Family income trajectory during childhood is associated with adolescent cigarette smoking and alcohol use

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HIGHLIGHTS

- The impact of childhood income trajectory on adolescent substance use was examined.
- Socioeconomic disadvantage during childhood was associated with smoking.
- Downward socioeconomic mobility in childhood was associated with alcohol use.

ARTICLE INFO

ABSTRACT

Background: Although childhood socioeconomic disadvantage has been linked with adolescent tobacco and alcohol use in cross-sectional research, less is known about the influence of changes in socioeconomic status during childhood. Upward socioeconomic mobility may attenuate the negative influence of earlier socioeconomic disadvantage on health, while downward mobility may counter the health benefits of earlier socioeconomic advantage. This study evaluated the influence of common trajectories of family income during childhood on smoking and alcohol use during adolescence.
Methods: Data utilized were part of the 15-year longitudinal Study of Early Child Care and Youth Development. A 5-class trajectory model (two stable, one downward, and two upward income trajectories) was developed previously with this sample ($N = 1356$). Logistic regression analyses were conducted to determine whether children of the more disadvantaged income trajectories were more likely to engage in tobacco and alcohol use at age 15 relative to those of the most advantaged trajectory.
Results: Family income trajectory was significantly associated with ever-smoking ($p = .02$) and past-year alcohol use at age 15 years ($p = .008$). Children from the less advantaged trajectories were more likely to have ever-smoked than children of the most advantaged trajectory (all p's < .05). Children of the downwardly mobile trajectory were more likely to have used alcohol within the past year than children of the most advantaged trajectories as well as the most disadvantaged trajectory (all p's < .05).
Conclusions: Findings indicate that childhood socioeconomic disadvantage influences adolescent smoking, while downward socioeconomic mobility influences adolescent alcohol use.

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1. Introduction

The prevalence of alcohol and tobacco use among adolescents is alarmingly high. Recent estimates from the Youth Risk Behavior Surveillance System (YRBSS) indicate that 44.7% of high school students have ever-smoked and 18.1% have smoked within the past 30 days (Eaton et al., 2012). Further, 70.8% of students have ever consumed alcohol, and 38.7% reported alcohol use in the past 30 days (Eaton et al., 2012). Most adults who smoke report initiating smoking prior to 18 years of age (CDC, 2013), and those who began drinking in early adolescence have the greatest risk of developing alcohol use disorders in adulthood (DeWit, Adlaf, Offord, & Ogborne, 2000). Tobacco- and alcohol-attributable deaths are among the leading causes of mortality in the U.S. (Mokdad, Marks, Stroup, & Gerberding, 2004). Tobacco and alcohol use are also associated with numerous other negative consequences, including risky sexual behavior, early pregnancy, illicit drug use/activities and violent criminal activities (Ellickson, Tucker, & Klein, 2001; Ellickson, Tucker, & Klein, 2003; Stueve & O'Donnell, 2005).

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Socioeconomic status (SES) during childhood is associated with substance use in adolescence (for a review, see Hanson & Chen, 2007). SES includes an individual's economic, social, and work status, which together reflect a broader dimension of social stratification. The most commonly measured indicators of SES include income, education, and occupation (Adler et al., 1994). Childhood socioeconomic status is commonly represented by either or both parent's income, education, or occupation (see Hanson & Chen, 2007). General models describing the influence of childhood socioeconomic disadvantage on adult health focus on the harmful physical and psychosocial environmental exposures (e.g., risky/unstable families, neighborhood crime/violence, poor quality education, crowding) associated with socioeconomic disadvantage. In turn, these exposures are hypothesized to have a negative influence on psychological (e.g., increased stress/negative affect), behavioral (e.g., substance use, poor diet, insufficient physical activity), and physiological outcomes (e.g., altered cortical development) which may adversely impact adult health (see conceptual model in Cohen, Janicki-Deverts, Chen, & Matthews, 2010).

Additional research suggests several pathways through which SES may influence substance use specifically. Fergusson, Horwood, Boden, and Jenkin (2007) reported that childhood socioeconomic disadvantage was associated with smoking later in life via several pathways, including cognitive/educational factors, behavioral factors, and parental or peer smoking. Consistent with the concept of observational learning in Social Cognitive Theory (Bandura, 1986), socioeconomically disadvantaged children are more likely to initiate and develop smoking habits when they spend time in an environment where others around them smoke (e.g., parental and peer role models; Fergusson & Horwood, 1999; Green, MacIntyre, West, & Ecob, 1991). In addition, lower intellectual ability, underachievement in school, misbehavior and conduct problems are linked with both socioeconomic disadvantage in children (Teasdale & Owen, 1986; Tuvblad, Grann, & Lichtenstein, 2006) and smoking (Feinstein & Bynner, 2004; Kubička, Matějček, Dytrych, & Roth, 2001; Lynskey & Fergusson, 1995).

