# Evaluation of the National Youth Anti-Drug Media Campaign: 2004 Report of Findings

Delivered to:
National Institute on Drug Abuse,
National Institutes of Health
Department of Health and Human Services

By:

Westat
1650 Research Boulevard
Rockville, MD 20850-3195

Contract No.:
N01DA-8-5063

June 2006

A report based on the National Survey of Parents and Youth

# Evaluation of the National Youth Anti-Drug Media Campaign: 2004 Report of Findings

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This report was produced under the Evaluation of the National Youth Anti-Drug Media Campaign, Contract Number N01DA-8-5063, to the National Institute on Drug Abuse (NIDA). The NIDA project officer is William Bukoski. Robert Orwin and David Maklan serve as Co-Principal Investigators on the contract and Graham Kalton serves as the Scientific Director. Diane Cadell is the Project Director. Senior statisticians on design and analysis include Adam Chu and Andrea Piesse. The senior system analyst is Eric Mehl. The editor is Barbara Brickman. Robert Hornik, Annenberg School for Communication, consulted on the report.

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# Highlights of the Report

The National Youth Anti-Drug Media Campaign was funded by Congress to reduce and prevent drug use among young people by addressing youth directly as well as indirectly, and by encouraging their parents and other adults to take actions known to affect youth drug use. The major intervention components include television, radio, and other advertising, complemented by public relations efforts including community outreach and institutional partnerships. This Final Evaluation Report covers Phase III of the Campaign, from September 1999 through June 2004.

- Recall of Campaign Messages:

  Most parents and youth recalled exposure to Campaign anti-drug messages. About 72 percent of parents and 77 percent of youth reported exposure to one or more messages weekly through all media channels. In both groups, recall of television advertising has doubled across the 4½ years of the Campaign. The large increases in television ad recall cannot be entirely attributed to increased television advertising. Both parents and youth also reported substantial recognition of the Campaign's "anti-drug" brand phrases. In general, ads were evaluated positively by parents and youth, and both rated more recent ads (e.g., 2003 and 2004) more positively than ads from earlier in the Campaign.

- Effects on Parents:

  The evidence is consistent with a favorable Campaign effect on parents. Overall, there is substantial evidence of favorable Campaign effects on four of five parent belief and behavior outcome measures including talking with children about drugs, doing fun activities with children, and beliefs about monitoring of children. Evidence for Campaign effects on parents' monitoring behavior had been absent until the last wave of data collection (first half of 2004), where the cross-sectional association between specific exposure and parent-reported monitoring was favorable and significant for the first time. This is encouraging because monitoring behavior has been the focus of the parent Campaign for much of Phase III and is the parent behavior most associated with youth nonuse of marijuana. On the other hand, there is little evidence for favorable effects on youth behavior or beliefs as the result of parent exposure to the Campaign.

- Effects on Youth:

  There is little evidence of direct favorable Campaign effects on youth, either for the Marijuana and Early Intervention Initiatives, or for the Campaign as whole. There were indications of an increase in past month marijuana use between 2000 and 2002, followed by a decrease in both lifetime and past month use between 2002 and 2004, but there is no evidence that the Campaign was responsible for these changes. Among nonusing youth, there were favorable changes over time in anti-drug attitudes and beliefs, and the proportion of youth saying they would definitely not try marijuana; however, results from the association analyses did not support a claim that exposure to the Campaign influenced these trends.

  Through most of the Campaign period, there were significant delayed effects of Campaign exposure on social norms and perceptions of other kids' use of marijuana, and these effects were consistently in an unfavorable direction, i.e., higher exposure leading to weaker anti-drug norms. In addition, there may have been a significant unfavorable effect of exposure from the Marijuana Initiative period on initiation of use, i.e., higher Campaign exposure leading to higher rates of initiation. Finally, an analysis of youth who had already begun using marijuana yielded no evidence that higher Campaign exposure led to quitting or reduced use.

# Executive Summary

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." One of the objectives in support of that goal includes, "Pursue a vigorous advertising and public communications program dealing with the dangers of drug use by youth." Under the Treasury-Postal Appropriations Act of 1998, Congress approved funding (P.L. 105-61) for "a national media campaign to reduce and prevent drug use among young Americans." Pursuant to this act, the Office of National Drug Control Policy (ONDCP) launched the National Youth Anti-Drug Media Campaign (the Campaign).

The Campaign has progressed through three phases of increasing complexity and intensity. Phases I and II are discussed only briefly in this report—the primary focus is on Phase III, which began in September 1999.[1] An evaluation of Phase III has been conducted under contract to the National Institute on Drug Abuse (NIDA) by Westat and its subcontractor, the Annenberg School for Communication at the University of Pennsylvania.[2] Funding of the Evaluation is provided by ONDCP from the appropriation for the Campaign itself. This is the seventh and final report of the Westat and Annenberg Evaluation of Phase III of the Campaign.

The primary tool for the Evaluation is the National Survey of Parents and Youth (NSPY). This survey has collected initial and followup data from nationally representative samples of youth between 9 and 18 years of age and parents of these youth. This final report presents analyses from the complete nine waves of NSPY, covering the period from September 1999 through June 2004.

This report provides six types of information about the campaign and its effects:

- A brief description of the Campaign's activities through June 2004, including a description of the Marijuana and Early Intervention Initiatives.
- A review of the logic and approach of the Evaluation.
- Statistics on the level of exposure to messages achieved by the Campaign during Phase III.
- Estimates of change in the marijuana use behaviors of youth between 2000 and the first half of 2004.
- Estimates of Campaign effects on youth. These include estimates of trends among nonusing youth between 2000[3] and the first half of 2004; changes between 2002 and 2004 in outcomes including attitudes, beliefs, and intentions; and estimates of association between exposure to the Campaign and both simultaneous and delayed measures of outcomes, with statistical controls for

[1] ONDCP has available other reports that evaluate Phases I and II.

[2] For prior reports, the Annenberg School for Communication at the University of Pennsylvania, Westat's subcontractor, had the lead responsibility for the study's design, data analysis, and report preparation. However, for the preparation of this final report, Westat took lead responsibility, with the Annenberg School in a consulting role.

[3] Wave 1 data collection started in November 1999. Because only a relatively few interviews were completed in 1999, for discussion and presentation purposes these interviews are treated as having occurred in 2000.

confounders. The report also includes analyses of trends and of associations for various subgroups of the nonusing youth population. In addition, it addresses whether the Campaign has influenced marijuana users to quit or reduce use.

- Estimates of Campaign effects on parents. These include estimates of trends between 2000 and the first half of 2004 in the parent outcomes; estimates of association between exposure to the Campaign and parents talking about drugs with their children, parents monitoring their children's behavior, and parents engaging in fun activities with their children, as well as their attitudes and beliefs about talking and about monitoring; and estimates of association between parent exposure and youth's beliefs and drug use behavior. Both change and association data are reported for various subgroups of the population. As with youth exposure, the delayed-effects associations of earlier parent exposure to Campaign advertising with later parent and youth outcomes are presented.

## Background on the Campaign

The 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 Campaign originally targeted its advertising to youth aged 9 to 18, parents of youth in this age range, and other influential adults. Phase III advertising is being disseminated through a full range of media or "channels" following a *Communications Strategy* developed by and later revised by ONDCP. Phase III also includes components other than advertising. There are outreach programs to the media, entertainment, and sports industries, as well as partnerships with civic, professional, and community groups. These other components, which are being coordinated by a public relations firm, include encouraging entertainment programs with anti-drug themes, coverage of the Campaign in the news media, community activities, corporate co-sponsorship, and special interactive media programming on the Internet.

ONDCP performs overall management of the Campaign in collaboration with the following groups:

- The Partnership for a Drug-Free America (PDFA), which provides the creative advertising for the Campaign through its existing relationship with leading American advertising companies;
- 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;
- Ogilvy (through September 2004), a national advertising agency with responsibility for media buying (as well as for carrying out some supportive research and assuring a coherent advertising strategy);
- Fleishman-Hillard, a public relations firm, which coordinates the nonadvertising components of the Campaign; and

- The Advertising Council, a coordinator of national public interest advertising campaigns, which supervises distribution of donated advertising time to other public service agencies under the "pro bono match" program (see below).

For Phase III, advertising space has been purchased on television, radio, newspapers, magazines, billboards, transit ads, bus shelters, movie theaters, video rentals, Internet sites, Channel One broadcasts in schools, and other venues as appropriate. The television buys include spot (local), network, and cable television. 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. The pro bono match involves one-to-one matching time for public service advertisements or in-kind programming. The pro bono spots may include both supplemental transmission of the Campaign's anti-drug ads and ads addressing other themes including anti-alcohol, anti-tobacco, and mentoring. However, except for the anti-alcohol message, these other themes are not part of the Campaign's advertising.

Earlier reports in this series (Hornik et al., 2002a; Hornik et al., 2002b) suggested that the Campaign was not achieving its major objective of affecting youth marijuana use, and even showed some evidence of an unfavorable delayed effect of the Campaign on youth. Partly in response to these results, in October 2002, the Campaign initiated a major redirection of the youth component of the Campaign, beginning with the Marijuana Initiative, followed by the Early Intervention Initiative. The Marijuana Initiative made several core changes:

- For youth, it focused all advertising effort on strong, Negative Consequences of marijuana use ads, rather than the mix of Negative Consequence, Positive Alternative/Normative Education, and Resistance Skills ads that had been featured over the previous waves.

- It shifted its primary target audience from 11- to 14-year-olds to 14- to 16-year-olds.

- It implemented more rigorous copy–test procedures, requiring each television advertisement to undergo pretesting before being aired to a national audience, with increased oversight by the ONDCP in guiding the development and production of advertisements.

In the most recent previous report (Hornik et al., 2003), there were some analyses of the effects of the Marijuana Initiative over the first 6 to 8 months of operation, along with continuing evaluation of the entire Campaign. That report also did not find evidence for Campaign success in affecting youth.

The Early Intervention Initiative was introduced in February 2004:

- The Early Intervention Initiative is targeted to both parents and teen friends, two of the most critical influencers in a youth's decision to use drugs.

- The Campaign's goal is to leverage the power of parental and peer pressure to halt drug or alcohol use among teens.

- For the first time in the Campaign, alcohol use is included in these messages; it was added to address the realistic patterns of this behavior in teens who also engage in drug use.

# Methodology

This final report presents results from nine data collection waves of the National Survey of Parents and Youth (NSPY), an in-home survey designed to represent youth living in homes in the United States, and their parents. Each of the first three waves of NSPY enrolled nationally representative samples of youth aged 9 to 18 and their parents. The respondents at these waves represent the approximately 40 million youth and their parents who are the target audience for the Campaign. Wave 1 included 3,298 youth aged 9 to 18 years old and 2,284 of their parents, who were interviewed between November 1999 and May 2000; Wave 2 included 2,361 youth and 1,632 of their parents interviewed between July and December 2000; Wave 3 included 2,458 youth and 1,682 of their parents interviewed between January and June 2001.

Sampling of eligible youth in Waves 1, 2, and 3 was designed to produce approximately equal-sized samples within three age subgroups (9 to 11, 12 to 13, 14 to 18). One or two youth were randomly selected from each eligible sample household. One parent was randomly chosen from each eligible household. A second parent was selected in the rare event when two youths who were not siblings were sampled.

