2 CD diagnosis ( $N = 32$ ; i.e., not including the 10 T2 CD cases that were also identified at T1). There were significant effects of group for both amount and percentage:  $F_s(2, 603) = 13.17$  and  $14.69$ ,  $ps < .001$ . The mean amount reported was higher for the T1 CD group ( $M = .32$ ) than either the T2 CD ( $M = .12$ ;  $t = 3.02$ ,  $p < .003$ ) or the no-CD group ( $M = .07$ ;  $t = 4.96$ ,  $p < .001$ ). The latter two groups did not differ from one another ( $t = 1.04$ , NS). On percentage using, the T1 CD group (46.2%) differed from the no-CD group (13.5%;  $t = 4.54$ ,  $p < .001$ ), but not the T2 CD group (34.4%;  $t = 1.24$ , NS). The T2 CD group did differ from the no-CD group:  $t = 3.17$ ,  $p < .002$ . Comparing the percentage and amount analyses suggests that the T2 CD users were using less than the T1 CD users on average; and, in fact, that was the case:  $M_s = .35$  vs.  $.68$ ,  $t[21] = 2.55$ ,  $p < .02$ . The second ANOVA (marked *Analysis 2* in the Table) included the no-CD group vs. the T2 CD onset group ( $N = 32$ ) and those in the T1 CD group who were no longer in the CD category at T2 ( $N = 16$ ). This analysis revealed a main effect of group:  $F(2, 593) = 7.61$ ,  $p < .001$ . Contrasts indicated that the early-onset (T1 only) group ( $M = .30$ ) was using more than the T2 onset group (.12) at T3:  $t(593) = 2.41$ ,  $p < .02$ . Thus, T1 CD diagnosis was associated with more use on average—overall and among those who were using—than was T2 CD diagnosis.

**3.5.2. Amount by CD category and T1 Discrimination**—The pattern of the SEM suggested that the combination of early discrimination and early CD was associated with

<sup>2</sup>A measure of friends' use (reported by the targets) was available at T1. It was positively correlated with discrimination ( $p < .001$ ); however, controlling for it made very little difference in the SEM. For this reason, and because there was very little friends' use at T1 (as there was very little target use), T1 friends' use was not included in the model. As can be seen in Fig. 2, however, T1 friends' use was included in the cross-lag analysis to examine Hypothesis d.

greatest risk (Hypothesis b). To assess this, two additional ANOVAs were conducted, one on amount, the other on percentage use, that included T1 CD (yes/no) and T1 discrimination as independent variables. For illustration purposes, the discrimination factor was divided into two groups: the highest  $\frac{1}{4}$  of the discrimination distribution and the other  $\frac{3}{4}$  of the distribution. The two ANOVAs looked very similar (see Table 5). Both produced main effects of T1 discrimination; amount:  $p < .001$ , percent:  $p < .03$ ; and main effects of T1 CD (both  $ps < .001$ ). The analysis of amount also revealed a T1 CD x T1 discrimination interaction ( $F = 5.60, p < .02$ ), which reflected the fact that use was higher in the high discrimination/T1 CD cell ( $M = .44$ ) than in any other cell ( $M$ s range from .06 to .17, overall  $M = .09$ ; all simple effect  $t$ s  $> 2.86, ps < .005$ ).

### 3.6 CD and Friends' Use: Hypothesis d

Previous cross-lag analyses with the FACHS sample had shown that the cross-lag from T1 target discrimination to T2 CD was significantly stronger than the lag from T1 CD to T2 discrimination (Brody, Chen, Murry, Ge, Simons, Gibbons, Gerrard, & Cutrona, in press). Thus, early discrimination experiences appeared to be a stronger predictor of subsequent CD behavior than vice-versa. In order to increase power, the Brody et al. study used CD symptom counts—i.e., CD was coded as a continuous variable, based on the number of behaviors that the target had engaged in. In the current study, hypothesis d was assessed with a similar cross-lag analysis that included T1 and T2 friends' use and T1 and T2 CD (also symptom counts, again to increase power; see Fig. 2). The two cross-lags were first constrained to be equal and then that model was compared with one in which both paths were estimated. This analysis showed that targets' CD behavior and their reports of their friends' use were related at both waves ( $ps < .004$ ). However, a significant change in  $\chi^2$  in the analysis:  $\Delta \chi^2 = 10.01, p < .002$ , indicated that target T1 CD was a stronger predictor of change in friends' use ( $\beta = .14, t = 3.36, p < .001$ ), than vice-versa ( $\beta = .09, t = 2.32, p < .03$ ).

