Evaluation of the National Youth Anti-Drug Media Campaign: Historical Trends in Drug Use and Design of the Phase III Evaluation

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1. INTRODUCTION

The number one goal of *The National Drug Control Strategy* is to "Educate and enable America's youth to reject illegal drugs as well as alcohol and tobacco." Objectives in support of that goal include "Pursue a vigorous advertising and public communications program dealing with the dangers of drug, alcohol, and tobacco use by youth." The President's drug control budget for FY 1998 included proposed funding for a Media Campaign, which received bipartisan support in Congress. Under the Treasury-Postal Appropriations Act, 1998, the House and Senate approved funding (P.L. 105-61) for "a national media campaign to reduce and prevent drug use among young Americans."

Planning for the Media Campaign began in early 1997. The Office of National Drug Control Policy (ONDCP) initiated a collaboration with the Partnership for a Drug-Free America (PDFA), which provided the creative advertising for the Media Campaign through their existing pro bono relationship with leading American advertising companies.

The Media Campaign has three goals:

■ Educate and enable America's youth to reject illegal drugs;

■ Prevent youth from initiating use of drugs, especially marijuana and inhalants; and

■ Convince occasional users of these and other drugs to stop using drugs.

ONDCP initiated the Media Campaign in three phases with an evaluation component for each phase:

■ Phase I was a 26-week pilot test that was conducted from January through June 1998 in 12 metropolitan areas across the country. To expedite implementation, television, radio, newspaper, and outdoor advertisements that had already been produced by the PDFA were used and were placed in paid slots. One of the requirements in the Campaign appropriations language is that each paid advertising slot must be accompanied by a donation of equal value for public service messages from the media, known as the pro bono match.

■ Phase II, which was conducted from July 1998 until July 1999, released the Media Campaign to a national audience. Phase II included 82 advertisements that were presented through television, radio, newspapers, magazines, school book covers, movie theaters, and the Internet. Television included national network and cable stations, as well as local stations and in-school Channel One. Paid advertising was accompanied by the pro bono match. New and existing ads were part of the Campaign.

■ Phase III, initiated in September 1999, marks the full implementation of the Media Campaign. Phase III will disseminate new advertising following the *Communications Strategy* developed by ONDCP, as well effective existing advertising. In addition to the advertising, Phase III includes a full range of media, and partnerships with the media, entertainment and sports industries, as well as civic, professional, and community groups. Paid advertising will also be accompanied by the pro bono match.

Management and direction of the Campaign is coordinated by ONDCP Campaign staff. The staff works with a Behavioral Change Expert Panel (BCEP) of outside scientists who help to inform the content of the advertisements to reflect the latest research on behavior modification, prevention, and target audiences; the PDFA, which coordinates the creation of new advertisements through its pro bono relationship with leading American advertising companies; a leading advertising firm, under contract to ONDCP, to purchase time slots to place the advertising; and a public relations firm to coordinate the non-advertising components of the Campaign.

For Phase III, advertising space is purchased on television, radio, newspapers, magazines, billboards, transit ads, bus shelters, movie theaters, video rentals, Internet sites, Channel 1 broadcast in schools, and other venues as appropriate. The television buys include spot (local), network, and cable television. The pro bono match involves one-to-one matching time for public service advertisements or in-kind programming. The pro bono spots may include anti-alcohol, anti-tobacco themes, and mentoring, but such themes will not be part of the paid advertising.

The Campaign target audiences include youth aged 9 to 11, youth aged 12 to 13 (tweens), youth aged 14 to 18, parents of youth in these age ranges, and

other influential adults. The goals for the paid advertising include reaching 90 percent of teens four times per week, 74 percent of parents three and one-half times per week, and 66 percent of children three times per week. Phase III also includes components other than advertising. These other components, which are being coordinated by a public relations firm, include encouraging entertainment programs with anti-drug themes, coverage of the anti-drug campaign in the news media, community activities, corporate co-sponsorship, and special interactive media programming.

The authorizing legislation provides "that the Director [of ONDCP] shall...report to Congress within 2 years on the effectiveness of the national media campaign based upon the measurable outcomes provided to Congress previously." ONDCP managed the evaluations of Phase I and Phase II of the Media Campaign but asked the National Institute on Drug Abuse (NIDA) to conduct an independent science-based evaluation of the Phase III Media Campaign. NIDA, in concert with an expert panel, devised an evaluation design. The expert panel included experts in sample survey design, evaluation of public programs, substance abuse prevention research, and communications research. NIDA then organized a full and open competition among evaluation contractors for assistance in implementing the evaluation design. In September 1998, NIDA awarded a contract for the evaluation to Westat and its subcontractors—the Annenberg School for Communication at the University of Pennsylvania and the National Development Research Institute—to elaborate the design and carry out the research.

The Phase I Evaluation involved an experiment where 12 media market areas received paid anti-drug advertising and 12 did not. School-based surveys of youth were conducted near the beginning and end of the 26-week Media Campaign period. There were also telephone surveys of parents and focus groups and interviews with relevant community members (e.g., prevention coordinators and media representatives). The Phase II Evaluation involved national baseline and followup surveys of youth through their schools and of parents through random telephone designs. It also involved focus groups and site visits in 12 metropolitan areas. Reports on the Phase I and Phase II Evaluations are available from ONDCP's clearinghouse and web site (www.whitehousedrugpolicy.gov).

The Phase III Evaluation will use very different methodology from that used for Phases I and II. Based on guidance from a panel of experts and lessons learned from the Baseline Phase I evaluation, which found, among other things, difficulty in accessing schools to survey youth and lower response

rates for parents through telephone surveying, NIDA selected integrated in-person household-based surveys of youth and their parents instead of continuing with separate school-based surveys of youth and telephone surveys of parents used in the earlier phases. The new methodology focuses on using computerized interviews to get better measurements of exposure to anti-drug advertising and on obtaining background data from the parents of the sample youth rather than collecting information from an unrelated set of parents. To achieve these objectives, new household-based surveys were designed and are now in the field. These new surveys will end in June 2003.

This first Special Report from the Evaluation of the National Youth Anti-Drug Media Campaign describes the historical trends of the use of the primary drugs targeted in the Campaign, marijuana and inhalants and drug attitudes, from major prevalence studies from 1976 to 1998. The purpose is to describe the patterns of use and attitudes before the national launch of the Media Campaign so that progress can be tracked over the next 4 years toward achieving the Campaign goals of reducing drug use among youth. The other purpose is to introduce the design and implementation plans of the Phase III Evaluation, which will measure campaign impact from November 1999 through June 2003.

2.   TREND DATA FROM EXISTING SURVEYS

Three national data systems are watched to judge the Nation's success in combating drug use by youth. These systems are the National Household Survey on Drug Abuse (NHSDA), run by the Substance Abuse and Mental Health Services Administration (SAMHSA), the Monitoring the Future (MTF) Study, run by the Institute for Social Research (ISR) with funding from NIDA, and the privately funded Partnership Attitude Tracking Study (PATS), run by PDFA. These surveys will be used to estimate long-term changes in substance abuse patterns due to all causes, including Phase III of the Media Campaign. While a decrease in substance abuse rates would not be enough by itself to conclude that the Media Campaign was effective, it would certainly be difficult to claim a successful Media Campaign if substance abuse rates were to increase. Thus, it is useful to review the patterns of substance abuse leading up to the introduction of Phase III of the Media Campaign.

Figure 1 presents the pattern of past-month marijuana use among older secondary school students since the mid-1970s as measured by the three data systems. All three data systems provide comparable information with regard

to general trends for the time periods that they cover. Marijuana use declined between 1978 and 1992. The average annual decline during that period was 1.8 percentage points per year according to both the MTF and NHSDA surveys.

This was followed by an increase from 1992 through 1997 of about 2.3 percentage points per year according to the MTF Study. Despite this agreement on the broad trends, the three surveys provide discrepant point estimates in many years. From 1997 to 1998, PATS and MTF show small declines, but NHSDA shows no significant changes.

Figure 1
Percentage of youth reporting past-month
marijuana use: NHSDA, MTF, & PATS, 1976-98
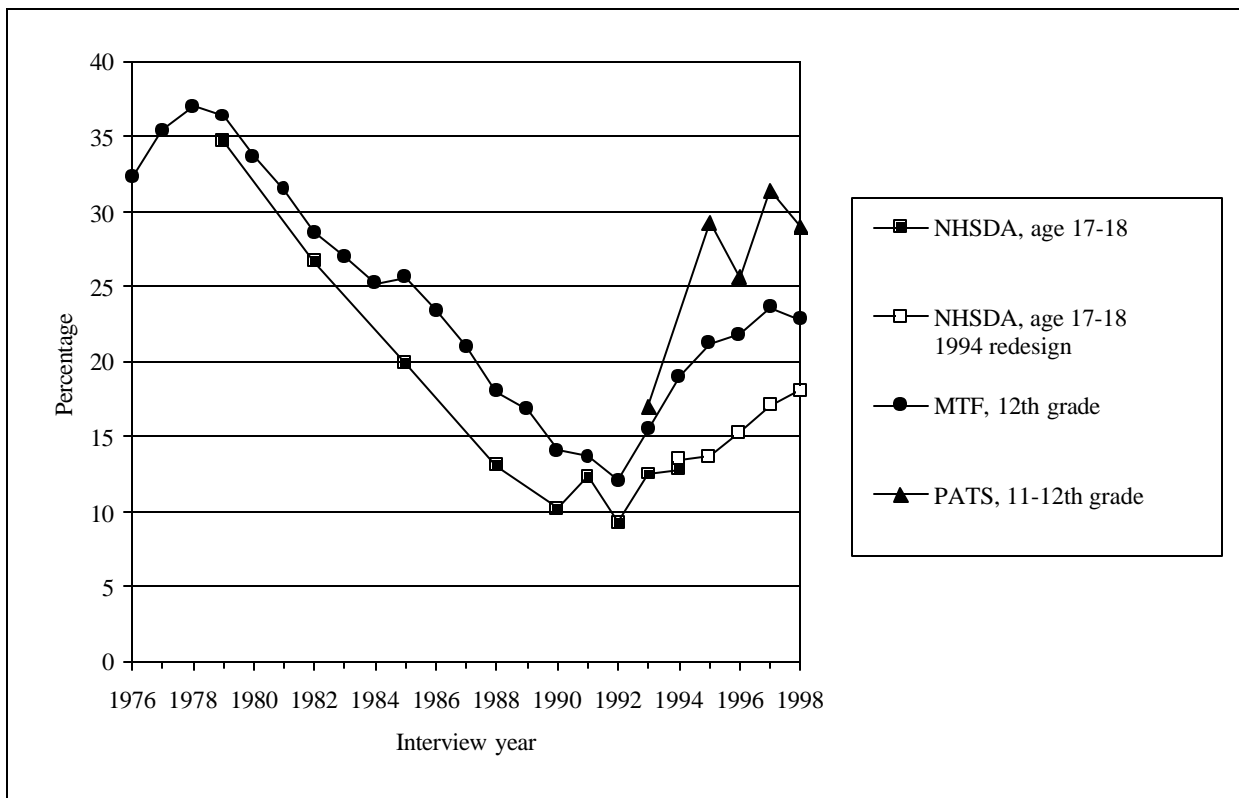
NOTE: Change in boxes for NHSDA line in 1994 shows years with redesigned questionnaire and data processing procedures.

The reasons for the differences between the surveys are not well understood. It is suspected by many that youth provide more honest answers in a school-based setting than in a household setting, but there may be other factors. In 1999, the NHSDA switched to computerized interviews in the home that offer more privacy to sample respondents. It is hoped that the differences among the surveys will shrink as a result of this change. However, for most analyses, these differences among the surveys are not troubling. The results from each survey are usually only compared to prior results from the same survey.

These results have important implications for the design of the new data collection system that has been created to evaluate the Media Campaign. They are discussed below. However, before that issue is addressed, one must consider what role these continuing data systems can play in the overall evaluation of the Media Campaign.

The great advantage of the NHSDA and MTF is their longevity. They have asked the same questions of comparable populations with (mostly) consistent methodologies since the mid-1970s. For drug use measures and for some broad attitude measures, these data systems will enable us to determine whether drug abuse rates declined and anti-drug attitudes strengthened after the launch of the Media Campaign. This will not be possible to assess with the evaluation surveys since they only started data collection in November of 1999. Given the offsetting advantages and disadvantages that are discussed, there is no clear methodological ground for choosing any one of the existing data systems as the exclusive measurement tool for pre-Media Campaign to Media Campaign change. A consistent pattern of changes among them will be the essential basis for claiming that the youth drug abuse rates and attitudes are moving in the right direction. Thus, these ongoing data collection systems will address crucial questions even though the questions they can answer do not match the entire task of the evaluation.

We note four clear limitations on what we can expect from the Evaluation based on results from the existing data systems.

1. **Changes may be small and difficult to detect.** During the period 1978 to 1992, the rate of change in behavior and in attitudes was about 1.8 percentage points per year. While only the MTF sample sizes are large enough to detect such subtle declines among youth within narrow age ranges from one year to the next, all the surveys should be able to detect a persistent multiyear change averaging 1.8 percentage points per year or comparable changes in broader age ranges. Also, the expansion of the

NHSDA in 1999 to 70,000 interviews per year (up from 25,500 in 1998) should greatly improve the NHSDA's ability to measure small changes from 1999 forward.

2. **None of the existing data systems could be used to measure the effectiveness of the Media Campaign.** It will not be possible to suggest what the future trend in drug use would have been in the absence of the Media Campaign on the basis of the historical data. Referring again to Figure 1, one can observe that after peaking in the late 1970s, marijuana use appeared to be in general decline until the early 1990s when the trend in usage rates reversed course. The time series itself provides no explanation as to why this trend was so abruptly reversed in the early 1990s. No matter how clear a trend might be, it can be a very poor predictor of the future.

3. **None of the existing data systems can serve as a baseline for measures taken with the new survey.** The sharp discrepancies in the point estimates for marijuana use (and other behaviors and attitudes) among the three surveys establishes the sensitivity of these measures to methodological variations. Choice of any of the three surveys as *the* baseline for the new survey would be misleading.

4. **Past MTF measurements of exposure to anti-drug media messages (recall of seeing such advertising) have not correlated as strongly with outcomes at the individual level as might have been hoped.** The MTF was not designed with a primary goal of obtaining sensitive measures of exposure to anti-drug advertising. The failure to find an individual association between exposure to the anti-drug ads and attitudes or behavior in the MTF can be explained in several ways: There was no influence; there was an influence, but it did not depend on individual exposure to the ads; or the measure of exposure in MTF was not sensitive enough to pick up the true variation in exposure among individuals. The two explanations that suggest methodological weaknesses have implications for the Evaluation. If effects of exposure occur indirectly through social contacts regardless of whether youth were personally exposed, then the Evaluation needs to be able to examine effects that occur at a level of aggregation higher than the individual. Also, there is a need in the new Evaluation to measure anti-drug message exposure with great care.

3. ROLE OF PHASE III EVALUATION SURVEY

The task of the Evaluation is to decide whether observed changes in drug use or drug attitudes can be attributed to the Media Campaign specifically. The Media Campaign is only one piece in the National Drug Control Strategy. Any change in drug abuse rates by youth may be caused by other Federal Government activities, such as interdiction at our borders and crop eradication in foreign countries, local government activities, such as police enforcement or judicial practices, school-based drug education, price changes related to these activities or others, or by unknown forces. Some researchers have argued that there are epidemics in substance abuse that follow their own natural patterns of ebb and flow. Simply tracking usage rates is not enough to identify the forces behind change. In order to be able to make reasonable claims that the Media Campaign was responsible for change, the Evaluation is designed to go well beyond analysis of trends from existing data systems.

The possibility of multiple causes for any change in drug abuse rates led to the development of a new national data system that will emphasize measurement of drug attitudes, exposure to the Media Campaign, and family risk factors, in addition to drug abuse. This new system has been named the National Survey of Parents and Youth (NSPY). It is not meant as a replacement of any of the existing systems. The three existing systems will provide the primary measurements of *change* in drug abuse rates. While NSPY will also track change from 2000 through 2003, its principal purpose is to monitor the success of the Media Campaign in first reaching its target audiences and then convincing viewers to adopt desired attitudes and intentions.

Analysis of trends needs to be combined with analysis of *exposure* of youth and parents to the Media Campaign and the *association* between exposure and outcomes. If evidence of favorable trends in the existing time series can be combined with evidence that large numbers of youth and parents recall seeing the advertisements (and were thus exposed to the Media Campaign) and that the youth and parents with higher levels of exposure had more favorable beliefs, attitudes, intentions, and behaviors than those with lower levels of exposure, then it will be possible to build a convincing case that the Media Campaign has had an effect.

To strengthen any evidence of an effect, NIDA has designed the NSPY such that it can be used for both cross-sectional and longitudinal analysis. The first phase of the survey will be to recruit large samples of youth and parents. This will last through June 2001. The second phase will be to follow the youth and

parents and reinterview them at 12-month intervals to measure changes. This phase will start in January 2001 and continue through June 2003. These repeated interviews will allow us to measure some aspects of adolescent development and will thereby allow a much better sorting through of causal processes than is possible with a purely cross-sectional survey.

The evaluation survey were designed to minimize the chance of falsely concluding there is no benefit in the event that the Media Campaign does indeed produce some benefits. There are 10 specific ways in which the Evaluation design reduces the chance of a false conclusion of no effect compared to an analysis restricted to existing data systems.

1. **Better measure of exposure to anti-drug media messages.** The new survey improves measurement of exposure in three ways. First, the survey asks about many channels of exposure in addition to radio and television, including billboards, in-school media, movie advertising, newspapers and magazines, and the Internet. Second, the survey asks respondents to recall exposure to the specific ads that were on the air during the 2-month period just before the interview, in addition to asking about general exposure. Finally, the new survey will use new technology to actually play the TV and radio ads on a laptop computer for each respondent, a procedure that appears to be more sensitive than providing brief verbal summaries of specific ads. Included in these plans will be interviews in Spanish and playing of Spanish language TV and radio ads.

2. **Richer measures of beliefs and attitudes sensitive to the specific messages of the Media Campaign.** The new survey includes questions that are as up to date as possible for detecting acceptance of the specific arguments being made in Media Campaign messages.

3. **Better quality of measures of marijuana and inhalant use.** To improve the quality of drug abuse data, respondents will enter their reports of marijuana and inhalant usage into the laptop computer without their answers being observed—either by interviewers or by parents. It is hoped that the extra confidentiality afforded by the headphones and touch-pad screens will encourage more honest answers to sensitive questions. Similar changes were made in the 1999 NHSDA.

4. **Inclusion of younger children.** The new survey includes youth age 9 to 11, as does PATS, whereas the NHSDA starts interviews at age 12 and the MTF starts at grade 8, when children are usually 13 or 14.

5. **Opportunity to understand the paths of effects.** The conceptual model of the Media Campaign is that anti-drug messages can change knowledge and beliefs, perceptions of social norms, and skills in resisting drugs. In turn, these beliefs would lead to intentions to perform certain behaviors, and intentions would lead to actions. This model led to the development of a questionnaire with a strong focus on questions about beliefs, perceived social norms, self-efficacy, intentions, exposure, and family history. With this questionnaire, it will be possible to directly measure the association of exposure with knowledge and beliefs, of beliefs with intentions, of intentions with actions, all controlling for the effects of family history.

6. **Recognition that the Media Campaign may work through different paths.** The Media Campaign may work because individuals are exposed to messages and are convinced about the balance of costs or benefits of drug use and quickly change their behavior. But it may work in other ways, as well. It may work on a delayed basis—so that early exposure (among 9-11 year olds) affects later behavior. It may work because larger social units are exposed to the messages. It may work because specific messages about marijuana or inhalants are generalized to other drugs. The Evaluation is designed to be able to detect changes that work through any of these paths: immediate or delayed, individual or social, message specific or general.

7. **Evidence about the social context of effects.** One particularly striking element of the new survey design is the ability to associate each youth with parallel questionnaire responses from one parent. This will allow us to incorporate a much improved set of control variables so that we can separate the effects of exposure to anti-drug media messages from other influences on a youth's life. In addition, we can understand, in way that has been heretofore impossible, how a campaign that addresses messages to both parents and youth affects their interaction around the issue of drug use.

8. **Opportunity to apply more powerful analytic techniques to sort out causal influences.** The first NSPY analysis will focus on youth with similar personal and family backgrounds but different levels of Media Campaign exposure. They will be compared with each other in terms of the strength of their anti-drug attitudes, intentions, and behavior. The quality of the exposure measures and the extensive nature of the background measurements available will allow us to do this with a validity not otherwise possible.

9. **Opportunity to confirm theories of adolescent development.** Cross-sectional associations are useful but leave open questions. To address these methodological challenges, the repeated interviews will be used to study the development of drug-related attitudes, intentions, and behaviors and how the timing of this development interacts with exposure to the Media Campaign. It will not be possible to produce these results until 2004, but when they are available, they will constitute the strongest evidence for causal claims.

10. **Measurement of local variation in pre-existing conditions and of participation in school and extra-curricular drug-education programs.** The interviews will be matched with local Decennial Census data about the neighborhood to see whether the Campaign is differentially effective in different types of neighborhoods. Also, the interviews will contain questions about participation in local anti-drug efforts that will offer a competing explanation of interpersonal variation in drug-related attitudes and behavior.

FUTURE REPORTS

The first report from the new national survey will be issued in August 2000. It will cover NSPY interviews from November 1999 through May 2000. This interview period coincides generally with the roll-out period for the new advertisements in Phase III of the Media Campaign. The first report will present findings on anti-drug attitudes, intentions, drug use, and exposure to the Media Campaign. This report will be updated every 6 months, in March and September of each year, through the Evaluation period, highlighting change since the baseline report in August 2000. Reports in this series are called the semi-annual reports. The second semi-annual reports will also present information on the association between direct exposure to advertising and various attitudes and intentions for the youth. These two reports will also include information on the association between direct exposure to advertising and various attitudes and intentions on the part of parents. Thereafter, the semi-annual reports will gradually grow in richness. The third will have information about interactions of the Campaign with demographic characteristics and about the differential effectiveness of components of the Campaign. The fourth will have information about the lagged association of past exposure with current attitudes, intentions, and behaviors. It will also have information about annual changes from 2000 to 2001. The sixth report will stress changes from 2000 and 2001 to 2002.

This report is the first of two special reports to be produced as part of the Evaluation. The topic for the remaining special report will be the study of indirect effects mediated by parents and institutions.

1. INTRODUCTION

In the National Drug Control Strategy (ONDCP, 1997, 1998a, and 1999a), produced annually by the Office of National Drug Control Policy (ONDCP), the number one goal is to "Educate and enable America's youth to reject illegal drugs as well as alcohol and tobacco." One of the objectives in support of that goal is to "Pursue a vigorous advertising and public communications program dealing with the dangers of drug, alcohol, and tobacco use by youth." To meet this objective, ONDCP designed the National Youth Anti-Drug Media Campaign (Media Campaign) (ONDCP, 1998b). The Media Campaign involves the production and broadcast of media messages directed at youth and their parents, as well as complementary work in encouraging diffusion of the anti-drug message in mass media programming and supporting national and local organizations' involvement in the anti-drug effort. The Media Campaign is designed to dissuade youth from experimenting with illicit drugs and to encourage parents and other influential adults to help children stay drug free.

The Media Campaign was authorized by Congress in 1997 with an initial appropriation of $195 million under the Treasury-Postal Appropriations Act, 1998 (P.L. 105-61). Planning for the Media Campaign began in early 1997. ONDCP initiated a collaboration with the Partnership for a Drug-Free America (PDFA), who would provide the creative advertising for the Media Campaign through their existing pro bono relationship with leading American advertising companies. The Media Campaign has three goals:

■   Educate and enable America's youth to reject illegal drugs;

■   Prevent youth from initiating use of drugs, especially marijuana and inhalants; and

■   Convince occasional users of these and other drugs to stop using drugs.

The communications strategy for the Media Campaign has been evolving since 1997. A three-phase implementation was planned. Phase I was a 26-week pilot test that ran from January through June 1998 in 12 metropolitan areas across the country, with 12 other sites selected for comparison. Because the schedule did not allow for the development of new advertising, advertisements that had already been produced by PDFA were used and placed in paid spots. Stations were required to provide pro bono, one-to-one matching time for other advertisements with consistent message themes or in-kind programming.

Phase II expanded the Phase I intervention to the national level and used additional media as new advertising became available. It began in July 1998 and ran into July 1999. Phase II included 82 different advertisements that were presented through a range of media, including television, radio, newspapers, magazines, school book covers, movie theaters, and the Internet. As in Phase I, the Media Campaign purchased time slots and stations were again required to provide a pro bono match.

Phase III was launched in September of 1999 with new creative content for the advertising. Phase III includes paid advertising, a full range of media, and partnerships with the media, entertainment and sports industries, as well as civic, professional and community groups.

Management and direction of the Campaign is coordinated by ONDCP Campaign staff. They work with a Behavioral Change Expert Panel (BCEP) of outside scientists who help to inform the content of the advertisements to reflect the latest research on behavior modification, prevention and target audiences; the PDFA, which coordinates the creation of new advertisements through its pro bono relationship with leading American advertising companies; a leading advertising firm, under contract to ONDCP, to purchase time slots to place the advertising; and a public relations firm to coordinate the non-advertising components of the Campaign.

Time and/or space is purchased on a full range of media and the pro bono match is negotiated. Slots are purchased on television, radio, newspapers, magazines, billboards, transit ads, bus shelters, movie theaters, video rentals, internet sites, and Channel 1 broadcast in schools. The television buys include spot, network, and cable television. The goals for the paid advertising include reaching 90 percent of teens four times per week, 74 percent of parents three and one-half times per week, and 66 percent of children three times per week.

Phase III also includes nonadvertising components, which are being coordinated by a public relations firm. These components include encouraging entertainment programs with anti-drug themes, community activities, corporate co-sponsorship, and special interactive media programming.

The authorizing legislation provides "that the Director [of ONDCP] shall...report to Congress within 2 years on the effectiveness of the national media campaign based upon the measurable outcomes provided to Congress previously." ONDCP managed its own evaluations of Phase I and Phase II of the Campaign (ONDCP, 1999d and 1999c) but in January 1998 asked the

National Institute on Drug Abuse (NIDA), National Institutes of Health, to conduct an independent assessment of the Phase III Campaign. To assist in the development of a science-based evaluation of Phase III, NIDA assembled an expert panel, including experts in sample survey design, evaluation of public programs, substance abuse prevention research, and communications research.

The panel met in February 1998. At the meeting, plans for evaluating Phases I and II and lessons learned from the work underway on evaluating those phases were reviewed and recommendations for evaluating Phase III were developed. The panel recommended that the national surveys, Monitoring the Future (MTF) and the National Household Survey on Drug Abuse (NHSDA), be fully utilized for the Phase III evaluation, but that a separate new survey of exposure of the Media Campaign was also needed. Consideration was given to (1) separate in-person household surveys of youth and telephone surveys of parents, (2) combined in-person household surveys of youth and their parents, and (3) separate school surveys of youth and telephone surveys of parents. Consideration was also given to both tracking change cross-sectionally for groups of youth and tracking change longitudinally for particular sample youth. Finally, stress was placed on the ability to link community factors into the evaluation. NIDA then organized a full and open competition among evaluation contractors for assistance in implementing the evaluation design. In September 1998, NIDA awarded a contract for the evaluation to Westat and its subcontractors, the Annenberg School for Communication at the University of Pennsylvania and the National Development Research Institute. The final design for the new exposure surveys is described briefly in Section 1.3 and at length in Chapter 3.

In 1998, ONDCP designed a Performance Measures of Effectiveness (PME) System (ONDCP, 1998c; ONDCP, 1999b) for assessing the efficacy of the National Strategy. ONDCP issues an annual report to Congress each year on progress toward meeting the goals and targets of the PME System. The entire Strategy is very broad, encompassing much more than the Media Campaign, but there are specific PME objectives for monitoring the impact of the Campaign. These targets include the following:

Goal 1: Goal Impact Target a. Use of illegal drugs, alcohol, and tobacco by youth – By 2002, reduce the prevalence of past month use of illegal drugs and alcohol among youth by 20 percent as measured against the 1996 base year. By 2007, reduce this prevalence by 50 percent as compared to the base year. Reduce tobacco use by youth by 25 percent by 2002 and by 55 percent by 2007.

Goal 1: Goal Impact Target b. Initial age of drug use by youth – By 2002, increase the average age for first-time drug usage by 12 months from the average age of first-time use in 1996. By 2007, increase the average age of first-time drug usage by 36 months from the 1996 base year.

Goal 1: Objective 2, Target 1. Youth risk perception – By 2002, increase the number of youth who perceive that regular use of illegal drugs, alcohol, and tobacco is harmful to 80 percent and maintain this rate through 2007.

Goal 1: Objective 2, Target 2. Youth disapproval – By 2002, increase the number of youth who disapprove of illegal drug, alcohol, and tobacco use to 95 percent and maintain this rate through 2007.

The Phase III Evaluation is charged with measuring the impact of the paid advertising component of the Campaign, which is designed to directly target these goals in terms of its ability to reduce drug use, not alcohol or tobacco use. Also, since the Campaign has focused on marijuana and inhalants as the primary drug targets for initiation of use among youth, NIDA will specifically measure use of these drugs among youth. The alcohol and tobacco use targets are addressed by the pro bono match component of the Campaign, the success of which is not being assessed by the Phase III Evaluation. NIDA will report evaluation results to ONDCP as one measure of the Campaign contribution to the National Strategy goals.

This Special Report from the Evaluation of the National Youth Anti-Drug Media Campaign describes the historical trends of marijuana and inhalant use and attitudes from major prevalence studies from 1976 to 1998, which is the period preceding the national launch of the Campaign, and introduces the design and implementation plans of the Phase III evaluation, which will measure campaign impact from November 1999 into 2003. In future, NIDA will submit two regular semi-annual reports to ONDCP each year on the Evaluation. The first report with results of the Evaluation of Phase III of the Media Campaign will be available in August 2000. In addition, there will be one additional special analytic report in early 2004. This report lays out the methodology that will be used in the regular semi-annual reports and some of the options for the special analytic reports. This introductory chapter provides an overview of the guiding analytic strategy, a review of how existing data sources on drug abuse in youth fit into this Evaluation, and an explanation of how a new survey will provide additional information needed for the

Evaluation. This chapter closes with a description of the organization of the balance of the report.

1.1   OVERALL ANALYTIC STRATEGY

The overall strategy has two main components. The first is to use existing surveys to monitor change in some attitudes and behaviors. This is discussed further in Section 1.2 and is the focus of Chapter 2. The second component is to monitor the exposure achieved by the Media Campaign and how exposure relates to beliefs, attitudes, intentions, and behavior. A new survey is required for this monitoring. This is discussed further in Section 1.3 and is the focus of Chapter 3. The conventional approaches to supporting causal inferences (comparison with baselines and use of control groups) are not feasible. Claims of Media Campaign effects will instead rely on demonstrating the following phenomena: large numbers of youth exposed to Campaign messages, a decline in marijuana and inhalant use, a reduction in pro-drug beliefs and intentions, an association between exposure and the desired anti-drug attitudes and intentions, and an association between attitudes and intentions and the desired behaviors.

Several surveys will be jointly analyzed to look for evidence of these phenomena. The new survey will be used to measure exposure to Campaign messages on a semi-annual basis. Existing surveys will be used to measure change in marijuana and inhalant usage, youth assessments of the risks of marijuana and inhalant usage, and youth disapproval of marijuana and inhalant use since 1997 (the last year prior to the Campaign). Changes in pro-drug beliefs and intentions will be reported on by the new semi-annual reports from the new survey with reference to change since late 1999 and early 2000. Associations of exposure with attitudes and intentions, and associations between attitudes and intentions and the desired behaviors, will be measured both contemporaneously and with lags using cross-sectional and longitudinal analysis techniques based on data from the new survey, respectively.