Wave 4 followup interviews were conducted with the youth who were sampled in Wave 1 and were still eligible, and with their parents. Wave 6 followed up with this same cohort. Similarly, Wave 5 included interviews with eligible youth and their parents first sampled in either Wave 2 or Wave 3, and Wave 7 followed up with this cohort. Finally, Waves 8 and 9 followed up on Waves 6 and 7, respectively. While the focus of the Campaign in the past has been on youth age 11 or older, the inclusion of 9- and 10-year-old children at Waves 1, 2, and 3 provided a sample of those who would age into the primary target audience at the times of the followup interviews. Wave 4 comprised followup interviews conducted between July and December 2001 with 2,478 youth and 1,752 parents of those sampled at Wave 1. Wave 5 included 4,040 youth and 2,882 parents, and the interviews were conducted between January and June 2002. Wave 6 (followup to Wave 4) included 2,267 youth and 1,640 parent interviews conducted between July and December 2002, and Wave 7 (followup to Wave 4) included 3,587 youth and 2,621 parent interviews conducted between January and June 2003. The new data included in this report come from Wave 8 (followup to Wave 6), which included 1,983 youth and 1,488 parent interviews conducted between July and December 2003, and Wave 9 (followup to Wave 7), which included 3,142 youth and 2,381 parent interviews conducted between January and June 2004.

NSPY achieved a response rate of 65 percent for youth and 63 percent for parents across Waves 1 through 3 of data collection (the recruitment waves), with little response rate variation by wave. In Waves 4 and 5, respectively, NSPY successfully reinterviewed 82 percent of youth first interviewed in Wave 1, and 89 percent of youth first interviewed in Waves 2 and 3 who were still eligible for the survey (primarily still under age 19). Similarly, 80 percent of Wave 1 parents and 88 percent of Wave 2 and 3 parents were successfully reinterviewed. Wave 6 obtained successful reinterviews with 93 percent of the Wave 4 eligible youth and 93 percent of the Wave 4 eligible parents. Wave 7 obtained successful reinterviews with 92 percent of the eligible youth and 91 percent of the eligible parents from the Wave 5 sample. Finally, Wave 8 included successful reinterviews with 92 percent of the Wave 6 eligible youth and 92 percent of the Wave 6 eligible parents. Wave 9 included 93 percent of the eligible youth and 92 percent of the eligible parents from the Wave 7 sample. In preparing the respondent data for analysis, adjustments were made at all nine waves to compensate for nonresponse and to make certain survey estimates conform to known population values. Confidence intervals for

survey estimates and significance tests are computed in a manner that takes account of the complex sample design.

NSPY questionnaires were administered in respondents' homes using touch-screen laptop computers. Because of the sensitive nature of the data to be collected during the interviews, a Certificate of Confidentiality was obtained for the survey from the Department of Health and Human Services, and confidentiality was promised to the respondents. All sensitive question and answer categories appeared on the laptop screen and were read aloud to the respondent over headphones by a recorded voice that could be heard only by the respondent. The responses were chosen by touching the laptop screen.

The NSPY questionnaire for youth included extensive measurement of their exposure to Campaign messages and other anti-drug messages. It also included questions about their beliefs, attitudes, intentions, and behaviors with regard to drugs and a wide variety of other factors either known to be related to drug use or likely to make youth more or less susceptible to Campaign messages.

The NSPY questionnaire for parents also included measures about exposure to Campaign messages and other anti-drug messages. In addition, it included questions about parents' beliefs, attitudes, intentions, and behaviors with regard to their interactions with their children. These included talking with their children about drugs, parental monitoring of children's lives, and involvement in activities with their children. The responses of a parent and his or her child are directly linked for some analyses, for example, those that look at the effects of parent exposure to the Campaign on youth attitudes and beliefs about marijuana.

Campaign-initiated ad exposure was measured in NSPY for both youth and parents by asking about recall of specific current or very recent TV and radio advertisements. The TV and radio advertisements were played for respondents on laptop computers in order to aid their recall. For the most part, youth were played youth-targeted ads and parents were played parent-targeted ads.[4] In addition, both youth and parents were asked some general questions about their recall of ads seen or heard on TV and radio, and in other media such as newspapers, magazines, movie theaters, billboards, and the Internet.

# Media Purchases and Evidence about Exposure

## Media Purchases

Across its multiple media outlets, the Campaign reports that it purchased enough advertising time over the 58-month period covered by this report (September 1999 through June 2004) to achieve an average exposure of 2.5 youth-targeted ads per week for youth and an average of 2.2 parent-targeted ads per week for parents. These estimates include Campaign advertisements intended for either all youth or all parents; they do not include exposure by youth or parents to advertisements intended for other audiences, often called "spill," or separate advertising targeted to specific race- or ethnicity-defined audiences.

[4] Beginning in Wave 4, one of the television ads shown during the interview was either a ringer ad (one that had never been broadcast) or a spill ad (one that had been broadcast, but was targeted at the other (parent or youth) audience.) This was done to assess the accuracy of the ad recall and the spill effects on the unintended audience.

Figures ES-1 and ES-2 present the weekly Gross Rating Point (GRP) totals for youth-targeted and parent-targeted ad exposures, respectively. Both the actual weekly GRPs achieved and a smoothed line averaging over 3-week periods are presented. Both graphs show that the GRPs achieved varied a good deal, both between and within the periods corresponding to the NSPY waves of data collection.

**Figure ES-1. Weekly youth-targeted general market GRPs (September 1999 through June 2004)**

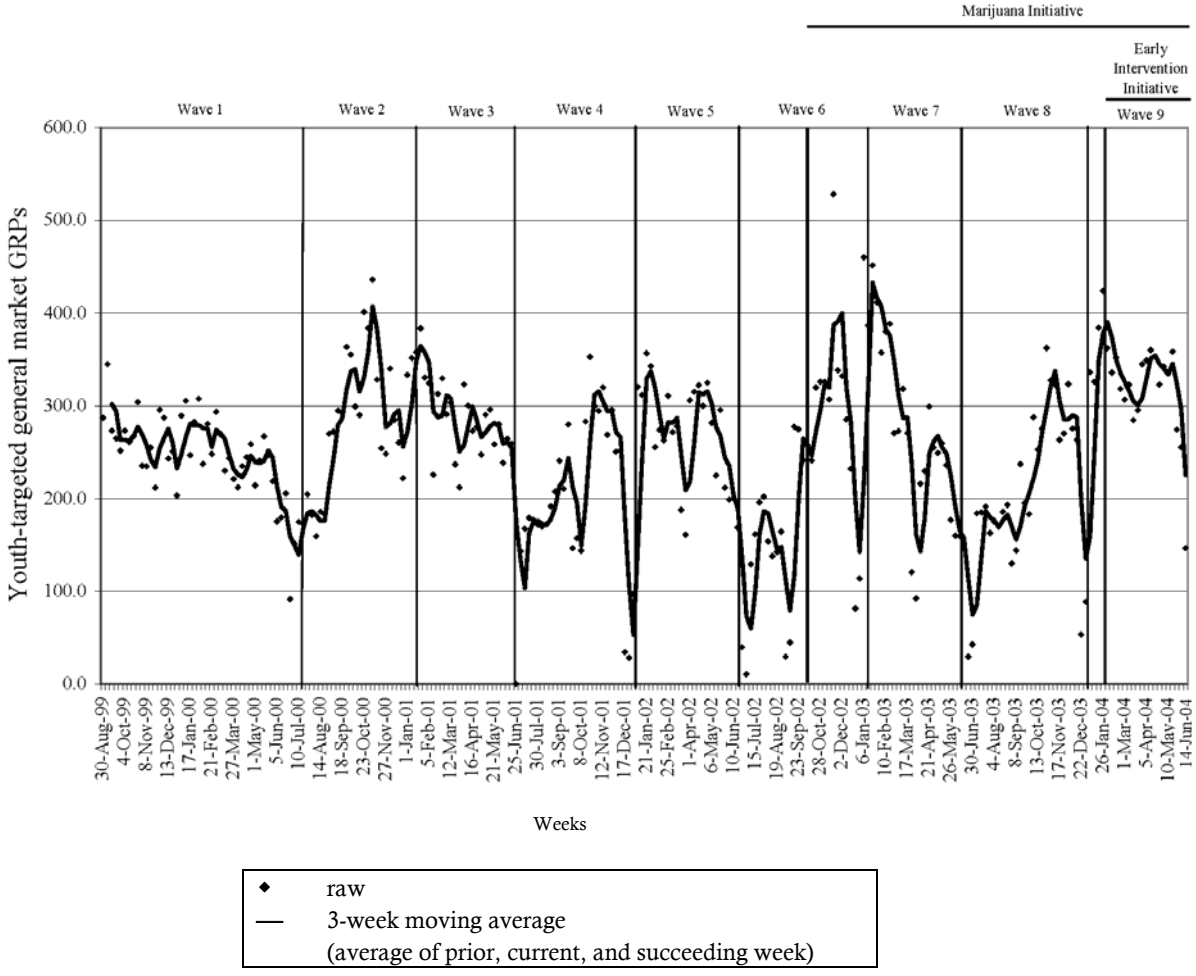


**Figure ES-2. Weekly adult-targeted general market GRPs (September 1999 through June 2004)**

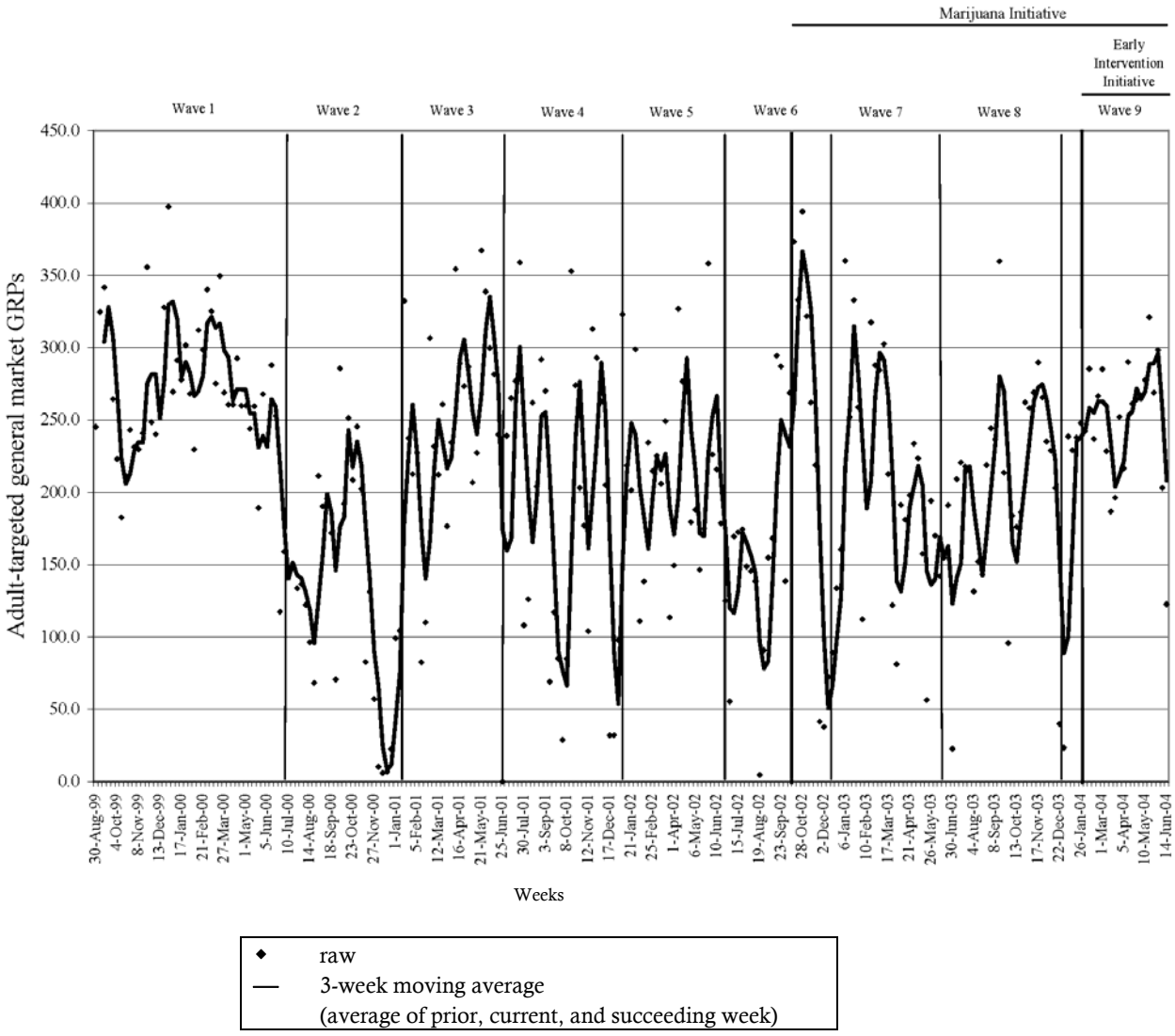



Table ES-1 summarizes the variations across periods. The table shows that average exposures of 2.5 per week for youth in 2000 and 2001 were followed by a decline to 2.2 exposures per week during the first 9 months of 2002, and then rebounded during the period of the Marijuana Initiative to 2.6, roughly the same as the overall Campaign average. GRPs achieved in the first 10 weeks of the Marijuana Initiative were particularly high.