## 4. Discussion

### 4.1. Early CD as a Predictor

Although it occurred in only a small percentage of the sample (4.3%), early-onset CD had a noticeable effect on these adolescents. First, it was associated with earlier use of marijuana. More important, it was also associated with more drug use five years later. In fact, it was a stronger predictor of targets' later use than was the more proximal (T2) CD diagnosis and their parents' self-reports of use at T3 (which was not related significantly).<sup>3</sup> The fact that T1 CD predicted T3 use and T2 CD did not, suggests that the amount of use was higher by those who manifested behavioral problems early-on as opposed to at age 12.5, and the analyses of amount of use were consistent with that interpretation. In fact, if the 10 cases of "continuous" CD problems—those diagnosed at both T1 and T2—are excluded, the amount of use by the T2 CD group was not much greater than that of the no-CD group. The percentage of the T2 CD group reporting use was high (34%), but the amount they were using was low, perhaps evidence of a more normative type of use pattern (Moffitt, 1993).

Early-onset CD was associated with T1 reports of use by the parents ( $p < .001$ ). There was also some evidence of a reciprocal relation between parent distress and their child's CD. Although not correlated with T1 CD, parents' T1 distress did predict an increase in CD diagnoses in the targets. Undoubtedly, parents' and children's problems are going to affect each other in some fashion. Additional waves of data collection in the FACHS should allow further investigation of this issue.

<sup>3</sup>T3 CD data were available, but were not included in the SEM because the number of cases dropped to only 19 (only 4 of whom were also T1 cases).

## 4.2. Critical Period

**4.2.1. Discrimination**—This study provides additional evidence of the impact of early experiences with discrimination. First, early discrimination was strongly correlated with T1 CD status. In fact, almost every child (77%) manifesting diagnosable CD symptoms was above the median in discriminatory experience, and 54% of the T1 CD cases were in the top 20% of self-reported discrimination. Like early-onset CD, early discrimination was also related to earlier use of marijuana, and it predicted drug use five years later, through its relation with friends who were using. Moreover, as expected, the combination of discrimination and conduct problems was particularly important, as those CD-diagnosed adolescents who were in the top quarter of the discrimination distribution were more likely to report using than was any other group. In fact, below a certain level of discriminatory experience, risk for substance use-- even for adolescents with CD-- was not much higher than it was for those with minimal discrimination experience. In short, it appears that early discriminatory experiences can have an aversive effect on Black children that can last for a while and, for some, may evoke a reaction that can harm their health. Finally, the impact of discrimination was not limited to the adolescents: the relation between the parents' T1 reports of discrimination and their T1 use was also very strong ( $p < .001$ ).

**4.2.2. Risk environment**—Although only exploratory, the cross-lag analysis suggests that those children who manifested early-onset conduct problems may have sought out the company of peers who were using drugs.<sup>4</sup> This pattern is consistent with Caspi et al.' (1989) notion of cumulative continuity; i.e., children with behavior problems will gravitate toward social environments that facilitate risky or problematic behavior. The result is a gradual increase in their conduct problems. Moreover, consistent with Moffitt's early-onset analysis, the CD/ friends' use relation was stronger at T1 than at T2, and T1 CD was actually a better predictor of T2 friends' use than was T2 CD. Thus, it would appear that some of these early-onset children may be "creating" a risk-facilitating environment that will eventually result in enhanced vulnerability to health problems and perhaps other types of behavioral problems as well.