1.2   EXISTING SURVEYS

Chapter 2 of this report includes a series of charts and tables from existing data sources about use of marijuana and inhalants and attitudes toward them over the past 25 years. These tables and charts draw upon the National Household Survey on Drug Abuse (NHSDA), the Monitoring the Future

(MTF) Study, and the Partnership Attitude Tracking Study (PATS). These ongoing annual national surveys can be used to track many of the targets in the PME System and can be useful in assisting in NIDA's Evaluation of the Media Campaign. Certainly, the best measures of change in substance abuse over the life of the Media Campaign will be obtained by comparing NHSDA and MTF estimates from 2000-2003 with the corresponding NHSDA and MTF estimates from 1996 through mid-year 1998, just prior to the initiation of Phase II the Media Campaign in the summer of 1998.

However, the tables and charts emphasize some of the well-known differences among the surveys discussed in this report. Chapter 2 discusses how these surveys will be used to track long-term changes in marijuana and inhalant use and in attitudes about such usage.

1.3 PHASE III EVALUATION SURVEYS

NIDA directed the development of a new survey to evaluate the impact of the Campaign. It is a national longitudinal survey called the National Survey of Parents and Youth (NSPY). The recurring national survey will enroll each of three cohorts of youth 9-18 and their parents over approximately 6 months periods starting in November 1999. Youth and their parents will then be re-interviewed on an annual basis up to three times, as long as they are still within the target age range. Either a nationally representative fresh cohort or a re-interviewed cohort will be interviewed during each 6-month period through 2003. The new national survey will accelerate the Evaluation in two ways. First, the survey will be conducted every 6 months rather than once per year, allowing quicker measurements of change within the 2000-2003 study period. Second, it will focus on exposure to the Campaign as well as on precursors of substance abuse such as drug attitudes than on substance abuse itself under the theory that a Media Campaign will change awareness and attitudes before it changes behavior.

In deciding to design new surveys, NIDA considered replicating the design of the school-based surveys that were being conducted in 1998 for ONDCP to evaluate Phases I and II of the Media Campaign (ONDCP, 1999c and 1999d). Based on guidance from its expert panel and lessons learned from the Baseline Phase I school-based surveys in early 1998, NIDA selected integrated in-person household-based surveys of youth and their parents instead of continuing with separate school-based surveys of youth and telephone surveys

of parents. Some of the advantages that were identified for the integrated household approach were the following:

■   Higher overall youth response rates (considering refusal of many schools to participate and the difficulties of obtaining parental consent for school-based surveys);

■   Higher overall parent response rates (considering the high telephone screener nonresponse for parents in telephone surveys);

■   The ability to conduct longer interviews;

■   The ability to use computers with visual and audio displays for youth and their parents to better assure privacy and allow media ads to be shown;

■   The ability to have year-round data collection;

■   Coverage of high-school dropouts and absentees;

■   The ability to obtain background data about sample youth from their parents (instead of interviewing an unrelated set of parents);

■   The ability to correlate changes in parental attitudes and behavior with changes in youth attitudes and behavior; and

■   Improved ability to track the same youth in the longitudinal studies.

A number of these advantages combine to facilitate much better measurement of exposure than is possible in a school-based survey and to correlate it more meaningfully with youth attitudes. In making this choice, NIDA recognized that the first estimates from the new surveys would pertain to a period after the start of Phase II making it impossible to use the new surveys to measure change from a point in time prior to the Media Campaign. NIDA's judgment was that the advantages (particularly the stronger measures of exposure and the ability to correlate these more meaningfully to youth attitudes) were more important than the ability to track changes in exposure consistently from 1998 onward. The design of this survey and its planned uses are the subject of Chapter 3.

The primary purpose of the new survey will be to provide better information on the connection between the Media Campaign and youth beliefs, attitudes, perceptions of social norms, feelings of self efficacy to resist drugs, and

intentions to use drugs. As mentioned previously, the Media Campaign is just one part of a much larger Strategy coordinated by ONDCP. Simple changes in drug abuse over time measured in the NHSDA and the MTF could be due to any component or a combination of efforts of the Strategy or to forces totally outside the control or influence of the government. NIDA designed a study that will more clearly identify linkages between exposure to the Media Campaign and psychological outcomes in the targeted youth.

Longitudinal analysis of data from the new survey will help to demonstrate the linkages between exposure to the Media Campaign and psychological outcomes at a young age (9-14) and actual behavior (drug usage) at later ages (12-17). First, analyses will examine whether exposure to the Media Campaign is correlated with certain favorable psychological outcomes (such as disapproving of marijuana smoking) and behaviors, and establish that the observed correlations are not due to other pre-existing conditions. Then analyses will examine longitudinally whether exposure predicts youthful psychological outcomes and drug usage and also whether those early psychological variables that were associated with exposure predict reduced trial and usage rates in subsequent years. If each of these analyses provide confirming evidence, then there will be powerful support for a claim that the Media Campaign did play a positive role in the overall strategy against illicit drug usage.

For this strategy to work as planned, it is critical that three types of measurement be carefully conducted in NSPY. First, it is critical that exposure to the Media Campaign be measured well. Exposure of anti-drug media is not a central feature of the NHSDA or the MTF Study, although some questions on exposure do exist in the MTF questionnaire and in some years of the NHSDA questionnaire. This is one of the subjects highlighted in Chapter 2 of this report. Second, it is critical that the psychological outcomes in youth be measured well. The measures of these outcomes used in NSPY include some of those used in the NHSDA and the MTF Study, but also include a much more detailed set of questions on beliefs about consequences, about perceptions of social norms, about perceived self-efficacy to resist drugs, and about intentions to use drugs. Chapter 2 shows how some of these outcomes track over time and correlate with substance abuse. Third, it is critical that confounding variables be measured well.

Confounding variables are those that predispose a youth simultaneously to a certain level of exposure to the Media Campaign and to a certain set of psychological outcomes. For example, current low levels of parental

supervision of youth might predispose a youth to both more television watching and more tolerance of marijuana smoking. This is an area where there are almost no data. Interviews for the MTF Study are conducted in the school with no information whatsoever about parental beliefs and behavior. Interviews for the NHSDA are conducted on a random sample of persons 12 and older from a household. Most households do not have both an interviewed youth and an interviewed parent. PATS has a telephone survey of parents, but these parents are unrelated to the youth in the PATS school surveys. Thus, NSPY will be unique in collecting a rich set of parental data that can serve as predisposing factors for their youth. Perhaps even more important, we will have a brief history of each youth's attitudes and behaviors over a 2- or 3-year period. Past attitudes and behaviors can serve as confounders when attempting to explain current attitudes and behaviors. Also, with the repeated measurements, there will be less uncertainty about the direction of cause and effect. Another important confounder will be the youth's natural sensation-seeking inclination, which is being measured in this survey with a battery of four items.

Another possible type of analysis is to correlate media consumption with psychological outcomes. The NSPY questionnaire does have a battery of questions on general media consumption such as hours of television watched and exposure to the specific television programs where the ads were placed. We recognize that general media consumption is viewed by communication experts as a much weaker measure of exposure to advertisements than actual recall of the advertisements. Thus it might be difficult to detect any relationship between such consumption and attitudes of interest. Nonetheless, if a relationship were found, the direction of cause and effect would be less subject to debate since general media consumption is unlikely to be caused by drug-related attitudes.

To summarize the overall analytic strategy, we will be looking for evidence of exposure-outcome linkage with both contemporary and lagged measures, together with longitudinal evidence that early exposure is associated with psychological outcome variables that, in turn, are predictive of later usage rates, evidence of desirable trends in psychological outcomes and usage rates, and evidence of a high level of exposure to the messages.

1.4   REPORT ORGANIZATION

Chapter 2 pulls together information from prior and continuing surveys on substance abuse among youth in America. There is a particular emphasis on data that might be used in progress reports to the PME System. These include the following:

- Trends in marijuana usage within the 30 days prior to interview;

- Trends in inhalant usage within the 30 days prior to interview;

- Trends in lifetime trial of marijuana;

- Trends in lifetime trial of inhalants;

- Trends in anti-drug attitudes; and

- Trends in reported exposure to anti-drug advertisements.

In addition, there are explorations of how anti-drug attitudes have correlated with drug abuse; and how awareness of anti-drug advertisements has correlated in the past with anti-drug attitudes and with illegal drug usage.

Chapter 3 summarizes the rationale behind the questionnaires for the new survey. It includes discussions of theoretical pathways by which the Media Campaign could influence youth, how the surveys could be used to study each of those theoretical pathways, and plans for reports. It is noted that planned reports do not cover all potential pathways. Public use data sets will be created (with rigorous safeguards to ensure subject confidentiality and anonymity) so that other researchers can replicate and expand upon the NIDA research findings.

2. TREND DATA FROM EXISTING SURVEYS

This chapter reviews data from the National Household Survey on Drug Abuse (NHSDA), Monitoring the Future (MTF) Study, and the Partnership Attitude Tracking Survey (PATS) relevant to the Media Campaign and its evaluation. NHSDA is sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA), MTF is conducted by the Institute for Social Research (ISR) with funding from NIDA, and PATS is sponsored by the Partnership for a Drug-Free America (PDFA). The overarching questions concern how to use these existing surveys to track changes in (1) marijuana and inhalant use, (2) attitudes about marijuana and inhalant use, and (3) exposure to anti-drug advertising. The chapter opens with a discussion of the methodology used in each survey. Trends in each of the three substantive areas are then presented and discussed. Areas of agreement and disagreement among the surveys are noted along with their methodological implications. The limits in historical swings are also noted with implications for interpreting future changes. The lack of a basis for forward projection of any trends is noted. The chapter concludes with a discussion of how to interpret future changes in the trends.

2.1 METHODOLOGY

The methodology used in each of the three existing surveys is first reviewed. Since the NHSDA is a household survey, while MTF and PATS are school-based surveys, the methodologies are very different. These differences have important implications for measurement of pre- and post-Media Campaign changes.

2.1.1 The National Household Survey on Drug Abuse

NHSDA was established in 1971 to measure the prevalence and correlates of illegal drug use and monitor trends over time (SAMHSA, 1999a, 1999b). The survey was conducted in 1971 and 1972 and then every 2 or 3 years until 1990 when it became an annual survey. At the time of this report, public release data sets were available from the Inter-University Consortium for Political and Social Research (ICPSR) at the University of Michigan for surveys from 1979, 1982, 1985, 1988, and 1990 through 1997. Originally, the survey covered the household population in the 48 contiguous states. Starting in 1991, the survey was expanded to include all of the U.S. civilian, noninstitutionalized population aged 12 or older. For the first time, Alaska and Hawaii were included in the sample as were civilians living on military

bases and persons living in noninstitutional group quarters, such as college dormitories, rooming houses, and shelters. Analyses suggested that this change had little impact on estimates of drug use. Persons excluded from the survey include homeless people who do not use shelters, active military personnel, and residents of institutional group quarters, such as jails and hospitals.

The NHSDA uses a multistage area probability sample design and is conducted over the course of the year from January through December. Up through 1998, at the highest level, more than 100 metropolitan areas or counties nationwide were selected as primary sampling units (PSUs), some at random and some with certainty.[1] Subsequently, segments (typically blocks) within the PSU were selected, followed by a sample of dwelling units and eligible residents (if any). In 1997, nearly all (93%) households approached allowed survey staff to ask the screening questions used to select individual respondents at the final stage of the sampling procedure. Most (77%) individuals initially selected for inclusion agreed to be interviewed. Procedures are used to compensate for nonresponse through the sample weights. Oversampling is used to obtain accurate estimates of drug use within specific subpopulations, including Hispanics, blacks, and youth age 12 to 17. Sample weights are developed to account for variation in each respondent's probability of selection, reduce nonresponse bias, and improve consistency of demographic total estimates from other Federal data systems. Standard errors are routinely calculated for reports and used to suppress estimates with low precision.

NHSDA data collection is continuous in time. Interviews are conducted every month. Data are edited, imputed and weighted annually The first estimates for each calendar year appear in August of the following year.

NHSDA uses various procedures to help assure that persons report sensitive information. Eligible persons are informed that participation is voluntary and that responses will be kept anonymous. Trained interviewers survey respondents in person in their homes. Up through 1998, the procedure was to hand the respondent a piece of paper with the questions on illicit drug use, let them read the questions for the themselves and record their own answers on a separate sheet of paper. Respondents were also given the choice to have the interviewer read questions about illicit drug use aloud while showing cards indicating the response categories. When this option was used, respondents

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[1] The design for 1999 and beyond is radically different with direct selection of segments in every state.

still usually recorded their answers themselves on a separate sheet of paper. These procedures assured that the interviewers did not see the respondent's answers. Starting in 1999, the questions are administered with an audio computer-assisted self-interview (ACASI) instrument (Barker, Gfroerer, and Caspar, 1998). This is a laptop computer with headphones and software that plays the questions over the headphones and then allows respondents to enter responses on the keyboard. A field test indicated that this method can result in higher reported rates of substance abuse for youth compared to pencil and paper administration (Witt, Lessler, and Caspar, 1998).

In 1994, the NHSDA program underwent an extensive redesign including the following changes: increased consistency in question wording, reduced use of vague terms, reordered questions, increased use of skip patterns, changed response format from circle-the-answer to check-the-box, and revised procedures for logical editing of responses (SAMHSA, 1996). To identify the impact of the redesign, a *split sample* was implemented in which about one-fifth of the sample was administered the old questionnaire and edit procedures and four-fifths the new questionnaire and edit procedures. Tables and figures in the report present both the 1994 estimates using the previous survey (1994 bridge survey) and using the new survey. The redesign had a particularly large impact on the question pertaining to perceived risk of regular marijuana use. In 1994, regular use was operationalized as use "once or twice per week." The percentage disapproving of regular marijuana use with the new question was substantially lower than with the old question.

A major expansion of the NHSDA was implemented in 1999. The total annual sample size rose to from _25,500to about 70,000 interviewed persons. The purpose of the expansion is to be able to provide state estimates. A bridge sample was also implemented in 1999 to allow estimation of the effects of changing the questionnaire from pen and paper to ACASI.

2.1.2   Monitoring the Future

Each spring since 1975, the University of Michigan's Institute for Social Research has conducted a survey to estimate the prevalence of drug use among American secondary school students and to monitor trends over time (Bachman et al., 1996; Johnston et al., 1999). Originally, the survey only recruited high school seniors and had even been known as the "National High School Senior Survey." Starting in 1991, the survey started to recruit annual samples of 8th and 10th graders. At the time of this report, public release data

files were available for the 12th grade surveys 1976-1998 and the 8th and 10th grade surveys 1991-1998. The 1998 survey of 8th and 10th graders was available only on a "fasttrack" basis. Fasttrack is a provisional status in which ICPSR makes data available even before all the corrections are made to a final archival version. For the most part, the 1998 MTF statistics used in this special report were taken from published reports rather than from tabulations of the fasttrack 1998 Public Use File.

The MTF Study uses a multistage probability design to recruit a sample of 12th graders each year. Similar procedures are used to recruit a separate sample of 10th graders and another separate sample of 8th graders. The first stage involves selecting geographic areas. Next, one or more high schools in each geographic area are selected with probability proportionate to enrollment. Each eligible school is invited to participate in the study for a 2-year period (terms are staggered across schools). Each year, about 50 to 70 percent of these initially eligible schools agree to participate in the survey. For each school that declines to participate, a similar school is selected as a replacement. In each year, the sample has included approximately 125 to 145 public and private high schools selected to provide an accurate representative cross section of the 48 contiguous states. Up to 350 seniors from each school are invited to participate in the survey. In 1998, most eligible students chose to participate: 82 percent of 12th graders, 87 percent of 10th graders, and 88 percent of 8th graders. The single largest reason for nonparticipation was absence from school on the day the survey was administered. Less than 1 percent of students approached explicitly declined to participate. Sample weights are used to account for variation in each respondent's probability of inclusion. Of note, the MTF Study by design excludes the 15 to 20 percent of youth that drop out of school by the 12th grade.

Questionnaires are administered in classrooms during a normal class period whenever possible, although some schools require the use of larger group administrations. To help assure that students disclose sensitive information, students are reminded that their participation is voluntary and that their information will be kept anonymous. Students complete the questionnaires by themselves. Teachers are asked to remain present in the classroom to help guarantee an orderly environment but are discouraged from walking around the room, lest students feel that their answers might be observed.

The questionnaire administration dates vary by school but are usually in the springtime, near the end of the school year. These data are then edited, imputed and weighted prior to publishing in December of the same year. Note

that the MTF schedule is earlier by about 9 months for each calendar year but only reflects data from the spring. Changes taking place over the summer and fall are only reflected the following year.

2.1.3　　The Partnership Attitude Tracking Survey

PATS was established in 1986 by the Partnership for a Drug-Free America (PDFA) to monitor the impact of its own public service anti-drug media campaign. Originally, the study was conducted by intercept in shopping malls (PDFA, 1999). Starting in 1993, the PATS program adopted a school-based sampling procedure similar to the one used by the MTF Study. The PATS program surveys three different groups with three different questionnaires: students in 7th to 12th grade, students in 4th to 6th grade, and parents with children under age 19. PATS is different from MTF and NHSDA in interviewing children under age 12 and in asking a richer set of attitudinal questions related to substance abuse.

For its school-based surveys of youth, PATS recruits 150 schools (public and private), nationwide, to participate in the program. In order to facilitate accurate comparisons by race/ethnicity, 25 schools are selected from heavily black areas and 25 from heavily Hispanic areas. Each school is then assigned to either the 7th to 12th grade survey group or the 4th to 6th grade survey group. Three classes are randomly selected to be surveyed from each participating school. Surveys are group administered in May and June within the classrooms. Students fill out the questionnaires on their own. Interviewers and teachers are instructed to never look at any student's work in order to assure students of confidentiality. Sample weights are developed to correct for the multistage, hierarchical, stratified sampling procedure. Beginning with the 1995, a separate telephone survey was conducted with parents of children under 19 years of age, but no data from that sample are used in this report.

2.1.4　　Analysis Procedures for this Report

The analyses of the NHSDA 1979-1997 and MTF 1976-1997 data were accomplished using the public release data files available from the ICPSR. For a variety of reasons, the estimates in this report are not always identical to those in previously published reports. With respect to the MTF, the exact content of the survey forms has varied over the years. Some questions appear

on more forms in some years than in others. Where this happened, the tabulations in this report were based on all forms containing the question. Previously published reports were sometimes restricted to the traditional form for each question. Also, the sample weights in the public use files have been statistically perturbed as an additional privacy safeguard. With respect to the NHSDA, there was a major redesign in 1994. Reports on the NHSDA published since then have included backward revisions to the pre-1994 data in order to smooth the time series gaps in 1994. That was not done for this report. For most statistics, the differences are not large. In all tables and figures with NHSDA data, two separate estimates for 1994 are shown so that readers can see the impact of the 1994 redesign.

1998 MTF estimates were obtained from published reports and from tabulations of the 1998 fasttrack public use file. Since the published reports incorporate different sampling weights and different form selection, a comparison with the previous estimates has to be done with care. 1998 NHSDA statistics were obtained from SAMHSA as a special request for this report. Data sets from the PATS were not available for secondary analysis. Findings from PATS were taken from a recently published report (PDFA, 1999) and from private communications with the Partnership for a Drug-Free America.

Most of the analyses examined responses separately by age or grade categories. The three surveys do not categorize individuals by age in the same manner. The MTF Study recruits students in grades 8, 10, and 12 in the spring of each year. PATS recruits students in grades 7 through 12 and subdivides their sample into groups of two grades at a time. The NHSDA categorizes individuals by chronological age as opposed to grade and conducts interviews year round. In order to analyze variation with age and grade across surveys, we established the following comparison groups in Table 2-1 as roughly equivalent.

Table 2-1
Comparison of studies

NHSDA	MTF	PATS
Age 17-18	12th grade	11-12th grade
Age 15-16	10th grade	9-10th grade
Age 13-14	8th grade	7-8th grade

Variation with other demographic factors is another focus of this report. These data are relevant to the Evaluation because the Campaign has specific goals for racial and ethnic groups. For example, the Campaign includes Spanish-language advertising and advertising designed to be especially influential among black viewers. In addition, advertising materials are being translated into 11 different languages. The NHSDA was used to examine the extent to which prevalence estimates varied by race/ethnicity and gender. The MTF and PATS also have tabulations by race and ethnicity, but the NHSDA oversamples black and Hispanic youth and has corroborating racial and ethnic classification data from an adult in the household. The Detail Tables in this report provide prevalence estimates at each age from 12-18 (from NHSDA) to facilitate more precise analysis of variation with age as well as variation by age categories consistent with those planned for the National Survey of Parents and Youth: age 12-13 and 14-18. This report shows more information about various age categories than in published SAMHSA reports. Standard SAMHSA guidelines were followed about requiring a specific level of accuracy before allowing estimates to appear in the tables. The figures presented are based upon data given in the Detail Tables.

2.1.5 Reliability of Estimates

The reliability of each estimate developed for this report depends on the size of the sample asked each question and the design of the procedure used to recruit respondents for the survey sample. The reliability of an estimate is summarized by its standard error. The formula for calculating the standard error *(S.E.)* for a prevalence estimate (P) from a randomly selected sample of size N is as follows:

$$S.E. = \sqrt{\frac{P(1-P)}{N}}$$

However, the NHSDA, MTF, and PATS surveys use clustering and varying probabilities of selection. These features tend to reduce the reliability of estimates compared to a simple random sample of the same size. The *design effect* is defined as the ratio of the actual sampling variance to the sampling variance that would have been obtained with a random sample of the same sample size. (The *sampling variance* statistic is equal to the square of the standard error.)

$$Design\ Effect = \frac{S.E.[survey\,design]^2}{S.E.[random\,sample]^2}$$

The 1975-98 MTF Study reports various average design effects for comparisons of information across years and across subpopulations within a year (Johnston, O'Malley and Bachman, 1999, pp. 339-368). These numbers vary greatly but are typically in the range from 1.5 to 6.0. PDFA (1999) does not report design effects for PATS. Because PATS uses a data collection methodology similar to the MTF, we speculated that the design effects for estimates with PATS data should be comparable to those for the MTF Study. The 1997 NHSDA provides design effects for individual subpopulations that tend to vary in the range from 2.0 to 4.0 (SAMHSA, 1999a, H-8, Appendix C).

The analysis undertaken for this special report examined trends over extended time periods in anti-drug attitudes and the use of marijuana and inhalants. Explicit tests for statistical significance were not generally performed due to time constraints. Instead, the following table of standard errors based on a typical design effect of 3 was employed to assure that the highlighted findings represented true changes and not arbitrary fluctuations due to chance. Table 2-2 indicates how the standard error for an estimate varies with sample size and the prevalence rate, assuming a design effect of 3:

Table 2-2
How standard error for an estimate varies

Sample size (N)	Standard error by prevalence rate (P)					Comment
	50%	25%	10%	5%	1%	
200	6.1%	5.3%	3.7%	2.7%	1.2%	Typical size of an NHSDA subsample for a single-year age group prior to 1991
500	3.9%	3.4%	2.3%	1.7%	0.8%	Typical size of an NHSDA subsample for a 2-year age group prior to 1991
1,000	2.7%	2.4%	1.6%	1.2%	0.5%	Typical size of an NHSDA subsample for a single-year age group 1991-97
2,000	1.9%	1.7%	1.2%	0.8%	0.4%	Typical size of a PATS sample of two grades
16,500	0.7%	0.6%	0.4%	0.3%	0.1%	Typical size of an MTF sample of a single grade

These *S.E.*s provide an approximation for the reliability of any prevalence estimate. However, when comparing two prevalence estimates, the reliability of both is essential in determining whether a difference might reasonably be attributed to random fluctuations. The Z-test is commonly used for this purpose. Table 2-3 indicates the threshold, or minimum difference between two estimates that will trigger a finding of statistical significance assuming that both have similar sample sizes, similar prevalence rates, a design effect of 3, and using an α=.05 level of significance in a two-sided test:

Table 2-3
Threshold differences that can be detected

Sample size (*N*)	Threshold for statistical significance by *P*					Comment
	50%	25%	10%	5%	1%	
200	17.0%	14.7%	10.2%	7.4%	3.4%	Typical size of an NHSDA subsample for a single-year age group prior to 1991
500	10.7%	9.3%	6.4%	4.7%	2.1%	Typical size of an NHSDA subsample for a 2-year age group prior to 1991
1,000	7.6%	6.6%	4.6%	3.3%	1.5%	Typical size of an NHSDA subsample for a single-year age group 1991-97
2,000	5.4%	4.6%	3.2%	2.3%	1.1%	Typical size of a PATS sample of two grades
16,500	1.9%	1.6%	1.1%	0.8%	0.4%	Typical size of an MTF sample of a single grade

Overall, the thresholds in this table suggest that differences in estimates of a few percentage points must be evaluated cautiously. For example, a decrease from 23.6 percent down to 19.7 percent among youth age 17 to 18 in the prevalence for some characteristic may be statistically significant or not, depending on the sample size involved. Prior to 1991, there were approximately 500 youth age 17 to 18 interviewed by the NHSDA in each year. In which case, the table indicates that the threshold for statistical significance for $P\approx.25$ and $N\approx500$ is 9.3 percent. The observed difference of 3.9 percent would then be evaluated as not statistically significant. However, a difference of the same magnitude as measured by the MTF Study would be evaluated as statistically significant. The MTF Study interviews approximately 16,500 youth in each grade in each year. The table indicates

that the threshold for statistical significance for $P \approx .25$ and $N \approx 16,500$ is 1.6 percent. In this case, the observed difference is above the threshold. During the preparation of this report, trends were confirmed as prevailing across multiple years, across multiple populations, and across multiple surveys, whenever possible. Small isolated changes from year to year or for specific age groups were generally not emphasized.

The sample sizes available for preparing the estimates for each subpopulation in each year are provided in Table 2-5A and 2-5B. The MTF Study uses six different versions of its questionnaire, including and excluding different domains of questions on each form, among 12th graders and four different forms for 8th and 10th graders. Consequently, some of the questions in this report are based on less than the full survey sample. Table 2-4 indicates the variables involved and the approximate percentage of the sample available. Any variable not mentioned in the table uses 100 percent of the sample sizes indicated in Table 2-5B.

Table 2-4
MTF variables involved and the approximate
percentage of the sample available

Variable	Grades	Years	Percentage of sample available
Past month inhalant use	12	1976-97	80%
Lifetime inhalant use	12	1976-97	80%
Risk of trying marijuana	12	1976-89	20%
		1990-97	80%
Risk of using marijuana regularly	12	1976-89	20%
		1990-97	80%
Disapproval of trying marijuana	12	1976-89	20%
		1990-97	60%
Disapproval of using marijuana regularly	12	1976-89	20%
		1990-97	60%
Frequency observed anti-drug ads	12	1987-97	15%
	8, 10	1990-97	50%

Table 2-5A
Survey sample sizes for subpopulations analyzed: NHSDA 1979-97

	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94Br[a]	94	95	96	97	98
Age																								
18				260			123			230			233		274	1081	1039	744	148	508	548	617	887	1102
17				375			260			349			576		358	1309	1208	1067	179	709	678	746	1275	1099
16				398			295			401			534		382	1405	1230	1152	169	771	794	809	1313	1083
15				380			247			369			546		380	1315	1158	1169	180	787	799	752	1370	1207
14				341			264			442			514		348	1344	1192	1210	187	824	761	799	1380	1149
13				341			269			321			495		372	1429	1209	1231	223	847	845	749	1274	1136
12				330			246			348			430		337	1203	1257	1149	181	760	718	683	1232	1104
Age 12-17 combined				2165			1581			2230			3095		2177	8005	7254	6978	1119	4698	4595	4538	7844	6778
Male				1128			830			1120			1557		1051	3995	3672	3521	576	2352	2318	2252	3871	3871
Female				1037			751			1110			1538		1126	4010	3582	3457	543	2346	2277	2286	3973	3973
White, non-Hispanic				1705			1228			988			1518		1136	3646	3110	2958	541	2249	2205	2092	3970	3091
Black, non-Hispanic				263			215			589			747		448	2036	1887	1733	233	1084	1068	1073	1346	1374
Hispanic				133			94			625			763		526	2029	1941	2011	311	1241	1184	1225	2086	1869
Other, non-Hispanic				64			44			28			67		67	294	316	276	34	124	138	148	442	444
Age groups for comparison with MTF																								
17-18				635			383			579			809		632	2390	2247	1811	327	1217	1226	1363	2162	2201
15-16				778			542			770			1080		762	2720	2388	2321	349	1558	1593	1561	2683	2290
13-14				682			533			763			1009		720	2773	2401	2441	410	1671	1606	1548	2654	2285
Age groups for comparison with NSPY																								
14-18				1754			1189			1791			2403		1742	6454	5827	5342	863	3599	3580	3723	6225	5640
12-13				671			515			669			925		709	2632	2466	2380	404	1607	1563	1432	2506	2240
12-18				2425			1704			2460			3328		2451	9086	8293	7722	1267	5206	5143	5155	8731	7880

Interview year

[a]NHSDA was redesigned in 1994. A separate bridge sample was conducted with old methods. This column shows the size of that bridge sample.

Table 2-5B
Survey sample sizes for subpopulations analyzed: MTF 1976-98, PATS 1993-98

	Interview year																						
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
MTF																							
12th grade	16677	18436	18924	16662	16524	18267	18348	16947	16499	16502	15713	16843	16795	17142	15676	15483	16251	16763	15929	15876	14823	15963	15780
10th grade																14996	14997	15516	16080	17285	15873	15778	15419
8th grade																17844	19015	18820	17708	17929	18368	19066	18667
PATS																							
11-12th grade																		1103	NA	2186	2004	1979	2132
9-10th grade																		2198	NA	1779	2633	2246	2343
7-8th grade																		2705	NA	2131	4287	2750	2377
Age 11-12																		1311	NA	1301	1395	940	1228
Age 9-10																		784	NA	826	870	747	707

2.2   USE OF MARIJUANA AND INHALANTS

The NHSDA, MTF, and PATS surveys ask respondents if they used a variety of substances ever (defined as lifetime use), in the last 12 months (recent use), and in the past 30 days (current use). This section examines trends over time in past month and lifetime use of marijuana and inhalants as recorded in all three surveys. This section also examines variation in each measure with race/ethnicity and gender for the NHSDA. (This variation can also be examined with MTF and PATS data, but for purposes of this report, it seemed adequate to just study the NHSDA by race, ethnicity and gender.) Complete tables of NHSDA, MTF, and PATS results are provided in the Detail Tables, which immediately follow this report, as Detail Tables 1 to 4. Selected portions of these tables are graphed in the text that follows.

Past-month Marijuana Use (Table 1 in Detail Tables)

Substantive Results:

1.   **NHSDA, MTF, and PATS indicate comparable trends.** The NHSDA, MTF and PATS surveys recorded comparable trends past month (current) marijuana use among youth, despite differences in methodology; despite slight differences in age/grade categories; and despite differing rates each year (Figure 2-1).

2.   **Large discrepancies among surveys during 1990s.** The three surveys yielded similar estimates in 1991-1993, but more recently, differences have expanded between the surveys. In every year, PATS (11th to 12th graders) reported the highest percentage of past month marijuana use followed by the MTF (12th graders) and then NHSDA (17- to 18-year-old) surveys.

3.   **Decline 1978-1992.** The prevalence of current marijuana use peaked in 1978 and then declined steadily over the next 14 years. Among 12th graders, the MTF data recorded close to a 1.8 percent average annual decline from 37 percent (1978) down to 12 percent (1992). The NHSDA recorded a comparable decline from 35 percent in 1979 down to 9 percent in 1992.