**Table ES-1. Distribution of youth and adult average weekly GRPs across years**

| | Sept 99–Dec 00 | Jan–Dec 01 | Jan–Sep 02 | Marijuana Initiative (Oct 02–Jan 04) | Early Intervention Initiative (Feb–Jun 04) |
|---|---|---|---|---|---|
| Youth | 257 | 245 | 220 | 258 | 304 |
| | **Sep 99–Dec 00** | **Jan–Dec 01** | **Jan–Dec 02** | **Jan 03–Jan 04** | **Early Intervention Initiative (Feb–Jun 04)** |
| Adults | 221 | 212 | 195 | 205 | 281 |

Average ad exposure for both youth and parents were at their highest during the Early Intervention Initiative. During the period of the Early Intervention Initiative, from February through June 2004, enough time and space was purchased to achieve an average of 3.0 youth- and 2.8 parent-targeted exposures per week, roughly a 20 percent increase above the overall Campaign average for youth and a 30 percent increase for parents (though not all from ads in that Initiative).

- About 35 percent of youth GRPs were achieved on network (including cable) and "spot" (or local) television, with about another 30 percent achieved on network and "spot" radio. Thus, about 65 percent of total exposures came from media with the potential to reach a wide portion of youth. The rest of youth GRPs occurred on media that reach narrower audiences, including in-school television (16%), magazines (10%), and others such as basketball backboards, the Internet, nontraditional media, and arcades (all less than 5% each).

- For parents, averaged across the nine waves, almost two-thirds of the adult GRPs were achieved from potentially wider-reach media, that is, network radio (28%) and network television (36% of adult GRPs). Less than 40 percent of the parent GRPs were from narrower-reach media such as outdoor media (18%), magazines (10%), newspapers (4%), the Internet (4%), and nontraditional (0.1%).

- For both youth and parents, Campaign advertising was centered on a small number of platforms or themes. The focus on each platform varied across time, as displayed in Tables ES-2 and ES-3, which present the percentage of all television and radio GRPs in each wave dedicated to each platform. For youth, an early focus on the negative consequences of drug use had disappeared by Wave 3, but was revitalized in Waves 4 and 5 and was dominant in Waves 6 through 8—consistent with the exclusive focus of the Marijuana Initiative on the negative consequences of marijuana use. Negative Consequences ads highlight the adverse physical health, mental health, or schooling outcomes of drug use, as well as the relationship between drugs and terrorism. Overall, ads in the Negative Consequences platform received more than half of the general market youth television and radio GRPs in the period covered by the Evaluation.

- About a quarter of youth GRPs went to ads that emphasized the Normative Education/Positive Alternatives platform, which involved the idea that most youth do not use drugs and/or that others expect the youth not to use drugs. This emphasis at least partially reflects the introduction (in late 2000 and early 2001) of a series of "What's Your Anti-Drug?" spots, as part of the launch of a branding effort that stressed the number and variety of youth who do not use drugs (along with their favorite alternative behaviors).

- For parents, the Parenting Skills/Personal Efficacy/Monitoring platform—which includes monitoring and boosting personal efficacy to intervene with youth—dominated across the Campaign, receiving 71 percent of parent GRPs. The remaining GRPs were divided between ads on other behavioral platforms: Early Intervention (10%), Drugs and Terror (9%), Perceptions of Harm (6%), and Your Child Is at Risk (4%).

**Table ES-2. Percent of GRPs from ads in specific youth platforms across waves (television and radio)**

| | Year 2000 | | Year 2001 | | Year 2002 | | Year 2003 | | Year 2004 |
|---|---|---|---|---|---|---|---|---|---|
| Platform | Wave 1 (%) | Wave 2 (%) | Wave 3 (%) | Wave 4 (%) | Wave 5 (%) | Wave 6 (%) | Wave 7 (%) | Wave 8 (%) | Wave 9 (Jan-Jun) (%) |
| Negative Consequences | 30.9 | 16.4 | 0.0 | 60.2 | 63.2 | 99.3 | 99.9 | 100.0 | 45.8 |
| Drugs and Terror | 0.0 | 0.0 | 0.0 | 0.0 | 19.0 | 2.5 | 0.6 | 0.0 | 0.0 |
| Marijuana Initiative | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 44.1 | 97.9 | 100.0 | 45.8 |
| Other Negative Consequences | 30.9 | 16.4 | 0.0 | 60.2 | 44.2 | 52.7 | 1.4 | 0.0 | 0.0 |
| Normative Education/ Positive Alternatives | 50.2 | 70.3 | 46.0 | 35.6 | 36.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Resistance Skills | 41.3 | 3.0 | 51.5 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Early Intervention | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 54.2 |
| Other | 2.8 | 10.3 | 3.3 | 1.2 | 0.5 | 0.7 | 0.1 | 0.0 | 0.0 |

NOTE: For youth, some ads fell into more than one platform (e.g., Negative Consequences and Resistance Skills). However, the denominator is the actual total, which permits the percentages by category to total more than 100 percent.

**Table ES-3. Percent of GRPs from ads in specific parent platforms across waves (television and radio)**

| | Year 2000 | | Year 2001 | | Year 2002 | | Year 2003 | | Year 2004 |
|---|---|---|---|---|---|---|---|---|---|
| Platform | Wave 1 (%) | Wave 2 (%) | Wave 3 (%) | Wave 4 (%) | Wave 5 (%) | Wave 6 (%) | Wave 7 (%) | Wave 8 (%) | Wave 9 (Jan-Jun) (%) |
| Parenting Skills/ Personal Efficacy/ Monitoring | 54.2 | 98.8 | 48.6 | 91.2 | 77.1 | 85.1 | 83.9 | 100.0 | 19.6 |
| Your Child at Risk | 31.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Perceptions of Harm | 13.6 | <0.1 | 51.4 | 7.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Early Intervention | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 80.4 |
| Other | 1.2 | <0.1 | 0.0 | 1.0 | <0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Drugs and Terror Ads[1] | 0.0 | 0.0 | 0.0 | 0.0 | 22.9 | 14.9 | 16.1 | 0.0 | 0.0 |

[1]These ads constitute unique messages, not a new platform, as the messages fall under more than one platform.

## Recall of Exposure

NSPY used two measures of exposure; the first was based on general recall of anti-drug ads across all media, and the second was based on specific recall of currently broadcast ads on television and radio initiated by the Campaign. All of the following results relate only to youth aged 12½ to 18 and their parents (i.e., children younger than 12½ in NSPY are excluded).[5] The most striking result in these reports is the rapidly increasing level of recall of specific television ads both for youth and for parents.

[5] The youth population reported on in prior reports was 12- to 18-year-olds. In this final report it has been changed from 12- to 18-year-olds to 12½- to 18-year-olds.This change was necessary when, in 2003, ONDCP requested that a fourth round of data collection be completed (a change from the previous three-round design) because, by Round 4, the number of children in the sample less than 12½ years old was very small.

- General exposure recall to all anti-drug advertising, which may include exposure to advertising targeted to the other audience and to advertising placed by other institutions, was fairly stable for parents and for youth across the nine waves. There was no overall detectable change in reported general exposure over the course of the Campaign, suggesting that this general exposure measure was insensitive to the changes in the Campaign's targeted advertising. Across all waves, about 72 percent of all parents and 77 percent of all youth recalled weekly exposure to any anti-drug ads (Table ES-4). The median response was 9.5 exposures per month for parents and 12 exposures per month for youth across all waves. This was probably equivalent to between 2 to 3 exposures per week.

**Table ES-4. Exposure to Campaign advertising by year**

| | | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 | |
|---|---|---|---|---|---|---|---|
| Population | Exposure measure: Percent seeing/hearing ads 1 or more times per week | Waves 1 and 2 (%) | Waves 3 and 4 (%) | Waves 5 and 6 (%) | Waves 7 and 8 (%) | Wave 9 (Jan-Jun) (%) | All Waves (%) |
| Parents of Youth 12½ to 18 | General Exposure: Across all media | 72 | 68 | 71 | 73 | 74 | 72 |
| | Specific Exposure: Television ads | 25 | 30 | 54 | 58 | 50 | 43 |
| | Specific Exposure: Radio ads | 10 | 17 | 11 | 14 | 16 | 13 |
| Youth 12½ to 18 | General Exposure: Across all media | 78 | 76 | 77 | 75 | 75 | 77 |
| | Specific Exposure: Television ads | 37 | 52 | 52 | 63 | 74 | 54 |
| | Specific Exposure: Radio ads | N/A[1] | 8 | 7 | 10 | 7 | 8 |

[1] N/A: Radio exposure not measured for youth during Wave 1.

- Estimates of recall of specific Campaign ads among parents and youth provide an alternative view of exposure to the estimates generated from the general recall measures. Parents reported a median of 3.3 exposures per month and youth reported a median of 4.4 exposures per month to specific Campaign TV ads broadcast "in recent months." Similarly, parents reported a median of 0.4 exposures per month and youth reported a median of 0 exposures per month to specific Campaign radio ads broadcast "in recent months."

- For both parents and youth, there was a very sharp increase in recalled, specific exposure of television ads across the Campaign (with some up and down movement). For parents, weekly television ad exposure increased from 25 percent to 50 percent between 2000 and the first half of 2004, while youth recall on the same measure increased from 37 percent to 74 percent over the same period (Table ES-4).

- The large increases in television ad recall cannot be entirely attributed to increased television GRPs. It is possible that later media placements were better at reaching the desired target audiences, that the ads themselves were more memorable, that individual ads were on the air for a longer time making it more likely they were recognized, or some other explanation.

- The absolute level of recall of radio ads was much lower than for television ads in both groups across all waves. For youth, even though Waves 3 and 7 were the high points of radio exposure, 87 percent of youth reported less than weekly exposure during these two 6-month periods. For parents, the percentage who claimed at least weekly exposure varied from 10 percent to 17 percent across the Campaign.

