

NEDS ANALYTIC SUMMARY

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Highlights

Substance use and criminal activities were more prevalent among youth who had initiated marijuana use before age 15 than at 15 or older.



CSAT
Center for Substance
Abuse Treatment
SAMHSA

Early Initiation of Marijuana Use in Job Corps and NHSDA



NEDS Analytic Summary Series

The Center for Substance Abuse Treatment (CSAT) works to improve the lives of those affected by alcohol and other substance abuse, and, through treatment, to reduce the ill effects of substance abuse on individuals, families, communities, and society at large. Thus, one important CSAT mission is to expand the knowledge about effective substance abuse treatment and recovery services. In support of these efforts, CSAT established the National Evaluation Data Services (NEDS) contract to provide a wide array of secondary data analysis products to the substance abuse treatment field.

Specifically, the NEDS project is focused upon providing CSAT with an analytic capability to use existing data to address policy- and practice-relevant topics as well as future research and evaluation activities. NEDS has developed several product lines designed to provide analytic findings to substance abuse treatment policy makers, service providers, services researchers and evaluators in a format that is most useful to the end user.

The Analytic Summary is one of the NEDS product lines. The purpose of the Analytic Summary is to provide a brief summary of each technical report produced by NEDS written in non-technical language. Readers who find the Analytic Summary results of interest can contact the original NEDS technical report authors for more detailed information. Through this process, the NEDS Analytic Summaries provide information to the substance abuse treatment field and promote linkages among different areas in the field.

This Analytic Summary

This Analytic Summary is based on the NEDS Technical Report titled *Early Initiation of Marijuana Use in Job Corps and NHSDA* (Greenfield, L., French, K., & Devine, P., 2002). For a more thorough discussion of the analysis and findings, please obtain a copy of the complete Technical Report. Information for doing so is provided on the last page of this summary.

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Early Initiation of Marijuana Use in Job Corps and NHSDA

Analytic Importance

One important function of CSAT is to expand the knowledge about, and the availability of, effective treatment and recovery services for those affected by alcohol and other substance abuse. In sponsoring these analyses of the data it has collected, CSAT is attempting to gain useful insight into the fundamental question: *What constitutes effective (and cost-effective) treatment, and for what populations?*

Substance use and abuse among adolescents has become a persistent problem during the past three decades, especially among economically disadvantaged youth. Experimentation with so-called soft drugs, such as alcohol and marijuana, by youngsters in their early teens frequently leads to their abuse of hard drugs, such as cocaine, crack, and heroin, in their later years. Furthermore, various studies have suggested an association between the initiation of drug use during early adolescence and subsequent behavioral problems, including criminal activity, during later adolescence and adulthood.

Given the frequent occurrence of adolescent substance use, a broadened understanding of this problem and its implications is fundamental to efforts aimed toward its ultimate resolution.

Analytic Purpose

This analysis was designed to test the notion that individuals who begin using marijuana early in adolescence are more likely to engage in further substance use and criminal behaviors than are those who begin use later in adolescence.

The analysis is based on two samples of adolescents from economically different backgrounds. One sample included

young men and women enrolled in Job Corps, a national education and job-training program for economically disadvantaged, at-risk youth.

The other sample included young men and women who had responded to the National Household Survey on Drug Abuse (NHSDA), an annual nationwide survey designed to measure the prevalence of drug use in the United States and to monitor drug use trends over time.

The analysis focused on marijuana use because that drug had been identified as the primary substance of abuse among Job Corps youth. To examine whether early marijuana use is associated with current and future substance use and/or criminal behaviors, five analytic questions were asked:

- What are the characteristics of the Job Corps and NHSDA youth who initiated marijuana use before age 15 and those youth who initiated marijuana use at age 15 and older?
- Is early initial marijuana use associated with the substance use behavior of Job Corps students prior to their admission to the program and during follow-up?
- Is early initial marijuana use associated with the further substance use behavior of NHSDA youth?
- Is early initial marijuana use associated with Job Corps students' criminal behaviors and arrests prior to admission to the program and during follow-up?
- Is early initial marijuana use associated with the criminal behavior of NHSDA youth?