Figure 2-1
Percentage of youth reporting past-month
marijuana use: NHSDA, MTF, & PATS, 1976-98
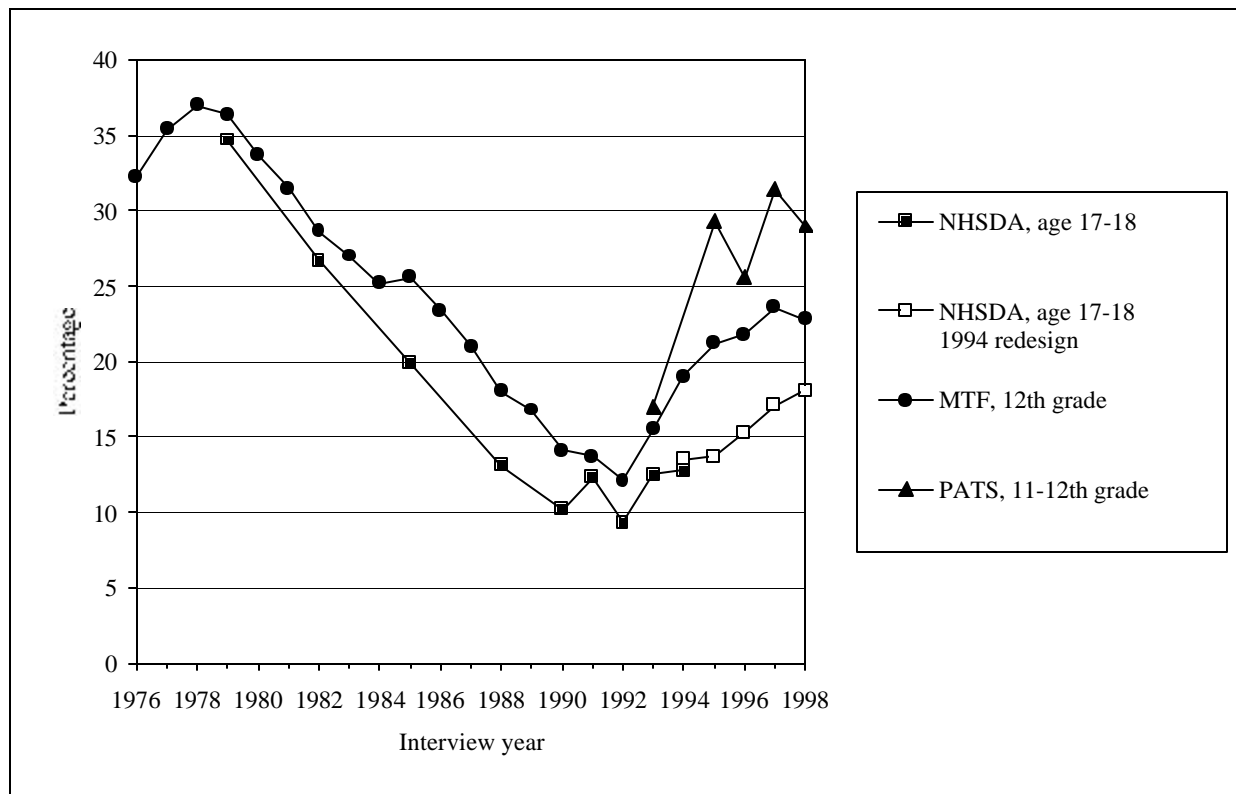
4. **Increase 1992-1997.** The downward trend reversed itself after 1992. Among 12th graders, the MTF recorded an average 2.3 percent increase per year from 12 percent (1992) up to 24 percent (1997).

5. **Small decline 1997-1998.** The MTF and PATS studies both recorded small declines (up to 2%) from 1997 to 1998 among youth in nearly every grade. None of the estimated changes in the NHSDA were statistically significant.

6. **Use increases with age.** The prevalence of past-month marijuana use increases with age up through 12th grade. (See Figure 2-2 for MTF and Detail Table 1 for NHSDA and PATS.) The increase from 8th grade to 10th grade is sharper than the increase from 10th to 12th grade. Similarly, the NHSDA recorded a sharper increase from ages 13-14 to ages 15-16 than from ages 15-16 to ages 17-18.

Figure 2-2
Percentage of 8th, 10th, and 12th graders
reporting past-month marijuana use: MTF, 1991-98
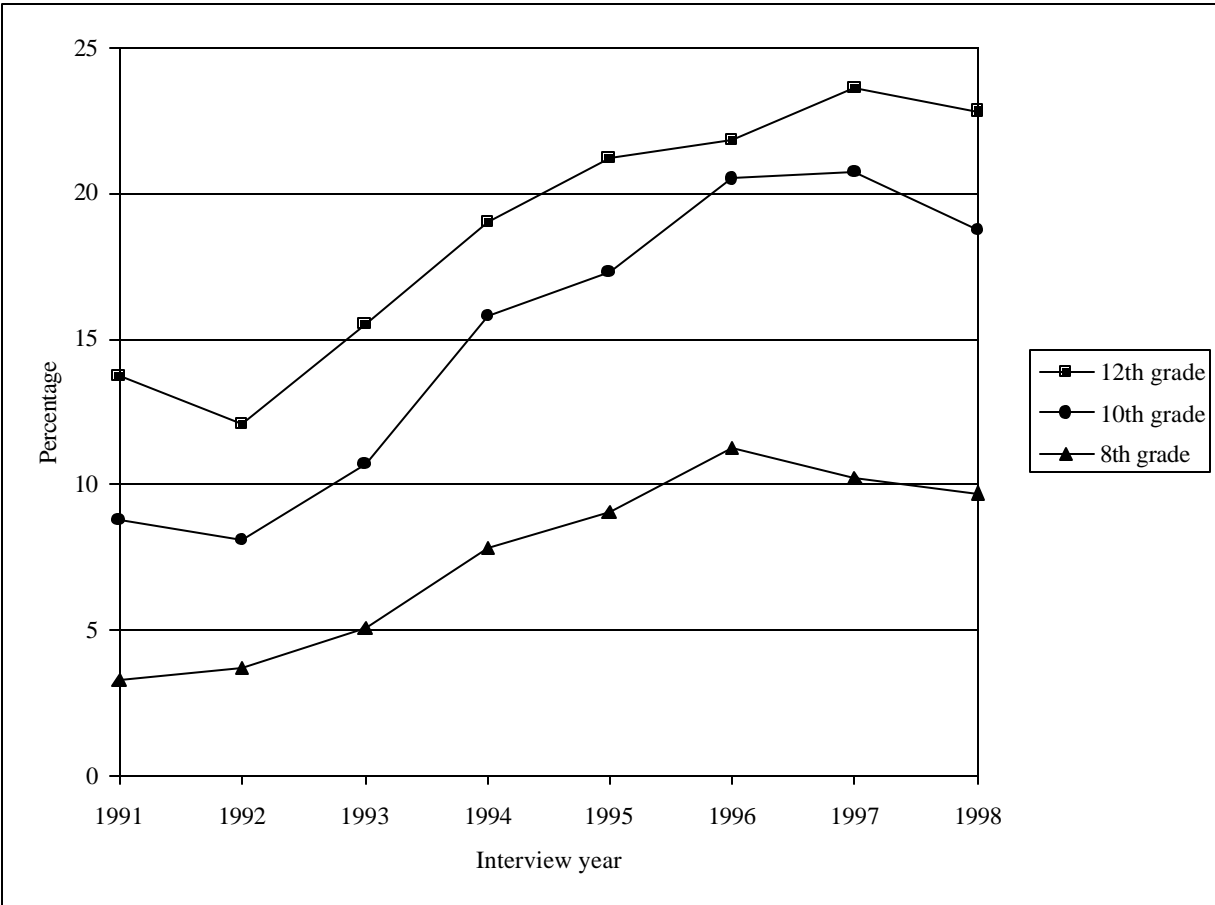
7.   **Usage gap between 8th and 10th graders widened 1992-1997.** The MTF study showed a gradually widening gap between the usage rates of 8th and 10th graders from 1992 to 1997. The usage gap between 10th and 12th graders remained relatively constant over this period.

8.   **Prevalence and trends similar across race/ethnicities.** The rates (NHSDA) among white, black, and Hispanic youth (age 12 to 17) were most often comparable to each other. All three exhibited a decline during the 1980s and an increase in the mid-1990s in current marijuana use.

9. **Girls have consistently used marijuana less than boys.** The current marijuana use rates among females age 12 to 17 were almost always lower than among males. The rates among males and females both exhibited parallel decline in the 1980s and increases in the 1990s.

Implications for the Evaluation:

10. **Long-term trends are reliable.** The fact that the long-term trends are consistent across the surveys is encouraging. If the Media Campaign does have an impact on current marijuana use, the effect should show up in all three existing data systems. On the other hand, estimates of change in any particular year can be different. There was a blip in the 1991 NHSDA series that was not mirrored in the MTF series. Also, there was a downward blip in the 1996 PATS that was not mirrored in either the NHSDA or the MTF. This underscores the need to look at several years of data before drawing conclusions about trends.

11. **None of the existing surveys can serve as a baseline for the evaluation surveys.** The large variation in the absolute levels of usage among the surveys indicates that it is very hazardous to compare surveys with different methodologies at different points in time as a means for measuring change over time. The details of how questions about usage are asked and the environment and context in which they are asked appear to be very important. This means that none of the existing systems can serve as a baseline for the evaluation surveys. Instead, it will be necessary to continue monitoring the existing surveys in order to obtain valid measurements of pre- and post-Media Campaign change.

12. **Evidence of a favorable direction of change alone does not permit attribution of influence to the Media Campaign.** The downward slope in usage rates from 1978 through 1992 is similar in magnitude to the upward slope from 1992 through 1997. The reasons for this reversal in the sign of the slope are open to debate. The time series by themselves provide no clues as to causes. If the Media Campaign does cause a drop in past-month usage of marijuana, other techniques will be needed to make causal findings. These other techniques are discussed in Chapter 3 as the fundamental rationale for the evaluation surveys.

13. **How big a change is worth attention? There are many ways to determine this.** For example, ONDCP has set a target for the reduction in past-month usage of marijuana by 2002 and by 2007. So one criterion

for judging future movement is to just compare it with the ONDCP targets for change. Another criterion might be to examine the historical experience. Since the prior trough is in the range of 9 to 13 percent in 1992, a return to these levels would certainly be interpreted by many as success. Just matching the annual rate of decline of 1.8 percentage points seen from 1978 through 1992 would also be judged by many as a success if such annual declines were maintained for several years. It is noted that only the MTF sample sizes are large enough to detect such subtle effects from one year to the next, but that all the surveys should be able to detect these changes if such an annual rate of change were maintained for several years.

Lifetime Marijuana Use (Table 2 in Detail Tables)

Trends in lifetime marijuana use (Detail Table 2) generally paralleled trends in past month use (Detail Table 1), but the rates were considerably higher.

Substantive Results:

1. **Marijuana experimentation among youth peaked around 1979.** The highest rates of lifetime marijuana (Figure 2-3) use were recorded in 1979 by both the MTF (60% among 12th graders) and NHSDA studies (59% among 17- to 18-year-olds). Over the next 13 years the prevalence of lifetime use steadily declined. By 1992, the prevalence had fallen to nearly one-half of its peak level as recorded by both the MTF (33% in 1992) and NHSDA Studies (27% in 1992).

2. **Lifetime marijuana use increased 1992-1997.** Lifetime marijuana use among youth reached its all-time low around 1992 but remained there for only a short time. The MTF and PATS studies recorded important increases from 1992 to 1997. Lifetime marijuana use returned to 50 percent of all 12th graders in 1997 (MTF), approaching the peak levels (60%) of 1979. NHSDA recorded a much more modest and gradual increase from 1992 (27%) to 1997 (36%) among 17- to 18-year-olds. Figure 2-3 shows that the MTF rates of lifetime marijuana use among 12th graders and the NHSDA rates among youth age 17 to 18 were very close from 1979 through 1992. The divergence of their trends from 1992 to 1997 resulted in the largest disparity in these rates ever recorded; the MTF rate exceeded the NHSDA rate by 14 percent in 1997.

Figure 2-3
Percentage of youth reporting lifetime
marijuana use: NHSDA, MTF, & PATS, 1976-98
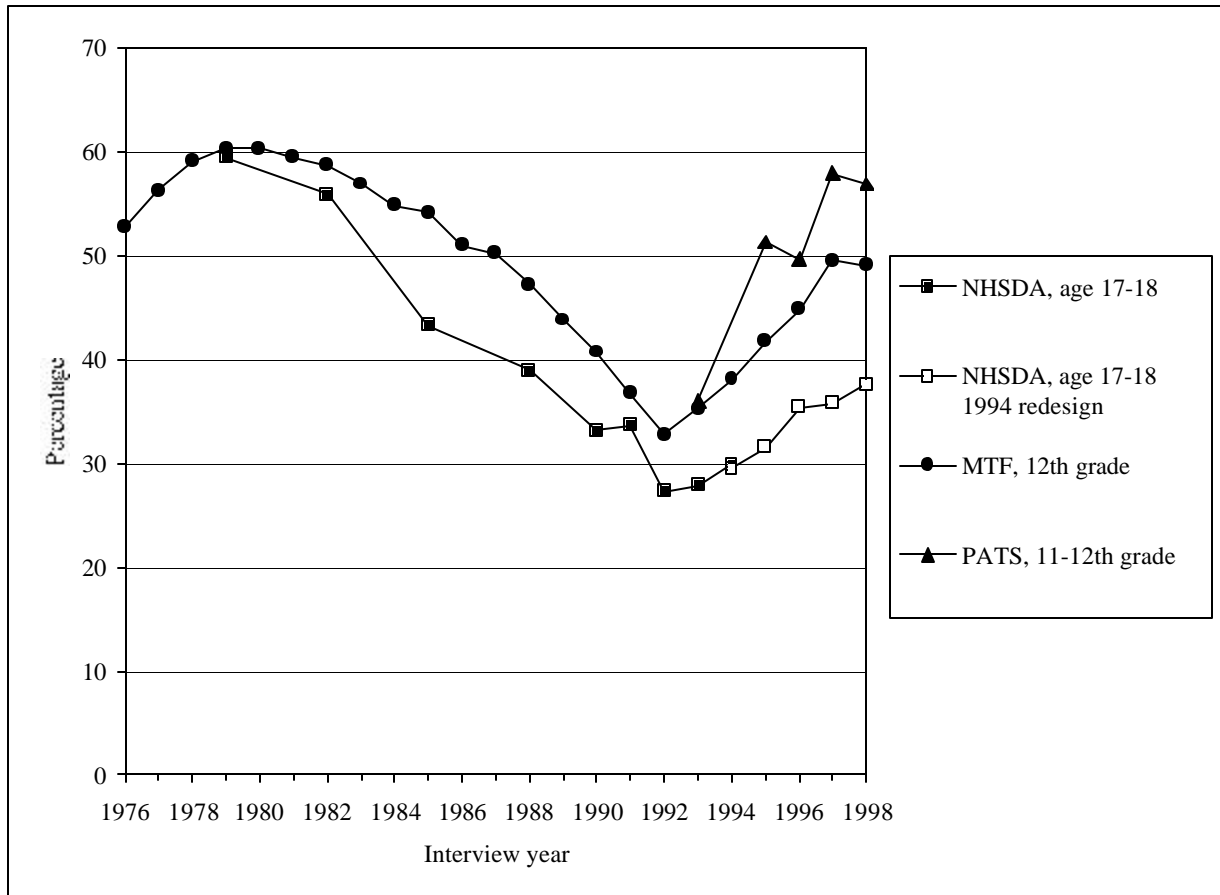
3. **Twelve-year-olds showed near zero prevalences for ever using marijuana throughout the 1979-1998 period.** While some variability is evident in the rates (Figure 2-4), all remain below 5 percent, and the variability shows no clear trend.

4. **The decrease in youth self-reports of ever using marijuana between 1979 and 1992 was most evident among the 16- and 18-year-old respondents.** Rates for both 16- and 18-year-olds decreased each year of the period except for 1991 when they showed an increase. The decrease among 14-year-olds was less substantial and was interrupted by small increases in 1985 and 1990.

**Figure 2-4
Variation in lifetime marijuana use by age: NHSDA, 1979-98**
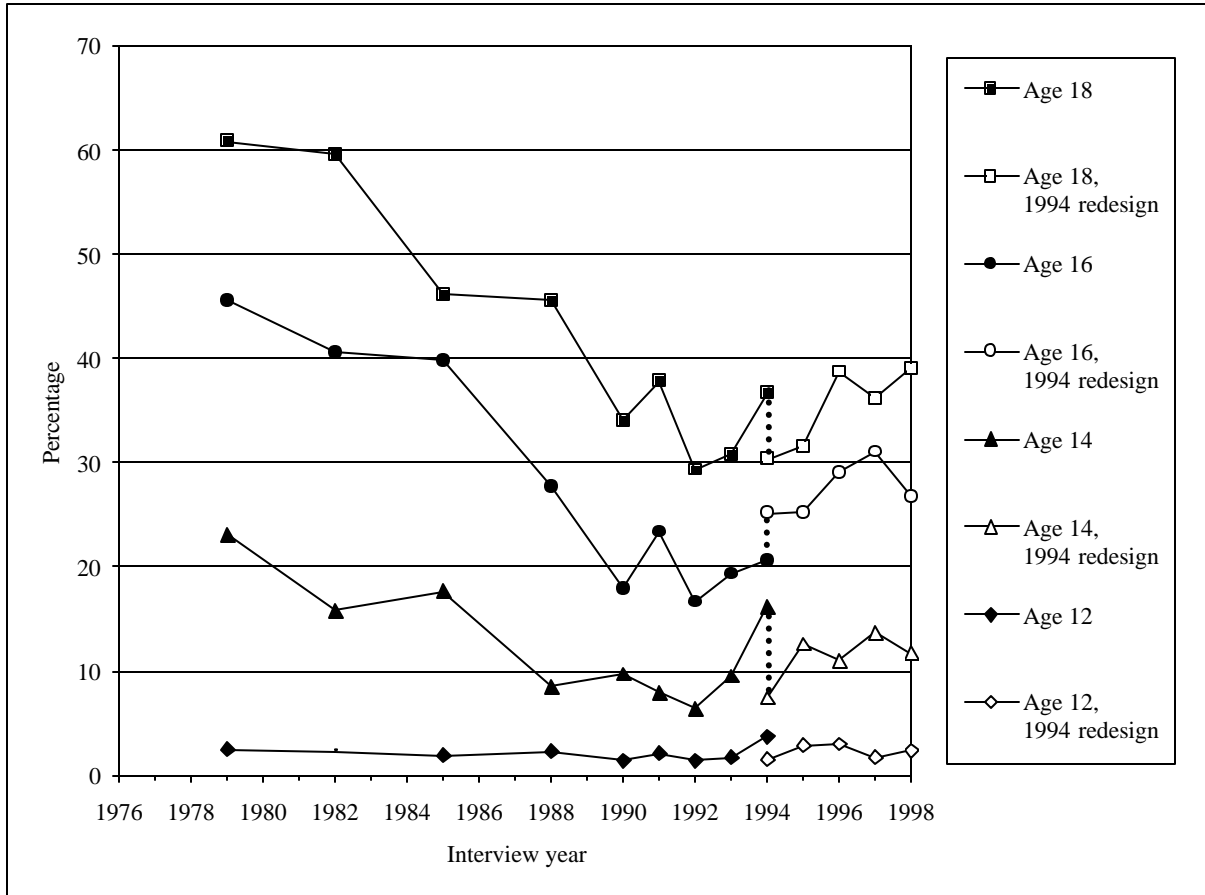
5.   **The increase in youth self-reports of ever using marijuana between
      1992 and 1997 was also most evident among the 16- and 18-year-old
      respondents.** During this period, the greatest increase occurred among
      the 16-year-old respondents. Estimated changes from 1997 to 1998 were
      not statistically significant.

Implications for the Evaluation:

6.   **Lifetime use patterns support the same methodological implications
      as do past month patterns.** From Figure 2-3, the same basic
      conclusions may be drawn as from Figure 2-1 on past-month usage. The
      consistency of the long-term trends indicate that Media Campaign-
      induced changes should be manifest in all three series after 2 to 3 years if

they are large enough to be interesting. However, given differences in point estimates in any given year, it will be important not to compare levels from the evaluation surveys with those from the other surveys prior to Media Campaign introduction.

Past-month Inhalants Use (Table 3 in Detail Tables)

Substantive Results:

1. **NHSDA, MTF, and PATS all report that current inhalant use is uncommon.** Overall, the variation across surveys was similar to that observed for current marijuana use; PATS reported the highest rates followed by MTF and then NHSDA (Figure 2-5). For example, in 1997 PATS recorded the highest rates of inhalant use (4%) among 11th to 12th graders, higher than reported by 12th graders to the MTF Study(2.5%), and by 17- to 18-year-olds to the NHSDA Survey (2.1%).

2. **Trends clear in MTF but not in NHSDA.** The rate among 12th graders (MTF) increased from 0.9 percent (1976) to 2.8 percent (1987) and subsequently fluctuated between 2.3 percent and 3.2 percent. Changes in past-month inhalant use among 12th graders, as small as 0.5 percentage points, are significant in the MTF, so the increase from 1976 to 1987 is highly significant, but most of the subsequent variation is not. By contrast, the rate among 17- to 18-year-olds (NHSDA) from 1979 through 1997 fluctuated between 0.8 percent and 3.0 percent, but no substantial trend was evident. It is noted that with the much smaller NHSDA sample sizes, even combining two years of age (17-18), changes of less than 1.5 percentage points are not significant.

3. **Age variation differs across surveys.** Both the MTF and PATS studies reported that past-month inhalant use decreased with grade in school. In 1997, 6 percent of 8th graders (MTF) reported current inhalant use compared to only 3 percent for 10th graders and 2 percent for 12th graders. The PATS data indicated an even more dramatic decrease with age. In 1997, 13 percent of 7-8th graders (PATS) reported current inhalant use compared to 6 percent for 9-10th graders and 4 percent for 11-12th graders. The NHSDA data contradicted this pattern and suggested that current inhalant use was relatively stable throughout the high school-age years. In 1997, the rates for all three NHSDA age categories (13 to 14, 15 to 16, and 17 to 18) were 2 percent plus or minus a few tenths of a percent.

Figure 2-5
Percentage of youth reporting past-month
inhalant use: NHSDA, MTF, & PATS, 1976-98
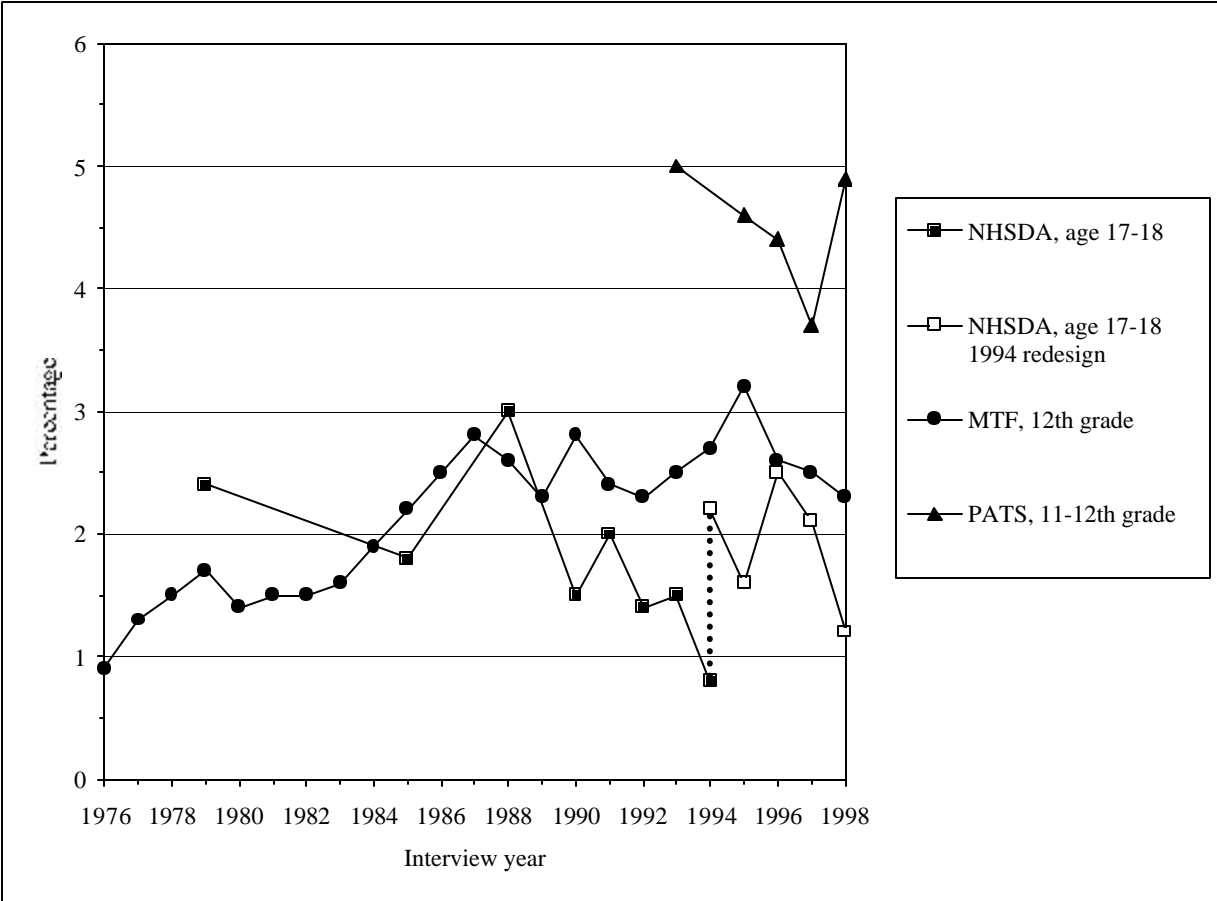
4. **Declines among 13- to 16-year-olds 1979-1988.** Only NHSDA
    collected information about inhalant use among persons younger than
    18, prior to 1991. NHSDA indicated that inhalant use had declined from
    over 4 percent for those age 13 to 14 and 15 to 16 (1979 though 1985) to
    closer to 2 percent starting in 1988. The timing of the decline could not
    be placed any more precisely than between 1985-1988 because the
    survey had not been performed in intervening years. This lower rate of
    current inhalant use (about 2%) continued from 1988 on through 1997.

5. **Inhalant use declined the most among black youth.** The decline in
    past-month inhalant use (NHSDA) was more pronounced among blacks
    (age 12 to 17) than among whites or Hispanics. Current inhalant use
    among blacks declined from 5.3 percent (1979) down to 0.3 percent

(1993) and remained at about 1 percent or less through 1997. The rate among whites peaked at 4 percent (1985) and subsequently fluctuated at around 2 percent (1988-97). The rate among Hispanics peaked at 4.5 percent (1979) and fluctuated around 2 percent (1985-97).

6. **Boys used to be more likely to use inhalants than girls, but no longer.** In 1979, past-month inhalant use was more than twice as common among males age 12 to 17 (5.6%) than among females (2.1%). The rate among males declined substantially to 1.5 percent (1992). In each year from 1992 to 1997, the rates of current inhalant use among both males and females fluctuated around 2 percent.

Implications for the Evaluation:

7. **Low levels of current usage will make it difficult to detect change.** Levels of past-month inhalant usage among older teens are already so low that only the very large sample MTF is likely to be able to detect further declines. The 1999 sample expansion of the NHSDA will improve the probability of detecting changes within the 1999-2003 time period, but standard errors will still be large on pre-1999 NHSDA estimates. Although there are higher usage rates among the younger teens, and changes will be easier to detect for them, expectations should be cautious. The 1998 MTF rate for 8th graders of 4.8 percent is already not significantly different from the lowest rate that MTF has measured since it began its 8th grade survey in 1991. MTF can detect a change of about 0.8 percent per year from that level; as a proportion of current use, the minimum change detectable in 1 year would be a decline of one-sixth from the level of current use.

Lifetime Inhalants Use (Table 4 in Detail Tables)

Substantive Results:

1. **Trends over time differ across surveys.** The MTF Study suggested that rates of lifetime inhalant use for 12th graders (Figure 2-6) increased from 1976 (10%) to 1990 (18%). Whereas, NHSDA suggested that the rates for 17- to 18-year-olds declined from a peak in 1979 (16%) down to 11 percent (1985). The NHSDA, MTF, and PATS studies all indicated year-to-year fluctuations in the 1990s, but no major trends.

Figure 2-6
Percentage of youth reporting lifetime
inhalant use: NHSDA, MTF, & PATS, 1976-98
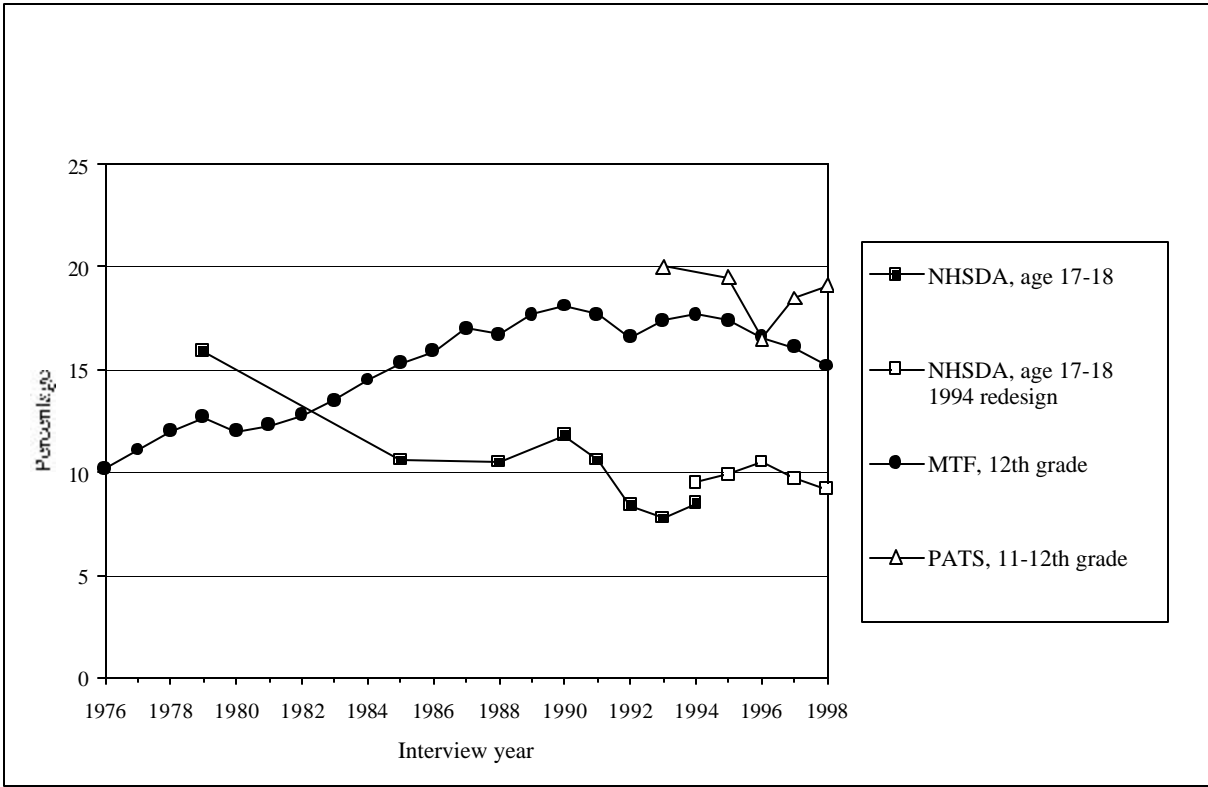
2.   **Reporting of lifetime usage inconsistent with age.** For most of the
years since MTF began collecting data on lifetime usage of inhalants by
8th and 10th graders, there has been an inconsistent age pattern. Clearly,
lifetime usage should not decline with age. Yet in almost every year,
lifetime usage among 12th graders was reported to be less than lifetime
usage among 10th graders, which was, in turn, lower than lifetime usage
among 8th graders. This need not be a sign of inconsistency within a
single year since the 12th graders in, for example, 1997 are a different
cohort of youth than the 10th graders in 1997. However, the 12th
graders in 1997 were 10th graders in 1995. From Detail Table 4B, one
sees a decline in the lifetime usage for this single cohort from 19.0
percent in 1995 (as 10th graders) to 16.1 percent in 1997 (as 12th
graders). One explanation might be that 12th graders no longer view
their early trial of inhalants as actually constituting usage. Another
explanation might be that inhalant users are much more likely to drop

out of school than other students. This second explanation is probably correct since the NHSDA shows a smooth increase in lifetime usage of inhalants with age for most years and cohorts (Detail Table 4A).