## "Brand" Recall

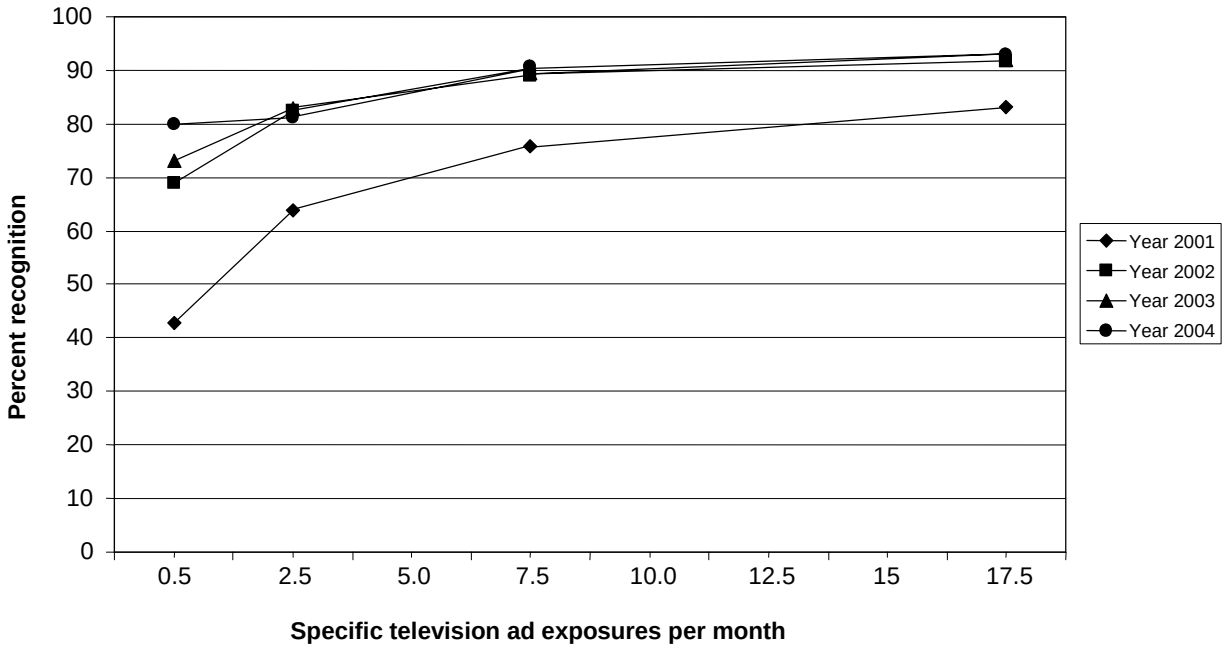
One of the innovations of Phase III has been the inclusion of a Campaign "brand"—for example, "the Anti-Drug." A brand is used in many advertising campaigns to provide a recognizable element to coordinate advertising, as well as nonadvertising components of the campaign. Insofar as the brand is recognized and positively regarded, its familiar presence may create some initial positive response to any new ad or increase the perception that each ad is part of a larger program. Such effects may, in turn, influence acceptance of the Campaign's message.

The NSPY started measuring brand phrase recall in Wave 3, the first half of 2001. The data provide evidence for brand phrase recall, particularly among youth, with stronger evidence in 2002 through 2004:

- When this question was first asked of youth in the first half of 2001, 61 percent of the 12½- to 18-year-old respondents reported recall of the Campaign brand. By 2002, recall had increased to 84 percent, and in the first half of 2004, recall of the brand had increased to 89 percent. Because some of the claimed recall could have been due to false recollection, true brand recall cannot be precisely estimated; still, it clearly increased.

- There is good evidence that the more individuals were exposed to Campaign advertising, the more likely they were to recall the brand phrase, which supports the idea that the phrase was learned as the result of Campaign exposure. Figure ES-3 shows the relationships between recalled exposure of TV ads for youth and the level of brand recognition. The more that respondents recalled specific ads, the greater their likelihood of recognizing the brand. This relationship became less powerful across time; it appears that even those with low exposure had accumulated ample opportunity to learn about the brand by 2002.

**Figure ES-3. Brand phrase recognition by exposure and year among youth**



## Television Ad Evaluation

All respondents were asked to evaluate a subset of the television ads that they reported having seen in recent months. The goal was to assess how individuals interpret and evaluate ads from the Campaign when they see or hear them.

Responses to three positively-phrased evaluative questions (whether the ad was attention getting, convincing, or said something important to the respondent) were combined to create a mean positive evaluation score for each ad and then averaged for each respondent across the ads that they recalled hearing or seeing. Additionally, a single skeptical item (whether the ad exaggerated the problem) was analyzed separately. Both positive and negative responses were placed on a scale from -2 to +2, with 0 representing a neutral response and higher scores indicating a more positive response to the ad (i.e., in the case of the exaggeration item, less belief that the ad exaggerated).

Both youth and parents reacted positively to the ads. Overall across all years, youth tended to favorably rate the Campaign's television ads that they were shown. The youth evaluations of the Campaign's later ads were higher than the evaluations of ads broadcast in the last quarter of 1999 and 2000. Parent ad evaluations increased between 2000 and 2004 and remained more enthusiastic than those provided by youth (Table ES-5).

**Table ES-5. Television ad evaluation scores among parents and youth (November 1999 through June 2004)**

| | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 | |
|---|---|---|---|---|---|---|
| Group | Waves 1 and 2 | Waves 3 and 4 | Waves 5 and 6 | Waves 7 and 8 | Wave 9 (Jan-Jun) | All Waves |
| | | | Mean evaluation score | | | |
| Parents | 1.08 (1.03, 1.13) | 1.27 (1.24, 1.30) | 1.17 (1.14, 1.20) | 1.20 (1.17, 1.23) | 1.29 (1.26, 1.32) | 1.20 (1.18, 1.22) |
| Youth 12½ to 18 | 0.73 (0.69, 0.78) | 0.73 (0.70, 0.76) | 0.79 (0.76, 0.82) | 0.85 (0.82, 0.88) | 0.83 (0.78, 0.87) | 0.78 (0.76, 0.81) |
| | | | Mean score for ad exaggerated the problem | | | |
| Parents | 0.97 (0.91, 1.04) | 1.19 (1.13, 1.24) | 1.06 (1.01, 1.11) | 1.07 (1.02, 1.12) | 1.27 (1.23, 1.31) | 1.11 (1.08, 1.13) |
| Youth 12½ to 18 | 0.73 (0.69, 0.78) | 0.72 (0.68, 0.76) | 0.75 (0.71, 0.80) | 0.72 (0.68, 0.75) | 0.77 (0.73, 0.82) | 0.74 (0.71, 0.76) |

Note: The evaluation scale runs from -2 to +2, with +2 being most positive. The exaggeration scale also runs from -2 to +2, with disagreement that an ad exaggerated getting a positive score, so that a higher score is more positive toward the ad.

## Exposure to Other Drug Messages

Both youth and parents receive messages about drugs from other public sources besides Campaign advertising. Those other sources of messages are themselves the target of Campaign efforts. In addition to distributing messages directly, the Campaign hopes also to reach its audiences indirectly, through other institutions and routes. While there was a substantial level of exposure to anti-drug messages through many of these other informational sources, there is little evidence that exposure to such messages has increased over the course of the Campaign. Thus it is difficult to claim these complementary exposures as indirect exposures produced by the Campaign. Rather, they are best understood as an ongoing context for the Campaign.

- The Campaign's efforts with respect to youth organizations have focused on integrating drug prevention messages and strategies into existing organizations' educational programs and extra-curricular activities. In 2004, about 56 percent of the youth reported in-school drug education in the past year (Table ES-6). This was a statistically significant decrease from 66 percent in 2000. Youth attendance at out-of-school drug education in the past year was relatively rare at around 5 percent. This too, was significantly down from 7.5 percent in 2000. Parent attendance at drug abuse prevention classes and at parent effectiveness training programs in 2004 were each around 25 percent; both showed small declines since 2000.

- Both youth and parents were asked about exposure to drug and youth stories across a variety of mass media (Table ES-6). Youth reported a substantial decline in exposure to such stories; 54 percent reported that they saw or heard such stories weekly in at least one source in 2000, whereas only 42 percent did so in 2004. Parent reports of exposure to such stories remained about the same across the period from 2000 to 2004. An examination of marijuana-related newspaper coverage from 1994 to 2003 in the context of the Campaign (Jacobsohn, et al., 2004) supports these findings, with no increase seen in newspaper coverage of drugs and youth during the Campaign. The percentage of parents who reported hearing a lot about anti-drug programs in their community in the past year also declined steadily between 2000 and 2004, from 35 percent to 24 percent.

- Parents reported a good deal of drug-related conversation with their children, with a statistically significant increase from 79 percent in 2000 to 85 percent in the first half of 2004 in the percentage of youth whose parents reported two or more such conversations in the past 6 months (Table ES-7). Youth reported a substantial level of such conversations, although considerably less than their parents reported. However, in contrast to the parent reports of increases, youth overall reported a decrease of 5 percentage points in conversations with their parents from 2000 to the first half of 2004.

With the Marijuana and Early Intervention Initiatives, the Campaign was able to increase the level and focus of its advertising purchases and pro bono matches, to concentrate them over time, and then reach a sharp increase in recall, at least for specific television messages. That is a positive result, but it may have been accomplished in the midst of declining support from some of the other potential anti-drug message sources. There is little evidence that anti-drug messages from other institutions were increasing over the course of the Campaign, and in some cases there were declines, including for in-school and out-of school drug education and in youth reports of talking with parents, although parents were reporting a positive trend in such conversations. Exposure to stories in the media concerning youth and drugs, and awareness of local anti-drug activity also showed small declines.

**Table ES-6. Exposure to drug-related communication by year**

**Percentage of Youth**

| | Waves 1 and 2 Year 2000 (%) | Waves 3 and 4 Year 2001 (%) | Waves 5 and 6 Year 2002 (%) | Waves 7 and 8 Year 2003 (%) | Wave 9 (Jan – Jun) Year 2004 (%) |
|---|---|---|---|---|---|
| Past year in-school drug education | 65.9 (63.2, 68.5) | 64.9 (62.0, 67.7) | 61.2 (59.2, 63.2) | 60.8 (58.3, 63.3) | 56.2 (53.2, 59.1) |
| Past year out-of-school drug education | 7.5 (6.2, 9.0) | 5.9 (4.9, 7.1) | 7.0 (6.2, 8.0) | 5.3 (4.6, 6.1) | 5.2 (4.5, 6.1) |
| Percent recalling weekly exposure to stories in at least one medium with drugs and youth content | 53.7 (51.4, 56.0) | 50.6 (48.1, 53.1) | 46.5 (44.4, 48.6) | 41.0 (39.3, 42.7) | 41.7 (39.6, 43.8) |

**Percentage of Parents**

| | Waves 1 and 2 Year 2000 (%) | Waves 3 and 4 Year 2001 (%) | Waves 5 and 6 Year 2002 (%) | Waves 7 and 8 Year 2003 (%) | Wave 9 (Jan–Jun) Year 2004 (%) |
|---|---|---|---|---|---|
| Percent recalling weekly exposure to stories in at least one medium with drugs and youth content | 65.1 (62.9, 67.2) | 64.7 (62.4, 66.9) | 63.8 (61.8, 65.7) | 61.6 (59.5, 63.7) | 62.5 (59.9, 64.9) |
| Percent hearing a lot about anti-drug programs in community in the past year | 35.2 (32.7, 37.7) | 30.0 (27.7, 32.4) | 29.6 (27.9, 31.4) | 25.3 (23.6, 27.1) | 24.2 (22.2, 26.4) |

# Estimates of Youth Drug Use

Following the goals of the Campaign given earlier, NSPY was designed to assess the influence of the Campaign on initial use (i.e., using at least once in a lifetime) and the shift from initial to regular use (i.e., using at least 10 or more times in a year) of marijuana and inhalants. However, because NSPY has data available only since 2000, and a relatively smaller sample than other national data collection efforts, it is important to compare its trends with those reported by those other sources, including the school-based Monitoring the Future survey (MTF), the Youth Risk Behavior Surveillance System (YRBSS), and the home based National Household Survey of Drug Abuse, now renamed the National Survey on Drug Use and Health (NSDUH).