## 4.3. Limitations

There are several limitations of the analyses that need to be considered. First, there was relatively little use by either the parents or the adolescents, and even less problematic use. Similarly, there were not many adolescents at either T1 or T2 with diagnosable CD. Thus, the data are skewed and the significant effects are attributable to a relatively small number of respondents. We would suggest that similar analyses be conducted with larger samples in the future. Second, we relied on targets' reports of their friends' use; self-reports by the friends would have been preferable (we will collect those data in the future). We also relied on targets' and parents' self-reports of their discriminatory experiences and their substance use. Although we have no reason to doubt their validity, future studies might include additional verification of these self-reports (e.g., ask parents and children about each other's experiences, or ask friends or teachers of the targets about the targets' substance use). Along these same lines, the cross-lag analyses suggested that discrimination was a stronger predictor of both affiliation and CD (see Brody et al., in press) than vice-versa, and that CD tended to predict affiliation. It is likely, however, that these relations have a significant degree of reciprocity. For example, adolescents with CD are likely to elicit more negative responses from others, and that may include discrimination, and they may be more likely to perceive prejudice as a motive in the behavior of others toward them. Similarly, it is very likely that the friends/CD relation in adolescents works in both directions. Future studies should include multiple waves and, where possible, multiple informants of these important constructs to further elucidate their relations

<sup>4</sup>We don't know if they sought out these companions *because* they were using drugs, or if there was some other reason or combination of reasons. The next wave of data collection in FACHS will help address this question by including reports from targets' friends.

with each other over time. Finally, the sample comprised only African Americans, which limits our ability to generalize to other racial or ethnic groups. There is a need for this type of research among large samples (panels) of African American adolescents. Nonetheless, comparisons with other ethnic groups are definitely also needed.

#### 4.4. Implications

Comparing these participants' reports of drug use with those of national norms indicates that their use was below those of most individuals of similar age, but comparable to the reports of other African Americans. There is evidence, however, that Black adults experience more problems associated with their substance use than do White adults reporting similar amounts of use (Biafora & Zimmerman, 1998; SAMHSA, 2003). Given the well-established relation between both early use and early CD onset and subsequent substance use problems, these indicators are especially important within African American samples. These results suggest that identification of behavioral problems as well as distress associated with discriminatory experience at an early age among African Americans is very important. Preventive-interventions aimed at helping Black parents prepare their children for the difficulties they are likely to face as a result of discrimination from others (Brody et al., 2004; Gerrard, Gibbons, Brody, Murry, & Wills, 2006), may be particularly effective, especially if presented to children under the age of 12 or 13. More generally, these results suggest that family-based interventions, aimed at improving parenting skills (especially monitoring of the child's activities) at a young age, may be particularly effective at reducing the likelihood that these problems will eventually translate into more serious behavior problems. This is consistent with Lloyd and Anthony's recent (2004) finding that effective parenting by Black parents (i.e., monitoring of the children) prior to the age of 10 has a long term negative (inhibitory) effect on their children's tendency to affiliate with deviant peers. As the current results once again demonstrate, that affiliation is important.

#### 4.5. Conclusions

The vast majority of these African American adolescents will never experience any problems as a result of their substance use. However, those who report having had aversive experiences with discrimination very early in life-- prior to the age of 12-- are more likely to manifest conduct problems and to report early drug use. The combination of early discrimination and early behavioral problems puts them at higher risk for later use and possibly abuse.