Implications for the Evaluation:

3. **Lifetime measures, particularly for older youth, are likely to be unreliable.** Lifetime usage of inhalants is difficult to measure well. MTF estimates for seniors appear to suffer from fairly strong bias due to the omission of high school dropouts or from faulty recall of prior behavior, and yet, the MTF estimates of usage among 12th graders are still considerably higher than NHSDA estimates for 17- and 18-year-olds throughout the 1980s and 1990s.

2.3   ATTITUDES TOWARD MARIJUANA AND INHALANTS

This section examines four measures of attitudes toward marijuana and inhalants: perceived risk of *any* use, perceived risk of *regular* use, disapproval of *any* use, and disapproval of *regular* use. Complete tables of findings recorded by each survey are included in the Detail Tables 5 to 9. The MTF Study asks the following question regarding perceived risk of *any* use:

> The next questions ask for your opinions on the effects of using certain drugs and other substances. First, how much do you think people risk harming themselves (physically or in other ways), if they . . . try marijuana (pot, grass) once or twice? . . . 1) No Risk 2) Slight Risk 3) Moderate Risk 4) Great Risk 5) Can't Say/Drug Unfamiliar.

In evaluating responses, the MTF Study typically reports the percentage of valid responses that report a "great risk." For this calculation, individuals who are unfamiliar with the drug are included in the denominator. This section follows this convention and examines the percentage of respondents who report a great risk associated with any use. PATS asks this same question. NHSDA adopted this question in 1990 but discontinued its use after 1994.

The MTF and PATS studies also ask a similar question regarding perceived risk of *regular* use. NHSDA asked a similar question from 1985 through 1993. In 1994, the NHSDA questionnaire redesign included adding an operational definition of regular use as use "once or twice per week" as

opposed to allowing respondents to imagine regular use to be whatever they wanted.

The MTF Study also asks the following question regarding disapproval of *any* use:

> Individuals differ in whether or not they disapprove of people doing certain things. Do YOU disapprove of people (who are 18 or older) doing each of the following: . . . Smoking marijuana once or twice. . . .
>
> 1) Don't Disapprove 2) Disapprove 3) Strongly Disapprove.

A similar question asks about disapproval of *regular* use. In evaluating responses, the MTF Study typically examines the percentage of valid responses that report they "disapprove" or "strongly disapprove." This section follows this convention and examines the percentage of respondents who report disapproval of any and regular use.

Perceived Risk of *Any* Marijuana Use (Table 5 in Detail Tables)

Substantive Results:

1. **Perceived risk increased 1978-1991.** The percentage of 12th graders (MTF) perceiving that any marijuana use presented a "great risk" of harm (Figure 2-7) increased steadily from 8 percent (1978) to 24 percent (1991).

2. **Perceived risk decreased 1991-1994.** The MTF and NHSDA surveys recorded similar levels of perceived risk in 1991 for 12th graders (24% and 23%, respectively), for 10th graders (30% and 28%), and for 8th graders (40% and 39%). The surveys recorded roughly parallel trends 10th and 8th graders from 1991 to 1994. In 1994, the series widely diverged for 12th graders, perhaps due to the small sample size in the NHSDA bridge sample. As mentioned above, NHSDA discontinued the question after 1994. By 1997, the MTF rates in each age group had declined by about two-fifths.

**Figure 2-7
Variation over time in different measures of
anti-drug attitudes: MTF 12th graders, 1976-98**
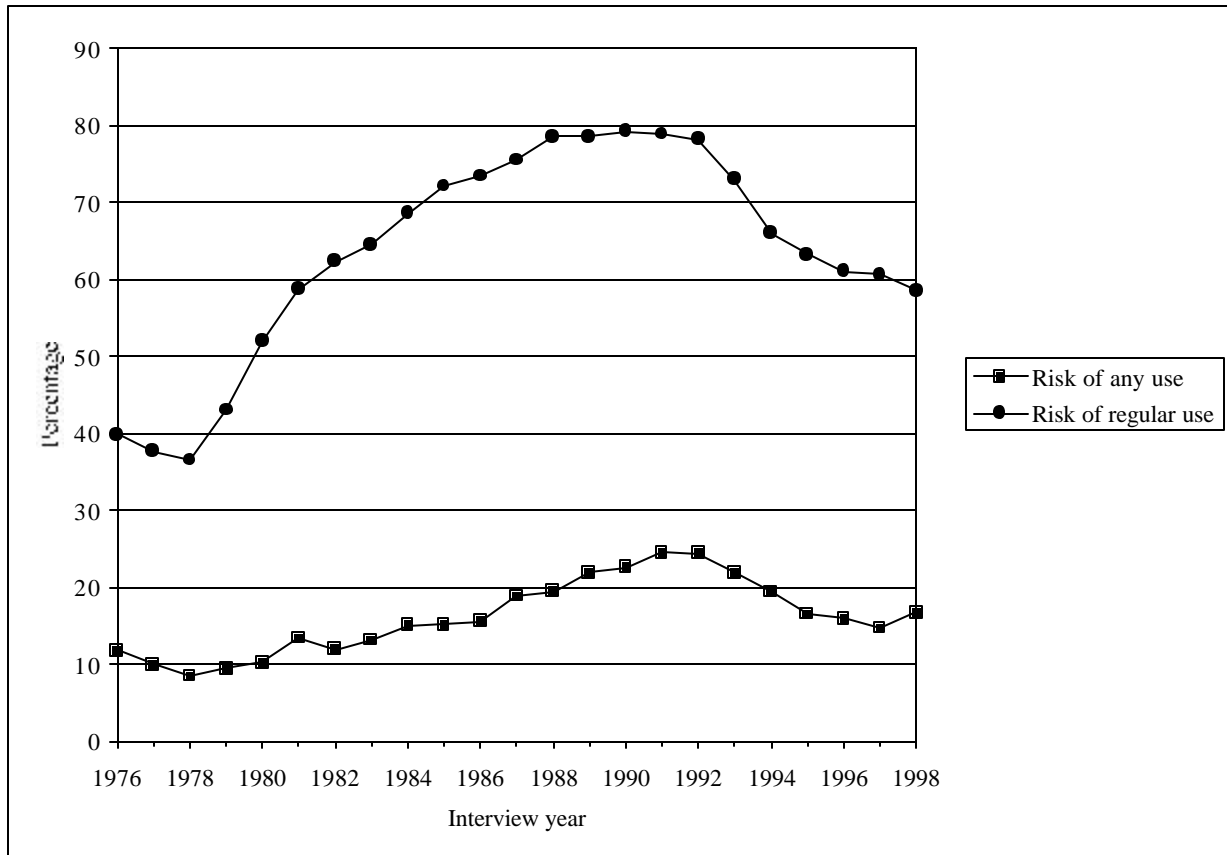
3. **MTF and PATS trends differ 1993-1998.** In 1993, PATS recorded
    substantially lower rates of perceived risk than the MTF Study for each
    age group: 18 percent versus 22 percent for 12th graders, respectively;
    19 percent versus 30 percent for 10th graders; and 24 percent versus 36
    percent for 8th graders. From 1993 to 1997, the MTF Study recorded a
    decline of one-third in each grade. PATS recorded a similar decline
    among 11-12th graders, but almost no decline among 7-8th and 9-10th
    graders. From 1997 to 1998, the MTF Study recorded an increase of 1
    percent to 3 percent for each grade. PATS recorded a 1 percent increase
    among 11-12th graders, but a decline among 9-10th graders and 7-8th
    graders.

4. **Younger persons perceive a greater risk.** Overall in all three surveys and in most years, the perceived risk of harm from any marijuana use decreased with age. In 1997 (MTF), 12th graders (15%) were slightly less likely to report a perceived risk of great harm from any marijuana use than were 10th graders (19%) and substantially less likely than were 8th graders (25%).

5. **White youth perceive less risk.** In every year from 1990 to 1994 (NHSDA), white youth (age 12 to 17) perceived less risk of harm than black and Hispanic youth. In 1994 (using the new NHSDA questionnaire and edit procedures), white youth age 12 to 17 (28%) were much less likely to report a perceived risk of great harm from any marijuana use than black youth (38%) or Hispanic youth (37%).

6. **Boys perceive slightly less risk than girls.** In every year from 1990 to 1994, males (age 12 to 17) were slightly less likely to perceive a great risk of harm from any marijuana use than were girls. In 1994, 31 percent of boys versus 32 percent of girls reported that they a perceived great risk of harm from any marijuana use.

Implications for the Evaluation

7. **Value of long time series with stable instruments and large sample sizes.** The MTF captures long-term trends in the 12th grade population and the change in direction around 1991. The NHSDA which started using the question in 1990, then experimented with a changed version in 1994 and then discontinued the item for 1995 and beyond does not appear to provide much additional information. Accordingly, the questionnaires for the evaluation surveys do include some questions on perceived consequences of any use of marijuana, but there is no attempt to duplicate the MTF data.

Perceived Risk of *Regular* Marijuana Use (Table 6 in Detail Tables)

1. **Perceived risk increased 1978-1988.** The MTF Study recorded a steady and substantial increase in the percentage of 12th graders that perceived a great risk of harm in regular marijuana use from a low of 36 percent (1978), up to 78 percent (1988), an average annual increase of 4.2 percent (Figure 2-7).

2. **Perceived risk of regular use and any use follow similar shaped curves.** The curve for great risk of regular use showed sharper acceleration in the early 80s than the curve for great risk of any use. The curve for regular use peaked two years before the peak for any use. Both curve showed sharp declines starting in 1993.

3. **MTF and NHSDA provided similar results 1985-1994.** In 1985, the percentage of 17- to 18-year-olds reporting a perceived great risk (73%) to NHSDA (Figure 2-8) nearly matched the rate among 12th graders (72%) reporting to the MTF Study. These measures remained close up until the NHSDA redesign in 1994.

Figure 2-8
Percentage of youth reporting perceived great risk of
***regular* marijuana use: NHSDA, MTF, & PATS, 1976-98**
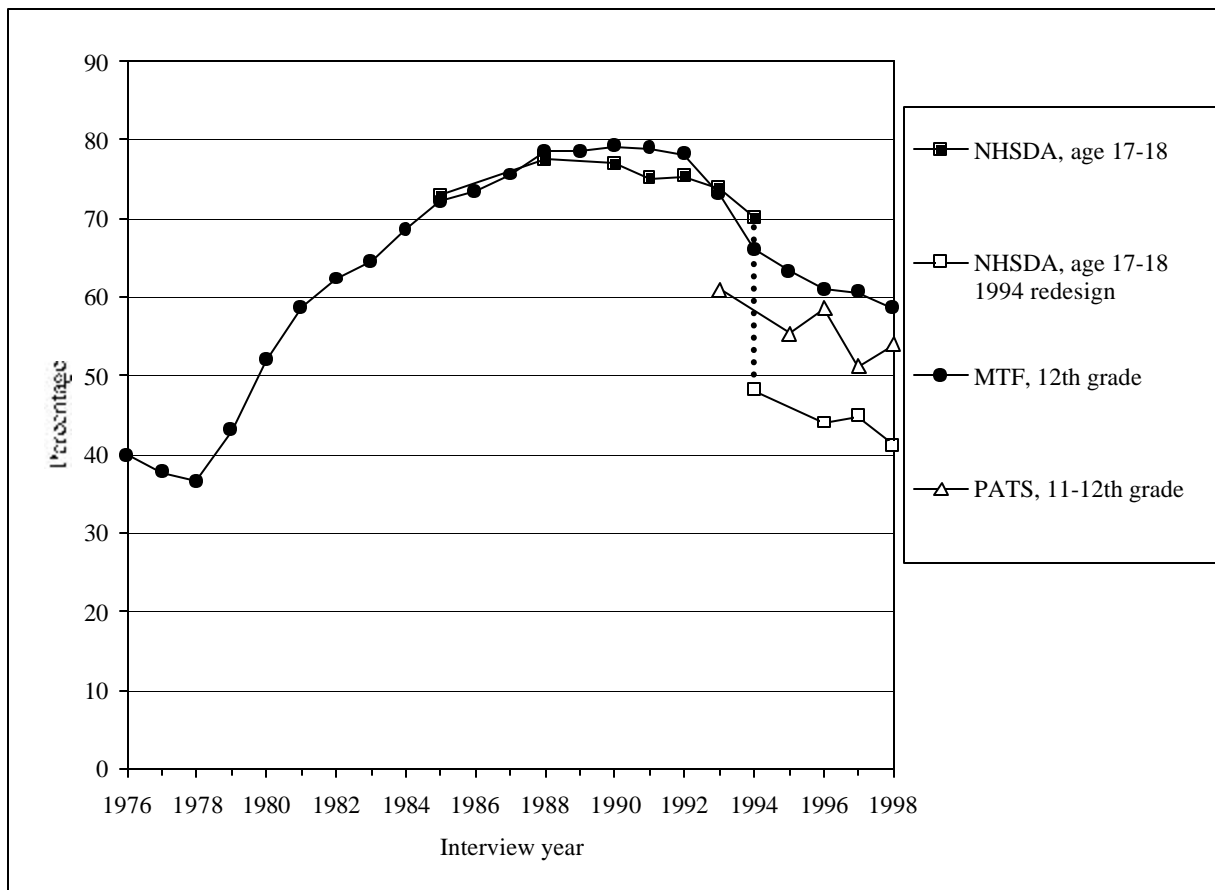
4. **Perceived risk for use "once or twice per week" is less than "regular" use.** In 1994, NHSDA redesigned its questionnaire and operationalized regular use to mean use "once or twice per week." The split sample comparison revealed that the percentage of youth age 17 to 18 that perceived a great risk of harm (70%) for regular use (1994 bridge column) was substantially higher than the percentage who perceived a great risk of harm (48%) in use "once or twice per week" (1994 column). The rates among younger individuals also declined substantially. Apparently, many youth understood "regular" marijuana use to be considerably more frequent than once or twice per week.

5. **PATS and MTF recorded declines in perceived risk 1993-1997.** Both the PATS and MTF Studies recorded declines in perceived risk from 1993 to 1997 for each age category, although the MTF declines were more substantial and showed a smoother pattern of decline. The MTF and PATS studies both reported modest changes from 1997 to 1998, although in the opposite directions. Among 12th graders, the MTF Study recorded a 2 percent decline; PATS recorded a 3 percent increase. The MTF rates among 10th and 8th graders were unchanged; PATS recorded a 3 percent increase among 9-10th graders and a 1 percent decline among 7-8th graders.

6. **Perceived risk of regular use decreased with age.** In nearly every year in every survey, perceived risk of regular marijuana use decreased moderately with age. In 1997, the MTF Study recorded a rate of 73 percent among 8th graders as compared to 66 percent among 10th graders and 61 percent among 12th graders.

7. **Whites, blacks, and Hispanics report similar levels of perceived risk of regular use.** From 1988-97 (NHSDA), white, black, and Hispanic youth age 12 to 17 reported similar levels of perceived risk of great harm from regular marijuana use. In 1985, a lower rate (67%) was recorded among Hispanic youth than among white (79%) or black (75%) youth. However, this lower rate for Hispanics did not prevail in any other years.

8. **Boys perceive slightly less risk than do girls do.** In every year from 1985-1997, NHSDA found that the percentage of girls that perceived that regular marijuana use represented a great risk of harm was a few percentage points higher than boys age 12 to 17. In 1997, NHSDA males aged 12 to 17 (52%) were slightly less likely to report a perceived risk than were females (56%).

Implications for the Evaluation:

9. **Results are very sensitive to wording changes.** Questions of perceived risk are very sensitive to wording and context. For example, "regular" use can mean quite different things. Explicit definition of regular use (how many uses in what period) will be needed if we are to know youth attitudes toward the specific behaviors that the Media Campaign addresses. Also, it will be important to maintain wording over time.

Disapproval of Marijuana Use (Table 7 in Detail Tables)

1. **Disapproval of marijuana use increased 1978-1992.** Back in the late 1970s, only one-third of 12th graders (MTF) disapproved of any marijuana use (Figure 2-9). This disapproval rate increased steadily from 33 percent (1978) to 69 percent (1992), an average increase in disapproval of 2.4 percent per year. Disapproval of regular marijuana use increased from 68 percent (1978) to its peak of 89 percent (1987) several years earlier than the peak for disapproval of any use. The rate of disapproval for regular marijuana use remained at about 88 percent 1987-92.

2. **Disapproval of marijuana use decreased 1992-1997.** The percentage of 12th graders that disapproved of any marijuana use declined from 69 percent (1992) down to 49 percent (1997), an average decline of 4 percent per year. The rate of disapproval for regular marijuana use declined in parallel but more slowly from 88 percent (1992) down to 77 percent (1997), an average decline of 2.2 percent per year. Parallel declines among 10th and 8th graders in disapproval of both any and regular marijuana use occurred during this time.

3. **Modest increase 1997-98.** From 1997 to 1998, rates of disapproval for any marijuana use increased modestly (1-3%) for each of the three grades surveyed. The rate of disapproval for regular use among 12th graders increased 4 percent. The rates for 8th and 10th grades remained the same.

**Figure 2-9
Variation over time in marijuana use and
attitudes: MTF, 12th graders, 1976-98**
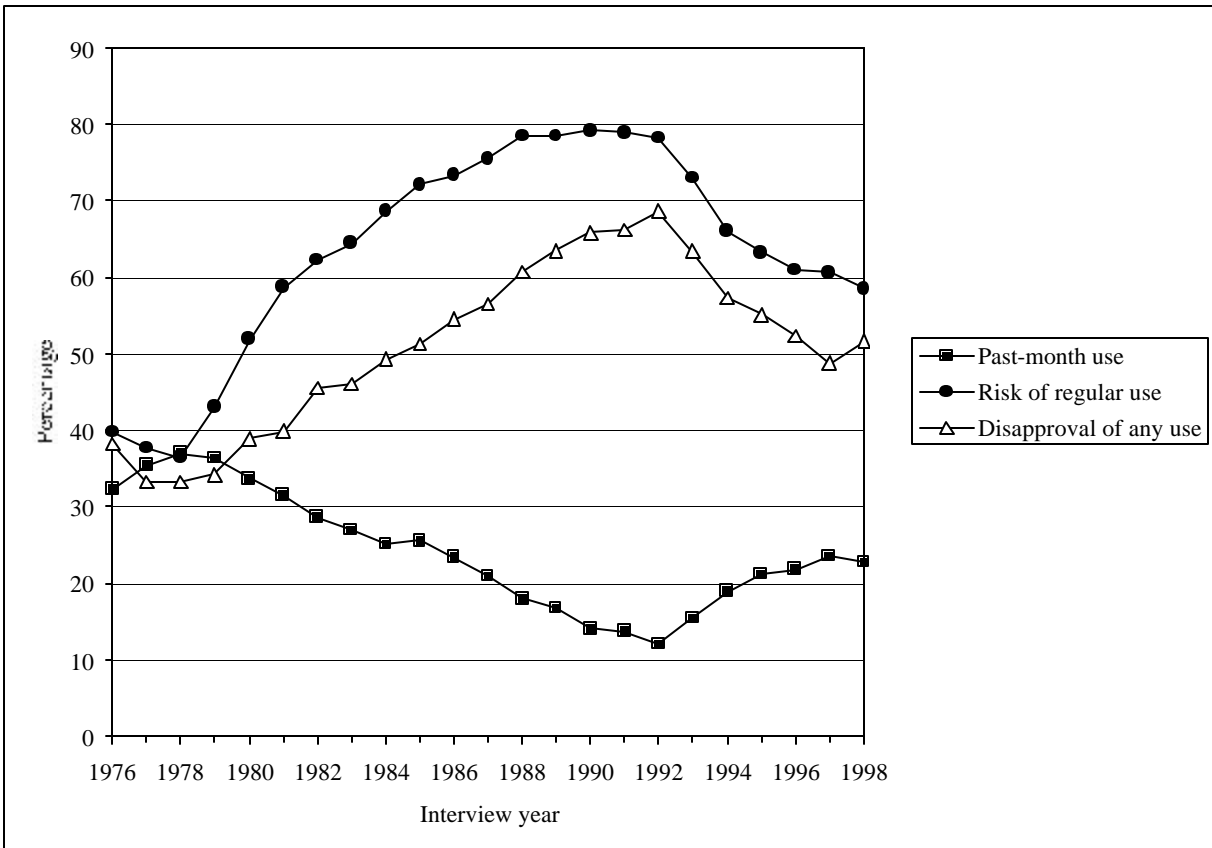
4. **Variation by grade.** In nearly all of the years surveyed, disapproval of
    any marijuana use declined with age. The disapproval of regular
    marijuana use also declined with age but was less prominent. In 1998,
    12th graders (52%) were slightly less likely to disapprove of any
    marijuana use than 10th graders (56%) and substantially less likely than
    8th graders (69%). In 1998, youth in all three grades reported
    comparably high levels of disapproval for regular marijuana use (80-
    84%).

5. **Movements in attitudes are inversely related to movements in usage.**
    Figure 2-9 also shows how trends in past-month use of marijuana relate
    to trends in perceived risk of *regular* use and disapproval of *any* use of
    marijuana as recorded by the MTF Study of 12th graders from 1976 to

1998. This relationship was the subject of an extended analysis published by the MTF Study (Bachman, Johnston, and O'Malley, 1998). Figure 2-7 clearly indicates that anti-marijuana attitudes and use of marijuana have been inversely associated over time. As marijuana use has decreased, both perception of risk and disapproval of use increased. Similarly, as use subsequently increased, perception of risk and disapproval decreased. Bachman, Johnston, and O'Malley (1998) performed multivariate analyses with the individual level data and confirmed that it was indeed individuals with more negative attitudes toward marijuana that were less likely to have used it.

Implications for the Evaluation:

6. There is good evidence for the importance of attitude and belief measures being closely related to behavior. This serves to justify the Campaign's emphasis on belief and attitude change and drives the Evaluation to make every effort to explore both these general attitudes and many more specific beliefs. They are likely to be essential in finding early indicators of Campaign influence and in understanding the particular processes through which the Campaign may affect behavior. The questionnaire for the evaluation surveys tries to be more specific about anti-marijuana beliefs about consequences, perceptions of social norms, feelings of self-efficacy to resist drug usage, and intentions – all in the attempt to try to find better leading indicators of marijuana usage.

Attitudes About Inhalant Use (Table 8 in Detail Tables)

Substantive Results:

1. **Nearly all youth disapprove of inhalant use.** From 1991 to 1998, the disapproval rates for any and regular inhalant use were relatively constant. In 1998, nearly all 10th graders disapproved of regular inhalant use (91%) and almost as many disapproved of trying inhalants even once or twice (86%). The rates were only slightly lower for 8th graders for disapproval of regular (90%) and any (83%) use of inhalants.

2. **Most youth perceive regular inhalant use as risky.** The percentage of 8th and 10th graders who perceived a great risk of harm from *regular* inhalant use was relatively constant 1991-1998. In 1998, most 10th graders perceived that regular inhalant use presented a great risk of harm (73%). Eighth graders perceived slightly less of a risk (67%).

3. **Less than one-half of all youth perceive use of inhalants once or twice as risky.** The percentage of 8th and 10th graders who perceived a great risk of harm from *any* inhalant use was relatively constant for the period 1991-1998. In 1998, less than one-half (46%) of all 10th graders and even fewer 8th graders (39%) perceived that using inhalants just once or twice posed a great risk.

Implications for the Evaluation:

4. **Changes in inhalant attitudes are going to be difficult to detect.** Given the low inhalant usage rates, high disapproval rates, and high perceptions of risk of regular use, it appears that it would be easier to detect changes in perceptions of risk from inhalant trial.

2.4   EXPOSURE TO ANTI-DRUG ADVERTISING

Observation of Anti-drug Ads (Table 9 in Detail Tables)

Substantive Results:

1. **Media exposure was highest 1987-1992.** Figure 2-10 presents the percentage of MTF 12th graders that observed anti-drug advertising at least once per day. From 1987 to 1992, more than a one-third (35-36%) saw the ads at least daily and more than one-quarter (28-32%) saw the ads 1 to 3 times per week (ignoring an anomalous 1989 drop). In 1989, only about one-quarter (26%) saw anti-drug ads at least daily and slightly more (30%) saw the ads 1 to 3 times per week. Among 10th and 8th graders from 1991 to 1992, almost one-half (43-45%) saw the anti-drug ads at least daily and approximately another quarter (24-28%) saw them 1 to 3 times per week.

2. **Media exposure declined substantially 1992-1998.** The MTF recorded a decline in the percentage of 12th graders that saw anti-drug advertising at least daily from 35 percent (1992) down to 17 percent (1998). Similar declines occurred among 8th and 10th graders. The percentages that saw anti-drug ads 1 to 3 times a week remained relatively constant at about one-quarter (23-28%) of respondents each year in each grade.

Figure 2-10
Variation over time in anti-drug media exposure,
marijuana use, and attitudes: MTF, 12th graders, 1976-98
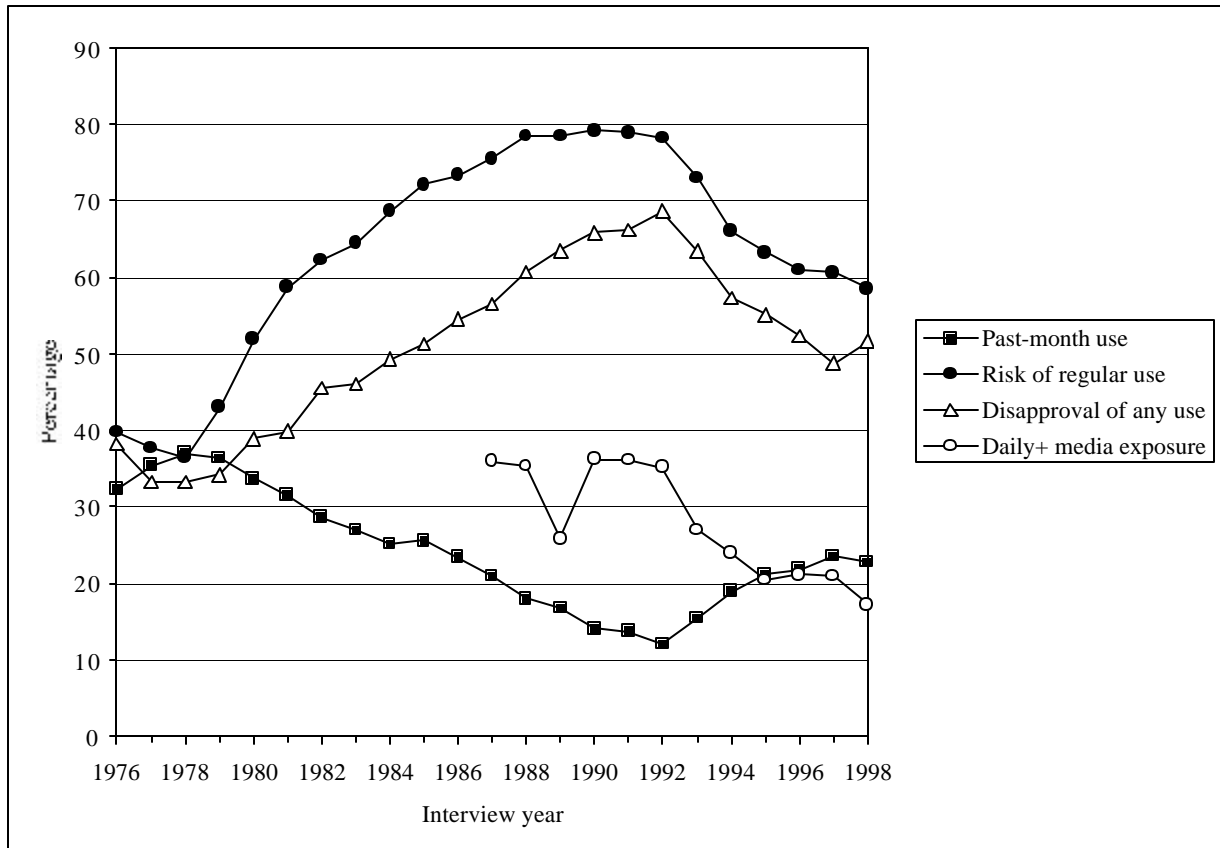
3.   **MTF and PATS studies recorded similar declines from 1993 to 1998.**
     In 1993, PATS recorded higher rates of at least daily exposure to anti-
     drug advertising in every grade (44-47%) than did the MTF Study
     (27-38%). The PATS and MTF studies both found that approximately
     one-quarter of the youth in each grade observed anti-drug ads 1-3 times
     per week. PATS recorded a slightly larger decline (16%) in the
     percentage of 11-12th graders that observed anti-drug ads at least daily
     than the MTF Study recorded for 12th graders (10%). PATS also
     recorded larger declines among 7-8th and 9-10th graders than did the
     MTF Study for the 8th and 10th graders. (Phase II of the paid Media
     Campaign started in the summer of 1998, after PATS 1998 data
     collection.)

4. **Younger students more likely to see anti-drug ads at least daily.** In each survey and in each year, media exposure to anti-drug ads declined with age. In 1997, MTF reported that 21 percent of 12th graders observed ads at least daily as compared to 29 percent of 10th graders and 34 percent of 8th graders. In each survey and in each year, similar percentages from all three age groups observed the ads 1 to 3 times per week.

Implications for the Evaluation:

5. **Self-reported recall of anti-drug advertising does capture interesting variation over time.** Both the MTF and PATS used fairly simple measures of exposure to anti-drug advertising. Yet they both captured a strong trend between 1992 and 1995 that coincided with a sharp decline in the strength of anti-marijuana attitudes and a sharp increase in the past-month use of marijuana. The fact of these convergent phenomena was one of the arguments in favor of funding the paid Media Campaign. These convergent phenomena, however, do not in themselves prove that increasing anti-drug advertising will reduce marijuana use or restrengthen anti-drug attitudes.

Association of Media Exposure to Anti-Drug Advertising on Attitudes and Use of Marijuana (Table 10 in Detail Tables)

These corresponding trends raise the question of whether reduced advertising in 1993 could have contributed to the recent increase in marijuana use. Of course, many other possibilities may explain the increase in marijuana use. The apparent correlation between trends in declining media exposure and increased marijuana use may be coincidental. The following analyses shed further light on this relationship.

Detail Table 10 presents the findings of partial correlation analyses of media exposure with marijuana use and attitudes, controlling for grade and interview year. The correlations of observing anti-drug ads daily with past-month marijuana use, perceived risk of regular marijuana use, and disapproval of any marijuana use were all under 0.03. In contrast, marijuana use, perceived risk, and disapproval were all clearly correlated and in the right direction: risk and disapproval were positively correlated (0.41) and past-month use was negatively correlated with risk (-0.32) and disapproval (-0.42) of marijuana use.

These findings suggest that individuals tend to hold attitudes toward marijuana that are consistent with their current use and that observation of frequent anti-drug ads has no significant relationship with current attitudes or marijuana use. These findings are consistent with other multivariate statistical analyses using individual-level data from the MTF Study (Stryker, 1998). This finding of Stryker's is one of the motivations behind the effort to measure exposure better in the evaluation surveys. While it is possible that advertising has no effect on attitudes or behavior, the lack of correlations observed might have been the result of poor measurement of exposure. If exposure is poorly measured, then it will not be strongly correlated with anything.

Figure 2-11 presents a graph of past-month marijuana use as a function of both current media exposure and interview year as recorded by the MTF Study of 12th graders. For each year, the graph identifies the percentage of 12th graders who reported past-month use among the subpopulation of youth who reported at least daily exposure to anti-drug advertising, among those who reported viewing the ads 1 to 3 times per week, and among those who reported viewing the ads less than weekly. If current media exposure had an impact on current use, then those who saw the ads more frequently would be much less likely to report having used marijuana. However, Figure 2-11 reveals that in most years, the rate of marijuana use differed by only a few percentage points across different levels of current media exposure. Starting in 1992, the percentage of youth reporting past-month marijuana use began to increase among youth in each of the media exposure categories.