**Table ES-7. Change in drug-related conversations by youth across years**

| Percent with two or more conversations in the past 6 months | Age groups | Waves 1 and 2 Year 2000 (%) | Waves 3 and 4 Year 2001 (%) | Waves 5 and 6 Year 2002 (%) | Waves 7 and 8 Year 2003 (%) | Wave 9 (Jan – Jun) Year 2004 (%) |
|---|---|---|---|---|---|---|
| With friends, reported by youth of ages: | 12½ to 13 | 45.4 (42.3, 48.5) | 43.7 (40.3, 47.2) | 42.8 (39.6, 46.1) | 42.2 (38.8, 45.6) | 41.3 (37.6, 45.2) |
| | 14 to 15 | 60.1 (56.1, 64.0) | 64.6 (61.3, 67.9) | 59.7 (56.9, 62.4) | 60.2 (57.3, 63.0) | 58.6 (55.2, 62.0) |
| | 16 to 18 | 69.6 (66.5, 72.6) | 71.1 (68.5, 73.5) | 69.6 (66.9, 72.2) | 66.9 (64.5, 69.1) | 64.5 (61.0, 67.8) |
| | 12½ to 18 | 60.7 (58.7, 62.6) | 62.4 (60.4, 64.3) | 60.0 (58.2, 61.8) | 58.8 (57.1, 60.4) | 57.2 (55.0, 59.4) |
| With parents, reported by youth of ages: | 12½ to 13 | 56.4 (52.8, 60.0) | 52.3 (49.0, 55.5) | 49.9 (46.5, 53.2) | 50.4 (46.6, 54.2) | 50.4 (46.8, 53.9) |
| | 14 to 15 | 55.2 (51.1, 59.2) | 51.1 (47.7, 54.5) | 48.6 (45.5, 51.7) | 47.6 (44.7, 50.6) | 47.7 (44.3, 51.1) |
| | 16 to 18 | 50.6 (46.8, 54.4) | 45.8 (42.2, 49.5) | 47.6 (44.8, 50.3) | 45.5 (42.5, 48.6) | 48.4 (44.9, 51.8) |
| | 12½ to 18 | 53.5 (51.0, 56.1) | 49.2 (47.1, 51.2) | 48.4 (46.6, 50.3) | 47.4 (45.3, 49.5) | 48.6 (46.6, 50.7) |
| By parents with children of ages: | 12½ to 13 | 78.8 (75.4, 81.8) | 82.3 (78.7, 85.4) | 83.2 (80.7, 85.5) | 84.4 (81.5, 86.9) | 85.8 (82.3, 88.7) |
| | 14 to 15 | 80.5 (75.7, 84.5) | 83.6 (80.1, 86.6) | 85.6 (83.2, 87.7) | 83.6 (81.4, 85.5) | 86.1 (83.3, 88.5) |
| | 16 to 18 | 78.6 (75.2, 81.7) | 82.5 (79.6, 85.1) | 84.6 (82.2, 86.8) | 81.7 (79.3, 83.9) | 83.6 (79.9, 86.7) |
| | 12½ to 18 | 79.3 (76.6, 81.8) | 82.9 (80.8, 84.7) | 84.6 (82.9, 86.2) | 82.9 (81.3, 84.4) | 84.9 (83.0, 86.7) |

In this report, the "standard" trend analysis (comparable to that done in prior reports) compared the estimates of marijuana use for the latest year for which NSPY data are available—in this case the first half of 2004 (i.e., Wave 9)—with estimates for 2000 (at the start of the Campaign) and with estimates for 2002 (the closest prior year in which any effects of the redirected Campaign could not have had a noticeable impact on the survey responses).

- The standard analysis found no significant change between 2000 and Wave 9 (the first half of 2004) or between 2002 and Wave 9 in lifetime, past year, past month, or regular use of marijuana overall for youth aged 12½ to 18 (Table ES-8).

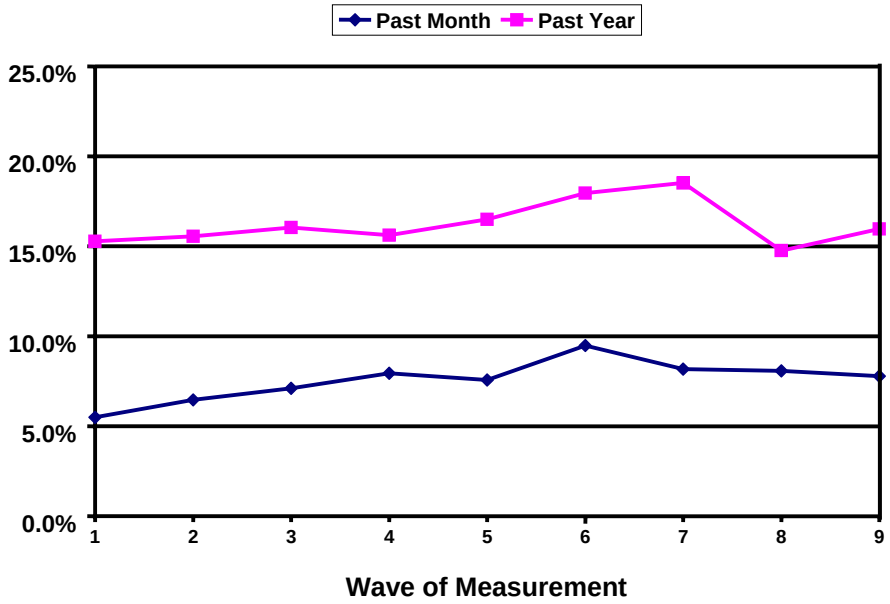
- Within the 14- to 16-year-old target age group for the redirected Campaign, there were also no significant changes between 2000 and Wave 9 or between 2002 and Wave 9 in lifetime, past year, past month, or regular use of marijuana.

While NSPY did not detect significant differences from 2000 to 2004, that test could well be masking significant changes *within* that period. Figure ES-4 displays estimates across time for both past year and past month marijuana use for 14- to 16-year-olds. The figure is organized by wave, with each wave encompassing about 6 months, either January to June or July to December, except for Wave 1 which represents November 1999 to June 2000. The figure shows generally upward trends through Wave 6 for past month use and through Wave 7 for past year use, followed thereafter by reversals of those trends in later waves.

**Table ES-8. NSPY trends in marijuana use across measures by age group**

| | Percent reporting use | | | | | | |
|---|---|---|---|---|---|---|---|
| Age groups | Year 2000 (Average for Waves 1 & 2) (%) | Year 2001 (Average for Waves 3 & 4) (%) | Year 2002 (Average for Waves 5 & 6) (%) | Year 2003 (Average for Waves 7 & 8) (%) | Year 2004 (Jan-Jun) (Wave 9) (%) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
| Lifetime | | | | | | | |
| 12½ to 13 | 6.1 | 5.3 | 5.7 | 5.4 | 5.0 | -1.1 (-3.8, 1.6) | -0.7 (-3.6, 2.2) |
| 14 to 16 | 20.6 | 22.4 | 24.1 | 22.3 | 21.8 | 1.1 (-2.3, 4.6) | -2.3 (-5.1, 0.5) |
| 14 to 18 | 29.1 | 30.9 | 31.8 | 29.4 | 29.3 | 0.2 (-3.3, 3.7) | -2.5 (-5.6, 0.6) |
| 12½ to 18 | 23.6 | 24.8 | 25.5 | 23.7 | 23.5 | -0.1 (-2.9, 2.8) | -2.0 (-4.5, 0.5) |
| Past year | | | | | | | |
| 12½ to 13 | 3.9 | 3.5 | 3.9 | 4.2 | 3.2 | -0.7 (-2.7, 1.2) | -0.7 (-2.8, 1.4) |
| 14 to 16 | 15.4 | 15.8 | 17.2 | 16.6 | 16.0 | 0.5 (-2.6, 3.6) | -1.3 (-3.6, 1.0) |
| 14 to 18 | 21.2 | 21.1 | 22.1 | 21.6 | 20.9 | -0.3 (-3.2, 2.6) | -1.2 (-3.8, 1.5) |
| 12½ to 18 | 17.1 | 16.9 | 17.7 | 17.4 | 16.7 | -0.4 (-2.6, 1.9) | -1.0 (-3.1, 1.1) |
| Past month | | | | | | | |
| 12½ to 13 | 1.7 | 1.6 | 1.1 | 1.3 | 1.2 | -0.5 (-1.5, 0.5) | 0.1 (-0.9, 1.0) |
| 14 to 16 | 6.0 | 7.5 | 8.5 | 8.1 | 7.8 | 1.8 (-0.1, 3.7) | -0.8 (-2.7, 1.2) |
| 14 to 18 | 9.7 | 10.8 | 12.3 | 10.8 | 10.4 | 0.7 (-1.6, 3.0) | -1.9 (-3.8, 0.1) |
| 12½ to 18 | 7.8 | 8.6 | 9.6 | 8.5 | 8.2 | 0.4 (-1.4, 2.2) | -1.3 (-2.8, 0.1) |
| Regular | | | | | | | |
| 12½ to 13 | 0.6 | 0.4 | 0.6 | 0.7 | 0.8 | 0.2 (-0.8, 1.2) | 0.2 (-0.7, 1.1) |
| 14 to 16 | 4.0 | 5.9 | 5.6 | 5.8 | 5.1 | 1.0 (-0.6, 2.7) | -0.5 (-2.1, 1.0) |
| 14 to 18 | 7.9 | 8.8 | 9.0 | 8.2 | 7.9 | -0.1 (-2.0, 1.9) | -1.2 (-2.9, 0.6) |
| 12½ to 18 | 6.2 | 6.8 | 7.0 | 6.4 | 6.2 | 0.0 (-1.5, 1.5) | -0.8 (-2.1, 0.5) |

**Figure ES-4. Marijuana Use Among 14- to 16-year-olds**



To better capture this, a second form of trend analysis was conducted, separated into two components. The first component compares marijuana use estimates for 2000 with those for 2002 to investigate any changes that may have occurred during the period before the redirection of the Campaign. The second component compares estimates for 2003 and the first half of 2004 combined (i.e., Waves 7, 8, and 9 combined, the period in which the redirected Campaign was in operation) with estimates for 2002. One advantage of this pooled analysis is that it provides change estimates that are closer in nature to the change estimates produced by the other national surveys. Another is that the sampling errors in the estimates are reduced because of the larger sample size obtained by pooling all the data for the Evaluation period of the redirected Campaign.

- The second analysis showed a statistically significant overall increase in past month marijuana use between 2000 and 2002. This increase was primarily driven by older youth aged 14 to 18 (Table ES-9). There also was a significant increase in lifetime use among 14- to 16-year-olds. No changes occurred for younger youth aged 12½ to 13.

- In contrast, the analyses of the changes from 2002 to 2003/2004 combined found statistically significant decreases overall in both lifetime and past month marijuana use, decreases that were concentrated among older youth.