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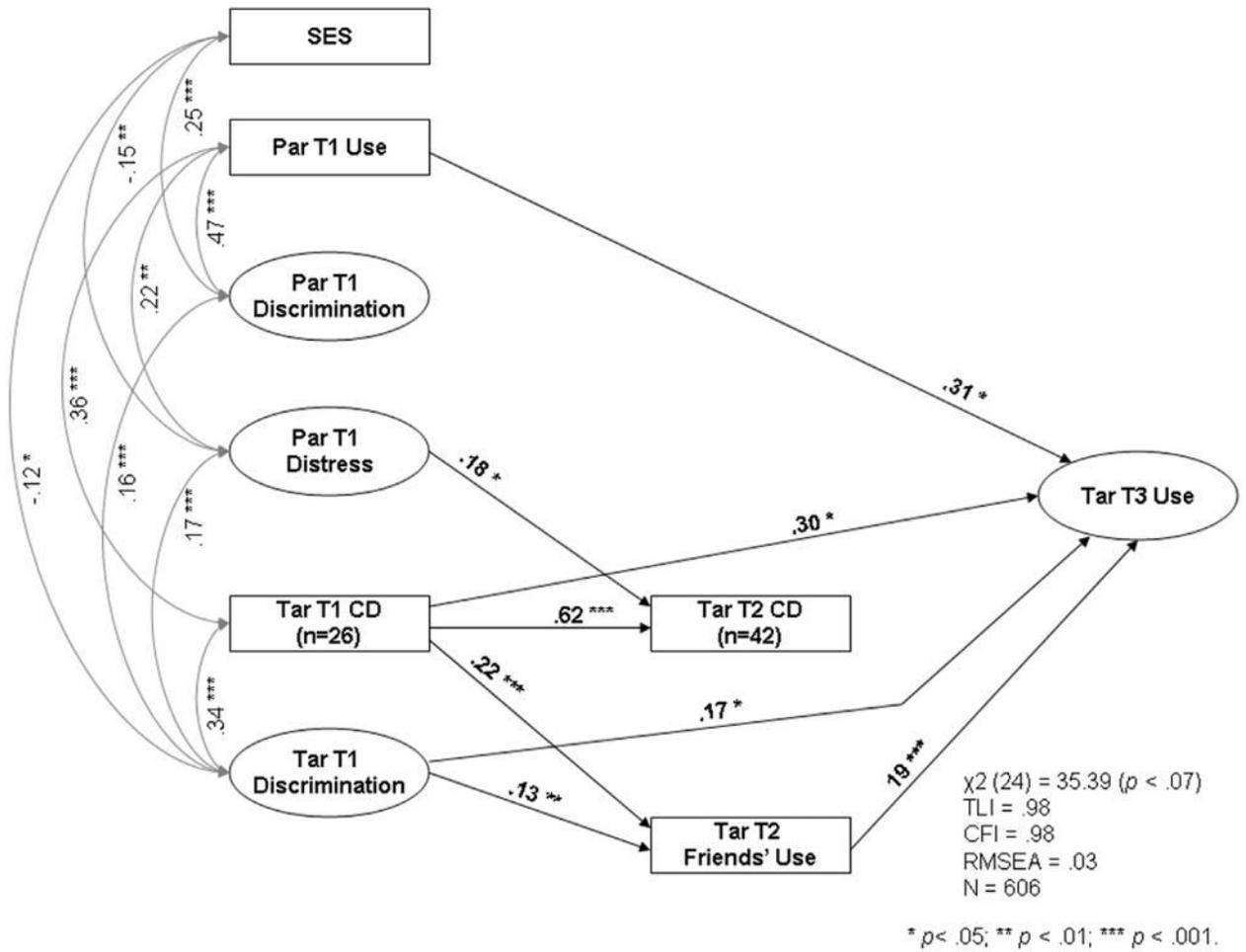
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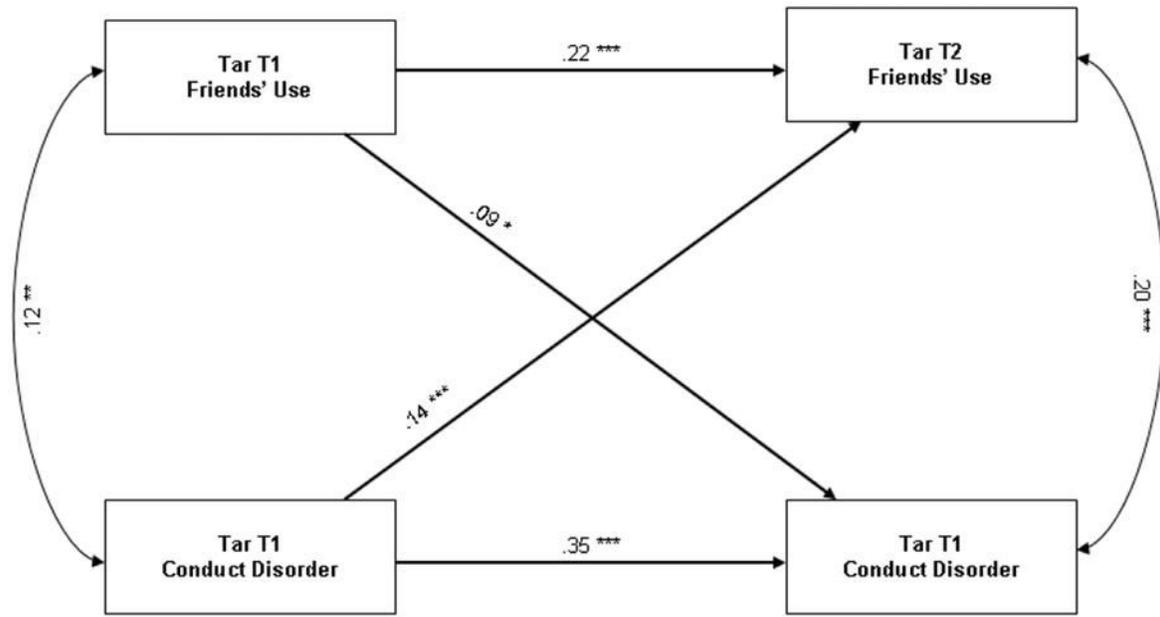
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**Figure 1.** Structural model of discrimination, CD, and substance use. T1 = Time 1; T2 = Time 2; T3 = Time 3; Par = parent; Tar = target; SES = socioeconomic status; Use = drug use for the targets and drug use and problems with alcohol for the parents; Distress = depression and anxiety; CD = conduct disorder. Values represent standardized linear regression and probit regression coefficients (and  $p$ -values).



