The association of ecstasy use and academic achievement among adolescents in two U.S. national surveys

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ABSTRACT

The association of ecstasy (3, 4-methylenedioxymethamphetamine, MDMA) use with low academic achievement was examined in two nationally representative surveys of adolescents. We tested whether associations with low academic achievement were of similar magnitude or of stronger magnitude for ecstasy versus marijuana use (without ecstasy use), alcohol/tobacco use (without other drug use) and non-drug use in adolescence. Data from the adolescents in the 2002–2005 National Survey of Drug Use and Health (NSDUH, $n=65{,}294$) and from the 2001–2003 Youth Risk Behavior Survey (YRBS, $n=27{,}592$) were analyzed via weighted logistic regression models. Ecstasy, marijuana, and alcohol/tobacco use were associated with moderate and low academic achievement among adolescents in both surveys. Moreover, ecstasy was more strongly associated with low academic achievement and reporting that school gave no grades than alcohol/tobacco in both samples and than marijuana (NSDUH sample only). Prevention programs should inform adolescents that ecstasy use might impair their academic achievement.

1. Introduction

Studies have shown that low academic achievement is associated with illegal drug use, particularly with marijuana use (Kandel & Davies, 1996; Sanders, Field, & Diego, 2001; Lynskey & Hall, 2000; Jeynes, 2002; Cox, Zhang, Johnson, & Bender, 2007); however, little is known about its associations with ecstasy (3,4-methylenedioxymethamphetamine, MDMA) use. Prevalence of ecstasy use among adolescents has increased in recent years. Data from the Monitoring the Future study (MTF) show that ecstasy use peaked among 12th grade students in 2001 (12% lifetime and 9% past year). In 2007 6.5% and 4.4% of 12th grade students had already used ecstasy in their lifetime and in the past year, respectively; these rates are still of concern and show a new cumulative increase in ecstasy use in the past couple of years (Johnston, O'Malley, Bachman, & Schulenberg, 2007). Indeed, while there is indication that hallucinogen use in general has decreased over the past several years, the number of persons who first used ecstasy in the past 12 months increased from 2005 to 2006 and the past year prevalence of ecstasy increased among young people (Substance Abuse and Mental Health Services Administration (SAMSHA), 2007). The most recent National Survey on Drug Use and Health (NSDUH) showed that 1.9% of adolescents aged 12–17 years old were lifetime ecstasy users in 2006 (SAMSHA, 2007). This study aims to estimate the association of ecstasy use with low academic achievement; but since the vast majority of ecstasy users have a history of marijuana use (Martins, Mazzotti, & Chilcoat, 2005; Martins, Ghandour, & Chilcoat, 2007; Martins, Storr, Alexandre, & Chilcoat, 2008a,b), we sought to test the association of ecstasy use above and beyond the association of marijuana use with low academic achievement.

Kandel and Davies (1996) analyzed data from adolescents in 53 New York state schools and found that those who used illegal drugs (marijuana, cocaine and or crack) showed deficits in school performance. Using data from the Mississippi 2003 Youth Risk

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Behavior Survey (YRBS), Cox et al. (2007) showed that marijuana use was associated with low academic achievement (defined in their study as students with mostly C's or below). Sanders, Field and Diego (2001) showed that both marijuana and cocaine were associated with low academic achievement in a small sample of 80 high school seniors from a suburban private school. Jeynes (2002) used data from the 1992 National Education Longitudinal Survey (NELS) and found that adolescents who used marijuana and/or cocaine had poorer performances on standardized tests. Pacula, Ringel, and Ross, (2003) used data from the 1988 NELS to examine the relationship between marijuana and performance on standardized tests. They conducted both longitudinal and cross-sectional analyses. Their results indicate that marijuana was associated with a 15% decrease in performance on standardized math tests for the 10 and 12th graders; but most of the negative impacts of marijuana in their cross-sectional analyses disappeared when they controlled for individual differences. Using data from the 2000 NELS, Chatterji (2006) has shown that marijuana and cocaine use in high school were associated with reductions in the number of schooling years completed. Roebuck, French, and Dennis (2004) used data from the 1997 and 1998 National Household Survey on Drug Use (NHSDA) and found that marijuana use was positively associated with school dropout and the number of days skipped from school. Yamada, Kendrix and Yamada (1996) used data from the National Longitudinal Survey of Youth (NLSY79) to investigate the impact of marijuana and alcohol use on high school graduation. They found significant adverse effects of current alcohol and marijuana use on high school graduation rates. Bray, Zarkin, Ringwalt, and Qi, (2000) examined whether the relationship between the initiation of marijuana use and the decision to drop out of high school varied with the age of dropout or with multiple substance use. They used data from four longitudinal surveys of students in a southeastern U.S. public school system. Their results were stable and indicated that the odds of dropping out for marijuana users were 2.3 times that of non-users. Thus, it seems that illegal drug use not only affects academic achievement but also influences high school graduation rates and increase the number of school drop-outs. However, to date, no study has investigated the association between low academic achievement and ecstasy use.