Less is known about how the timing of the exposure to socioeconomic disadvantage or changes in SES over time might influence substance use. Several theories including the critical/sensitive period, accumulation/cumulative exposure, and social mobility models attempt to explain how childhood socioeconomic disadvantage might influence health outcomes later in life (for reviews, see Cohen et al., 2010; Hallqvist, Lynch, Bartley, Lang, & Blane, 2004; Pollitt, Rose, & Kaufman, 2005). In the critical/sensitive period model, SES is hypothesized to have the greatest impact on health during specific developmental stages (e.g., early vs. late childhood). For example, Poulton et al. (2002) showed that those who experienced socioeconomic disadvantage during early childhood were more likely to develop alcohol dependence by age 26, regardless of adult socioeconomic position or infant health status. The accumulation model hypothesizes that the effects of exposure to socioeconomic disadvantage accumulate over time to increase the risk of poor health at later stages in life. For example, Mossakowski (2008) showed that longer durations of poverty and unemployment over a span of 13 years were independently and significantly correlated with heavy and frequent drinking later in adulthood, even after controlling for demographic variables, prior heavy drinking, and current socioeconomic status. Likewise, cumulative childhood socioeconomic disadvantage from birth to 16 years has been shown to be significantly associated with persistent smoking in later life (Jefferis, Power, Graham, & Manor, 2004). However, the concept of social mobility has been relatively understudied, wherein the negative effects of earlier socioeconomic disadvantage are hypothesized to diminish when an individual experiences upward socioeconomic mobility, while the benefits of earlier socioeconomic advantage on health are attenuated by downward socioeconomic mobility.

The purpose of the current study was to evaluate the influence of common trajectories of childhood family income on cigarette smoking and alcohol use during adolescence. It was hypothesized that children who experienced low income throughout childhood would be more likely to engage in tobacco and alcohol use at age 15 than those who experienced higher incomes throughout childhood. Children who experienced upward social mobility were expected to have outcomes consistent with a reduced likelihood of tobacco and alcohol use relative to children with consistently low SES, while those who experienced downward economic mobility were expected to have outcomes consistent with a greater likelihood of tobacco and alcohol use relative to children with consistently high SES.

2. Methods

2.1. Study design and participants

The Study of Early Child Care and Youth Development (SECCYD) was a longitudinal study designed to examine the influence of child care experiences on social, emotional, intellectual, and language development; as well as physical growth and health of children (for more information, see NICHD, 2012; NICHD ECCRN, 1994). Participants were enrolled at 10 sites across the U.S., and they were followed through four phases starting at the birth of the child and continuing through 15 years of age. Following the birth of their child, mothers were asked about their interest in being contacted to participate in the study. Mothers and their children were later contacted and enrolled in the study during a home visit when the child was 1 month of age.

A total of 1364 families were enrolled in Phase 1 in 1991, which continued from birth to 3 years of age and included assessments at 1, 6, 15, 24, and 36 months of age. During Phase 2, 1226 families (89.9%) were retained in the study. Phase 2 continued from 54 months through 1st grade, and included assessments at 54 months, kindergarten, and 1st grade. During Phase 3, 1061 families (77.8%) remained in the study. Phase 3 included assessments at 2nd, 3rd, 4th, 5th, and 6th grades. By Phase 4, 1009 families (74.0%) remained in the study. Phase 4 included assessments at 7th and 8th grades and at age 15 years. Data were collected by research assistants via home visits, visits to the children's various forms of child care, visits to a laboratory playroom, visits to schools, telephone calls, and mailed questionnaires to the children's parents and teachers. All study procedures were approved at the institutional review boards of each site, and informed consent was obtained from all participants at the beginning of each phase of the study. Information about inclusion/exclusion criteria, recruitment, enrollment, and the study protocol are presented in detail elsewhere (NICHD, 2012; NICHD ECCRN, 1994).

2.2. Measures

2.2.1. Demographics/socioeconomic status

Given that only 23.7% of the sample was of non-White race/ethnicity (i.e., 12.8% Black, 6.0% Latino/Hispanic, 1.4% Asian/Pacific Islander, 0.2% American Indian/Eskimo/Aleut, 3.3% other), race/ethnicity was dichotomized into White/Caucasian and non-White categories in all analyses. Maternal age and years of education were measured when the infant was 1 month of age. Income-to-needs ratio was calculated by dividing the self-reported total family income by the federal poverty threshold for that year given the size of the family (e.g., the poverty threshold for a family of four in 1991 was $13,924; see Census, 2010). Thus, an income-to-needs ratio of 1.0 indicates that the family was living at the poverty threshold. Given the low frequency of individuals living at or below the poverty threshold in the current sample, the income-to-needs ratio was dichotomized into low income (income-to needs ratio ≤ 2) or adequate income (income-to needs ratio > 2). This cut-point for low-income (i.e., 200% of the poverty threshold) was chosen because it has been used in previous research with the SECCYD data set (e.g., Nader, Bradley, Houts, McRitchie, & O'Brien, 2008; Nader et al., 2006) and often serves as a criterion for qualifying for government aid [e.g., Child Health Insurance Program (CHIP)]. Income was measured at 13 assessment points beginning at 1 month of age and