\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

**Figure 2.** Cross-lag analyses for friends' use and target CD diagnosis. T1 = Time 1; T2 = Time 2.

**Table 1**

Description of the study sample. Data from 273 male and 333 female participants in the Family and Community Health Study, 1997–2003.

	Percent or Mean (SD)
T1 Parent Substance Use	
Some lifetime alcohol problems	12.0%
Lifetime drug use	18.2%
Alcohol problems or drug use	24.1%
T1 Parent Discrimination (Scale: 1 – 4)	2.07 (0.74)
T1 Parent Distress	
Depression (Scale: 1 – 3)	1.28 (0.38)
Anxiety (Scale: 1 – 3)	1.43 (0.48)
Target Conduct Disorder	
Meeting Criteria at Time 1	4.3%
Meeting Criteria at Time 2	6.9%
T1 Target Discrimination (Scale: 1 – 4)	1.63 (0.52)
T2 Target Friend Use	
Some used Illegal drugs	14.7%
Some used Prescription drugs	5.9%
Some used Inhalants	5.4%
Some used Nonprescription drugs	3.3%
Some used Drugs to get high	20.5%
Friends think OK? (Scale: 1 – 4)	1.46 (0.76)
T1 Target Drug Use	
Used Marijuana in last year	2.1%
Used Other Drugs in last year	0.5%
T3 Target Marijuana Use	
None	84.3%
Minimal	11.2%
> Minimal	4.5%
T3 Target Use of Other Drugs (Summed)	
None	98.7%
Minimal	1.0%
> Minimal	0.3%

Note.  $N = 606$ . T1 = Time 1. Target Marijuana Use: *Minimal* = up to 1–2 times per month; *> Minimal* = at least 3–4 times per month. Target Use of Other Drugs: *None* = scored 0 for all four items; *Minimal* = summed score of 1–4; *> Minimal* = summed score of 5 or more.

Frequencies of Target T3 substance use in relation to covariates of interest. Data from 273 male and 333 female participants in the Family and Community Health Study, 1997–2003.

Table 2

	Parent T1 use		Parent T1 Discrimination		Target T1 CD		Target T2 CD		Target T1 Discrimination	
	No (N=460)	Yes (N=146)	Low (N=309)	High (N=297)	No (N=580)	Yes (N=26)	No (N=564)	Yes (N=42)	Low (N=288)	High (N=318)
Marijuana										
Never (N=511)	404	107	270	241	496	15	487	24	257	254
Minimal (N=68)	42	26	29	39	63	5	54	14	24	44
> Minimal (N=27)	14	13	10	17	21	6	23	4	7	20
Ecstasy (N=8)										
Never (N=598)	455	143	306	292	573	25	556	42	286	312
Minimal (N=5)	5	3	3	5	7	1	8	0	2	6
Methamphetamine (N=3)										
Never (N=603)	457	146	308	295	577	26	561	42	288	315
Minimal (N=3)	3	0	1	2	3	0	3	0	0	3
Cocaine (N=5)										
Never (N=601)	457	144	308	293	576	25	559	42	287	314
Minimal (N=5)	3	2	1	4	4	1	5	0	1	4
Needle (N=5)										
Never (N=601)	456	145	307	294	576	25	559	42	288	313
Minimal (N=5)	4	1	2	3	4	1	5	0	0	5

Note. N = 606. Target substance use: *Minimal* = up to 1–2 times per month; > *Minimal* = at least 3–4 times per month. T1 = Time 1. Parent and Target Discrimination measures were dichotomized using median splits.