How are the NSPY statistically significant increases from 2000 to 2002 and decreases from 2002 to 2003/2004 to be interpreted? The parallel results for three other major national surveys of drug use among adolescents provide relevant evidence. Examination of these other survey results leads to some uncertainty about the NSPY increase from 2000 to 2002, but supports the NSPY decrease from 2002 to 2003/2004.

- The data from the school-based surveys—the MTF and YRBSS—provide a possible justification for discounting the statistically significant increase in the pre-Marijuana Initiative period found in NSPY. MTF shows general decreases for 8th and 10th graders and no trend for 12th graders on all marijuana measures between 2000 and 2002, with statistically significant decreases for 10th graders in past year and past month use between 2001 and 2002. YRBSS shows general declines from 1999 to 2001, with statistically significant decreases for 14- to 18-year-olds for both lifetime and past month use. However, NSDUH—the other household survey—shows increases between 2000 and 2001 across all age groups and measures, many of which are statistically significant. Methodological changes in 2002 make the comparisons between 2001 and 2002 uninformative for the NSDUH. The NSDUH results showing an increase from 2000 to 2001 are consistent with the statistically significant NSPY increase from 2000 to 2002. The conflicting findings from the two school-based surveys with those from the two household-based surveys leave the nature of the change in marijuana use between 2000 and 2002 uncertain.

- In contrast to the 2000 to 2002 change, the evidence for a decrease between 2002 and 2003/2004 is more consistent across the four surveys. Each of the three other surveys shows decreases across all measures and all age groups for this period (for 2001 to 2003 for YRBSS and for 2002 to 2003 for NSDUH). However, the only statistically significant year-to-year decreases are those for past year use between 2002 and 2003, and past month use between 2003 and 2004 by MTF 8th graders, and for lifetime use between 2002 and 2003 by 12- to 17-year-olds in the NSDUH. While the results from the several surveys are not entirely consistent, combining the evidence from NSPY and these other surveys suggests it is likely that a small decline in marijuana use occurred since the start of the redirected Campaign.

**Table ES-9. NSPY marijuana use in 2000, 2002, and 2003/2004 across measures by age group**

| | Percent reporting use | | | | |
|---|---|---|---|---|---|
| Age groups | Year 2000 (Average for Waves 1 & 2)** (%) | Year 2002 (Average for Waves 5 & 6)** (%) | Years 2003/2004 (Average for Waves 7, 8 & 9) (%) (95% CI) | 2000 to 2002 Change (95% CI) | 2002 to 2003/2004 Change (95% CI) |
| Lifetime | | | | | |
| 12½ to 13 | 6.1 | 5.7 | 5.3 (4.2, 6.7) | -0.4 (-2.4, 1.5) | -0.4 (-2.2, 1.5) |
| 14 to 16 | 20.6 | 24.1 | 22.2 (20.6, 23.8) | **3.4* (0.4, 6.4)** | -1.9 (-4.0, 0.2) |
| 14 to 18 | 29.1 | 31.8 | 29.4 (27.8, 31.0) | 2.7 (-0.2, 5.6) | **-2.4* (-4.5, -0.2)** |
| 12½ to 18 | 23.6 | 25.5 | 23.6 (22.4, 25.0) | 1.9 (-0.3, 4.1) | **-1.9* (-3.6, -0.2)** |
| Past year | | | | | |
| 12½ to 13 | 3.9 | 3.9 | 3.9 (2.9, 5.2) | 0.0 (-1.5, 1.5) | 0.0 (-1.6, 1.6) |
| 14 to 16 | 15.4 | 17.2 | 16.4 (15.0, 17.9) | 1.8 (-0.7, 4.3) | -0.8 (-2.7, 1.0) |
| 14 to 18 | 21.2 | 22.1 | 21.3 (19.9, 22.9) | 0.9 (-1.5, 3.3) | -0.7 (-2.6, 1.1) |
| 12½ to 18 | 17.1 | 17.7 | 17.2 (16.0, 18.4) | 0.6 (-1.2, 2.4) | -0.5 (-2.0, 1.0) |
| Past month | | | | | |
| 12½ to 13 | 1.7 | 1.1 | 1.2 (0.7, 2.0) | -0.6 (-1.4, 0.3) | 0.1 (-0.8, 1.1) |
| 14 to 16 | 6.0 | 8.5 | 8.0 (7.1, 9.1) | **2.6* (0.4, 4.7)** | -0.5 (-2.0, 0.9) |
| 14 to 18 | 9.7 | 12.3 | 10.7 (9.7, 11.8) | **2.5* (0.4, 4.7)** | **-1.6* (-3.1, -0.1)** |
| 12½ to 18 | 7.8 | 9.6 | 8.4 (7.6, 9.3) | **1.8* (0.1, 3.4)** | **-1.2* (-2.3, 0.0)** |
| Regular | | | | | |
| 12½ to 13 | 0.6 | 0.6 | 0.7 (0.4, 1.4) | 0.0 (-0.6, 0.5) | 0.1 (-0.5, 0.7) |
| 14 to 16 | 4.0 | 5.6 | 5.5 (4.8, 6.5) | 1.6 (-0.2, 3.3) | -0.1 (-1.1, 1.0) |
| 14 to 18 | 7.9 | 9.0 | 8.1 (7.3, 9.0) | 1.1 (-0.5, 2.8) | -0.9 (-2.2, 0.3) |
| 12½ to 18 | 6.2 | 7.0 | 6.3 (5.7, 7.0) | 0.8 (-0.5, 2.1) | -0.7 (-1.6, 0.3) |

* Indicates a significant change at $p < 0.05$.

** Confidence intervals for the year 2000 and year 2002 estimates are given in the report.

If there was a decrease between 2002 and 2003/2004, can it be attributed to the Campaign? This is not a question that the trend analysis can answer. The existence of trends alone does not permit attribution of cause in a context when outside forces are likely to be affecting behavior. In this regard, it should be noted that:

- The declines observed in the MTF and the YRBSS started before 2002; indeed the declines in MTF started before Phase III of the Campaign; and
- If the significant NSPY change from 2000 to 2002 were due to an unduly high estimate for 2002, that would explain away both the increase from 2000 to 2002 *and* the decrease from 2002 to 2003/2004. The conclusion would then be that NSPY found no firm evidence of a change in marijuana use over the full period.

By examining whether initiation of marijuana use and the cognitive measures that are postulated to be precursors of drug use are related to Campaign exposure, the question of attribution of effects to the Campaign is addressed more directly. The results of the analyses addressing this question are presented below.

# Campaign Effects

The remainder of this Executive Summary presents evidence obtained in NSPY regarding Campaign effects. The discussion first summarizes the logic adopted for claiming effects. It then presents the findings regarding Campaign effects on youth followed by the findings for Campaign effects on parents.

## The Logic of Claiming Campaign Effects

Both the parent and youth outcomes analyses involve three components: (1) examining trends over time, (2) examining how the exposures to the Campaign that individuals report are associated with their outcomes measured at the same time, and (3) examining how individuals' reported exposures at one wave predict their outcomes at a later wave, among youth and parents who were measured at two points in time; i.e., for Round 1 (Waves 1, 2, and 3) to Round 2 (Waves 4 and 5), for Round 2 to Round 3 (Waves 6 and 7), and for Round 3 to Round 4 (Waves 8 and 9).

If the Campaign has been successful, it would be desirable to see favorable trends in the outcomes over time. However, change in outcomes over time (or a lack of change despite positive Campaign effects) may be due to influences other than the Campaign. Thus, if effects are to be definitively attributed to the Campaign, other supporting evidence is also needed.

Another form of evidence is an association between exposure and outcome, measured at the same time. However, evidence of the presence or absence of a simple association is inadequate for inferring that exposure has, or has not, had an effect on an outcome. The main threat to such an inference is that an association may be due to the influence of other variables (confounders) on both exposure and outcomes. This threat to inference can be substantially lessened by applying statistical controls for the confounders, as described below. However, even when controls have been applied for all known, measured confounders, there remains the possibility that unmeasured and perhaps unknown confounders are the cause of the adjusted association. Furthermore, even if controls were fully applied for all the confounders, there remains an alternative explanation for the adjusted association, namely that it is outcome that is the cause and (recall of) exposure that is the effect. Thus, an association between concurrent exposure and outcome, controlled for all known confounders, will not ordinarily definitively determine that the Campaign has had an effect on an outcome.

The ambiguity of causal direction that exists with a cross-sectional association can be overcome when longitudinal data are available. Then, if, after controlling for all confounders, *exposure* measured at time 1 is associated with *outcome* measured at time 2, the inference is that the causal direction is from *exposure* to *outcome* since an effect cannot precede its cause. With such longitudinal data, it is possible to establish time order between variables—that is, to examine whether a prior state of exposure affects a later outcome measure.

There is another constraint on the analysis of associations that needs to be considered. The analysis addresses only the direct effects of exposure. Associations between exposure and outcomes are expected only if individuals personally exposed to Campaign messages learn and accept those messages in the short term. This form of analysis does not reflect any indirect effects that might occur through other routes. Therefore, this report also includes analyses that assess one important route for indirect effects, that is, effects on youth that are mediated through parent exposure.

For youth, most analyses of Campaign effects are limited to 12½- to 18-year-olds who report never having tried marijuana (referred to as "nonusers" in this report) and concern their attitudes, beliefs, and intentions ("cognitions") about possible initiation of marijuana use in the subsequent year. However, an additional analysis was conducted for this final report that examined any impact the Campaign may have had on the subsequent marijuana use of youth who had used marijuana in the year they were exposed.

The parent analysis includes all parents of 12½- to 18-year-olds and focuses on the target parenting behaviors (and their supporting cognitions) including talk, monitoring, and engaging in fun projects or activities with their children in or out of the home. In addition, the analyses examine the association between parent exposure, and youth cognitions and behavior.

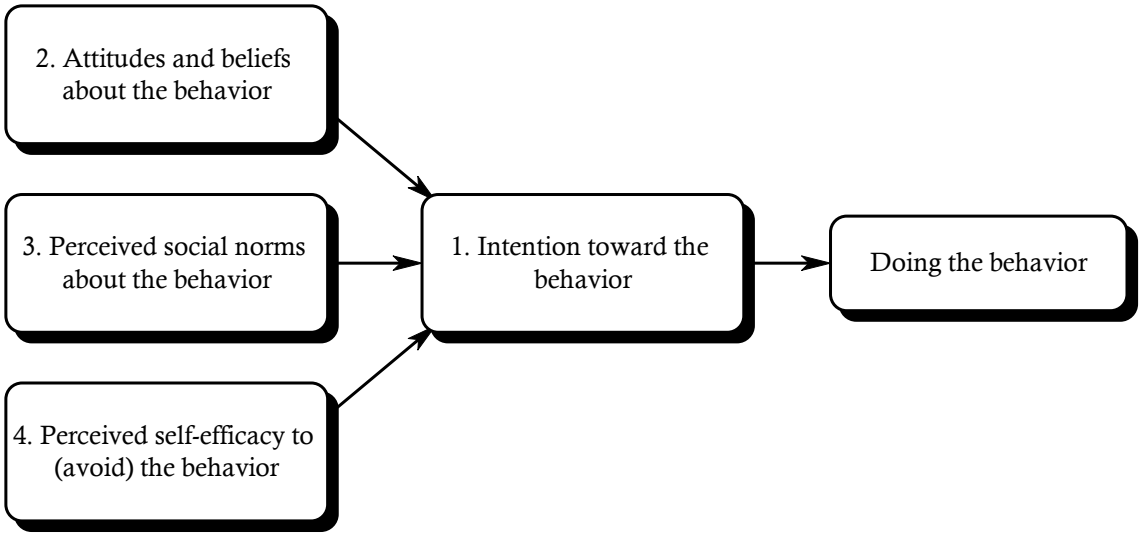
All analyses of associations between exposure to Campaign messages and outcomes use a method called "propensity scoring" to control for the possible influence of a very wide range of possible confounding variables. The analyses began with tests for any preexisting differences among the exposure groups on a large number of variables. The parent analyses were corrected, among other factors, for observed differences on race, ethnicity, gender, age of parent, income, marital status, strength of religious feelings, age of children, neighborhood characteristics, media consumption habits, language, and parental substance use (alcohol, tobacco, marijuana, and other illegal drugs). The analyses of youth associations were controlled for parent characteristics and further controlled for any preexisting differences among exposure groups on school attendance, grade level, academic performance, participation in extra-curricular activities, plans for the future, family functioning, personal antisocial behavior, association with antisocial peers, use of marijuana by close friends, personal tobacco and/or alcohol use of a long-standing nature, and sensation-seeking tendencies.