Youth who saw the ads most frequently (at least daily) did have the lowest rate of past-month marijuana use in most years, but there were exceptions. Youth who saw the ads the least frequently (less than once per week) had much *lower* past-month marijuana usage rates than youth with medium exposure to the ads (1-3 times per week) in 1995 and 1996. In 1998, youth who saw the ads most frequently had the highest rate of past-month marijuana use. This is certainly not what one would expect to see if the ads were effective and if exposure to the ads were well measured.

Figure 2-11
Correspondence between marijuana use and anti-drug
media exposure over time: MTF 12th graders, 1987-1998
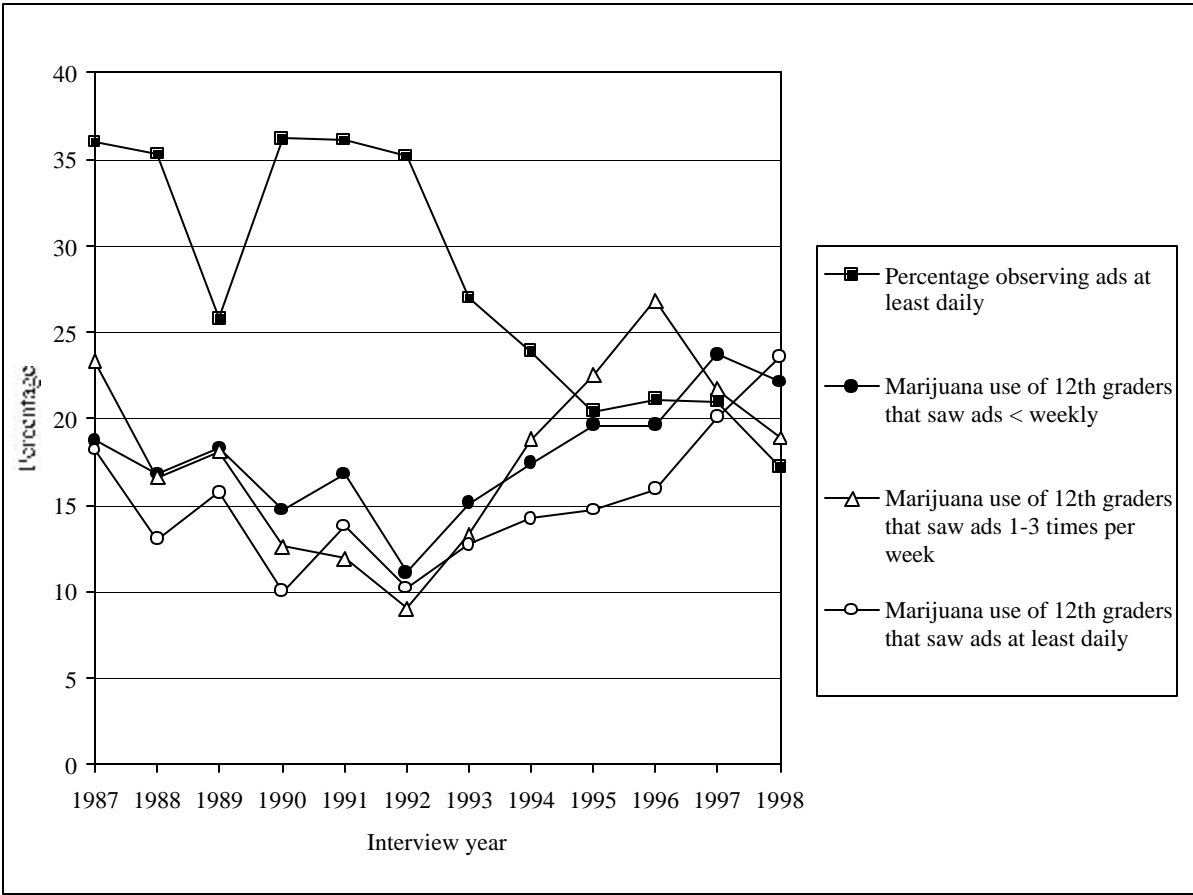
Implications for the Evaluation:

The MTF was not designed with a primary goal of obtaining sensitive
measures of exposure to anti-drug advertising. Instead, it was designed with a
primary goal of consistently measuring substance abuse year after year.
Indeed the results from the aggregate and individual analyses provide
contradictory information. At the population level exposure to ads and
attitudes and behavior track each other closely. At the individual level we find
no association between ad exposure and outcomes. The failure to find an
association between exposure to the anti-drug ads and attitudes or behavior in
the MTF can be explained in several ways: there was no influence; there was
an influence, but it did not depend on individual exposure to the ads; or the

measure of exposure in MTF was not sensitive enough to pick up the true variation in exposure among individuals. The two explanations that suggest methodological weaknesses have implications for the Evaluation. If effects of exposure occur at the aggregate (e.g., social network or community) level, where effects are shared among people regardless of whether they were personally exposed then the Evaluation needs to be able to examine effects that occur at a level of aggregation higher than the individual. Also, there is a need in the new Evaluation to measure anti-drug message exposure with great care. Chapter 3 (and in particular Section 3.5) discusses how the evaluation surveys will create and use more sensitive and more comprehensive measures of exposure to anti-drug advertising.

2.5   SUMMARY OF FINDINGS ON MEASURING LONG-TERM CHANGES

The great advantage of these existing data systems (particularly NHSDA and MTF) is their longevity. They have asked the same questions of comparable populations with (mostly) consistent methodologies since the mid-1970s. For drug use measures and for some broad attitude measures, these data systems will enable us to address global effects questions that will not be addressed by the Media Campaign evaluation whose initial data collection was initiated in November 1999: Does drug use and do drug attitudes change with the initiation of the Media Campaign? All three data systems will address these questions. A consistent pattern of changes among them will be the essential basis for claiming that the youth drug environment as a whole is moving in the right direction. These are crucial questions, but they do not match the entire task of the Evaluation.

The task of the Evaluation is to decide whether observed changes in drug use or drug attitudes can be attributed to the Media Campaign, specifically. The Media Campaign is only one piece in the National Drug Control Strategy. Any change in substance abuse rates by youth may be caused by other Federal Government activities, such as interdiction at our borders and crop eradication in foreign countries, local government activities, such as police enforcement or judicial practices, school-based drug education, price changes related to these activities or others, or by unknown forces. Some researchers have argued that there are epidemics in substance abuse that follow their own natural patterns of ebb and flow (Golub and Johnson, 1996). Simply tracking usage rates is not enough to identify the forces behind change. In order to be able to make reasonable claims that the Media Campaign was responsible for

change, the Evaluation is designed to go well beyond what will be available from the existing data systems.

However there are several clear limitations on what we can expect from the Evaluation based on the existing results from the data systems.

1. **The overall level of past-month inhalant use among seniors was minimal, in the range of 1 to 3 percent.** Declines below this level will be difficult to detect with the NHSDA or the new national evaluation survey. Given the higher usage rates among younger teens, change will be easier to detect there.

2. **During the longest period of steady annual declines in marijuana usage (1978-1992) the rate of change in behavior and in attitudes was about 1.8 percentage points per year.** ONDCP has set goal impact targets for the total National Drug Control Strategy against which change can be contrasted. However, this historical record might also be a standard against which to judge the current Media Campaign. If a rate of decline of 1.8 percentage points per year could be sustained for several years, matching the best historical decline, that would certainly be perceived as a success by many. It is noted that only the MTF sample sizes are large enough to detect such subtle declines from one year to the next, but that all the surveys should be able to detect a multi-year change of 1.8 percentage points per year or comparable changes in broader age ranges. Also, the expansion of the NHSDA in 1999 to 70,000 interviews per year (up from 25,500 in 1998) should greatly improve the NHSDA's ability to measure small changes from 1999 forward.

3. **None of the existing data systems can serve as a baseline for measures taken with the evaluation surveys.** The sharp discrepancies in the point estimates for marijuana use (and other behaviors and attitudes) among the three surveys establishes the sensitivity of these measures to methodological variations. (These variations include use of paper-and-pencil versus interviewer versus computer administration; school-based samples versus home interviews; and variations in question format.) Choice of any of the three surveys as *the* baseline for the evaluation surveys would be misleading. We cannot indicate which, if any, of the three surveys might provide comparable data.

However, we do intend to use these data systems for the purpose of documenting change from the period before the Media Campaign through various points in it. In Chapter 2, the strengths and weaknesses of each of the three systems are detailed. PATS is the only source of data on drug use and attitudes of children under the age of 12 prior to 1999, and contains a richer set of drug-related attitudinal questions than the other sources, but public use files are not issued for PATS and the sampling procedures are not well documented. NHSDA has the most representative samples and most extensive background data and a data collection procedure closest to the one used by the evaluation surveys. In contrast, the MTF offers a richer set of attitudinal data, a larger sample for the ages it covers, an earlier publication schedule, more consistent instrumentation over the years, and, it is often argued, somewhat more honest responses about drug use (due to the absence of parents during the data collection).

Given these offsetting advantages and disadvantages, there is no clear methodological ground for choosing PATS, NHSDA, or the MTF as the exclusive measurement tool for pre-Media Campaign to Media Campaign change. This leads into the question of whether use of the three surveys would be likely to lead to different results. This question of comparability is the central focus of Chapter 2. Generally, good comparability was found among the surveys in terms of trends, but the estimates in any given year can vary widely. Thus, it seems likely that similar conclusions would be reached with any of the surveys, provided that several years of pre- and post-Media Campaign data are used.

4. **It will not be possible to suggest what the future trend in drug use would have been in the absence of the campaign on the basis of the historical data.** Referring again to Figure 2-1, one can observe that after peaking in the late 1970s, marijuana use appeared to be in general decline until the early 1990s when the trend in usage rates reversed course. There is no explanation available as to why this trend was so abruptly reversed in the early 1990s. No matter how clear a trend might be, it can be a very poor predictor of the future. Continuing the analysis of Figure 2-1, it appears, as previously reported elsewhere, that in 1998 there was a pause in the upward climb of marijuana usage rates or perhaps even the beginning of a new period of decline. No sound technology exists for determining whether this short pause/decline in 1998 would have developed into a further natural decline in 1999 even without the Media Campaign or whether the upward trend seen in 1992-

1997 would have resumed. Analysis of the trends in themselves can not yield definitive information about the effectiveness of the Media Campaign. Analysis of trends needs to be combined with analysis of exposure and the association between exposure and outcomes.

3.   ROLE OF PHASE III EVALUATION SURVEYS

Given that the simple extension of existing time series will not provide sufficient information to draw conclusions about the effectiveness of the Media Campaign, a new survey has been designed and is now in the field. This chapter provides information about this new survey. This chapter also discusses the complementary roles of the new and existing surveys in the overall evaluation.

The chapter opens with a review of the goals of the evaluation. The next section discusses a theoretical model for the Campaign and how it might work. This is important because the theory has testable implications: the new survey was designed to measure phenomena in society that should occur if the Campaign is working as intended. The third section provides a broad view of the evaluation strategy. The fourth section describes the new survey that was designed specifically to evaluate Phase III of the Campaign—the National Survey of Parents and Youth (NSPY). The fifth section discusses how this new survey fits into the evaluation strategy. The sixth section gives projections of power for statistical analyses given planned sample sizes and other aspects of the sample design. The seventh section talks about the structure and timing of future reports. Finally, the last section provides a summary of the benefits of the new survey.

3.1   WHAT THE EVALUATION WILL ACCOMPLISH

As discussed in Chapter 1, the Media Campaign seeks to educate and enable America's youth to reject illegal drugs; prevent youth from initiating use of drugs, especially marijuana and inhalants; and convince occasional users of these and other drugs to stop using drugs. It is the task of the Evaluation of the Media Campaign (Evaluation) to determine how successful the Media Campaign is in achieving these goals and to provide ongoing feedback useful to support decisionmaking for the Media Campaign.

Although there are literally hundreds of questions that the Evaluation can and will answer, four overarching questions will form the central focus of the Evaluation: (1) Is the Media Campaign getting its messages to the target populations? (2) Are the desired outcomes going in the right direction? (3) Is the Media Campaign influencing changes in the outcomes? (4) What do we learn from the overall Evaluation that can support ongoing decisionmaking for the Media Campaign?

The range of additional questions that will be answered is indicated by the following five major objectives for the Evaluation:

1. To measure changes in drug-related knowledge, attitudes, beliefs, and behavior in youth and their parents;

2. To assess the relationship between changes in drug-related knowledge, attitudes, beliefs, and behavior and their association with self-reported measures of media exposure, including the salience of messages;

3. To assess the association between parents' drug-related knowledge, attitudes, beliefs, and behavior and those of their children;

4. To assess changes in the association between parents' drug-related knowledge, attitudes, beliefs, and behavior and those of their children that may be related to the Media Campaign; and

5. To assess the extent to which community-based drug prevention activities change in response to the Media Campaign and how these changes relate to changes in the other objectives.

The circumstances of the Media Campaign present a serious challenge to evaluation. It is not possible to use experimentation to evaluate the Media Campaign. Experimentation would require conducting the Media Campaign in a random sample of media markets. This was ruled out as antithetical to the Campaign goal of reaching out to all youth across America to help them avoid drug problems. Instead of using experimentation to create sharp random variation in exposure to the Media Campaign, we will try to evaluate the Campaign by studying natural variation in exposure to the Campaign and how this variation appears to correlate with phenomena predicted by the theoretical model for the Campaign. This means comparing groups of people with high exposure to other groups with low exposure. If such groups can be found, then it will be critical to see if the groups with different levels of exposure also have different levels of drug-related traits predicted by theory. Examples of traits predicted by theory are beliefs, attitudes, perceptions of social norms, feelings of self-efficacy, intentions for future behavior, and behavior itself.

We are planning on looking for variation across media markets, variation across time, and variation within media markets at a single time. Variation across media markets could be caused by use of local media or by variation in viewing habits. Variation across time could be caused deliberately by the Campaign operators or as a result of unexpected difficulties in Campaign implementation (such as in creating the ads or in buying the space for them).

Variation across individuals could be caused by differences in viewing habits, differences in the speed of channel surfing during commercial breaks, and differences in memory of the respondents. Due to the fact that the Campaign operators are trying very hard to eliminate variation in exposure, we might not succeed in finding any such variation. Nonetheless, we have designed the survey to make it very sensitive to variation in exposure.

If groups are indeed found with different levels of exposure to the Media Campaign, it will be necessary to study whether there were any pre-existing differences between the groups that might explain both the variation in exposure and any variation in outcomes. To be prepared for this, we have designed the new survey to include many questions on personal and family history.

3.2   MODELS FOR HOW THE MEDIA CAMPAIGN MIGHT ACHIEVE ITS OBJECTIVES

We have developed an overall model of Media Campaign influence, which we present largely in the form of four figures. Three of these figures focus on influences on youth drug use and one focuses on influences on parents' actions with regard to their children's drug use. In elaborating on this model, we rely on two foundations: basic theories and evidence about influences on drug use and basic theories and evidence about health behavior change. In addition, we lay out, in text form, five distinct models for the way the Media Campaign might operate. These reflect current thinking in public health communication theory. These Media Campaign effect models will drive the process of data collection and analysis.

Figure 3-1 presents the overall model of effects. It includes the model for Media Campaign influence in broad outline and names the categories of external variables likely to influence the process. All of the Media Campaign activities (advertising, work with partnership organizations, encouragement of parent and peer conversations about drug use) are intended to increase youth exposure to anti-drug messages. The process through which these activities will produce exposures is laid out in Figure 3-2. Those exposures are meant to produce changes in young people's thinking about drugs, their perceptions about what others expect them to do, and their skills to resist drugs. These influence paths are laid out in some detail in Figure 3-3. In turn, the youth's changed thinking about drugs is meant to reduce his or her intention to try drugs or to graduate from trial to occasional or regular use of drugs.