Three key analytic questions were addressed:

- **What are the characteristics of youth who initiated marijuana use before age 15 and those youth who initiated marijuana use at 15 years and older?**
- **Is early initial marijuana use associated with later substance use?**
- **Is early initial marijuana use associated with subsequent criminal behaviors and arrests?**



Early Initiation of Marijuana Use in Job Corps and NHSDA (cont.)

An additional objective of this analysis was to determine if the association between early initiation of marijuana use and later substance use and criminal behaviors would be found only for more economically disadvantaged youth or for both disadvantaged and nondisadvantaged youth.

Analytic Approach

Data Sources

The analyses included comparisons of personal characteristics, substance use behaviors, and criminal behaviors of Job Corps and NHSDA youth who reported prior marijuana use.

The Job Corps sample was selected from more than 6,000 students on whom data were available between 1993 and 1995 as part of the CSAT-sponsored evaluation of the Job Corps Drug Treatment Enrichment Project (DTEP). The current analysis was based on admission and follow-up data on 1,031 Job Corps students (273 females and 758 males) who reported marijuana use prior to enrolling in Job Corps. The students averaged 18 years of age upon entry to the Job Corps.

To facilitate comparisons of the Job Corps and NHSDA samples, 4,999 youth who had reported prior marijuana use were selected from the 1993 and 1995 NHSDA surveys. The selected NHSDA respondents ranged in age from 16 to 26, a range similar to that of the Job Corps students at both entry to the program and at follow-up.

Analytic Strategies

The Job Corps sample and the NHSDA sample were each split into two groups based on age of initiation of marijuana use:

- **Early Initiators:** Those who initiated marijuana use before age 15
- **Late Initiators:** Those who initiated marijuana use at age 15 or older.

Approximately 40 percent (447) of Job Corps students reported that they initiated marijuana use before age 15. Approximately 60 percent (584) reported initiating marijuana use at age 15 and older.

The 1993 NHSDA sample included 826 Early Initiators and 2,006 Late Initiators. The 1995 NHSDA sample included 521 Early Initiators and 1,658 Late Initiators. Together, approximately 27 percent (1,335) of the NHSDA interviewees reported that they initiated marijuana use before age 15. Approximately 73 percent (3,664) of the NHSDA respondents reported initiating marijuana use at age 15 or older.

Job Corps youth who reported early initiation of marijuana use and Job Corps youth who reported late initiation of marijuana use were compared on personal characteristics, substance use, and criminal behaviors. Similar analyses of early and late initiators in the NHSDA survey were included in order to explore the extent to which behaviors associated with early use are found in a more economically diverse population of youth.

To examine the effects of early initiation of marijuana use, the analysis included a number of variables in the following categories:

- **Personal characteristics:** Gender, race/ethnicity, education, employment, prior treatment for alcohol/drugs
- **Substance use:** Tobacco; past 30-day and 12-month use of marijuana,

Two categories of Job Corps youth and NHSDA youth were compared:

- **Those who initiated marijuana use before age 15**
- **Those who initiated marijuana use at age 15 or older.**



Among Job Corps youth, risk factors associated with early initiation of marijuana use included:

- **Difficulties in school and at home**
- **Early onset of criminal behavior**
- **Early use of alcohol.**



Early Initiation of Marijuana Use in Job Corps and NHSDA (cont.)

cocaine, crack and heroin; past 30-day alcohol use; past 30-day and 12-month binge drinking (from 2 to seven drinks per hour)

- **Criminal behaviors and arrests:** Driving while under the influence (DUI); destroying property; assaulting/beating someone up; number of arrests in past 12 months.

A number of risk factors, such as problems at home or at school, were also included in the analyses.

The statistical procedures included both bivariate and multivariate analytic methods to assess the significance of differences between Early Initiators and Late Initiators on the above variables at admission and at follow-up. For the Job Corps analyses, hierarchical linear modeling (HLM) was used to control for variations in Job Corps sites and to assess the contribution of age of initiation to substance use and criminal behaviors, controlling for such factors as age, gender, education, employment, and race/ethnicity. For the similar NHSDA analyses, logistic regression was used.