## Campaign Effects on Youth

The basic theoretical model underpinning the Evaluation of Campaign effects on youth is shown in Figure ES-5. The model argues that if the Campaign were to be successful, it would affect behavior through one or more of the depicted paths.

As in prior reports, the analysis of marijuana cognitive outcomes focuses on the four measures that correspond to the expected four predictors of behavior. However, this report adds a fifth measure—the perception of other kids' regular use of marijuana. The rationale was that the delayed effects analyses presented in the Fifth Semi-Annual Report found evidence of possible unfavorable effects of Campaign exposure on outcomes measured a year later. It was hypothesized that a possible mechanism for such effects is that the Campaign may be increasing youth perception that others use marijuana and that may adversely affect their behavior. Some supportive evidence for this hypothesis is that there are strong cross-sectional and prospective relationships between this perception and

**Figure ES-5. The expected relationships among cognitive outcomes**




marijuana use. To examine this hypothesis further, perception of other kids' use is being treated as an outcome parallel to the other youth cognitive outcomes in this report.[6]

The single item measure of intentions outcome focuses on the proportion of youth who said "definitely not" when asked about the likelihood of their using marijuana in the next year. This measure has proved to be highly predictive of subsequent use. Similarly, each of the three multi-item indices presented in Figure ES-5 are highly related to intentions to use marijuana. The Attitudes and Beliefs Index includes questions about eight specific consequences of marijuana use for the respondent, as well as general attitudes toward marijuana use. The Social Norms Index includes questions about what parents and friends would expect the respondent to do about marijuana use. Finally, the Self-Efficacy Index assesses the respondent's confidence that he or she could refuse marijuana in a variety of circumstances. The three indices are calibrated so all 12- to 18-year-old nonusers at Wave 1 had a mean score of 100 and a standard deviation of 100.[7]

## Youth Trends

Table ES-10 presents a summary of the trend data for all nonusing youth. As shown, two of the cognitive outcomes yielded statistically significant trends in the overall sample, both in a direction favorable to the Campaign:

- The Attitudes/Beliefs Index registered a significant favorable change between 2000 and the first half of 2004, which was particularly strong for the 12½- to 13-year-old age group. Among the attitudes that changed, nonusers in 2004 were significantly more likely than in 2000 to disapprove of occasional marijuana use by others and to perceive that using marijuana would "Be acting against my moral beliefs." However, there was no evidence that this favorable trend accelerated when the Campaign was redirected in late 2002, nor was there significant movement among the

[6] This item had always been part of the general social norm index, but effects of this item by itself were not previously examined.

[7] The indices were not recalibrated for the 12½- to 18-year-old sample used in the present report. However, this has no impact on significance tests of trends and associations.

new target population of 14- to 16-year-olds. When restricted to the 2002 to 2004 period, the trend results for the Attitudes/Beliefs Index showed no statistically significant changes overall or for any of the age subgroups.

- The one statistically significant favorable overall trend since the Campaign was redirected in 2002 was in intentions to not use marijuana. For the full sample of 12½- to 18-year-olds, the proportion of nonusing youth saying they would "definitely not" try marijuana over the next 12 months increased by 2.1 percentage points between 2002 and 2004. The resulting proportion—87.5 percent—was the highest since the NSPY began in November 1999. Among older nonusers—who are historically at greater risk—the 2002 to 2004 increase was statistically significant and somewhat larger (2.6 percentage points). Because of the strong relationship between intention to use and subsequent initiation, any change in intentions would have to be viewed as important.

**Table ES-10. Trend evidence for youth aged 12½ to 18**
**Trends in intentions, beliefs, norms, and self-efficacy about marijuana use among nonusers**

| | Year 2000 (Mean) | Year 2001 (Mean) | Year 2002 (Mean) | Year 2003 (Mean) | Year 2004 (Jan to Jun) (Mean) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
|---|---|---|---|---|---|---|---|
| Percent definitely not intending to use marijuana | 86.7 | 85.3 | 85.4 | 86.3 | 87.5 | 0.8 (-1.0, 2.6) | **2.1* (0.5, 3.7)** |
| Mean score on Attitudes/Beliefs Index | 105.06 | 101.30 | 108.49 | 108.82 | 111.35 | **6.29* (0.36, 12.23)** | 2.86 (-2.36, 8.09) |
| Mean score on Social Norms Index | 103.64 | 98.65 | 103.33 | 99.83 | 104.79 | 1.15 (-5.05, 7.34) | 1.46 (-3.89, 6.81) |
| Mean score on Self-Efficacy Index | 102.63 | 100.76 | 106.25 | 107.88 | 105.04 | 2.41 (-3.34, 8.16) | -1.21 (-7.17, 4.75) |
| Percent perceiving few other kids regularly use marijuana | 57.8 | 59.7 | 56.9 | 56.7 | 57.2 | -0.6 (-3.7, 2.5) | 0.3 (-2.3, 2.9) |

* Change between specified years significant at $p < 0.05$

Note: The three indices were standardized so that 12- to 18-year-old nonusers had a mean and standard deviation of 100 at Wave 1.

Additional analyses of individual item responses provide insight into factors driving the change in intentions:

- Nonusers in 2004 were significantly more likely than in 2002 to disapprove of occasional marijuana use by others and to perceive others as risking harm by using marijuana occasionally.

- The 12½- to 13-year-old nonusers in 2004 were significantly more likely than in 2002 to cite "Damage my brain" and "Lose my ambition" as possible outcomes of regular marijuana use, while 14- to 18-year-old nonusers were more likely to cite "Mess up my life" and "Do worse in school."

- In general, youth reported greater concern about the negative consequences of marijuana use than at any time since NSPY began.

## Youth Cross-Sectional Associations

As noted above, trends alone, whether favorable or unfavorable to the Campaign, do not establish a Campaign effect. Cross-sectional results for youth outcomes are summarized in Table ES-11. The

exposure columns represent the level of exposure reported by these youth to Campaign television advertising. The rows present average scores on the five outcomes of interest within each category of exposure. The estimates in the cells are adjusted, through the propensity scoring methodology, for a wide variety of potential confounders, as well as being survey weighted to represent the U.S. population. The statistical significance tests take the complex sample design into account. The overall relationship of exposure and each outcome is summarized by the gamma statistic, which varies from -1 to +1, with 0 indicating no relationship. The results are presented for the overall sample, and broken out by the period preceding (Waves 1 through 6) and following (Waves 7 through 9) the October 2002 redirection of the Campaign.

Key results are as follows:

- The cross-sectional association analyses provide no evidence that the favorable trend in youth intentions not to use marijuana was influenced by Campaign exposure. This does not prove that the trend was not due to the Campaign; it is possible that the effect occurred after a minimum threshold of exposure was reached but was insensitive to additional exposure, in which case the associational analyses would not detect it. This is unlikely, however, for two reasons. First, a favorable trend alone cannot permit unambiguous attribution of effect to the Campaign, and claims of an effect are much more vulnerable to alternative explanations when uncorroborated by associational evidence. Second, the thesis that exposure quantities do not matter, i.e., that seeing ads 12 or more times per month is no different than seeing ads once per month, is inconsistent with both communication theory generally and the theory of impact articulated by Campaign planners specifically.

- None of the cognitive outcomes registered favorable cross-sectional association effects for the Campaign as a whole. One of them—the Attitudes/Beliefs Index—registered a favorable cross-sectional effect of general exposure for the Waves 7 to 9 period, which included the Marijuana and Early Intervention Initiatives and related redirections of the Campaign. This effect was particularly strong among older youth, boys, Hispanics, and lower risk youth. However, because the Marijuana and Early Intervention Initiatives were more likely to change associations with specific exposure, and no association with specific exposure was found, it is questionable whether an association only with general exposure reflects Campaign influence. Moreover, neither of the other two predictors of intentions (social norms and self-efficacy), nor intentions themselves, showed any association with exposure. The absence of such effects, both for the overall Campaign and specifically for the period of the Marijuana and Early Intervention Initiatives, contradicts a claim that youth exposure to Campaign advertising has affected these outcomes.

**Table ES-11. Outcome measures by exposure per month among 12½- to 18-year-old nonusers of marijuana**

| Outcome | | Exposure | | | | Gamma | | |
|---|---|---|---|---|---|---|---|---|
| | | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | Overall gamma (95% CI) | Waves 1-6 gamma (95% CI) | Waves 7-9 gamma (95% CI) |
| Percent definitely not intending to use marijuana | General exposure | 86.9 | | 85.1 | 86.2 | -0.01 (-0.06, 0.05) | -0.02 (-0.09, 0.05) | 0.03 (-0.03, 0.10) |
| | Specific exposure | 87.5 | 86.3 | 85.0 | 87.4 | -0.02 (-0.07, 0.03) | -0.02 (-0.09, 0.05) | -0.01 (-0.09, 0.06) |
| Mean score on Attitudes/Beliefs Index | General exposure | 104.53 | | 105.33 | 108.65 | 0.02 (-0.01, 0.04) | 0.00 (-0.03, 0.03) | **0.05* (0.02, 0.08)** |
| | Specific exposure | 109.94 | 105.13 | 103.26 | 112.12 | 0.00 (-0.02, 0.02) | 0.00 (-0.03, 0.03) | 0.01 (-0.02, 0.04) |
| Mean score on Social Norms Index | General exposure | 100.60 | | 100.42 | 102.34 | 0.00 (-0.03, 0.02) | -0.01 (-0.04, 0.02) | 0.01 (-0.02, 0.05) |
| | Specific exposure | 111.56 | 100.42 | 101.12 | 103.26 | -0.02 (-0.04, 0.01) | -0.03 (-0.06, 0.01) | -0.01 (-0.04, 0.03) |
| Mean score on Self-Efficacy Index | General exposure | 101.70 | | 102.71 | 107.47 | 0.03 (-0.00, 0.07) | 0.03 (-0.01, 0.07) | 0.03 (-0.02, 0.09) |
| | Specific exposure | 106.44 | 102.94 | 103.78 | 110.26 | 0.02 (-0.01, 0.05) | 0.02 (-0.02, 0.07) | 0.01 (-0.03, 0.06) |
| Percent perceiving few other kids regularly use marijuana | General exposure | 61.1 | | 57.1 | 56.5 | **-0.06* (-0.10, -0.02)** | -0.05 (-0.10, 0.00) | **-0.07* (-0.13, -0.01)** |
| | Specific exposure | 63.7 | 59.3 | 56.5 | 56.4 | **-0.07* (-0.12, -0.03)** | **-0.06* (-0.11, -0.00)** | **-0.10* (-0.17, -0.03)** |

*Gamma significant at $p < 0.05$.