Figure 3-1
Overall model of Media Campaign influence

```
                                                          ┌─────────────────┐
                                                          │ Factors that    │
                                                          │ directly        │
                                                          │ affect drug use │
                                                          │ (e.g., price,   │
                                                          │ accessibility,  │
                                                          │ arrest risk)    │
                                                          └────────┬────────┘
                                                                   │
┌──────────────┐   ┌──────────────┐   ┌──────────────┐   ┌──────────────┐   ┌──────────────┐
│ NYAMC        │   │ Exposure to  │   │ Briefs,      │   │ Intentions   │   │ Use of drugs │
│ activity     │──▶│ anti-drug    │──▶│ social       │──▶│ to use drugs │──▶│              │
│ (including   │   │ messages     │   │ expectations,│   │              │   │              │
│ direct media,│   │ from a       │   │ skills, and  │   │              │   │              │
│ community    │   │ variety of   │   │ self-efficacy│   │              │   │              │
│ organizing,  │   │ sources      │   │              │   │              │   │              │
│ parent and   │   │              │   │              │   │              │   │              │
│ peer sources)│   │              │   │              │   │              │   │              │
└──────────────┘   └──────────────┘   └──────────────┘   └──────────────┘   └──────────────┘
                          ▲     ▲            ▲                  ▲
                          │     │            │                  │
                          └─────┴────────────┴──────────────────┘
                                      │
                  ┌───────────────────────────────────────────────────┐
                  │ Exogenous factors: demographics, prior behavior,  │
                  │ family and peer factors, personal factors. May    │
                  │ have direct effects or influence susceptibility   │
                  │ to Media Campaign effects                         │
                  └───────────────────────────────────────────────────┘
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Figure 3-2
Model of influences on exposure to anti-drug messages
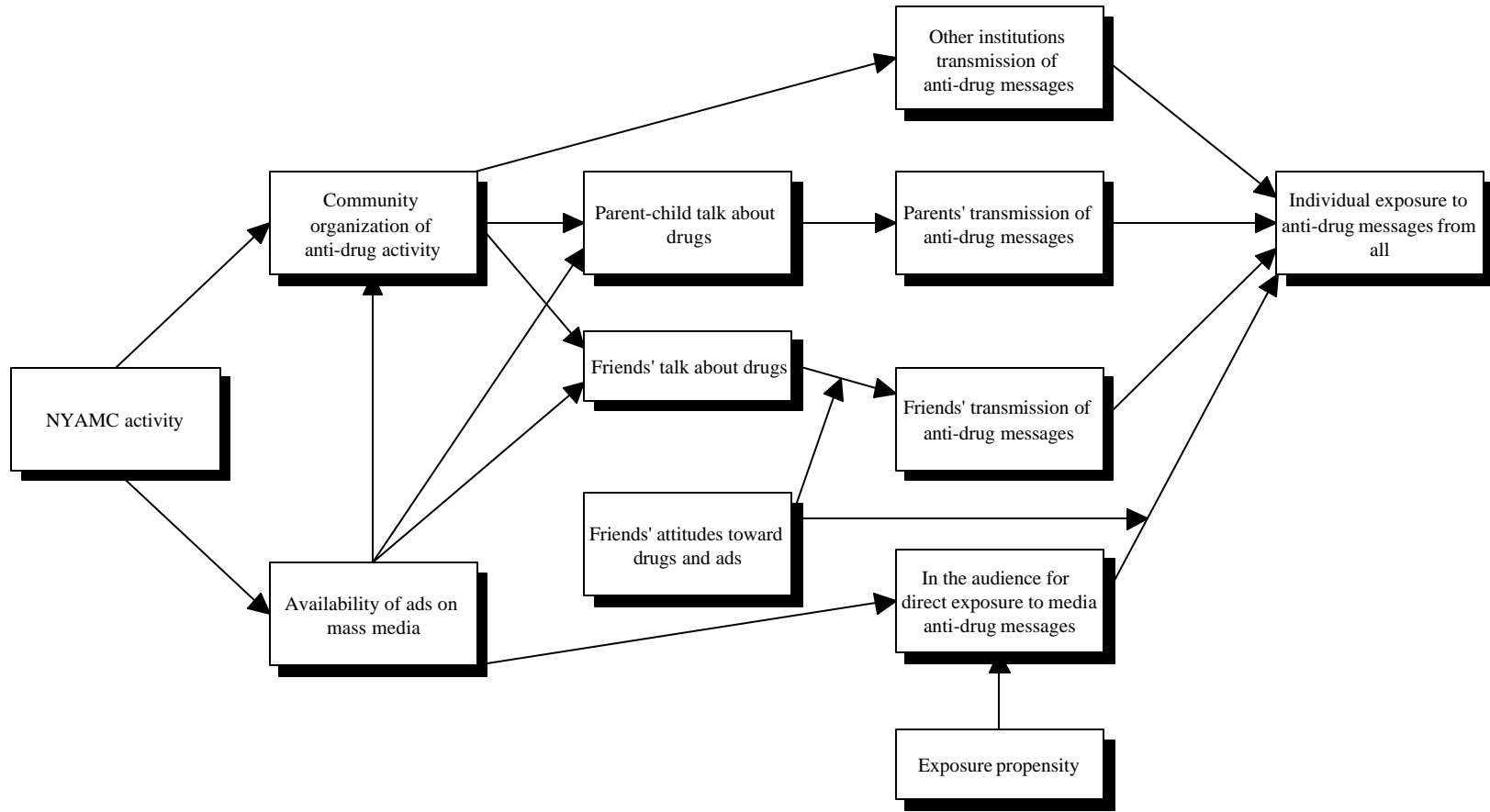
Figure 3-3
Model of influences of exposure to drug outcomes

Knowledge and beliefs about positive and negative consequences of drug use

Overall attitude toward drug use

Factors that directly affect the ability to use drugs given intention: price, accessibility, arrest risk, etc.

Individual exposure to anti-drug messages from all sources

Perceptions of specific others' expectations for respondent's drug use

Overall perceptions of others' expectations for respondent's drug use

Intentions for future drug use

Drug use

Self-efficacy to avoid drug use

Exogenous factors that may influence all variables in this model and may also influence susceptibility to effects of Media Campaign exposure on all belief and behavior outcomes. (Relationships not pictured for clarity.)

| Demographics: gender, age, ethnicity | Family and peer factors: parental monitoring, family functioning, friends' attitudes and behaviors, involvement with youth engaged in risk behaviors | Personal factors: sensation seeking, academic success, ambitions, religious involvement, drug experience |

At the same time, the model recognizes that all elements of the Media Campaign's intended process of influence must operate in the context of a series of other determinants. These are additional factors that will influence drug use or nonuse, and they may also influence respondents' willingness to expose themselves to Media Campaign messages; their beliefs, social expectations, and skills; and their intention to use or avoid drugs. In estimating the size of Media Campaign effects, we will have to control for such potential confounding influences. These potential external factors are summarized in Figure 3-1 and presented in greater detail in Figure 3-3.

These external factors may also influence respondents' susceptibility to Media Campaign effects. The Media Campaign may work well for one group but not as well for another group (e.g., for adolescents with little drug use experience vs. those with substantial experience). These susceptibility or interaction effects are pictured in the figures by arrows that point to other arrows rather than to boxes.

Figure 3-2 elaborates the part of Figure 3-1 that relates Media Campaign activities to an individual youth's exposure to anti-drug messages. It portrays the complex and multiple routes through which the Media Campaign will work. Any one youth may receive anti-drug messages from each of the following four sources.

1.   **Exposure to media messages.** These messages may come from direct exposure to Media Campaign advertisements on television, on the radio, in magazines, on the Internet, on billboards, and elsewhere. Also, youth may be directly exposed to unplanned anti-drug media messages, if, for example, the news media increase their coverage of the issue as the result of Media Campaign activity. A youth's likelihood of direct exposure to media anti-drug messages depends on two factors: first, how often the youth is exposed to that communication medium (for instance, how often they watch television), and second, the number and nature of advertisements that are placed in a given time period and on that medium.

2.   **Interaction with friends and other peers.** Anti-drug messages may come from conversations with friends. These conversations among peers may have been stimulated by with the presence of the Media Campaign, whether by advertisements or by activities undertaken by other organizations. It may be that the youth was involved in the activities or saw the advertisements and introduced the topic; it may be

that his or her friends saw the advertisements and introduced the topic. In either case, the Media Campaign might have activated a social diffusion process that increased the number of anti-drug messages heard by respondents (although below we consider some constraints on this social diffusion of anti-drug messages).

3. **Interaction with parents.** Anti-drug messages may come from parent-child conversations. One of the Media Campaign's early emphases has been to encourage parents' involvement in their children's lives and, in particular, to encourage conversations about drugs and drug use. If the mass media advertisements are successful, there should be more parent-child talk about drugs and thus a greater transmission of anti-drug messages.

4. **Interaction with organizations.** Partnership organizations, including general youth organizations (sports teams, scouts, and religious groups) and anti-drug-focused institutions, are expected to increase their active transmission of anti-drug messages. The Media Campaign intends to work through partnership organizations to encourage local action in support of the anti-drug message. These organizations may reach enrolled youth directly or through parents or peers as intermediaries. The level of activity of partnership organizations may be affected by the presence of the Media Campaign.

An additional idea about the influence of friends is incorporated into the model in Figure 3-2. The Media Campaign may stimulate friends' retransmission of anti-drug messages. However, that is only one possible effect. The Media Campaign may also stimulate discussion that rejects those messages and even reinforces pro-drug messages. We hypothesize in the model that the prior attitudes of friends are an important influence on the valence of message retransmission. We suspect that talk among friends will result in the transmission of anti-drug messages most often when the attitudes of friends are consistent with those messages. Similarly, the way in which youth respond to advertising messages will be influenced partly by the content of the advertisements but also by the way their friends interpret those messages. The model suggests that those interpretations will be partly dependent on the nature of friends' attitudes. Individuals may see or hear Media Campaign advertisements, but they may interpret them as anti-drug messages or as preaching to be resisted (and thus made into pro-drug messages) depending on the stance of their social network.

Figure 3-3 further elaborates Figure 3-1, focusing on how exposure to anti-drug messages might be turned into behavior. The model relies fundamentally on the basic approach of the Theory of Reasoned Action developed by Martin Fishbein and Icek Ajzen, supplemented by the arguments of Albert Bandura concerning the importance of self-efficacy. The model assumes that intention to undertake an action is the primary determinant of whether that action will be undertaken, although external forces (e.g., the price of drugs, their availability, and the risk of arrest) may constrain the transition from intention to action. The model assumes further that intentions are largely a function of three influences: attitudes toward specific drug behaviors, perceptions of how important others expect one to act, and the belief that one has the skills to take an action (called self-efficacy). The overall attitudes are in turn influenced by the youth's beliefs about the expected positive or negative consequences of those behaviors. Perceived social expectations are a reflection of the specific expectations of each group of important others (parents, friends). Finally, the model assumes that exposure to anti-drug messages will influence those beliefs, perceived social expectations, skills, and self-efficacy.

Figure 3-3 provides a full listing of all of the external factors that will be incorporated in the measurement for the Evaluation. These include basic demographic characteristics and a broad category called family and peer factors. These factors include parental monitoring (which is a particular objective of the Media Campaign), family functioning, and friends' attitudes and behaviors (including involvement with others who engage in risky behaviors), all of which have been shown to influence drug use and abstention. The final category encompasses a range of personal factors, including sensation seeking, which, it has been argued, is an important determinant not only of drug use but also of responsiveness to advertising messages of a particular style. In addition, the personal factors category includes academic success, ambitions, and religious involvement (which have been shown to predict drug use and abstention), as well as prior drug involvement (usually the best single predictor of future drug use). As discussed previously, all of these factors may directly influence any of the variables in the central model, and they may predict who is and is not susceptible to Media Campaign influence.

We considered adding additional external variables related to mental health and co-morbid psychiatric conditions but decided against such questions for two reasons. The first reason was the difficulty in measuring such variables well in a self-administered fashion in a reasonable time. The second reason

was the difficulty in establishing causal order because drug use affects psychiatric status.

Figure 3-3 has drug use and non-use as its outcome. However, the use of that general term, and parallel general terms, throughout the model should be understood as merely shorthand. Each particular behavior on which we have chosen to focus has its own set of determinants. The particular focus of the Media Campaign, and thus of the Evaluation, will be the trial use of marijuana and inhalants and the transition from trial to occasional or regular use of these drugs. Those are four distinct behaviors, each with its own specific influences. Thus, for example, belief about the consequences of behavior is a general category that applies to all four behaviors. However, it may be that fear of parental disapproval is a particularly important determinant of the trial use of marijuana, whereas concern about becoming dependent on the drug is a more important determinant of regular marijuana use. Thus, each behavior and its determinants are measured distinctly, although the basic model applied to each behavior is well represented in Figure 3-3.

Figure 3-4 addresses the second strategy emphasized by the Media Campaign—the parent component. The Media Campaign seeks to address three distinct parent behaviors, each of which is modeled separately in Figure 3-4. Each model includes only those variables that will actually be measured by the parent instruments. In choosing which variables to measure, priority was given to the communication objectives for parents.

The parent objectives relate to three parent behaviors, as follows: (1) parent-child talk about drugs (both about attitudes toward drug use and strategies for resisting drug use), (2) parental monitoring of youth behavior, and (3) support for community anti-drug activity. Given their relative importance in the Media Campaign, the models for the first two behaviors are presented in greater detail. In all models, we have used a box labeled "NYAMC activity" without further elaborating the process, although the elaborated version might look a good deal like a modified Figure 3-2. Most of the questions in the parent interviews will focus on a particular reference child or children who will also be interviewed. We will be able to compare responses to common questions for parents and their children.

Model A in Figure 3-4 describes a limited set of determinants for parental monitoring behavior. The new survey will include measures of past and intended monitoring behavior. We will measure only two of the determinants of intention: attitudes toward monitoring and self-efficacy to engage in

monitoring. In turn, and consistent with basic health behavior theory, attitudes are seen as related to beliefs about the consequences of such monitoring. We divide those consequences into two parts: drug-related consequences (whether the parent thinks that the degree of monitoring will affect a child's drug use) and other consequences (including expected effects on the relationship between parent and child). We understand that a decision to increase monitoring may be seen by a parent as having both positive and negative consequences. Media Campaign activities are presumed to affect both beliefs in the positive consequences of monitoring and the self-efficacy of parents to engage in monitoring behavior. As we follow the sample youth over time in NSPY, we will also be able to examine the extent to which Media Campaign exposure predicts changes in monitoring behavior. There are other external variables that we will not measure such as intensity of maternal participation in the labor force. We will instead assume that these factors may be adequately summarized by past monitoring behavior when studying intentions and actual future monitoring.

Model B in Figure 3-4 describes a more complete process for the influence of the Media Campaign on parent-child talk about drugs, which is expected to be the parent behavior most emphasized by the Media Campaign. We separate talk into two types of conversations: those dealing with drug use in general and those involving talk about specific strategies and skills for avoiding drug use. We recognize that both are targets for the Media Campaign, but one may occur independently of the other. Intentions for future talk are seen as the product of attitudes toward talking, self-efficacy to engage in talking, and general social expectations about whether one ought to talk with one's child about drugs. The attitudes are presumed to reflect three types of beliefs: belief that drug use has negative consequences for the reference child, belief that the reference child is at risk for drug use, and belief that parent-child talk is likely to discourage drug use by the reference child. General social expectations are hypothesized to be a function of the specific social expectations of others (friends, spouse, other family members, and the child him- or herself) that the parent talk with the child. Media Campaign activity is presumed to affect all of the beliefs, self-efficacy, and specific social expectations for conversation about drugs.

Model C in Figure 3-4 focuses on parents' actions to support community anti-drug activities. Although it is important to measure this outcome behavior, none of the process variables that may lead from Media Campaign activity will be specifically measured.

Figure 3-4A
Effects of parental monitoring
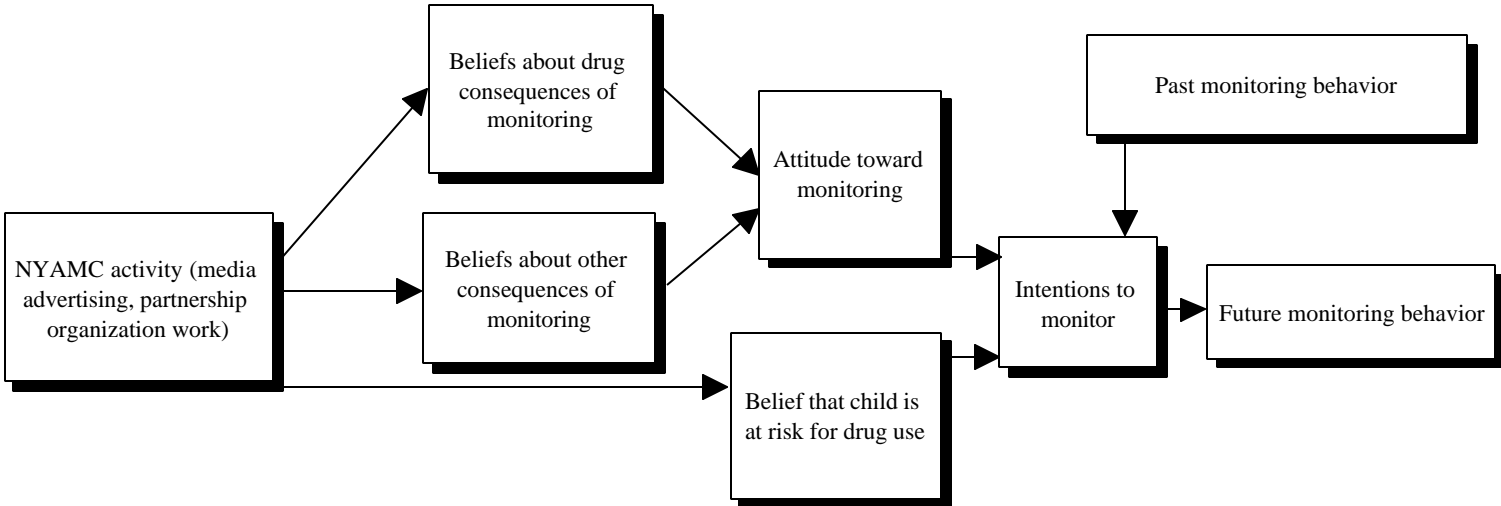
**Figure 3-4B
Effects on parent-child talk**
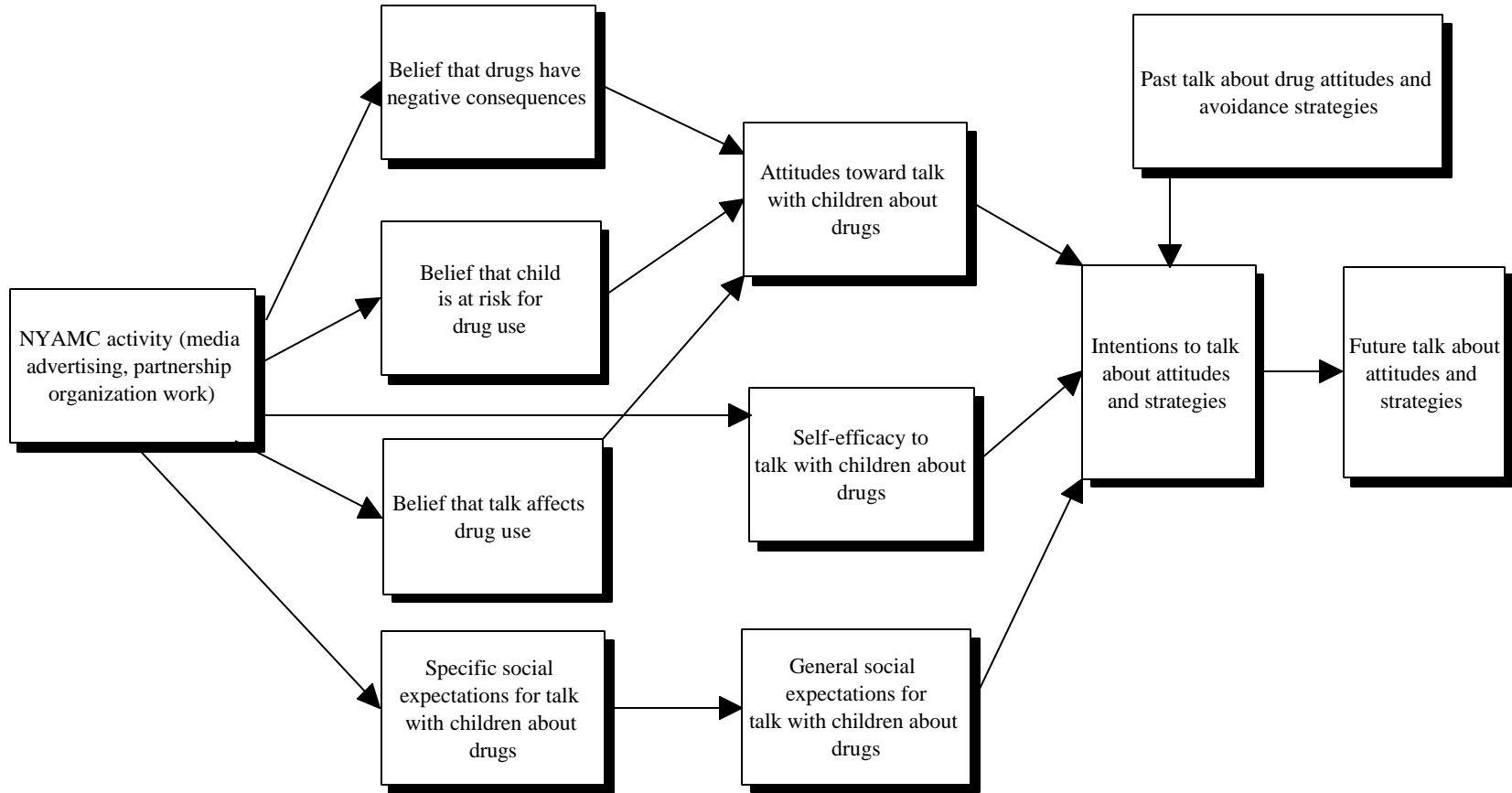
Figure 3-4C
Effects on parental support for community anti-drug activity

NYAMC activity (media advertising, partnership organization work)

Awareness of local activities

Attitudinal support for local activities

Actions to support community anti-drug activity
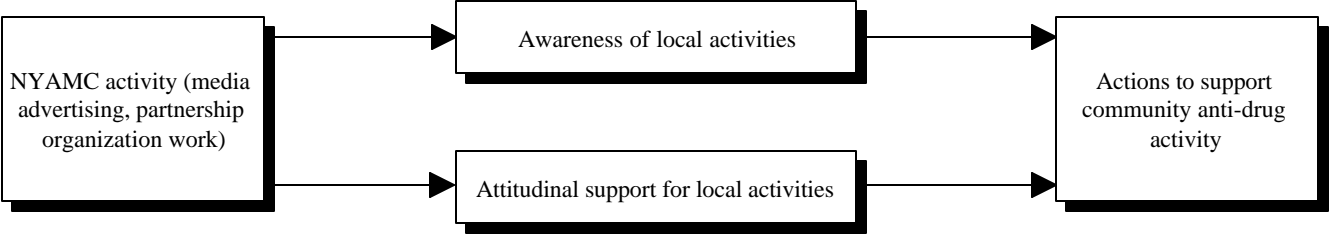
Although many external factors will be influential in all three models, we have left them out for ease of presentation. However, we will measure a range of demographic variables (gender, ethnicity, age, educational background, and marital status) and also use some of the variables measured in one of the models as external factors in the other models. For example, a respondent's drug use history is likely to influence how he or she talks with a youth about drugs in response to the Media Campaign.

The models cannot easily portray some additional ideas about how the Media Campaign may produce its effects. We present five overlapping routes through which the Media Campaign may affect behavior. These routes overlap with the models presented in the figures, but they allow us to bring in three additional factors difficult to portray in the figures. First, it is possible that there will be time lags between the Media Campaign activities and their effects. Second, it is possible that the effects are realized through social interactions and institutions instead of (or in addition to) being realized through personal absorption of media messages. Third, it is possible that messages directed toward a specific belief or behavior will generalize to other beliefs or behaviors. The five routes are summarized below.

1. **Immediate learning.** As a direct result of the advertisements, youth immediately learn things about specific forms of drug use that lead them to make different decisions about those forms of drug use. For example, they learn that trying marijuana has bad consequences so they are less likely to try marijuana (but this belief does not generalize to other drugs). This new learning could have immediate consequences, which would be expected to show up in simultaneous associations of exposure with beliefs and behavior. The following are among the things that youth may learn:

    (a) Consequences of (particular) drug use for themselves: negative consequences (poor grades, loss of friendships, parents' anger, etc.) but also positive consequences (stress reduction, admiration of peers, etc.);

    (b) Social expectations about drug use: whether important others expect them to try, use, or avoid drugs, and whether they perceive that important others are trying, using, or avoiding drugs; and

    (c) Skills and self-efficacy with regard to skills: whether youth possess the skills to avoid drug use if they wish to and whether they believe they can successfully engage those skills to avoid drug use.

2. **Delayed learning.** As a direct result of the advertisements, youth learn things that lead them to make different decisions about drug use *at a later time*. The advertisements might have a delayed impact; their influence will show up immediately in associations between exposure and affected beliefs, but current exposure will predict only subsequent behavior. This might be particularly true for 9- to 11-year-olds (and possibly for 12- to 14-year-olds), where current learning would be expected to influence future behavior, when opportunities to engage in drug use increase.

3. **Generalized learning.** The advertisements provide direct exposure to specific messages about particular forms of drug use, but youth learn things that lead them to make decisions about drug use in general. Thus, if they learn that cocaine has a particular negative consequence or that medical authorities are opposed to cocaine use, they may generalize those cognitions to a broad negative view of other types of drug use. From the perspective of the Evaluation, this generalized learning would mean that exposure effects are not message specific and will not necessarily operate through an intervening path of acceptance of the specific consequences emphasized. This seems particularly likely among younger children, who may read the meta-message of the barrage of advertisements as saying that drug use is bad but without learning an elaborate set of specific rationales for that attitude. We will develop exposure scales reflecting both generalized and specific learning.

4. **Social diffusion.** The advertisements stimulate discussion among peers and between youth and parents, and that discussion affects cognitions about drug use and subsequent drug use. The discussions may provide new information about consequences or social expectations, as well as new skills or self-efficacy. That information may be derived directly from the advertisements or merely stimulated by the presence of the advertisements regardless of their particular messages. Discussions may take place between individuals who have seen the advertisements and those who have not; thus, the effects would not be limited to those who have been personally exposed to or learned things from the advertisements. The discussions may produce or reinforce anti-drug ideas, or they may produce pro-drug ideas (reactance). From the perspective of the Evaluation, this effect transmission may occur even though individual youth who are personally more or less exposed do not show different levels of beliefs or behavior.

5. **Institutional diffusion.** The presence of the advertisements (and the other elements of the Media Campaign) produces a broad response among other public institutions, affecting the nature of what they do with regard to drug use. In turn, institutional actions affect youth cognitions and social expectations about drug use and their own drug use behavior. Thus, Media Campaign activities may stimulate concern about drug use among school boards and lead them to allocate more time to drug education. Religious, athletic, and other private youth organizations may increase their anti-drug activities. News organizations may cover drug issues more actively, and the nature of their messages may change. Popular culture institutions (movies, music, entertainment television) may change the level of attention to and the content of drug-related messages. Like the social diffusion route, institutional diffusion does not require an individual-level association between exposure and beliefs or behavior. From the perspective of the Evaluation, we would expect to see a relatively long lag between Media Campaign activities and institutional response and an even longer lag until the effects on youth beliefs or behavior become apparent.

Measuring the effects of institutional diffusion will be difficult because of plans to create a very even exposure across all markets. Nonetheless, we may be able to capture such effects if we are able to show that (a) there are increases in parent or youth reports of drug programs in institutions in which they are involved and (b) there is evidence that involvement in such institutions is associated with drug-related outcomes. The measurement procedures, data collection plans, and data analytic strategies for the Evaluation are intended to capture effects occurring through any of these routes. However, we recognize some risk that these methods and strategies will not be adequate to address all five routes. In that case, we must at least ensure that the Media Campaign is not declared a failure on the basis of approaches capable of capturing only one of the routes. In general, the approach of the Evaluation will be to capture evidence consistent with each route (recognizing that, without a control group, we will be unable to eliminate all alternative explanations for outcomes consistent with the proposed causal routes).

3.3   QUESTIONS TO BE ANSWERED BY THE EVALUATION

As was previously stated, four overarching questions will be the central focus of the evaluation: (1) Is the Media Campaign getting its messages to the target

populations? (2) Are the desired outcomes going in the right direction? (3) Is the Media Campaign influencing changes in the outcomes? (4) What do we learn from the overall Evaluation that can support ongoing decisionmaking for the Media Campaign? Each question is discussed in turn in the following sections.

3.3.1   Is the Media Campaign Getting Its Messages to the Target Populations as Intended?

Most public communication campaigns fail for the simple reason that their messages do not reach enough members of the target population often enough. Before looking for evidence of change in outcomes or trying to make causal inferences about the effects of the Media Campaign, we must be able to show evidence of high levels of exposure to Media Campaign messages. Did the target populations receive the message—repeatedly—over the duration of the Media Campaign?

The Media Campaign is a complex affair (as presented schematically in Figure 3-2). It seeks to ensure that anti-drug messages come from many sources. Although the largest single investment of the Media Campaign will be to purchase advertising in the mass media, the media represent only one subset of the major channels for anti-drug messages. Mass media channels are to be complemented by increased anti-drug messages from other community institutions and from interpersonal sources. The Evaluation must describe the amount of exposure youth and parents have to anti-drug advertising on radio, on television, and through other mass media; it will also describe youth exposure to Media Campaign messages on the Internet and parental exposure to Media Campaign messages in newspapers. Respondents in the new survey will be asked about general levels of perceived frequency of ad viewing and whether they recall individual advertisements. For some of the ads that they report seeing, they will also be asked about their reactions to the ads. The recall and assessments of individual ads will be accumulated as indicators of overall exposure to the Media Campaign. Ads will be shown in English and/or Spanish, depending on the languages in which the person watches TV and listens to the radio.

Youth will also be asked to recall drug-related conversations with peers and parents, including information about the content of recent conversations. Parents will be asked to recall conversations with their children. Both will be asked whether Media Campaign advertising was a topic of their conversations.

A unique feature of our evaluation plan is the fact that we will have data from specific youth and their parents, allowing us to determine whether parent and youth reports are consistent.

Youth will report on their participation in a wide range of in-school and out-of-school activities and whether or not they involved specific drug education/information activities. Respondents in the community cohort study will be asked for additional evaluations of those drug-related programs.

The Evaluation will also collect information on the following susceptibility factors: sensation seeking, parental monitoring, family functioning, friends' attitudes and behaviors, involvement with youth engaged in risk behaviors, gender, age, ethnicity, drug experience, academic success, ambitions, and religious involvement. These variables will allow us to determine the extent to which exposure is shared across the entire target population.

We will describe the amount of exposure to anti-drug messages reported by respondents. For some types of exposures, we will be able to point to the influence of the Media Campaign without much fear of contradiction (e.g., for recalled exposure to particular advertisements). However, for exposures such as parent-child conversations about drugs, we will be on shakier ground if we report only an absolute level of conversations, because, to some unknown degree, these conversations will already be occurring before the Media Campaign. Because the first round of NSPY data collection started at about the same time as the launch of Phase III of the Media Campaign (15 months after the start of Phase II), we will have no estimate of the baseline level of conversation.

A claim of Media Campaign influence on parent-child conversations, for instance, would depend on three pieces of evidence: First, that the number of parent-child dyads engaging in conversation had increased over the course of the Evaluation. Second, that discussion of the advertisements was a common theme of such conversations. Finally, that the observed level of conversation was associated with variation over time in the intensity of messages recommending such conversations. Of course, if the Phase III startup of the Media Campaign has some immediate effects on conversation before we begin data collection, we will underestimate Media Campaign effects on conversation.

A final focus of exposure measurement will be to ask about the level of exposure to mass media messages that are not under the direct control of the

Media Campaign. These include two sorts of exposure. On the one hand, the Media Campaign may generate additional coverage in a variety of media that will affect children's (and, to an even greater extent, parents') impressions of the Media Campaign and the drug issue. As examples, the Media Campaign may generate coverage of its activities (including the Evaluation reports) in the news media, the presence of the Media Campaign (through Campaign outreach) may make the news media more attentive to stories about drugs, or entertainment media may incorporate drug concerns into the plots of television series. Such outcomes might reflect active lobbying by the Media Campaign or its partner organizations, or they might reflect more spontaneous responses. In either case, the dose of anti-drug messages available to the population would increase, and we will have to have some measure of these sorts of exposure.

On the other hand, the mass media will also generate messages that do not portray drug use in a negative light. They may suggest some positive consequences of drug use (e.g., medical marijuana initiatives), endorse a laissez faire attitude toward drugs (e.g., legalization efforts), or model casual or other use of drugs (e.g., marijuana scenes in films). Although such pro-drug messages may influence youth behavior, we view the existence of these messages as merely part of the entire background noise of societal forces, including price, availability, interdiction, police activities, and so on. At first, we considered measuring exposure to pro-drug messages, but we have mostly dropped those plans due to limitations on the length of the interviews.

3.3.2   Are the Outcomes Going in the Right Direction?

To achieve the overall goal of reducing youth drug use, the Media Campaign will attempt to change several implicit and explicit intermediate outcomes. Figure 2-3 outlines additional major intermediate outcomes for youth, and Figure 2-4 shows the subset of intermediate and final outcomes for parents. One of the major tasks of the Evaluation will be to document that change in these sets of outcomes is moving in the right direction. For each of the measures detailed in the figures that follow, we will document trends for the entire population and for major youth subgroups defined by the following susceptibility factors: sensation seeking, parental monitoring, family functioning, friends' attitudes and behaviors, involvement with youth engaged in risk behaviors, gender, age, ethnicity, drug experience, academic success, ambitions, and religious involvement.

For youth, the Media Campaign (and, therefore, NSPY) emphasizes two drugs—marijuana and inhalants—and the prevention of two distinct behaviors for each drug—trial use and the transition from a low level of use to more regular use. In addition, we will include some other measures of drug use, including tobacco, and alcohol use behaviors. We will also include some minimal measurement of attitudes and beliefs about other drugs, such as cocaine, heroin, methamphetamines, hallucinogens, and stimulants, as well as tobacco and alcohol. Most of the included measures of intermediate outcomes, however, will focus on marijuana trial and transition to occasional or regular use.

The outcomes that will be measured, often specific to the two target behaviors, assume that the forces affecting decisions about each behavior may be distinct. For example, health concerns may play only a limited role in the decision to try marijuana but may be a much more significant factor in the move from trial use to regular use. Thus, for trial of marijuana, we will measure the following:

- Beliefs about the positive and negative consequences of trying marijuana;

- Perception of others' expectations for respondent's trial of marijuana;

- Attitudes toward trial of marijuana;

- Perception of the social norms of the youth's neighborhoods with regard to trial of marijuana;

- Self-efficacy to resist trial of marijuana if offered; and

- Intentions to try marijuana in a subsequent period.

Similar measurements are used for the hypothesized determinants of the three other behaviors: regular use of marijuana, trial use of inhalants, and regular use of inhalants. The Evaluation will track changes in each of these intermediate outcomes over each measurement wave, with an expectation that all of the cognitions that predict drug use will be moving in a direction consistent with less drug use.

There is one youth communication objective for which we have not yet developed an extended measurement approach: "Enhance perceptions that a drug-free lifestyle is more likely to lead to a variety of positively valued consequences." In order to develop a distinct behavior for "living a drug-free

lifestyle," we would have to assume that youth view a set of nonbehaviors as constituting a unified singular positive behavior. The background literature does not provide support for the notion that this is how youth view their behavior. However, we *can* measure the construct by viewing it as the opposite of using drugs; we can characterize youth as living a drug-free lifestyle if they are nonusers of all drugs, tobacco, and alcohol. Finally, we will use the combined intention and belief questions concerning marijuana and inhalants to characterize the beliefs and intentions of youth who reject all drug use.

For parents, we will focus on four primary target behaviors: closer parental monitoring of children; parent-child talk about drugs; reduction in personal drug use; and, to a lesser extent, support for community anti-drug activity. As suggested in Figure 3-4, there are more or less elaborate models of the determinants of those outcomes. These models are more elaborate for the central target behaviors that fall under the category of effective parenting: parental monitoring and parent-child conversations about drugs (see Figure 3-4, Models A and B). We will measure beliefs about the consequences of drug use, perceptions of the risks of drug use for their children, attitudes, social expectations, and self-efficacy to engage in the target behaviors and intentions. The measures of determinants are more limited for the behaviors of support for community anti-drug activity and personal drug use (see Figure 3-4, Model C).

3.3.3   Is the Media Campaign Influencing Changes in the Outcomes?

The question of whether the Media Campaign is influencing changes in outcomes is fundamental to the Evaluation. The following subquestions will be answered in assessing the Media Campaign's impact on youth and parent behavior and attitudes.

