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Influences of behavior and academic problems at school entry on marijuana use transitions during adolescence in an African-American sample

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HIGHLIGHTS

- This study included data from 458 African Americans followed from 1st to 9th grade.
- Two problem behavior classes emerged; externalizing and attention/concentration.
- Academic problems co-occurred with both problem behavior subtypes.
- Externalizing problems were associated with increased risk of being offered marijuana.
- Attention/concentration problems were associated with use given an opportunity to use.

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ABSTRACT

Background: The aim of this study was to examine how patterns of academic and behavior problems in the first grade relate to longitudinal transitions in marijuana use from middle school through entry into high school among African-Americans.
Methods: Latent class and latent transition analyses were conducted on a community sample of 458 low-income, urban-dwelling African-Americans.
Results: Two behavior problem classes emerged at school entry; externalizing and attention/concentration. Academic problems co-occurred with both problem behavior classes although more strongly with attention/concentration. Youth in the attention/ concentration problem class were more likely to transition from no marijuana involvement to use and problems beginning in the 7th grade and to use and problems given the opportunity to use marijuana early in high school compared to youth with no problems. Youth in the externalizing behavior problem class were significantly more likely to transition from no involvement to having a marijuana opportunity during the transition to high school compared to youth in the attention/concentration problems class.
Conclusions: These findings highlight the importance of developing prevention programs and providing school services that address the co-occurrence of academic and behavior problems, as well as their subtype specific risks for marijuana involvement, particularly for low-income minority youth who may be entering school less ready than their non-minority peers. These findings also provide evidence for a need to continue to deliver interventions in middle school and high school focused on factors that may protect youth during these critical transition periods when they may be especially vulnerable to opportunities to use marijuana based on their academic and behavioral risk profiles.

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1. Introduction

Marijuana use now exceeds the rate of cigarette use among adolescents; rates of past 30 day cigarette smoking are 4.9%, 10.8% and 17.1%, respectively for 8th, 10th and 12th graders compared to 6.5%, 17.0% and 22.9% for marijuana use (Johnston, 'O'Malley, Bachman, & Schulenberg,

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2013). While rates of marijuana use have historically been higher in Whites than African-Americans, increases in African-American marijuana use and abuse in the 1990s, particularly among younger African-Americans, began to narrow this difference (Compton, Grant, Colliver, Glantz, & Stinson, 2004). Recent data show that rates are now slightly higher for African-Americans aged 12 and older than Whites (Substance Abuse and Mental Health Services Administration, 2013). According to the most recent Youth Risk Behavior Surveillance System (YRBSS) survey of high school students, African-American males have the highest rate of current marijuana use compared to all other racial, ethnic and gender groups (Centers for Disease Control and Prevention, 2012). Despite these increases over the past 20 years, little research has examined the longitudinal patterns and antecedents of African-American marijuana use (Brown, Flory, Lynam, Leukefeld, & Clayton, 2004).

Life course social field theory provides one framework for understanding the role that early academic, social and behavioral competencies play in the development of marijuana use that may be particularly salient to low-income African-American children (Patterson, Reid, & Dishion, 1992). According to this theory, early elementary school is a critical transition period that requires successful adaption to social task demands (e.g., making friends, learning classroom expectations, acquiring academic skills, and complying with adult directions). Children, however, arrive at school with diverse experiences. Children from middle-class, educated families are likely to have attended educationally-oriented preschools, have traveled, visited libraries and museums and to have been read to by their parents and teachers. They have been prepared to enter school since toddlerhood in contrast to poor, minority, inner-city children who are prepared to manage an entirely different set of experiences (e.g., assuming responsibilities in the household, caring for younger siblings), which may not be compatible with school expectations (Wilson, 1989).

While early academic and behavior problems in the classroom have independently been associated with later risk for substance use and dependence (e.g. Clark, Belgrave, & Nasim, 2008; Colder et al., 2013; Storr, Wagner, Chen, & Anthony, 2011), there is little research focused on the impact of a child experiencing both academic and behavior problems despite research documenting that they co-occur in children at rates greater than expected by chance (e.g., Bradshaw, Buckley, & Ialongo, 2008). In an effort to understand these relationships, Reinke, Herman, Petras, and Ialongo (2008) used latent class analysis to identify subgroups of children based on their observed patterns of academic and behavior problems at school entry. They found that children with co-occurring academic and behavior problems in the first grade had the highest likelihood of negative outcomes, specifically special education placement, deviant peer affiliation, suspension from school, and conduct problems.