Findings

The analyses of Job Corps youth and NHSDA youth both showed that early initiation of marijuana use is associated with increased levels of subsequent substance use and criminal activities.

Differences in substance use rates of Early Initiators and Late Initiators were significant at admission to Job Corps, but once other factors were considered, the differences disappeared over time, with the exception of binge drinking. The NHSDA findings showed a significant association between early initial marijuana use and later substance use, with the exception of alcohol.

Among Job Corps youth, differences in criminal behaviors of Early Initiators and Late Initiators were not significant once other factors were controlled. The NHSDA comparisons consistently showed higher levels of physical assault among Early Initiators compared to Late Initiators.

Personal Characteristics and Risk Factors Associated with Early Use

Characteristics of Job Corps youth. Early Initiators and Late Initiators were different in gender and race/ethnicity but similar in age, education, and employment status. Compared to Late Initiators:

- Early Initiators included more males (64% vs. 54%)
- Early Initiators included a higher percentage of whites (26% vs. 13%) and a lower percentage of African Americans (49% vs. 64%).

On average, both Early Initiators and Late Initiators in the Job Corps sample were about 18 years old, few had high school diplomas (11% and 15%, respectively), and about 17% were employed prior to Job Corps entry.

Risk factors among Job Corps youth. Early initiation of marijuana use among Job Corps students correlated with a number of risk factors for substance use. Such problems as difficulties in school and at home, the early onset of criminal behavior, and the early use of alcohol were associated with early marijuana use.

Specifically, running away from home, being expelled or suspended from school, committing a crime before age 15, and using alcohol before age 15

Compared to Late Initiators in Job Corps, Early Initiators had higher substance use at admission but not at follow-up.

Early Initiation of Marijuana Use in Job Corps and NHSDA (cont.)

were more often reported by Early Initiators than by Late Initiators. Early initial marijuana use also was associated with the use of drugs and alcohol among friends and relatives.

Characteristics of NHSDA youth.

Among the 1993 respondents, Early Initiators and Late Initiators differed in education and prior use of alcohol but were similar in age, gender, and race/ethnicity. Compared to Late Initiators:

- A higher proportion of Early Initiators did not complete high school (38% vs. 27%).
- A much higher proportion of Early Initiators consumed alcohol prior to age 15 (79% vs. 37%).
- A higher proportion of Early Initiators had been treated for substance use during the past 12 months (6% vs. 2%).

On average, the age of both Early Initiators and Late Initiators was about 21 years (3 years older than the average Job Corps student). Nearly one-half of each group were female, and about three-fourths of each group were white.

Risk factors among NHSDA youth.

As among the Job Corps youth, the early initiation of marijuana use was associated with a number of risk factors for the NHSDA respondents. Compared to Late Initiators, Early Initiators were less likely to complete high school, more likely to drink alcohol prior to age 15, and more likely to have been treated for substance use during the past 12 months.

Differences in the sample characteristics of the Job Corps youth at admission and the 1993 NHSDA youth were as follows. Compared to the 1993 NHSDA youth, the Job Corps youth at admission were on average 2 years younger, more

likely to be male, more likely to be African American, less likely to be employed, and less likely to be married. Job Corps and NHSDA respondents were about equally likely to report drug/alcohol treatment in the past 12 months.

Early Initiation of Marijuana Use Linked to Substance Use of Job Corps Youth

The second area of analysis was the relationship between age of initial marijuana use and the current use of marijuana and other substances, i.e., cocaine, crack, alcohol, and tobacco. Substance use by age of first marijuana use, both at admission to Job Corps and at follow-up, is shown in Exhibit 1. With the exception of binge drinking, the initial differences in substance use between Early Initiators and Late Initiators disappeared during follow-up.

After controlling for age, gender, race/ethnicity, education and work status, Early Initiators compared to Late Initiators were:

- Twice as likely to use cocaine, engage in binge drinking, and smoke an average of six or more cigarettes per day
- Three times more likely to engage in near-daily use of marijuana
- Nine times more likely to use crack.