**Table 3**  
Correlations, Means, and Standard Deviations of all Variables

	1	2	3	4	5	6	7	8	9	10	11
1. T1 Parent SES <sup>a</sup>	-										
2. T1 Parent Use <sup>b</sup>	-.04	-									
3. T1 Parent Disc <sup>c</sup>	.24	.22	-								
4. T1 Parent Depression <sup>d</sup>	-.16	.10	.05	-							
5. T1 Parent Anxiety <sup>d</sup>	-.08	.07	.05	.60	-						
6. T1 CD <sup>b</sup>	-.05	.18	.00	.04	.08	-					
7. T1 TR Disc <sup>c</sup>	-.11	.05	.15	.11	.14	.17	-				
8. T2 CD <sup>b</sup>	-.02	.02	.05	.14	.12	.26	.15	-			
9. T2 friends' Use <sup>a</sup>	-.09	.04	-.02	.01	.02	.16	.19	.14	-		
10. T3 TR Marijuana Use <sup>d</sup>	.01	.11	.09	.06	.04	.19	.15	.18	.17	-	
11. T3 TR Other Drugs Use <sup>d</sup>	-.05	.04	.05	.02	.02	.03	.08	-.03	.05	.11	-
Mean	-.01	.02	2.07	1.28	1.43	.04	1.63	.07	.00	.20	.02
SD	.87	.05	.74	.38	.48	-	.52	-	.64	.50	.15

Note.  $N = 606$ . All correlations  $\geq .08$ ,  $p < .05$ ;  $\geq .10$ ,  $p < .01$ ;  $\geq .13$ ,  $p < .001$ . All variables coded such that high scores indicate more of the construct. T1 = Time 1; T2 = Time 2; T3 = Time 3; TR = target; SES = socioeconomic status; Parent Use = parents' substance use; Disc = discrimination; CD = target conduct disorder.

<sup>a</sup>Scale is standardized.

<sup>b</sup>Scale range = 0–1.

<sup>c</sup>Scale range = 1–4.

<sup>d</sup>Scale range = 1–3.

**Table 4**  
T3 Target Drug Use by CD Diagnosis at Waves 1 and 2

	T3 Drug use		N	Analysis	
	Means	%			
No CD diagnosis	.07	13.5	548	1	2
T1 CD	.32	46.2	26	1	
T1 CD only <sup>a</sup>	.30	31.3	16		2
T2 CD onset <sup>b</sup>	.12	34.4	32	1	2
T1 and T2 CD <sup>c</sup>	.34	70.0	10		
T2 CD <sup>d</sup>	.17	42.9	42		

Note.  $N = 606$ . Means = mean scores over the five items for Target T3 substance use; % = Percentage of targets reporting use of at least one substance at T3.

<sup>a</sup> CD diagnosis at T1 but not at T2.

<sup>b</sup> CD diagnosis at T2 but not at T1.

<sup>c</sup> CD diagnosis at both T1 and T2.

<sup>d</sup> CD at T2 (i.e., combination of cases b and c above). Analysis refers to the two separate ANOVAs comparing use among the different groups (see Section 3.5.1 of the text).

**Table 5**  
T3 Target Mean Drug Use as a Function of T1 Target Discrimination and T1 CD Diagnosis

T3 Drug use:	T1 CD			
	No		Yes	
	Low Disc.	High Disc.	Low Disc.	High Disc.
Amount	.06	.11	.17	.44
Percentage	13	21	33	57
<i>N</i>	440	140	12	14

*Note.* *N* = 606. Amount = mean scores over the five items for Target T3 substance use; Percentage = target T3 substance use was dichotomized into no use and use of at least one substance; Low Disc. = target T1 discrimination scores were in the bottom 75% of the total sample distribution; High Disc. = target T1 discrimination scores were in the top 25% of the total sample distribution.