That marijuana use and ecstasy use might be associated with low academic achievement is consistent with Jessor and Jessor's problem behavior theory that indicates drug use and disruptive behaviors share a common etiology (Jessor & Jessor, 1977; Jessor, 1987, 1998). In a review of several cross-sectional and longitudinal studies that investigated the association of marijuana use with low academic achievement, Lynskey and Hall (2000) propose that marijuana use and low academic achievement co-occur either due to common risk factors or because early marijuana use 'increases the chances of adopting an unconventional lifestyle characterized by affiliations with delinquent and substance—using peers and disengagement from conventional social roles including completing education and obtaining employment' (p.1628). Adverse effects of marijuana and ecstasy use might be associated with low academic achievement; several studies have shown that ecstasy can cause acute adverse effects that include: difficulty concentrating, anxiety, depressed mood, increased elation, dissociation feelings, delusions, and confusion (Morland, 2000; Liechti, Gamma, & Vollenweider, 2001; Tancer & Johansen, 2003; Verheyden, Henry, & Curran, 2003). In this paper we take an approach analogous to Cox, Zhang, Johnson, and Bender (2007) to explore the association between low academic achievement and ecstasy use above and beyond that for marijuana. We hypothesized that ecstasy users would have stronger associations with low academic achievement than marijuana users, alcohol/tobacco users (who did not use other drugs) and non-drug users. Thus, we estimate these associations for four mutually exclusive groups of adolescents (similar to Martins et al., 2008a): 1) non-drug users (who never used any type of illegal drug), 2) alcohol/tobacco users (who never used other drugs), 3) lifetime marijuana users (defined as respondents that used marijuana at least once but had never used ecstasy prior to the interview), and 4) lifetime ecstasy users (defined as respondents that used ecstasy at least once independent of their marijuana use status). We use data from two nationally representative surveys of adolescents: the National Survey of Drug Use and Health and the Youth Risk Behavior Survey. Therefore, the specific aims of this study are to: 1) test whether low academic achievement is associated with ecstasy use in adolescence; and 2) test whether associations with low academic achievement are of similar magnitude or of stronger magnitude for ecstasy versus marijuana use, alcohol/tobacco use, or non-drug use in adolescence.

2. Methods

2.1. National Survey on Drug Use and Health (NSDUH) sample and measures

We analyzed data from the 2002 ($n=54,079$), 2003 ($n=55,230$), 2004 ($n=55,602$), and 2005 ($n=55,905$) National Survey on Drug Use and Health (NSDUH) public use data files. The NSDUH is sponsored by the Substance Abuse and Mental Health administration (SAMHSA) and is designed to provide estimates of the prevalence of extramedical use of legal drugs and of illegal drugs in the household population of the United States 12 years of age and older (SAMHSA, 2003, 2004, 2005, 2006). The survey employs a 50 state design with an independent multistage area probability sample for each of the 50 states and the District of Columbia. African-American, Hispanics, and young people were over sampled to increase the precision of estimates for these groups. The response rate was about 91% for household screening in 2002–2005, and 71%–79% (2002–2005) for completed interviews. Survey items were administered by computer-assisted personal interviewing conducted by an interviewer (CAPI) and audio computer-assisted self-interviewing (ACASI). Use of ACASI was designed to provide respondents with a highly private and confidential means of responding to questions and to increase the level of honest reporting of illegal drug use and other sensitive behaviors (SAMHSA, 2003, 2004, 2005, 2006). Respondents were offered a $30 incentive payment for participation in the survey. Detailed information about the sampling and survey methodology in the NSDUH are found elsewhere (SAMHSA, 2003, 2004, 2005, 2006). In this study the data analyses were restricted to the 65,294 adolescent respondents who were either non-drug users, or alcohol/tobacco users only, or marijuana or ecstasy users (those who used other drugs but not ecstasy and marijuana were excluded, $n=7591$).