While these results suggest that early marijuana use may be a marker for substance abuse, they cannot be used to infer that early marijuana use causes these other substance use problems.

Early Initiation of Marijuana Use Linked to Substance Use of NHSDA Youth

Comparisons between Early Initiators and Late Initiators in the 1993 and 1995 NHSDA samples yielded generally simi-



Early Initiation of Marijuana Use in Job Corps and NHSDA (cont.)

Among NHSDA youth, Early Initiators had consistently higher substance use than Late Initiators in both 1993 and 1995.



Exhibit 1				
Substance Use by Age of First Marijuana Use Among Job Corps Respondents at Admission and During Follow-up				
Substance Use	Admission		Follow-up	
	Early Initiators (n=447) %	Late Initiators (n=584) %	Early Initiators (n=447) %	Late Initiators (n=584) %
Marijuana- Near-daily use past 30 days	23	9	11	10
Marijuana - Past 30 days	78	78	35	34
Cocaine - Past 12 months	12	6	3	3
Crack - Past 30 days	4	1	4	2
Alcohol - Past 30 days	56	44	54	52
Binged* - Past 30 days	27	14	19	10
Smoked 6+ cigarettes per day	49	33	52	41

*Binge drinkers in Job Corps averaged four or more drinks per hour.

lar results to those in the Job Corps comparisons. As shown in Exhibit 2, consistently higher rates of drug use were reported by Early Initiators than by Late Initiators in both the 1993 and 1995 NHSDA surveys.

With other variables controlled, Early Initiators compared to Late Initiators were:

- Twice as likely to report past 30-day marijuana use, past 12-month

cocaine use, and past 2-week smoking of six or more cigarettes per day.

- Three times more likely to report past 12-month crack use
- Four times more likely to engage in near-daily use of marijuana.

No differences were found in substance use rates reported in the 1993 and 1995 surveys.

Exhibit 2				
Substance Use by Age of First Marijuana Use Among NHSDA Respondents in 1993 and 1995				
Substance Use	1993*		1995*	
	Early Initiators (n=826) %	Late Initiators (n=2,006) %	Early Initiators (n=521) %	Late Initiators (n=1,658) %
Marijuana- Near-daily use past 30 days	10	3	14	3
Marijuana - Past 30 days	34	25	39	26
Cocaine - Past 12 months	15	8	17	7
Crack - Past 30 days	5	1	5	2
Alcohol - Past 30 days	73	77	78	81
Binged - Past 30 days	42	43	49	43
Smoked 6+ cigarettes per day	40	28	48	30

*Differences between Early Initiators and Late Initiators in 1993 and 1995 were significant, except for alcohol and binge drinking.

Early Initiation of Marijuana Use in Job Corps and NHSDA (cont.)

In the NHSDA analyses, early initiation of marijuana use appears to influence later drug use but not alcohol use (including binge drinking). Overall, the analysis indicated an association between early marijuana use and later substance use in both the economically disadvantaged Job Corps sample and the more economically diverse NHSDA sample.

Early Initiation of Marijuana Use Linked to Criminal Behaviors of Job Corps Youth

Four criminal activity categories were included in the analysis: driving under the influence of drugs and/or alcohol (DUI), property destruction, physical assault, and past-year arrests. The relationship between age of marijuana initiation and subsequent criminal behavior was examined, as well as the significance of other variables (e.g., age, race, gender, education, and work status) as predictors of criminal behaviors.

Early Initiators had higher rates of criminal behaviors than Late Initiators both prior to Job Corps admission and during follow-up (see Exhibit 3). After

controlling for such factors as age, gender, education, and employment, the difference in arrests noted between Early Initiators and Late Initiators during follow-up was not significant.

Changes in criminal behaviors and arrests over time were examined for Early Initiators and for Late Initiators. Significant increases in arrest rates and assaults were found for both Early Initiators and Late Initiators after adjusting the data for the length of follow-up time. Further analysis showed that Early Initiators who reported near-daily marijuana use during follow-up had a higher assault rate (50%) than Early Initiators who did not report near-daily marijuana use (29%). The differences in rates of DUI and destroying property were not significant for Early Initiators after making adjustments for follow-up time.