The purpose of the current study is to expand upon these findings, focusing solely on African-Americans to yield insight into the co-occurrence of behavioral and academic problems displayed by this racial subgroup at school entry. We then use latent transition analysis (LTA) to examine the influence of latent classes of behavior and academic problems in the first grade on transitions between latent stages of marijuana involvement during early adolescence. Specifically, the objectives of this study are to: (1) identify classes of academic and behavior problems in the first grade in an urban, African-American sample and estimate their prevalence; (2) identify stages of marijuana involvement from the 6th through 9th grades; (3) examine the probability of transitions between stages; and (4) investigate the influence of the classes of academic and behavior problems at school entry on transitions in marijuana involvement during early adolescence.

2. Methods

2.1. Participants

Data were drawn from a longitudinal study conducted by the Baltimore Prevention Research Center (BPRC) at Johns Hopkins University. The original study population consisted of a total of 798 children and families, representative of students entering the first grade in nine Baltimore City public elementary schools in 1993. The children were recruited for participation in a school-based, randomized preventive trial targeting early learning and aggressive/disruptive behavior (Ialongo et al., 1999). Interventions were provided throughout the first grade. Information on drug use was collected annually beginning in the 6th grade. Written consent was obtained from parents and verbal assent from youth in accord with the requirements of the Johns Hopkins Bloomberg School of Public Health Committee on Human Research.

Of the 798 children available for participation in the fall of first-grade assessments, 678 (85%) were African-American. Approximately 67% of the African-American students (N = 458) had data available on the first-grade study measures of interest as well as data for the 6th and 7th grade assessments in 1999 and 2000 to examine at least the first transition in marijuana involvement. These 458 youth comprised the sample of interest for this study; 240 (52%) were males and 218 (48%) were females. Approximately 72% of the sample received free or reduced lunches at the first-grade assessment. At the time of the 6th-grade assessment, youth were on average 11.77 years (range 10.62 to 13.12 years). Chi-square tests revealed no differences in terms of gender ($\chi^2 = 1.17$, $p = 0.280$) and intervention group assignment ($\chi^2 = 2.11$, $p = 0.146$) between the 458 African-American students participating in this study and the 220 not included. T-tests revealed no differences between these groups in terms of age at entry into the study ($T = -1.75$, $p = 0.081$). However, those included in the study were significantly more likely to receive free or reduced lunch ($\chi^2 = 6.78$, $p = 0.009$). Among those not included in the study because of missing sixth or seventh grade assessments but with data available on first grade measures (N = 167 of the 220), they did not differ significantly from the 458 included in the study on the first grade measures of aggressive and disruptive behaviors, attention and concentration problems, oppositional behavior, academic performance, or achievement. The sample of 458 youth with data available in the 6th and 7th grades in addition to the first grade measures of interest decreased slightly to 450 youth in the 8th grade, and 432 in the 9th grade.

2.2. Measures

2.2.1. Early behavior problems

Teacher ratings of behavior were obtained in the first grade and are based on the Teacher Observation for Classroom Adaptation — Revised (TOCA-R) (Werthamer-Larsson, Kellam, & Wheeler, 1991). The TOCA-R is a structured interview with the teacher, which was administered by a trained assessor. Teachers responded to 36 items pertaining to the child's adaptation to classroom task demands over the last 3 weeks. Adaptation was rated by teachers on a six-point frequency scale (1 = almost never to 6 = almost always). The aggressive/disruptive behavior, oppositional behavior, and attention–concentration problems subscales of the TOCA-R were used as indicators for behavior problems in the first grade. The Aggressive/Disruptive Behavior subscale is the mean of 11 items (e.g. “breaks rules”, “fights”) and has a reported alpha of 0.96. The Oppositional Behavior subscale with a reported alpha of 0.77 is the mean of 4 items (e.g. “talks back to teachers”, “disobeys teachers”). Finally, the Attention-Concentration Problems subscale is the mean of 9 items (e.g. “pays attention”, “easily distracted”) and has a reported alpha of 0.91. These scales were divided into binary items to indicate those children with the most problems in our sample (e.g., top 25% for aggressive behavior) relative to their peers with fewer or no problems.

2.2.2. Early academic problems

Academic performance was measured by the Comprehensive Test of Basic Skills 4 (4th ed.; CTBS, 1990); a standardized achievement battery. Internal consistency coefficients for the Total Math and Total Reading scores are greater than 0.80. We computed the average of the CTBS

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