■   Is there evidence that youth who report higher levels of exposure to anti-drug messages from each source and from all sources are more likely to show desirable outcomes compared to youth reporting lower levels of exposure? Are youth with higher levels of exposure more likely to exhibit anti-drug knowledge, beliefs, social expectations, attitudes, self-efficacy, intentions, and behaviors?

■   Does youth response to the Media Campaign differ according to the subgroups defined by susceptibility factors (sensation seeking, parental

monitoring, family functioning, friends' attitudes and behaviors, involvement with youth who engage in risk behaviors, gender, age, ethnicity, drug experience, academic success, ambitions, and religious involvement)?

- Are parents' reports of exposure to anti-drug messages associated with the desired beliefs, social expectations, attitudes, self-efficacy, intentions, and behaviors?

- Are parent-child pairs who report higher levels of Media Campaign exposure more likely to undertake recommended parent-child interactions?

- In communities where the Media Campaign has achieved a larger presence (e.g., because the local media have been used more intensively or because community institutions have taken a greater role in anti-drug activity), is there evidence of greater achievement of Media Campaign objectives?

- For the entire sample or important subsamples, is there evidence over time that the initiation of the Media Campaign or changes in the intensity of the media activities are associated with notable changes in desired outcomes?

Section 3.5 provides more detail on how these questions will be answered.

3.3.4 What Do We Learn from the Overall Evaluation That Can Support Ongoing Decisionmaking About the Media Campaign?

The Evaluation will provide large amounts of ongoing trend information concerning exposure achieved and movement in the entire range of outcomes. This information will be valuable in helping Media Campaign planners to track the progress of the Media Campaign. For example, it will allow them to determine whether specific ideas contained in the advertising are being absorbed. If advertisements suggest that parent-child talk has a particular benefit—reducing the likelihood that a youth will try drugs—information from the survey will indicate whether parental belief in that benefit is increasing as expected.

In addition to this straightforward tracking information, the Evaluation will provide two other major types of ongoing feedback to serve the Media

Campaign: information about advertisement recall and suggestions for promising foci for messages.

We will have detailed data on which advertisements are best recalled and how respondents reacted to those advertisements. The plan is to ask representative samples of respondents in a specific target population for their reactions to all radio and television advertisements given substantial national play. We will provide both absolute levels of recall and response to advertisements and, over time, provide comparisons against a standard defined by typical recall and reaction to advertisements. It will be possible to associate advertisement recall and reaction with both levels of intended media buys and data for the level of actual play for specific advertisements.

The data about individual advertisements will be available only after the advertisement has been on the air for a fairly extended period. Thus, information about the recall of specific advertisements may not be helpful to the media planners because these advertisements may already have run their course. However, the advertisements will be organized according to their objective, with regard to both behavior outcome strategy and underlying message strategy (negative consequences, normative beliefs, resistance skills, etc.). The reports will thus describe responses to classes of advertisements rather than to specific (possibly dated) advertisements.

Where sample sizes permit, we will assess differences in responses to advertisements among the subgroups defined by the susceptibility factors (sensation seeking, parental monitoring, family functioning, friends' attitudes and behaviors, involvement with youth engaged in risk behaviors, gender, age, ethnicity, drug experience, academic success, ambitions, and religious involvement). Special attention should be given to sensation seeking, which has been identified as an important factor in defining responsiveness to advertising (Donohew, Sypher, and Bukoski, 1991).

The Evaluation will also examine the association of particular beliefs about consequences (and other cognitions) with the desired outcomes to assist Media Campaign planners in choosing the focus for future messages. In general, campaign messages are more likely to be successful when directed to beliefs that (1) are already credible for some part of the population, (2) are likely to be open to change, and (3) are substantially associated with the target behavior. To influence rates of marijuana trial, for example, Media Campaign planners might be considering messages that focus on either the health consequences of marijuana use or the risk of upsetting one's parents. One

criterion for choosing between potential messages is the extent to which they are predictive of the target behavior. If intention to try marijuana were associated with the risk of upsetting one's parents but not fear of health consequences, it would make sense to target messages to the risk of upsetting parents (assuming that such messages were credible to the target audience). We expect to report to Media Campaign planners the nature of the associations of beliefs (and other cognitions) with recent behavior and future intentions.

3.4   A DESCRIPTION OF THE NATIONAL SURVEY OF PARENTS AND YOUTH

3.4.1   Sample Design

The National Survey of Parents and Youth (NSPY) has a two-phase design where the first phase recruits a sample of eligible youth and their parents and the second phase follows them for two or three additional interviews at 1-year periods. The recruitment phase is broken into three national cross-sectional surveys or waves that each last about 6 months. Together, the first three waves will involve approximately 5,170 baseline interviews with parents and primary caregivers of youth aged 9 to 18 and 7,265 baseline interviews with their children and wards. Recruitment started in November 1999.

The followup phase begins during the third wave of recruitment and lasts through June 2003.   Youth who move within the same metropolitan area will be followed. Parents will also be re-interviewed although some may be reselected in the event of separation or custody shifts. Combining the recruitment and followup phases, there will be seven 6-month waves from which national semiannual estimates will be prepared. This organization of the sample is depicted in Figure 3-5.

Sample sizes for each of the three targeted youth age ranges: 9 to 11, 12 to 13, and 14 to 18 years are shown in Table 3-1. Initially, the sample sizes for the three domains will be comparable in size, but as the children age, the age distribution will drift upward. These sample sizes will provide good power for detecting annual changes. See Section 3.9 for the details of statistical power.

Figure 3-5
Recommended sampling and setup plan for NSPY

Wave

1	A1	B1

2   C2

3   A3   D3

4   B4   C4

5   A5   D5

6   B6   C6

7   A7   D7
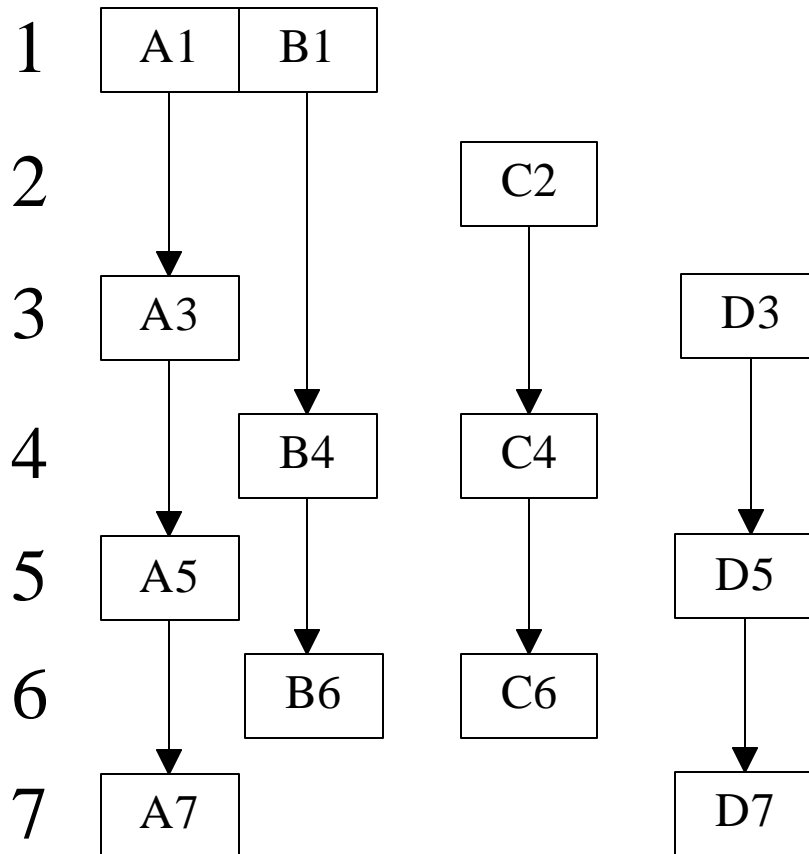
Arrow indicates tracking and followup interviews of sample youth and parents.
Movers would be followed within original PSU and nearby areas.

Table 3-1
Overview of the NSPY sample

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Total
Sample households	2,300	1,500	2,340	2,275	2,070	2,055	1,870	14,405
Parents	2,300	1,500	2,340	2,275	2,070	2,055	1,870	14,405
Youth 9-11 years	1,050	810	1,050	805	600	380	215	4,905
Youth 12-13 years	1,020	605	935	905	775	765	710	5,715
Youth 14-18 years	1,165	695	1,275	1,425	1,445	1,615	1,550	9,170
Total youth 9-18 years	3,230	2,110	3,260	3,140	2,815	2,765	2,475	19,790
Interviews of all types	5,530	3,610	5,600	5,415	4,885	4,820	4,340	34,200

NSPY has a number of features that are new or unique among national surveys in this field: (1) Each youth will be paired with a parent allowing a direct examination of aspects of parent/youth relations and collection of family history data. (2) Data will be collected using an audio-computer-assisted self-interview (ACASI) system, increasing the reliability of the survey and permitting each respondent to view and listen to actual examples of media messages when being asked exposure questions. (3) Interviews will be conducted in either English or Spanish, including the ACASI sections. (4) Although parents will be allowed to be present while the survey is taken by their child, they will be asked not to look at the display screen, in order to preserve their child's sense of the confidentiality of his/her responses. In the case of parents who refuse this condition, the parent-youth pair will be excluded from the study. (5) Youth as young as 9 will be interviewed. (6) Three or four observations will be made on each youth and parent, permitting measurement of change in personal attitudes and behavior and the regression of personal change on cumulative exposure to the Campaign. (7) Data on parents will not be restricted to mothers but will also be collected directly from a sample of fathers and stepfathers.

3.4.2   Measurement of Environmental Influences

Neighborhood data from the 1990 Decennial Census will be merged onto the NSPY interview data. Note that no personal data from the Decennial Census will be used, only aggregate data about neighborhoods. The census neighborhood is known for all NSPY respondents by virtue of the sample selection and coding methods. Although the information is fairly old in 2000,

it is possible that they will still prove to be valuable as confounding variables. Some of the neighborhood characteristics include the following:

■ Racial and ethnic composition;

■ Age composition;

■ Urbanicity;

■ Incidence of noncitizens;

■ Incidence of children living with mother but not father;

■ Moving rate;

■ High school dropout rate;

■ Incidence of linguistically isolated households;

■ Poverty rate;

■ High income rate;

■ Welfare participation rate;

■ Persons per room;

■ Incidence of high-rises, detached housing, mobile homes;

■ Age of housing;

■ Incidence of weekend and vacation homes;

■ Unemployment rate; and

■ Job share by major industry.

In addition, we have the PRIZM[1] code for each segment. This coding system recognizes 62 different types of neighborhoods. This classification has proven to be an effective tool in mass marketing. Since the anti-drug media campaign is a marketing program, it is reasonable to suppose that the clusters might have different reactions to the ads. The PRIZM codes are largely based on 1990

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[1] A trademark of Claritas, Inc.

census data but also reflect some updated information from consumer databases.

In addition to census neighborhood data about potential local factors shaping local drug-related attitudes, we will have information in the youth and parent interviews on participation in local programs. Our NSPY parent questionnaires include items about whether there has been local discussion of a variety of possible events, including school programs, public speeches, new laws, police activities, and ballot issues. Both parent and youth NSPY instruments have questions about youth and parent involvement in school-based local anti-drug activities and about youth involvement in anti-drug activities in performing arts groups, sports leagues, boys or girls clubs such as Boy Scouts and Girl Scouts, religious youth leagues, and other settings.

3.4.3 Qualitative Study of National Organization Leadership and Media Monitoring

Two types of qualitative information will be collected at the national level. This information will be only loosely linked with NSPY but will provide valuable context. One will be a study of the leadership of national youth-orientated organizations. The other will be a study of counts of drug-related stories in the media.

We will conduct open-ended key informant telephone interviews with representatives of up to 25 national organizations involved with the Campaign. The purpose of the interviews will be to ascertain these key informants' views and perspectives on the Campaign, including the degree to which and ways(s) in which Campaign messages and materials may have influenced their organization's prevention activities. Followup interviews will be conducted 2 years later in order to trace any evolution in their perspectives on and relationship(s) to the Campaign during that period.

The list of organizations to be contacted will be decided in consultation with NIDA. It might reasonably include groups such as the Girl Scouts of America, the National Education Association, the YMCA, the Future Farmers of America, and other youth-focused national organizations that have been enlisted to cooperate with the Campaign. Whenever possible and reasonable, the same individuals will be interviewed at both points in time. However, this may not always be possible, or make sense, as there will likely be some turnover in the personnel occupying these positions over a period of 2 years.

In those cases, we will conduct the second set of interviews with individuals in the same or equivalent positions in the same organization.

Separately, there will be a broad monitoring of the media environment. We will document the extent to which drug-related issues were being discussed in the news media doing searches through the Lexis-Nexis electronic database. This will involve generating one or more search terms that were adequate to locate articles that discuss issues of interest. One search term might be designed to capture all news about drugs; others might focus on particular aspects such as enforcement, legalization, treatment, adolescent use, or the Campaign itself. Using those terms, we would then count the amount of coverage on a monthly basis over the several-year period from before the launch of the Phase III Campaign through the field period of the Evaluation.

3.5   USES OF THE NATIONAL SURVEY OF PARENTS AND YOUTH

3.5.1   National Survey of Parents and Youth

NSPY will be used to address each of the questions developed in the previous sections. Comparisons across each 6-month wave will provide extensive information about trends in both exposure and outcome variables. Data from each wave will be analyzed to provide basic information about advertisement recall and to give Media Campaign planners feedback about which beliefs are associated with intentions and behavior. The NSPY data will also be used to determine whether trends in exposures or outcomes differ substantially in subgroups of interest over time.

In addition, we will use the NSPY data to examine associations between individual exposure variables and outcome variables, while controlling for likely confounders (e.g., neighborhood characteristics, demographics, family communication, parental monitoring, peer characteristics, and community characteristics) where appropriate. This can be done both cross-sectionally, using coeval measurements of exposure, outcomes, and confounders and longitudinally, using prior measurements of exposure and confounders and current measurements of outcomes. Information on exposure variables will be derived from the reports of individual respondents. The techniques for controlling for confounders are complex. Preliminary plans for this procedure are given in draft plans that can be requested from NIDA. NSPY can also be used to examine whether associations of exposure and outcome vary with the

characteristics of respondents, their families, or their communities. The fact that the Evaluation will have matched parent data for most youth will be critically important in controlling for confounders. Furthermore, this design feature makes it possible to study the indirect effects of the Media Campaign that are manifested through changes in parental behavior.

During NSPY, approximately 60 parents and 80 youth will be sampled in each of 90 primary sampling units (PSUs) across the three waves of the recruitment phase. These parents and youth will be interviewed two or three additional times, allowing additional measurements about each PSU. The Evaluation will have the capability to supplement the analysis of associations between exposure and outcomes at the individual level with a similar analysis at the PSU level. This analysis will be undertaken to respond to the arguments about alternative paths through which the Media Campaign might work. Specifically, one of those paths incorporates the idea that Media Campaign effects will not be restricted to individuals who are personally exposed to media messages. Rather, it is predicted that effective exposures will be shared and multiplied through social and community networks. This hypothesis suggests that effects might also be shared and that an analysis focusing only on the difference between more- or less-exposed individuals might miss some important effects of the Media Campaign. That argument points to the value of conducting analyses at a level of aggregation higher than the individual. Thus, we might measure overall exposure to anti-drug messages for a particular PSU based on average reports of exposures to all channels through which the Media Campaign will work among each target group of respondents. For some analyses, we might continue to use individual outcome scores, predicted from the aggregate measures of exposure. For other analyses, we might use average outcome measures and the average level of exposure for respondents in the PSU.

This approach raises the additional possibility of using the NSPY data as a longitudinal cohort at the PSU level, because the same 90 PSUs will be measured at each wave. Cumulative exposure to messages from all sources over the longer period might then be used to predict trends in outcomes at the PSU level. Both of these PSU-level analyses are under consideration as analysis methods that might be used. If there is little variation in the Media Campaign across markets, this type of evaluation may not be useful. Until the data are in, we will not be able to determine whether there will be enough reliable variation in exposure across PSUs and over time within PSUs to make this approach viable.

Another type of analysis that will be possible to do with NSPY data is to relate attitudes and behavior to both media consumption and time. If there is significant variation over time in the intensity or content of the Media Campaign and if the Media Campaign does have reasonably strong immediate effects on viewers, then one should see larger swings in the attitudes and behaviors of heavy media consumers than of light media consumers. The Media Campaign contractor will be providing regular reports on the intensity and content of the Media Campaign to the evaluation contractor. If there is sufficient variation, then this type of analysis could be carried out.

Yet another type of analysis that will be possible with NSPY is to use the information on the personal history of drug use among drug users (e.g., age at first use and age at first regular use). These data can be used to determine whether there are changes in the lag between trial and regular use of marijuana. They can also be used to infer levels of marijuana trial usage several years prior to the survey, including for years prior to the Media Campaign. With this approach, time series of marijuana trial could be extended backward.

Finally, it will be possible to use variables on participation in local anti-drug activities to estimate protective effects of such participation while controlling for confounders in the same way as we will look for any protective effects of exposure to the Campaign. If both have protective effects, then there will be the opportunity to study whether these effects can be separated, and if so, whether they have additive effects or whether there are interactions between them.

3.5.2   Qualitative Study of National Organization Leadership and Media Monitoring

These qualitative studies will be used to address questions of institutional mediation of effects that cannot be addressed through NSPY. Using NSPY, we will be able to estimate the protective effect of participation in local anti-drug efforts, but we will be unable to comment on the nature of these programs nor on how they came into existence. The open-ended interviews with the leadership of national youth-oriented organizations will help us shed some light on these issues.

Similarly, using NSPY we will be able to associate reports of awareness of drug-related material in the general media with drug-related attitudes of media consumers, but we will not be able to say much about the causes of any shifts in general media coverage of drug-related issues. The information from media monitoring will allow us to track media coverage over time with Campaign activities in a limited manner.

3.6 POWER OF THE ANALYSES

Power refers to the ability to detect significant differences between groups or significant associations between variables. Power is a vital concern in planning any study since a study with insufficient power cannot find anything. The major factor in a research design that will determine the study's power is sample size. In consultation with NIDA, the Evaluation Team chose to compute power for analyses of annual change in a simple prevalence statistic. For purposes of our power analysis, we chose to assume a baseline prevalence of 20 percent for parents and 10 percent for youth of all ages. We also decided that we would want to be able to reliably detect a downward swing of 3.1 points for parents and 2.3 points for youth within a given age range over a year. Table 3-2 shows the minimum detectable change for each pair of years and for various domains.

Table 3-2 shows the minimum detectable difference for wave-to-wave changes for each domain, where a difference is defined as "detectable" if the power for detecting the difference is at least 80 percent using a one-sided hypothesis test at the 0.05 level. These differences are expressed in percentage points. It would, of course, be possible to detect more subtle effects with less stringent tests such as tests at the 0.10 level. On the other hand, it would only be possible to detect grosser effects for more stringent tests in which the difference at the same 0.05 could be either greater or smaller. One-sided tests were chosen because of the presumption that the Media Campaign will not increase substance abuse rates. These detection limits apply only to downswings from the given baselines. Detection limits for upswings from the given baselines would be different. However, detection limits shown here for upswings from polarized baselines, such as 90 percent for youth and 80 percent for parents, would be identical to those for downswings from 10 percent of youth and 20 percent for parents.

Of course, baseline prevalence other than 20 percent for parents and 10 percent for youth will be of interest. Figure 3-6 shows minimum detectable downswings for Hispanic teens assuming a variety of baseline prevalence figures, all for comparing 1 entire year to the next. These downswings are shown in terms of absolute differences. Corresponding relative differences are shown in Figure 3-7. Results for black teens, parents of Hispanic teens, and parents of black teens are not shown separately but will be very similar given the small differences in effective annual sample sizes shown in Table 3-3. Power for analyses that are not age restricted will be much better given the larger sample sizes but also less useful given age differences.

Another type of race/ethnicity analysis compares the exposure levels for the minority populations with the level for the majority population. For illustrative purposes, consider the case in which the exposure level for a particular component of the campaign is 50 percent for the majority. Table 3-4 presents the minimum detectable differences on annual averages between the racial and ethnic minority populations and the majority population using two-sided significance tests with a 5 percent significance level. The differences for are fairly sizable but such differences may sometimes occur.

Table 3-2
Minimum detectable year-to-year downswing*

2000 to 2001

Race/ethnicity	Parents baseline=20%	Youth baseline =10%	Parents of teens baseline=20%	Teens baseline=10%
Total	2.4%	1.6%	3.1%	2.3%
Black	4.9%	3.1%	6.9%	4.9%
Hispanic	5.3%	3.3%	7.6%	5.3%
Asian/Pacific Islander	8.9%	5.5%	12.3%	8.3%

2000 to 2002

Race/ethnicity	Parents baseline=20%	Youth baseline =10%	Parents of teens baseline=20%	Teens baseline=10%
Total	2.0%	1.3%	2.6%	1.9%
Black	4.0%	2.6%	5.8%	4.2%
Hispanic	4.4%	2.8%	6.4%	4.5%
Asian/Pacific Islander	7.4%	4.6%	10.5%	7.2%

2001 to 2002

Race/ethnicity	Parents baseline=20%	Youth baseline =10%	Parents of teens baseline=20%	Teens baseline=10%
Total	1.9%	1.3%	2.5%	1.8%
Black	3.8%	2.5%	5.7%	4.1%
Hispanic	4.2%	2.7%	6.2%	4.4%
Asian/Pacific Islander	7.1%	4.5%	10.3%	7.1%

* All percentages in the tables are in absolute percentage points.

**Figure 3-6
Minimum detectable downswings for Hispanic
teens from one year to the next**
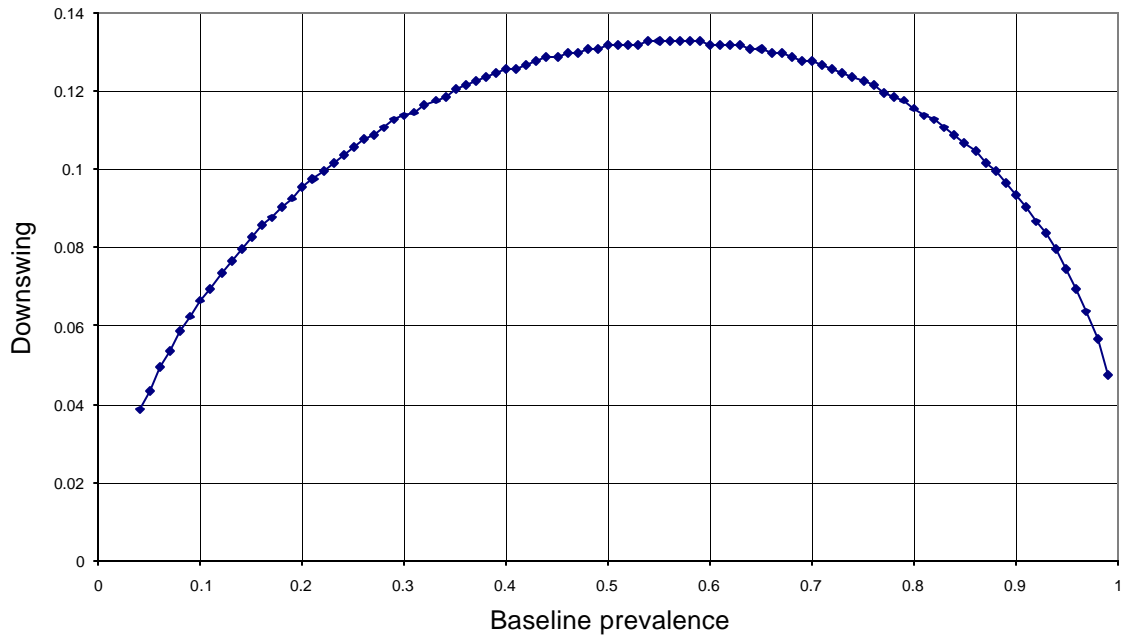
**Figure 3-7
Minimum detectable relative downswings for Hispanic
teens from one year to the next**
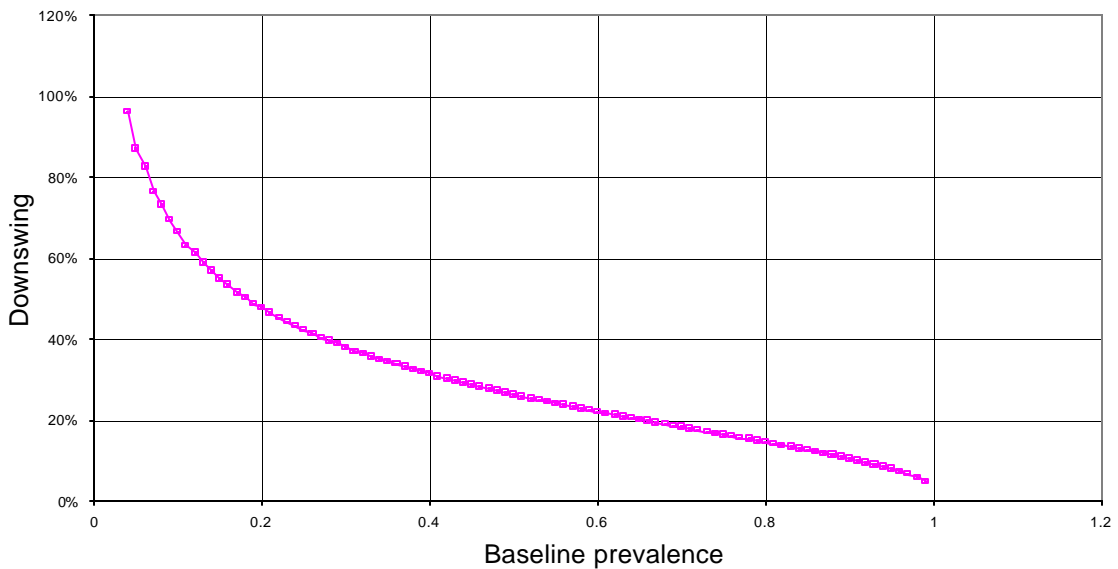
Table 3-3
Sample sizes by domain for 2001

Domain	Nominal sample size	Design effect	Effective sample size
Parents			
Total	4,615	1.95	2,367
Black	716	1.33	539
Hispanic	593	1.32	449
Asian/Pacific Islander	183	1.26	145
Youth			
Total	6,396	2.15	2,975
Black	990	1.38	718
Hispanic	839	1.35	622
Asian/Pacific Islander	253	1.28	197
Teens (aged 12-13)			
Total	1,843	1.31	1,407
Black	283	1.13	250
Hispanic	227	1.11	205
Asian/Pacific Islander	73	1.08	67
Parents of teens			
Total	1,843	1.34	1,375
Black	283	1.16	244
Hispanic	227	1.14	199
Asian/Pacific Islander	73	1.10	66

Table 3-4
Minimum detectable racial/ethnic differences with one wave of data

Comparison[1]	Parents majority @ 50%	Youth majority @ 50%	Parents of teens majority @ 50%	Teens majority @ 50%
Black vs. majority[2]	6.7%	5.9%	9.7%	9.6%
Hispanic vs. majority	7.2%	6.2%	10.6%	10.5%
Asian/Pacific Islander vs. majority	11.9%	10.3%	17.4%	17.2%

[1] Two-sided test with size equal to 0.05.

[2] Majority defined as white and not Hispanic.

3.7   FUTURE REPORTS

The reports from the Phase III Evaluation will include semi-annual reports of the results of the National Survey of Parents and Youth and two special analytic reports, of which this document constitutes the first. The first semi-annual report will be issued in August 2000 and March and September thereafter through September 2003. There will be one more special analytic report which is expected to be issued in March 2004.

3.7.1   Semi-annual Reports

The regular semi-annual reports will address three of the main questions for the Evaluation: what sort of exposure has been achieved, how have outcomes of interest changed over time, and what evidence is there that the Media Campaign influenced changes in those outcomes. Each report will have a series of tables about exposure and outcomes that will repeat over time. The baseline versions of these tables will be established in the August 2000 reports. Subsequent reports will highlight change since the baseline. The exposure tables will include information on different modalities and intensity of exposure. There will also be exposure indices that summarize exposure across various components of the Media Campaign. The outcome tables will include information on beliefs, attitudes, perceptions of social norms, self-efficacy to resist drugs, intentions to use drugs, and actual use of drugs. These tables will include responses to some individual questions, as well as average scores on various outcome scales.

There will be exposure and outcome tables for both children and their parents. The primary repetitions of the basic tables will be on age since the sample was designed to provide large sample sizes for each of three main age groups, 9-11, 12-13, and 14-18. However, there will also be repetitions for other demographic domains. Where the sample sizes for these domains are judged to be too small, the estimates will be suppressed.

In additions to the basic tables designed to measure change over time in exposure and outcomes, there will be tables on the relationship of exposure to outcomes. These tables will build in complexity with succeeding reports. There will be tables in the March 2001 report that focus on the average effects of direct exposure to the total Media Campaign. These tables will show projections of the distributions of youth outcomes that would have occurred if the sampled youth had very little exposure to the Media Campaign. There will also be tables that present parallel analyses for parents, projecting

the distributions of parental outcomes that would have occurred if the sampled parents had very little exposure to the messages of the Media Campaign. By comparing these tables to the actual distributions of outcomes, it will be possible to quantify the average effects of direct exposure to the total Media Campaign. The tables will also show projections of outcome distributions for various levels of success in exposing youth and their parents to the media messages.

A mock version of such a table is shown as Table 3-5. The column for "actual during period" will show the percentages of youth so responding (e.g., agree with the statement, "There is great risk in its trial use of marijuana.") given their actual exposure during the period. Columns 2 through 6 represent our best projection of the percentage of youth that would so respond under conditions of "very low" to "very high" levels of media exposure, taking into account the effect of confounding variables, as discussed in Section 3.5. Hence, the column for "very low" exposure will represent our best projection of the attitudes that would have been held by youth under conditions of very little or no exposure to the Campaign. The idea behind these columns is to show a dose-response relationship.

In the September 2001 report, there will be additional tables that look for more subtle effects—effects that are restricted to special populations and effects that are the result of just special types of exposure (such as just television advertisements or just television advertisements with a specific approach).

In the March 2002 report, the longitudinal data will be used to better separate outcome variables from confounding variables. This may lead to revisions of findings from the earlier reports as we will then have better evidence of effects. In the September 2002 report, the new tables introduced in the March report will be extended without much additional elaboration.

In the March 2003 report, there will be an emphasis on cross-sectional changes from 2000 to 2001 and 2002. Tables on longitudinal causal association will also be extended in this report and in the September 2003 report.

Table 3-5
Effect of exposure to anti-drug advertising on attitudes by youth

Attitude	Percentage of youth holding the attitude when exposure is the following:						Effect (Column 1 minus Column 2)
	Actual during period (1)	Very low (2)	Low (3)	Medium (4)	High (5)	Very high (6)	
There is great risk in the trial of marijuana							
Most youth try it							
I could turn it down							
My parents would be upset							
I would do worse in school							

NOTE: Percent effects are estimated by comparing observed percentages given the Media Campaign (1) to percentages obtained assuming no Media Campaign (2).

Data for period November 1999 - December 2000.

3.7.2   Special Analytic Reports

The second (and final) special analytic report will be issued in March 2004. We expect the report to focus on the indirect effects of the Campaign through parents and institutions. None of the analyses in the semi-annual reports will have been adequately sophisticated to shed light on this question. This is also where protective effects of participation in local anti-drug programs will be studied and whether such effects interact with effects of the Media Campaign. We may also be able to refine some of the earlier analyses by studying the trajectories of youth attitudes and behaviors.

3.8   SUMMARY OF BENEFITS OF THE NEW SURVEY

The new survey is designed to maximize the possibility of attributing any observed successes to the Media Campaign, if indeed it is a success. There are 10 specific ways in which the evaluation design provides an opportunity to attribute success to the Media Campaign that would not be possible with the current data systems.

1.   **Better measures of exposure.** MTF and NHSDA used one or a small number of simple recall measures to capture exposure to anti-drug messages. For example, the MTF Study asked, "The next questions ask about anti-drug commercials or 'spots' that are intended to discourage drug use. In recent months, about how often have you seen such anti-drug commercials, or heard them on the radio?" Respondents were allowed to choose from among six categories of frequency. This question was adequate to capture aggregate shifts in exposure of the entire population, but it may have been insensitive to individual differences in exposure. That may explain why the surveys show minimal associations of reported exposure and attitudes or behavior. The new NSPY survey addresses this in three ways. The survey asks about many channels of exposure in addition to radio and television, including billboards, in-school media, movie advertising, newspapers and magazines and internet. Second, the survey asks respondents to recall exposure to the specific ads which were on the air in the two month period just before the interview, as well as asking about general exposure. Finally, the new survey will use new technology to actually play the TV and radio ads on a laptop computer for each respondent. For respondents who enjoy their media in Spanish, we will also play the Spanish-language ads. This contrasts with other typical measures of

individual ad exposure which rely on brief verbal summaries of specific ads. By expanding and refining measures of exposure we have improved the ability of the evaluation to detect changes in exposure and particularly to establish whether there are credible associations with beliefs and behavior.

2. **Richer measures of beliefs and attitudes sensitive to the specific messages of the media campaign.** The strength of the MTF and NHSDA is that they are stable over a long period. But that very stability mitigates their being sensitive to the specific messages that are being used by the Media Campaign to affect broad attitudes and outcome behaviors. The new survey includes questions which are as up to date as possible detecting acceptance of the specific arguments being made in Media Campaign messages. Thus the Media Campaign has chosen to address parental supervision and involvement in the lives of youth; the Media Campaign has emphasized that it will address expectations about how frequently admired peers use drugs, about specific negative consequences about drugs, like the ability to participate in athletics, or disapproval of important social influencers. The new survey is able to include many of these beliefs, and in a limited way may be able to modify questions over time as Media Campaign messages vary.

3. **Better quality of drug use measures.** To improve the quality of drug abuse data, respondents will enter their drug attitudes into the laptop computer without their answers being observed—either by interviewers or by parents. One of the longstanding theories about why NHSDA usage estimates are lower than MTF estimates is that youth conceal their behaviors from their parents. It is hoped that the extra confidentiality afforded by the headphones and touch-pad screens will encourage more honest answers to sensitive questions. Similar changes were made in the 1999 NHSDA. It is hoped that those changes to the 1999 NHSDA will close at least some of the gap between it and the MTF.