Early Initiation of Marijuana Use Linked to Criminal Behaviors of NHSDA Youth

Early Initiators in both 1993 and 1995 had significantly higher rates of assaults than Late Initiators (see Exhibit 4). The remaining differences in regard

Among Job Corps youth, Early Initiators had higher rates of criminal behaviors than Late Initiators both prior to admission and at follow-up.

Among NHSDA youth, Early Initiators had higher rates of assault than Late Initiators in both 1993 and 1995.



Exhibit 3 Criminal Behaviors / Arrests by Age of First Marijuana Use Among Job Corps Respondents at Admission and During Follow-up				
Criminal Behaviors / Arrests	Admission		Follow-up	
	Early Initiators (n=447) %	Late Initiators (n=584) %	Early Initiators (n=447) %	Late Initiators (n=584) %
DUI (alcohol/drugs)	12	6	21	15
Destroyed property	7	3	13	9
Beat someone up	9	6	31	25
Arrested past 12 months	14	13	33	25

Early Initiation of Marijuana Use in Job Corps and NHSDA (cont.)

Implications for research:

- **Seek ways to assess drug use along the entire continuum of adolescence.**
- **Identify the time line between initial marijuana use and regular use.**
- **Expand use of NHSDA data in substance abuse treatment evaluations.**



Exhibit 4 Criminal Behaviors / Arrests by Age of First Marijuana Use Among NHSDA Respondents in 1993 and 1995				
Criminal Behaviors Arrests	1993		1995	
	Early Initiators (n=826) %	Late Initiators (n=2,006) %	Early Initiators (n=521) %	Late Initiators (n=1,658) %
DUI (alcohol/drugs)	34	31	39	29
Destroyed property	12	8	8	5
Beat someone up	11	5	7	3
Arrested past 12 months	12	7	7	6

to rates for DUI, property destruction, and arrests varied by survey.

Overall, the analysis of personal characteristics, substance use, and criminal behaviors among the Job Corps and NHSDA youth suggests a possible correlation between early initiation of marijuana use and later substance use as well as some types of criminal behaviors.

Implications

The analyses of the Job Corps youth and the NHSDA youth both showed that early initiation of marijuana use is associated with increased levels of later substance use and criminal activities. Because the findings for Job Corps and NHSDA samples were similar in many respects, they strongly suggest that adolescent substance use and other high-risk behaviors are by no means a byproduct of economic disadvantage alone. The findings have implications for further substance abuse treatment research, policy, and practice.

Implications for Research

Examination of the five key analytic questions that guided this analysis has pointed to various ways in which

research on adolescent drug abuse may be extended even further. Specific implications for future research and evaluation suggest the following:

- **Compare a single cut point for age of initial use with an age continuum.** In this analysis, Job Corps students who initiated marijuana use before the cut point of age 15 were compared to those who initiated drug use at age 15 and older. Another approach would be to compare the behaviors of Job Corps students at admission and follow-up along an age continuum, e.g., from ages 12 through 18 and older. Such an analysis could indicate whether the problems associated with early use increase, decrease, or remain the same with changes in age along the continuum.
- **Identify the time line between initial marijuana use and regular use.** Given that Late Initiators had less time to develop into regular marijuana users prior to Job Corps admission, it is possible that in the absence of Job Corps enrollment, they would eventually have become regular marijuana users to the same extent as the Early Initiators. To examine this possibility, further

Implications for policy:

- **Recognize the critical need for adolescent treatment and prevention services.**
- **Ensure that critical information about adolescent substance abuse reaches policymakers.**

Implications for practice:

- **Expand mental health services for adolescents.**
- **Provide more comprehensive services to substance users in early adolescence.**



Early Initiation of Marijuana Use in Job Corps and NHSDA (cont.)

research is needed to determine the time line between initial and regular use for both Early Initiators and Late Initiators.

- **Expand the use of NHSDA survey data in substance abuse treatment evaluations.** This survey provides a convenient sample for use in assessing social trends, and it can serve as a useful benchmark in treatment evaluations. In the treatment of adolescents, for example, changes in behavior may be partially attributed to maturation as well as to the treatment intervention itself. As NHSDA has recently been expanded from 18,000 to 70,000 respondents, it may soon be the source of more extensive normative data that can be used in comparisons with treatment samples.

Implications for Policy

As demonstrated by existing literature and by the results of this analysis of adolescent substance use, age of first marijuana use is associated with later substance abuse and criminal behaviors. Specific implications for policy suggest the following:

- **Recognize the critical need for adolescent treatment and prevention services.** National policy decision makers may need to consider giving as much attention (and funding) to adolescent services as to adult services.
- **Ensure that the critical information about adolescent substance abuse reaches those in positions of policy development.**

Policymakers must be kept informed on an ongoing basis of linkages found between adolescent substance use and later substance abuse and criminal behaviors.

Further analysis is needed to assess the cost effectiveness of services for high-risk youth.

Implications for Practice

This analysis augments the literature on adolescent substance abuse suggesting that individuals who become involved with alcohol and drugs in adolescence may have underlying social and mental health problems that render them more vulnerable to later substance abuse and more resistant to treatment. Specific implications for practice include the following:

- **Expand mental health services for adolescents.** Youth who use drugs and alcohol frequently have other behavioral problems, including early onset of criminal behavior and difficulties in functioning at home and at school. Such behaviors can often be precursors to adult mental health problems. Adolescents in substance use treatment or prevention programs stand to benefit greatly from mental health evaluations and services.
- **Provide more comprehensive services to the young substance users in Job Corps.** Previous research has shown that young drug and alcohol users who receive comprehensive services (e.g., job training, mental health counseling) as well as substance abuse treatment services tend to reduce their substance use to a greater degree than those receiving substance abuse treatment services alone.

As this analysis points out, early initiators of marijuana use who are especially high at risk for further substance use and criminal behavior, would clearly benefit from an array of services including both individual and group counseling.

Early Initiation of Marijuana Use in Job Corps and NHSDA (cont.)

Future Steps

This analysis underscores the need for concerted action by researchers, policymakers, and substance abuse treatment practitioners to address with increased energy the abuse of alcohol and drugs in early adolescence.

Many adolescent substance users, although not all of them, are raised in economically disadvantaged environments that offer little escape from the potential hazards of alcohol and drug abuse. Given that economic status is one of many risk factors for substance abuse, additional research is needed to understand the phenomenon of adolescent substance use, its sources, and its potential consequences.

Also needed is an assertive effort at all levels of government to fund and implement substance abuse services targeted toward youth who are at greatest risk for becoming substance abusers. It follows that further analysis is needed to assess the costs and cost-effectiveness of these services.

Reference

Greenfield, L., French, K., & Devine, P. (2002). *Early initiation of marijuana use in Job Corps and NHSDA*. Fairfax, VA: Caliber Associates.

For more information, please contact the National Evaluation Data Services analysis team at (703) 385-3200, or visit the NEDS Web site.

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Job Corps Drug Treatment Enrichment Project (DTEP)

Job Corps is a program of the U.S. Department of Labor intended to assist young individuals who need and can benefit from an unusually intensive program operated in a residential group setting to become more responsible, employable, and productive citizens. Job Corps is designed to serve economically disadvantaged youth aged 16 to 24 years through a comprehensive, competency-based service model, which includes assessment, basic education, and vocational skills training and work experience. The Drug Treatment Enrichment Project (DTEP) was a CSAT-DOL Office of Job Corps jointly spon-

sored demonstration introducing enhanced substance abuse intervention services within a sample of four Job Corps Centers. The evaluation of DTEP included Job Corps student and program data to compare DTEP with the standard Job Corps program through a collaborative study by Caliber Associates, Battelle Human Affairs Research Center, and Research Triangle Institutes. Data were collected for 6,510 students enrolling between February 1993 and July 1994. Follow-up interviews were conducted approximately one year after Job Corps termination for 1,156 students.

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