4. **Inclusion of younger children.** The new survey includes youth age 9 to 11, whereas the NHSDA starts interviews at age 12 and the MTF starts at grade 8, when children are usually 13 or 14. Coverage is being started at this younger age with the idea that important attitudes may be formed at younger ages than have usually been studied. (PATS has traditionally also initiated coverage around age 9, using a cutoff of 4th graders.) Coverage will also be extended to high school dropouts. As noted earlier, this is an important portion of the population that is included in NHSDA but excluded from MTF and PATS.

5. **Opportunity to understand the paths of effects.** The conceptual model of the Media Campaign is that anti-drug messages can change knowledge and beliefs, perceptions of social norms, and skills in resisting drugs. In turn, these beliefs would lead to intentions to perform certain behaviors, and intentions would lead to actions. At each step in the process, there are external variables that influence the probability of transition to the next step. These external variables are largely functions of family history, but there can also be external variables that are functions of peer and larger social networks and of individual personalities. The final step of translating intentions into actions also depends on external variables such as drug price and availability. This model led to the development of a questionnaire with a strong focus on questions about beliefs, perceived social norms, self-efficacy, intentions, exposure, and family history. There are also questions on peers and participation in local anti-drug activities (such as those in schools) to capture the moderating impact of broader social networks. With this questionnaire, it will be possible to directly measure the association of exposure with knowledge and beliefs, of beliefs with intentions, of intentions with actions, all controlling for the effects of family history.

6. **Recognition that the Media Campaign may work through different paths.** The Media Campaign may work because individuals are exposed to messages and are convinced about the balance of costs or benefits of drug use and quickly change their behavior. But it may work in other ways, as well. It may work on a delayed basis—so that early exposure (among 9-11 year olds) affects later behavior. It may work because larger social units are exposed to the messages (families, peer networks, neighborhoods, or communities), and regardless of whether the individual child is exposed to the messages, he or she is influenced by the other individuals or institutions. It may work because specific messages about marijuana or inhalants are generalized to other drugs. The evaluation is designed to be able to detect changes that work through any of these paths: immediate or delayed, individual or social, message specific or general.

7. **Better evidence about the social context of effects.** One particularly striking element of the NSPY survey design is the ability to associate each youth with parallel questionnaire responses from one parent. In addition, for about 60 percent of youth we will have also gathered data from one of their siblings. This will permit two major benefits. We will be able to incorporate a much improved set of control variables so that

we can separate the effects of exposure to anti-drug media messages from other influences on a youth's life. In addition, we can understand, in way that has been heretofore impossible, how a campaign that addresses messages to both parents and youth affects their interaction around the issue of drug use. For example, we can understand the extent to which parental message exposures, attitudes and behaviors and discussions with a child about drug use affect the susceptibility of a child to the anti-drug messages from the Media Campaign.

8. **Opportunity to apply more powerful analytic techniques to sort out causal influences.** The first NSPY analysis will focus on youth with similar personal and family backgrounds but different levels of Media Campaign exposure. They will be compared with each other in terms of the strength of their anti-drug attitudes, intentions, and behavior. The quality of the exposure measures and the extensive nature of the background measurements available will allow us to do this with a validity not otherwise possible.

9. **Opportunity to confirm theories of adolescent development.** Cross-sectional associations are useful but leave open questions. An association, for example, between media exposure with desired anti-drug attitudes does not necessarily mean that the advertisements *caused* those attitudes. A positive association could result if youth with strong anti-drug attitudes do a better job of remembering the anti-drug advertisements since the ads conform to their pre-existing views. To address these methodological challenges, the youth will be interviewed two to three times over the study period. By starting at an early age and then following the youth for 2 or 3 more years, the evaluation will be able to observe the development of drug-related attitudes, intentions, and behaviors and how the timing of this development interacts with exposure to the Media Campaign. Although delayed in publication, the longitudinal analyses will provide stronger evidence for causal claims of effects on drug abuse by the Media Campaign since long-term exposure will be measured starting at young ages.

10. **Measurement of local variation in pre-existing conditions and of participation in school and extra-curricular drug-education programs.** The interviews will be matched with local Decennial Census data about the neighborhood to see whether the Campaign is differentially effective in different types of neighborhoods. Also, the interviews will contain questions about participation in local anti-drug

efforts that will offer a competing explanation of interpersonal variation in drug-related attitudes and behavior.

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DETAIL TABLES

LIST OF DETAIL TABLES

Table 1A
Percentages of youth reporting past-month marijuana use by age, race/ethnicity, and gender: NHSDA 1979-1998

| | Interview year | | | | | | | | | | | | | | | | | | | | | | | |
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94Br[a]	94	95	96	97	98[b]
Age																								
18				36.0			27.0			19.8			14.6		10.0	14.0	9.8	12.0	16.7	14.0	13.0	17.1	16.6	18.9
17				33.3			26.5			19.9			11.6		10.4	10.3	8.7	13.1	8.6	13.1	14.4	13.2	17.7	17.1
16				24.1			20.5			22.0			12.0		8.7	7.6	6.8	8.0	9.0	10.6	11.8	12.9	14.9	12.1
15				21.8			13.4			12.5			6.8		7.7	5.1	4.9	5.0	12.5	7.6	11.5	9.5	11.5	11.3
14				11.9			4.4			9.6			2.8		2.1	2.3	2.7	2.6	10.2	2.4	7.9	4.2	7.0	6.3
13				7.6			3.9			6.9			1.9		.6	.5	1.3	1.5	1.9	2.6	3.5	1.2	3.9	2.5
12				.9			-[c]			.2			1.1		.1	.2	.5	.2	*	1.2	.8	1.2	1.0	0.8
Age 12-17 combined				16.8			11.9			11.9			6.4		5.2	4.3	4.0	4.9	7.3	6.0	8.2	7.1	9.4	8.3
Male				19.2			13.0			13.1			6.1		6.0	5.0	4.6	5.5	7.7	6.8	9.0	7.6	10.3	8.6
Female				14.3			10.7			10.7			6.7		4.3	3.7	3.5	4.3	6.9	5.2	7.4	6.6	8.4	7.9
White, non-Hispanic				17.3			11.7			13.0			6.8		5.9	4.4	4.1	4.5	7.3	6.2	8.4	7.3	9.8	8.7
Black, non-Hispanic				16.3			12.1			9.4			4.4		3.4	4.5	3.4	5.8	7.9	6.4	7.6	7.3	9.1	8.3
Hispanic				12.8			*			8.9			5.2		4.3	4.6	4.8	6.7	7.6	6.0	7.7	6.9	8.4	7.6
Other, non-Hispanic				*			*			*			*		.2	1.2	2.9	3.1	*	2.1	9.3	4.3	8.0	4.3
Age groups for comparison with MTF																								
17-18				34.7			26.7			19.9			13.1		10.2	12.3	9.3	12.5	12.8	13.5	13.7	15.3	17.1	18.1
15-16				23.0			17.2			17.5			9.3		8.2	6.3	5.8	6.4	10.8	9.0	11.7	11.2	13.2	11.7
13-14				9.8			4.1			8.4			2.4		1.4	1.4	2.0	2.0	5.7	2.5	5.6	2.8	5.5	4.4
Age groups for comparison with NSPY																								
14-18				25.3			18.4			16.6			9.7		7.9	7.9	6.6	8.1	11.5	9.4	11.6	11.3	13.5	13.1
12-13				4.2			2.0			3.4			1.5		.4	.4	.9	.8	1.9	1.9	2.2	1.2	2.5	1.7
12-18				19.5			14.1			13.1			7.7		5.9	5.8	4.9	6.0	8.8	7.2	8.9	8.6	10.5	9.9

NOTE: NHSDA trends are based on the public use data files. The percentages reported here may differ slightly from reports published directly by the survey programs.

[a] NHSDA survey was redesigned in 1994. A separate bridge sample was conducted with old methods. This column reflects estimates from that bridge sample.

[b] 1998 NHSDA survey results are based upon special SAMHSA tabulations.

[c] Survey estimate was zero, but the true rate was probably positive.

* Estimate suppressed because of poor reliability.

Table 1B
Percentages of youth reporting past-month marijuana use: MTF 1976-1998, PATS 1993-1998

	Interview year																						
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98[a]
MTF																							
12th grade	32.3	35.4	37.0	36.4	33.7	31.5	28.6	27.0	25.2	25.6	23.4	21.0	18.0	16.8	14.1	13.7	12.1	15.5	19.0	21.2	21.8	23.6	22.8
10th grade																8.8	8.1	10.7	15.8	17.3	20.5	20.7	18.7
8th grade																3.3	3.7	5.1	7.8	9.1	11.3	10.2	9.7
PATS																							
11-12th grade																		17		29.3	25.6	31.4	29.0
9-10th grade																		17		20.7	27.0	26.0	25.1
7-8th grade																		10		12.6	14.8	14.5	14.6

NOTE: MTF trends are based on the public use data files. The percentages reported here may differ slightly from reports published directly by the survey programs.

[a] 1998 survey results were taken from published reports.

Table 2A

Percentages of youth reporting lifetime marijuana use by age, race/ethnicity, and gender: NHSDA 1979-1998

															Interview year									
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94Br[a]	94	95	96	97	98[b]
Age																								
18				60.8			59.5			46.1			45.5		34.0	37.8	29.3	30.7	36.6	30.3	31.5	38.7	36.1	39.0
17				57.8			52.2			39.9			32.5		32.3	28.9	25.2	24.6	22.8	28.5	31.6	31.8	35.6	36.1
16				45.5			40.5			39.8			27.7		17.9	23.3	16.6	19.3	20.6	25.1	25.2	29.0	31.0	26.7
15				39.0			32.8			29.6			20.8		20.6	13.4	13.2	14.1	25.2	16.8	20.6	20.8	23.7	21.9
14				23.1			15.8			17.6			8.5		9.7	7.9	6.4	9.5	16.2	7.4	12.6	11.0	13.7	11.7
13				14.8			13.1			9.9			5.8		4.2	2.4	2.5	2.5	7.0	5.2	6.1	4.1	7.0	4.4
12				2.5			*			1.9			2.3		1.4	2.1	1.4	1.7	3.7	1.5	2.9	3.0	1.7	2.4
Age 12-17 combined				30.8			27.1			23.2			17.4		14.8	13.0	10.6	11.7	16.0	13.6	16.2	16.8	18.9	17.0
Male				33.9			28.8			25.2			16.8		15.4	14.7	11.6	12.7	14.2	14.7	17.5	16.5	19.5	17.7
Female				27.6			25.3			21.2			17.9		14.2	11.2	9.6	10.6	17.8	12.5	14.9	17.1	18.2	16.1
White, non-Hispanic				31.5			26.9			24.4			18.2		15.7	13.2	10.8	11.3	15.5	14.5	17.0	17.4	19.6	17.3
Black, non-Hispanic				30.4			26.1			20.3			13.5		12.6	13.7	9.1	10.9	17.8	11.8	13.4	14.6	16.1	14.9
Hispanic				23.3			*			19.1			16.9		14.4	12.1	11.9	15.7	17.2	14.4	15.3	17.2	16.7	18.5
Other, non-Hispanic				*			*			*			*		*	9.5	9.9	9.5	*	3.1	15.9	13.1	23.0	14.3
Age groups for comparison with MTF																								
17-18				59.4			55.9			43.3			38.9		33.2	33.6	27.3	27.9	29.9	29.5	31.5	35.4	35.8	37.6
15-16				42.2			36.9			35.0			24.1		19.2	18.2	14.8	16.5	23.0	20.8	22.9	24.9	27.3	24.1
13-14				19.0			14.5			14.3			7.2		7.0	5.1	4.4	5.9	11.3	6.3	9.3	7.7	10.5	8.1
Age groups for comparison with NSPY																								
14-18				45.1			40.2			34.1			27.6		23.0	22.3	18.1	19.6	24.5	21.3	24.0	26.1	28.0	27.0
12-13				8.5			8.6			5.7			4.2		2.9	2.2	2.0	2.1	5.5	3.4	4.6	3.6	4.4	3.4
12-18				35.1			31.9			26.8			21.8		17.7	16.8	13.3	14.5	19.1	16.1	18.3	20.1	21.5	20.3

NOTE: NHSDA trends are based on the public use data files. The percentages reported here may differ slightly from reports published directly by the survey programs.

[a] NHSDA survey was redesigned in 1994. A separate bridge sample was conducted with old methods. This column reflects estimates from that bridge sample.

[b] 1998 NHSDA survey results are based upon special SAMHSA tabulations.

* Estimate suppressed because of poor reliability.

Table 2B
Percentages of youth reporting lifetime marijuana use: MTF 1976-1998, PATS 1993-1998

	Interview year																						
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98[a]
MTF																							
12[th] grade	52.8	56.3	59.1	60.3	60.3	59.4	58.7	56.9	54.8	54.1	51.0	50.2	47.2	43.8	40.7	36.7	32.8	35.3	38.1	41.7	44.8	49.6	49.1
10[th] grade																23.6	21.4	24.1	30.2	34.3	39.8	42.4	39.6
8[th] grade																10.3	11.2	12.6	16.7	19.9	23.1	22.5	22.2
PATS																							
11-12[th] grade																		36	NA	51.3	49.6	57.9	56.9
9-10[th] grade																		31	NA	39.9	44.8	47.1	45.0
7-8[th] grade																		20	NA	23.9	27.7	27.3	26.8
Age 11-12																		2	NA	2.2	3.3	4.8	5.1
Age 9-10																		1	NA	0.9	1.6	2.0	2.2

NOTE: MTF trends are based on the public use data files. The percentages reported here may differ slightly from reports published directly by the survey programs.

[a] 1998 survey results were taken from published reports.

Table 3A

Percentages of youth reporting past-month inhalant use by age, race/ethnicity, and gender: NHSDA 1979-1998

	76	77	78	79	80	81	82#	83	84	85	86	87	88	89	90	91	92	93	94Br[a]	94	95	96	97	98[b]
Age																								
18				1.6						*			3.0		1.3	1.5	2.1	1.5	*	1.8	1.0	1.7	1.5	1.6
17				3.3						2.0			3.0		1.6	2.4	.6	1.5	-c	2.7	2.3	3.3	2.9	0.8
16				4.6						3.7			1.4		2.0	2.2	2.7	.9	*	2.4	1.1	1.8	1.9	0.9
15				4.1						5.5			2.0		3.1	2.2	1.6	1.8	*	.7	2.0	1.6	2.7	1.6
14				4.6						4.0			3.0		3.4	1.6	2.5	1.6	3.4	1.0	3.6	2.0	1.8	1.7
13				5.1						5.1			1.7		1.3	1.1	1.6	1.9	1.7	2.4	2.1	.7	1.5	0.9
12				1.5						1.5			.6		1.6	1.1	.8	.8	.8	.3	1.7	.9	1.3	0.6
Age 12-17 combined				3.9						3.7			2.0		2.2	1.8	1.6	1.4	2.0	1.6	2.1	1.7	2.0	1.1
Male				5.6						4.0			2.9		2.7	1.6	1.5	1.5	1.2	1.7	2.4	1.9	2.2	1.0
Female				2.1						3.3			1.1		1.7	2.0	1.8	1.4	2.7	1.4	1.8	1.6	1.8	1.2
White, non-Hispanic				3.4						4.3			2.4		2.5	1.6	1.6	1.6	2.3	1.8	2.5	2.2	2.3	1.2
Black, non-Hispanic				5.3						1.2			.9		1.3	1.9	2.0	.3	1.2	.9	.4	.5	.4	0.5
Hispanic				4.5						1.3			1.4		1.9	2.9	2.1	2.3	1.7	1.3	2.2	.7	2.0	1.4
Other, non-Hispanic				*						*			.0		*	.7	.3	.2	-c	*	1.7	1.2	*	0.6
Age groups for comparison with MTF																								
17-18				2.4						1.8			3.0		1.5	2.0	1.4	1.5	.8	2.2	1.6	2.5	2.1	1.2
15-16				4.4						4.5			1.7		2.6	2.2	2.1	1.4	2.9	1.5	1.5	1.7	2.3	1.3
13-14				4.8						4.5			2.4		2.4	1.3	2.0	1.8	2.5	1.7	2.8	1.4	1.7	1.3
Age groups for comparison with NSPY																								
14-18				3.7						3.4			2.5		2.3	2.0	1.9	1.5	2.1	1.7	2.0	2.1	2.1	1.3
12-13				3.3						3.2			1.2		1.4	1.1	1.2	1.4	1.3	1.4	1.9	.8	1.4	0.8
12-18				3.6						3.3			2.2		2.1	1.7	1.7	1.4	1.9	1.6	2.0	1.7	1.9	1.2

NOTE: NHSDA trends are based on the public use data files. The percentages reported here may differ slightly from reports published directly by the survey programs.

1982 survey did not include questions about inhalant use.

a NHSDA survey was redesigned in 1994. A separate bridge sample was conducted with old methods. This column reflects estimates from that bridge sample.

b 1998 NHSDA survey results are based upon special SAMHSA tabulations.

c Survey estimate was zero, but the true rate was probably positive.

* Estimate suppressed because of poor reliability.

Table 3B
Percentages of youth reporting past-month inhalant use: MTF 1976-1998, PATS 1993-1998

	Interview year																						
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98[a]
MTF																							
12th grade	.9	1.3	1.5	1.7	1.4	1.5	1.5	1.6	1.9	2.2	2.5	2.8	2.6	2.3	2.8	2.4	2.3	2.5	2.7	3.2	2.6	2.5	2.3
10th grade																2.7	2.7	3.3	3.7	3.5	3.3	3.0	2.9
8th grade																4.5	4.7	5.4	5.7	6.2	5.8	5.6	4.8
PATS																							
11-12th grade																		5		4.6	4.4	3.7	4.9
9-10th grade																		7		7.1	7.7	5.9	7.0
7-8th grade																		13		13.3	11.6	13.0	12.4

NOTE: MTF trends are based on the public use data files. The percentages reported here may differ slightly from reports published directly by the survey programs.

[a] 1998 NHSDA survey results are based upon special SAMHSA tabulations.

Table 4A
Percentages of youth reporting lifetime inhalant use by age, race/ethnicity, and gender: NHSDA 1979-1998

											Interview year												
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94Br[a]	94	95	96	97	98[b]
Age																								
18				15.0						9.4			10.2		11.2	11.2	9.3	9.4	10.6	10.7	11.5	11.1	8.4	9.5
17				17.0						12.0			10.8		12.5	9.8	7.6	6.0	6.2	8.1	8.1	9.9	11.1	8.8
16				11.5						13.8			11.7		7.8	8.5	8.6	5.3	10.4	8.8	9.3	8.6	9.6	6.5
15				10.5						13.0			10.6		9.3	8.5	4.9	9.3	7.3	8.2	8.1	6.8	7.1	8.4
14				8.1						8.6			9.0		7.1	6.3	5.3	8.6	8.7	7.1	9.8	5.2	6.8	5.2
13				8.2						7.9			5.6		6.0	6.0	5.6	4.0	3.4	6.1	5.5	2.7	5.1	4.4
12				3.8						1.8			2.9		3.1	2.4	2.4	2.0	1.3	3.8	3.2	2.0	3.6	3.3
Age 12-17 combined				9.9						9.6			8.8		7.8	7.0	5.7	5.9	6.2	7.0	7.4	5.9	7.2	6.1
Male				12.6						10.7			9.2		9.6	7.0	5.6	5.5	5.4	6.9	8.1	5.4	7.2	6.1
Female				7.1						8.4			8.3		5.8	7.0	5.7	6.3	7.0	7.2	6.6	6.5	7.3	6.0
White, non-Hispanic				9.6						10.5			9.9		8.6	7.6	6.2	6.5	7.4	8.1	8.8	7.0	8.1	7.2
Black, non-Hispanic				7.9						5.9			4.5		6.2	5.1	3.1	1.7	2.3	3.9	2.0	1.7	2.8	2.1
Hispanic				9.8						7.6			7.1		5.7	6.6	6.5	7.7	5.3	5.4	5.9	5.7	6.2	5.6
Other, non-Hispanic				*						*			*		*	3.8	4.1	*	*	*	6.7	4.2	10.2	4.2
Age groups for comparison with MTF																								
17-18				15.9						10.6			10.5		11.8	10.6	8.4	7.8	8.5	9.5	9.9	10.5	9.7	9.2
15-16				11.0						13.4			11.2		8.5	8.5	6.7	7.4	8.8	8.5	8.7	7.7	8.3	7.5
13-14				8.2						8.3			7.4		6.5	6.1	5.4	6.2	5.9	6.6	7.6	4.0	5.9	4.8
Age groups for comparison with NSPY																								
14-18				12.3						11.2			10.5		9.6	8.9	7.1	7.8	8.6	8.6	9.4	8.3	8.6	7.7
12-13				6.0						4.7			4.4		4.6	4.4	4.0	3.0	2.5	5.0	4.5	2.4	4.4	3.9
12-18				10.6						9.5			9.0		8.3	7.6	6.2	6.4	6.9	7.6	7.9	6.7	7.4	6.6

NOTE: NHSDA trends are based on the public use data files. The percentages reported here may differ slightly from reports published directly by the survey programs.

[a] NHSDA survey was redesigned in 1994. A separate bridge sample was conducted with old methods. This column reflects estimates from that bridge sample.

[b] 1998 NHSDA survey results are based upon special SAMHSA tabulations.

* Estimate suppressed because of poor reliability.

Table 4B
Percentages of youth reporting lifetime inhalant use: MTF 1976-1998, PATS 1993-1998

	Interview year																						
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98[a]
MTF																							
12th grade	10.2	11.1	12.0	12.7	12.0	12.3	12.8	13.5	14.5	15.3	15.9	17.0	16.7	17.7	18.1	17.7	16.6	17.4	17.7	17.4	16.6	16.1	15.2
10th grade																15.7	16.6	17.5	18.2	19.0	19.4	18.2	18.3
8th grade																17.9	17.4	19.3	19.9	21.7	21.3	21.0	20.5
PATS																							
11-12th grade																		20		19.5	16.5	18.5	19.1
9-10th grade																		23		22.8	22.2	21.0	19.6
7-8th grade																		27		28.2	25.4	28.5	25.7
Age 11-12																		7		6.5	8.3	8.3	8.4
Age 9-10																		3		4.3	3.2	4.9	4.8

NOTE: MTF trends are based on the public use data files. The percentages reported here may differ slightly from reports published directly by the survey programs.

[a] 1998 survey results were taken from published reports.

Table 5A
Percentages of youth reporting perceived great risk[†] of any marijuana
use by age, race/ethnicity, and gender: NHSDA 1990-1994

	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94Br[a]	94	95	96	97	98[b]
																			Interview year					
Age																								
18															32.5	20.6	26.0	24.5	23.5	22.5				
17															20.6	26.1	28.6	20.5	31.8	24.3				
16															29.2	25.7	29.4	24.0	21.8	23.4				
15															30.8	29.6	29.3	32.5	22.3	26.2				
14															38.2	35.4	37.6	34.2	26.5	30.6				
13															50.2	41.8	40.2	40.6	31.3	38.0				
12															46.8	45.8	49.0	42.4	47.2	45.3				
Age 12-17 combined															35.5	33.9	35.9	32.6	29.9	31.4				
Male															32.8	32.1	34.6	32.0	29.6	30.6				
Female															38.4	35.7	37.2	33.2	30.1	32.3				
White, non-Hispanic															33.6	32.2	33.1	29.8	26.1	28.5				
Black, non-Hispanic															41.8	36.2	44.0	39.8	37.3	38.4				
Hispanic															40.0	37.9	41.6	38.9	37.9	37.0				
Other, non-Hispanic															*	45.1	35.4	35.4	*	39.5				
Age groups for comparison with MTF																								
17-18															26.8	23.2	27.3	22.6	27.5	23.3				
15-16															30.0	27.7	29.4	28.5	22.1	24.9				
13-14															44.2	38.6	39.0	37.5	29.1	34.3				
Age groups for comparison with NSPY																								
14-18															30.3	27.5	30.2	27.3	25.2	25.5				
12-13															48.6	43.6	44.5	41.4	38.2	41.4				
12-18															35.1	31.9	34.4	31.4	28.9	30.1				

NOTE: NHSDA trends are based on the public use data files. The percentages reported here may differ slightly from reports published directly by the survey programs.

[†] Great risk of harm (physical or in other ways). Responses of "don't know" included in the denominator.

[a] NHSDA survey was redesigned in 1994. A separate bridge sample was conducted with old methods. This column reflects estimates from that bridge sample.

[b] 1998 NHSDA survey results are based upon special SAMHSA tabulations.

* Estimate suppressed because of poor reliability.

Table 5B
Percentages of youth reporting perceived great risk[a] of any marijuana use: MTF 1976-1998, PATS 1993-1998

	Interview year																						
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98[b]
MTF																							
12[th] grade	11.8	10.0	8.5	9.5	10.2	13.4	11.9	13.2	15.1	15.2	15.6	18.9	19.5	21.9	22.6	24.5	24.4	21.9	19.4	16.5	15.9	14.7	16.7
10[th] grade																29.8	31.8	29.8	24.3	21.4	19.9	18.7	19.6
8[th] grade																40.5	39.0	36.2	31.6	28.8	27.8	25.4	28.1
PATS																							
11-12[th] grade																		18		16.5	16.0	13.0	13.8
9-10[th] grade																		19		17.4	18.5	17.8	15.1
7-8[th] grade																		24		20.3	20.6	21.9	18.9

NOTE: MTF trends are based on the public use data files. The percentages reported here may differ slightly from reports published directly by the survey programs.

[a] Great risk of harm (physical or in other ways). Responses of "don't know" included in the denominator.

[b] 1998 survey results were taken from published reports.

Table 6A
Percentages of youth reporting perceived great risk[†] of regular
marijuana use by age, race/ethnicity, and gender: NHSDA 1985-1997

	85	88	90	91	92	93	94Br[a]	94	96	97	98[b]
Age											
18	74.0	75.8	73.9	73.2	73.5	73.0	66.9	45.9	40.7	46.5	41.4
17	71.5	79.1	80.3	77.2	77.4	74.7	73.4	50.7	47.5	42.9	40.9
16	71.9	77.8	84.6	77.3	78.9	77.7	68.2	54.4	48.8	47.8	48.0
15	74.9	76.7	83.7	85.5	81.5	80.6	67.4	56.9	54.4	53.6	46.8
14	79.5	83.1	85.0	83.3	84.8	85.0	72.1	59.5	62.0	56.3	58.8
13	82.2	82.5	89.0	88.3	88.3	83.9	83.0	65.6	63.9	58.2	61.6
12	82.7	86.6	86.7	87.6	86.3	87.5	86.1	62.6	67.2	65.5	64.8
Age 12-17 combined	77.1	80.7	84.8	83.2	83.0	81.7	75.0	58.5	57.1	54.0	54.4
Male	74.7	79.9	83.1	81.0	81.5	80.1	71.8	55.7	55.7	51.8	52.0
Female	79.6	81.4	86.6	85.5	84.6	83.3	78.3	61.4	58.7	56.2	55.3
White, non-Hispanic	78.8	82.7	87.4	85.2	84.3	82.1	75.9	60.5	60.0	55.2	55.5
Black, non-Hispanic	74.7	71.7	79.6	75.9	77.8	79.3	71.3	52.5	47.8	49.5	46.7
Hispanic	66.6	77.1	75.8	79.5	82.0	79.2	71.2	52.9	51.8	52.0	51.9
Other, non-Hispanic	*	90.1	*	86.2	83.3	90.2	*	61.3	58.4	55.0	52.1
Age groups for comparison with MTF											
17-18	72.9	77.5	77.0	75.1	75.4	73.8	70.1	48.1	44.0	44.8	41.1
15-16	73.3	77.2	84.2	81.5	80.3	79.2	67.8	55.7	51.6	50.8	47.3
13-14	80.6	82.8	87.0	85.8	86.6	84.4	77.9	62.5	62.9	57.2	60.2
Age groups for comparison with NSPY											
14-18	74.6	78.4	81.5	79.3	79.3	78.2	69.6	53.5	50.8	49.5	47.2
12-13	82.4	84.4	87.9	88.0	87.3	85.6	84.4	64.2	65.4	61.8	63.2
12-18	76.6	79.9	83.2	81.7	81.6	80.4	73.7	56.6	54.7	52.8	51.7

NOTE: NHSDA trends are based on the public use data files. The percentages reported here may differ slightly from reports published directly by the survey programs.

[†] Great risk of harm (physical or in other ways). Responses of "don't know" included in the denominator.

[a] NHSDA survey was redesigned in 1994. A separate bridge sample was conducted with old methods. This column reflects estimates from that bridge sample.

[b] 1998 NHSDA survey results are based upon special SAMHSA tabulations.

* Estimate suppressed because of poor reliability.

Table 6B
Percentages of youth reporting perceived great risk[a] of regular
marijuana use: MTF 1976-1998, PATS 1993-1998

	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98[b]
MTF																							
12th grade	39.8	37.7	36.5	43.0	51.9	58.7	62.3	64.5	68.6	72.1	73.4	75.5	78.5	78.5	79.2	78.9	78.2	73.0	66.0	63.2	61.0	60.6	58.5
10th grade																82.2	81.1	78.8	71.5	67.8	65.9	65.8	65.8
8th grade																83.8	81.9	79.6	74.3	73.1	70.9	72.7	73.0
PATS																							
11-12th grade																		61		55.4	58.6	51.2	54.0
9-10th grade																		63		59.3	60.7	58.1	60.9
7-8th grade																		70		60.4	67.0	65.8	65.3

Interview year

NOTE: MTF trends are based on the public use data files. The percentages reported here may differ slightly from reports published directly by the survey programs.

[a] Great risk of harm (physical or in other ways). Responses of "don't know" included in the denominator.

[b] 1998 survey results were taken from published reports.

DT-14

Table 7
Percentages of youth reporting disapproval of any and regular marijuana use: MTF 1976-1998

	Interview year																						
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98[a]
Any use																							
12th grade	38.2	33.3	33.3	34.2	38.9	39.9	45.5	46.1	49.3	51.3	54.5	56.5	60.7	63.5	65.8	66.2	68.6	63.4	57.3	55.1	52.3	48.8	51.6
10th grade																74.6	74.6	70.6	62.3	59.7	55.5	53.9	56.0
8th grade																84.5	82.2	79.1	72.8	70.7	67.5	67.6	69.0
Regular use																							
12th grade	69.3	65.6	67.5	69.1	74.6	77.3	80.7	82.4	84.8	85.5	86.6	89.3	89.3	89.0	88.2	87.1	88.2	85.1	81.1	79.8	77.5	77.2	81.2
10th grade																90.5	90.0	87.6	82.3	81.0	79.7	79.5	80.1
8th grade																92.0	90.9	88.8	85.2	85.1	82.8	84.6	84.5

NOTE: MTF trends are based on the public use data files. The percentages reported here may differ slightly from reports published directly by the survey programs.

[a] 1998 survey results were extracted from published reports.

Table 8
Percentages of youth reporting great risk of harm and
disapproval of any and regular inhalant use: MTF 1991-1998

	Interview year																						
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98[a]
Great risk of any use																							
10th grade																38.0	38.7	40.8	42.5	41.5	47.0	47.5	45.8
8th grade																35.9	37.0	36.5	37.9	36.5	40.9	40.2	38.9
Great risk of regular use																							
10th grade																69.7	67.9	69.6	71.6	71.7	75.8	74.6	73.3
8th grade																65.5	64.5	64.5	65.6	64.9	68.1	68.7	67.2
Disapproval of any use																							
10th grade																85.2	85.5	84.9	84.9	84.6	86.0	86.9	85.6
8th grade																84.8	84.1	82.4	81.7	81.8	82.9	84.2	83.0
Disapproval of regular use																							
10th grade																91.0	91.5	91.0	91.0	90.9	91.6	91.7	91.1
8th grade																90.6	90.0	88.8	88.2	88.9	89.3	90.4	89.5

NOTE: MTF trends are based on the public use data files. The percentages reported here may differ slightly from reports published directly by the survey programs. Twelfth graders were not asked about disapproval of inhalant use.

[a] 1998 survey results were extracted from published reports.

Table 9
Frequency of exposure to anti-drug advertising: MTF 1987-1998, PATS 1993-1998

													Interview year											
Survey	Age group	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98[a]
See ads at least daily																								
MTF	12th grade												36.0	35.3	25.8	36.2	36.1	35.2	27.0	23.9	20.4	21.1	21.0	17.2
	10th grade																45.2	42.8	35.2	32.9	29.1	29.7	29.0	27.9
	8th grade																44.9	44.6	37.6	36.7	33.7	32.7	33.6	31.2
PATS	11-12th grade																		44		33.2	33.2	31.7	28.5
	9-10th grade																		45		37.7	35.7	35.3	33.6
	7-8th grade																		47		36.4	39.9	38.9	33.1
See ads 1-3 times weekly																								
MTF	12th grade												29.2	31.6	30.3	30.2	27.7	27.7	27.5	27.0	25.5	26.4	23.0	22.9
	10th grade																27.7	28.4	27.9	27.5	27.1	27.3	24.9	24.7
	8th grade																25.2	24.1	25.2	22.8	23.5	23.2	23.2	22.2
PATS	11-12th grade																		24		27.2	26.9	26.9	24.2
	9-10th grade																		25		24.5	26.6	22.5	20.6
	7-8th grade																		22		19.9	21.3	19.5	20.3

NOTE: Questions do not distinguish which drugs the ad specifically cautioned against. Responses are coded as "1" not at all, "2" less than once per month, "3" 1-3 times per month, "4" 1-3 times per week, "5" daily, and "6" more than once per day. These categories form an approximately logarithmic scale for frequency of exposure.

[a] 1998 survey results were estimated using the provisional FASTTRACK data available from ICPSR. Estimates with Fasttrack data frequently differ by as much as 1 or 2 percentage points from those obtained with the fully archived data published reports.

Table 10
Partial correlation of media exposure with attitude and use of
marijuana controlling for interview year and grade: MTF 1987-1997

	Used marijuana in past month	Perceived great risk to regular marijuana use	Disapproved of any marijuana use
Observed anti-drug ads at least daily	-.002	.021	.024
Perceived great risk to regular marijuana use	-.321	--	.412
Disapproved of any marijuana use	-.422	.412	--

NOTES: Variation across grade and interview year were controlled.

All variables are binary.

All correlations were statistically significant at the $\alpha = 0.01$ level due to the extremely large sample involved.

Table 11
Variation in past-month marijuana use with media
exposure by grade and interview year: MTF 1987-1997

Grade	Media exposure	% Past-month marijuana use by interview year												Total
		87	88	89	90	91	92	93	94	95	96	97	98[a]	
8.0	<Weekly					3.7	4.3	5.7	7.6	9.3	11.8	11.0	9.2	8.2
	Weekly					2.5	2.8	5.1	6.4	8.1	9.8	9.3	8.5	6.5
	Daily+					3.0	3.6	5.2	8.6	8.8	10.6	9.9	9.1	7.0
	Total					3.1	3.6	5.4	7.7	8.8	10.9	10.2	9.0	7.3
10.0	<Weekly					9.8	9.4	10.8	15.6	17.3	22.1	20.4	19.9	16.5
	Weekly					9.5	8.0	9.5	15.7	15.9	19.3	19.4	17.5	14.3
	Daily+					7.6	7.3	10.5	16.2	17.5	18.8	22.6	17.0	13.9
	Total					8.7	8.1	10.3	15.9	17.0	20.4	20.8	18.5	15.1
12.0	<Weekly	18.7	16.8	18.3	14.7	16.8	11.1	15.1	17.4	19.6	19.6	23.7	22.1	18.2
	Weekly	23.3	16.6	18.1	12.6	11.9	9.0	13.3	18.8	22.5	26.8	21.7	18.9	17.7
	Daily+	18.2	13.0	15.7	10.0	13.8	10.2	12.7	14.2	14.7	15.9	20.1	23.6	14.6
	Total	19.9	15.4	17.6	12.3	14.3	10.2	14.0	17.0	19.3	20.7	22.5	21.6	17.0

[a] Calculated using the 1998 MTF FASTTRACK data set.

APPENDIX A

STRATEGIC GOALS AND OBJECTIVES
OF THE1999 NATIONAL
DRUG CONTROL STRATEGY

Strategic Goals and Objectives of the

Goal 1: Educate and enable America's youth to reject illegal drugs as well as alcohol and tobacco.

Objective 1: Educate parents and other care givers, teachers, coaches, clergy, health professionals, and business and community leaders to help youth reject illegal drugs and underage alcohol and tobacco use.

Objective 2: Pursue a vigorous advertising and public communications program dealing with the dangers of illegal drugs, alcohol, and tobacco use by youth.

Objective 3: Promote zero tolerance policies for youth regarding the use of illegal drugs, alcohol, and tobacco within the family, school, workplace, and community.

Objective 4: Provide students in grades K- 12 with alcohol, tobacco, and drug prevention programs and policies that are research based.

Objective 5: Support parents and adult mentors in encouraging youth to engage in positive, healthy lifestyles and modeling behavior to be emulated by young people.

Objective 6: Encourage and assist the development of community coalitions and programs in preventing drug abuse and underage alcohol and tobacco use.

Objective 7: Create partnerships with the media, entertainment industry, and professional sports organizations to avoid the glamorization, condoning, or normalization of illegal drugs and the use of alcohol and tobacco by youth.

Objective 8: Develop and implement a set of research-based principles upon which prevention programming can be based.

Objective 9: Support and highlight research, including the development of scientific information, to inform drug, alcohol, and tobacco prevention programs targeting young Americans.

Goal 2: Increase the safety of America's citizens by substantially reducing drug-related crime and violence.

Objective 1: Strengthen law enforcement — including federal, state, and local drug task forces — to combat drug-related violence, disrupt criminal organizations, and arrest and prosecute the leaders of illegal drug syndicates.

Objective 2: Improve the ability of High Intensity Drug Trafficking Areas (HIDTAs) to counter drug trafficking.

Objective 3: Help law enforcement to disrupt money laundering and seize and forfeit criminal assets.

Objective 4: Break the cycle of drug abuse and crime.

Objective 5: Support and highlight research, including the development of scientific information and data, to inform law enforcement, prosecution, incarceration, and treatment of offenders involved with illegal drugs.

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Goal 3: Reduce health and social costs to the public of illegal drug use.

Objective 1: Support and promote effective, efficient, and accessible drug treatment, ensuring the development of a system that is responsive to emerging trends in drug abuse.

Objective 2: Reduce drug-related health problems, with an emphasis on infectious diseases.

Objective 3: Promote national adoption of drug-free workplace programs that emphasize a comprehensive program that includes: drug testing, education, prevention, and intervention.

Objective 4: Support and promote the education, training, and credentialing of professionals who work with substance abusers.

Objective 5: Support research into the development of medications and related protocols to prevent or reduce drug dependence and abuse.

Objective 6: Support and highlight research and technology, including the acquisition and analysis of scientific data, to reduce the health and social costs of illegal drug use.

Objective 7: Support and disseminate scientific research and data on the consequences of legalizing drugs.

Goal 4: Shield America's air, land, and sea frontiers from the drug threat.

Objective 1: Conduct flexible operations to detect, disrupt, deter, and seize illegal drugs in transit to the United States and at U.S. borders.

Objective 2: Improve the coordination and effectiveness of U.S. drug law enforcement programs with particular emphasis on the Southwest Border, Puerto Rico, and the U.S. Virgin Islands.

Objective 3: Improve bilateral and regional cooperation with Mexico as well as other cocaine and heroin transit zone countries in order to reduce the flow of illegal drugs into the United States.

Objective 4: Support and highlight research and technology — including the development of scientific information and data — to detect, disrupt, deter, and seize illegal drugs in transit to the United States and at U.S. borders.

Goal 5: Break foreign and domestic drug sources of supply.

Objective 1: Produce a net reduction in the worldwide cultivation of coca, opium, and marijuana and in the production of other illegal drugs, especially methamphetamine.

Objective 2: Disrupt and dismantle major international drug trafficking organizations and arrest, prosecute, and incarcerate their leaders.

Objective 3: Support and complement source country drug control efforts and strengthen source country political will and drug control capabilities.

Objective 4: Develop and support bilateral, regional, and multilateral initiatives and mobilize international organizational efforts against all aspects of illegal drug production, trafficking, and abuse.

Objective 5: Promote international policies and laws that deter money laundering and facilitate anti-money laundering investigations as well as seizure and forfeiture of associated assets.

Objective 6: Support and highlight research and technology, including the development of scientific data, to reduce the worldwide supply of illegal drugs.