- In contrast, the newly added outcome—perceptions of other kids' use of marijuana—showed a significant unfavorable association with both measures of exposure for the Campaign as a whole, as well as the redirected Campaign. That is, youth reporting higher exposure to anti-drug ads were more likely to believe that their peers used marijuana regularly. The relationship extends across most major subgroups of age, sex, race/ethnicity, and risk. It is notable that the unfavorable cross-sectional effects appear for this outcome, in that it was specifically included in the present report to test the theory that exposure to the Campaign increases youth perception that others use marijuana, which in turn may affect their own use behavior. As noted above, because of the vulnerability of cross-sectional associations to reverse causation, the cross-sectional effect alone on perceptions of other kids' use does not permit a strong claim that the Campaign caused the association. However, tests for delayed effects of exposure on perceptions of other kids' use of marijuana also were statistically significant, greatly reducing the vulnerability to reverse causation. Delayed effects are reviewed next.

## Youth Delayed Effects

This section presents the results of analyses of the delayed effect of exposure at one round of data collection on outcomes at the following round. The outcomes are the five cognitive measures as well as actual initiation of marijuana use. Table ES-12 presents the overall average delayed effects combining all three of the one-round delayed effect analyses (so a youth who was interviewed at all four rounds would provide three cases for the analysis; Round 1 to Round 2, Round 2 to Round 3, and Round 3 to Round 4) as well as the delayed effects by round.

There is particular interest in examining whether there is evidence of a Waves 7 to 9 delayed effect, because Wave 7 was the first complete wave covering exposure to the Marijuana Initiative. The delayed effects for Round 3 to Round 4 are therefore divided into two components, Waves 6 to 8 and Waves 7 to 9, and these components are presented separately in the table.[8]

There were no significant delayed effects for the Attitudes/Beliefs Index or for the Self-Efficacy to Refuse Marijuana Index overall, or for any of the rounds or waves. There are significant delayed effects for the other three outcomes, all in an unfavorable direction.

- These include intentions to not use marijuana (general exposure: all rounds and Round 1 to Round 2), social norms (specific exposure: all rounds, Round 2 to Round 3, and Wave 7 to Wave 9), perceptions of other kids' use of marijuana (specific exposure: all rounds, Round 1 to Round 2, and Wave 7 to Wave 9), and initiation of use (specific exposure, Wave 7 to Wave 9).

- With respect to initiation in this sample of youth who had not previously reported marijuana use, there was no significant overall effect for general or specific exposure, but there was a significant unfavorable effect of specific exposure from the Wave 7 exposure period, which coincides with the Marijuana Initiative. This last finding is of particular concern, since it suggests that the Marijuana Initiative may have rekindled some of the unfavorable delayed effects that were first seen in the Round 1 to Round 2 analysis (Hornik et al., 2002a; 2002b), but were not seen in Round 2 to Round 3. Moreover, in Round 1 to Round 2, the unfavorable effects that reached statistical significance were limited to the cognitive outcomes, while in Wave 7 to Wave 9, they extend to initiation as well. Curiously, the unfavorable delayed effects of Wave 7 to Wave 9 are limited to specific exposure, that is, the unfavorable delayed effects of general exposure in Round 1 to Round 2 did not return.

- The unfavorable effects are counterintuitive, and therefore warrant special scrutiny. Section 5.5.4 of Chapter 5 presents a number of diagnostic analyses; each intended to investigate whether the unfavorable delayed effects could have resulted from a statistical artifact. While the possibility can never be categorically ruled out, examination of the most likely threats did not support overturning the basic finding of unfavorable delayed effects. However, concern remains over the unknown origin of the very low initiation rate in the lowest exposure category for Wave 7 to Wave 9 because this group contributed to the statistically significant unfavorable effect between specific exposure and initiation of marijuana use.

[8] In view of the redirection of the Campaign between Waves 6 and 7, it is more appropriate to give the separate wave results than the combined results for Round 3 to Round 4. However, it should be noted that the Waves 6 to 8 analyses are based on a relatively small sample size and hence the estimates have relatively large sampling errors.

**Table ES-12. Delayed effects of exposure on 12½- to 18-year-old nonusers of marijuana**

| Outcome | | Exposure | | | | Gamma[1] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | Overall gamma (95%CI) | Round 1 →Round 2 | Round 2 →Round 3 | Wave 6 →Wave 8 | Wave 7 →Wave 9 |
| Percent definitely not intending to use marijuana | General exposure | 82.3 | | 78.2 | 78.4 | **-0.07 * (-0.13,-.01)** | **-0.16* (-0.27,-0.06)** | 0.01 (-0.07,0.9) | 0.03 (-0.10,0.15) | -0.02 (-0.15,0.10) |
| | Specific exposure | 84.0 | 78.8 | 77.6 | 78.5 | -0.02 (-0.07, 0.03) | -0.05 (-0.13,0.03) | 0.01 (-0.06,0.09) | 0.00 (-0.13,0.13) | -0.01 (-0.12,0.10) |
| Mean score on Attitudes/ Beliefs Index | General exposure | 100.29 | | 91.81 | 95.24 | -0.01 (-0.04,0.02) | -0.03 (-0.08,0.02) | 0.02 (-0.03,0.07) | -0.02 (-0.09,0.08) | 0.01 (-0.05,0.07) |
| | Specific exposure | 105.57 | 94.75 | 91.29 | 90.40 | -0.02 (-0.04, 0.00) | -0.01 (-0.05, 0.02) | 0.00 (-0.04, 0.03) | -0.04 (-0.11, 0.03) | -0.03 (-0.08, 0.02) |
| Mean score on Social Norms Index | General exposure | 95.33 | | 87.02 | 87.68 | -0.03 (-0.06,0.00) | **-0.06* (-0.12,-0.01)** | 0.02 (-0.03,0.06) | -0.03 (-0.11,0.05) | -0.02 (-0.07,0.03) |
| | Specific exposure | 107.06 | 91.30 | 83.30 | 76.86 | **-0.05* (-0.08, -0.02)** | -0.04 (-0.08, 0.00) | **-0.05* (-0.10, -0.00)** | -0.04 (-0.11, 0.02) | **-0.12* (-0.17,-0.06)** |
| Mean score on Self-Efficacy Index | General exposure | 97.99 | | 95.49 | 98.21 | -0.01 (-0.05,0.03) | -0.05 (-0.10,0.01) | 0.02 (-0.04,0.09) | -0.01 (-0.09,0.07) | 0.03 (-0.04,0.10) |
| | Specific exposure | 107.30 | 95.18 | 96.36 | 91.37 | 0.00 (-0.04, 0.03) | -0.03 (-0.08, 0.03) | 0.01 (-0.06, 0.07) | 0.09 (-0.01, 0.19) | 107.30 |
| Percent perceiving few other kids regularly use marijuana | General exposure | 55.1 | | 54.7 | 52.9 | -0.03 (-0.08,0.02) | -0.01 (-0.09,0.08) | -0.05 (-0.11,0.01) | -0.10 (-0.22,0.01) | -0.01 (-0.10,0.08) |
| | Specific exposure | 63.2 | 54.6 | 51.1 | 50.4 | **-0.06* (-0.11, -0.02)** | **-0.08* (-0.15, -0.00)** | -0.04 (-0.10, 0.01) | -0.03 (-0.14, 0.07) | **-0.15* (-0.26,-0.04)** |
| Percent initiating use of marijuana | General exposure | 10.7 | | 11.2 | 12.5 | 0.07 (-0.01,0.15) | 0.08 (-0.05,0.20) | 0.01 (-0.11,0.13) | 0.14 (-0.03,0.32) | 0.08 (-0.11,0.28) |
| | Specific exposure | 10.8 | 12.6 | 11.5 | 13.2 | -0.02 (-0.13, 0.08) | 0.02 (-0.09, 0.14) | 0.00 (-0.12, 0.12) | 0.03 (-0.16, 0.10) | **0.20* (0.04, 0.35)** |

* Gamma significant at $p < 0.05$.

[1] A positive gamma represents a favorable effect, except in the case of "percent initiating use of marijuana," where a positive gamma represents an unfavorable effect (higher exposure associated with higher initiation rate).

If the results from the delayed-effects analysis are real, why are they occurring?

- When unfavorable delayed effects were first detected, in the Fourth Semi-Annual Report of Findings on Wave 1 to Wave 4, they were reported only with extreme caution. First, they were completely unexpected; the theory underlying the Campaign and the Evaluation was all about the process of eliciting anti-drug cognitions and behavior. Second, they were based on a small sample. Third, the confounder controls protocols—in particular the tests of balance—were still under development. When unfavorable delayed effects were again detected in the Fifth Semi-Annual

Report of Findings on Waves 2, 3 to Wave 5 (or when combined with the earlier results, the Round 1 to Round 2), they were based on a 150 percent larger sample, and tested with more mature protocols.

- Some of the strongest results—then and now—relate to social norms. With specific exposure the unfavorable effects are pervasive. The overall delayed effect of specific exposure is statistically significant; all three exposure rounds show unfavorable gammas (though Round 2 is nonsignificant), and the negative delayed-effect gamma from the Round 3 exposure period is primarily driven by Wave 7, the first full wave of the Marijuana Initiative. Is it possible that the Campaign, while its explicit message is anti-drug, provides a second implicit message—that the use of drugs is widespread? The Campaign's communication plan had proposed using messages that would say that most kids do not use drugs. But, in fact, there were very few messages broadcast during Waves 1 through 7 that put this idea forward. Contrarily, the messages that were broadcast—negative consequences, normative positive consequences, and resistance skills—all have as an implicit assumption that drug use is a problem. Is it possible that youth took from these messages a "meta-message" that drug use is widespread and therefore represents normative behavior?

- When the negative delayed effects were first observed (Round 1 to Round 2), it was speculated that this "meta-message" was a possible mechanism behind the observed unfavorable delayed effects, i.e., that the Campaign may be increasing youth perception that others use marijuana and that perception may, in turn, adversely affect their own behavior (Hornik et al., 2002b). Some supportive evidence for this mechanism came from the strong cross-sectional and prospective relationship between this perception and marijuana use. As described earlier, perception of other kids' use was added to the other youth cognitive outcomes in this report, in part to examine this mechanism further. The finding of a strong, unfavorable cross-sectional relationship between exposure and this outcome is consistent with the mechanism. If the meta-message is that drug use is widespread, higher exposure to Campaign ads should cause an immediate effect on the perception that other kids regularly use marijuana (cross-sectional association between exposure and perceptions). This perception eventually leads to a more generalized pro-marijuana social norm (delayed-effect association between specific exposure and Social Norms Index) and greater likelihood of actual initiation (delayed-effect association between specific exposure and use). Since the hypothesized causal chain is exposure to perceptions to initiation, another relationship must be observed, namely, an association between perceptions in one round and use in the next round. This was examined. Across the pooled sample of nonusing youth, those who responded that "some," "most," or "all" of their peer group had used marijuana regularly were almost 2½ times as likely to report initiation of use a year later than those who responded "none" or "a few" (21% vs. 9%).

Why were the unfavorable delayed effects strongest for the Marijuana Initiative?

- At this point, any explanation is based on speculation, but one explanation consistent with the meta-message mechanism is as follows: The Marijuana Initiative has been characterized as one phase of a "redirected Campaign." The youth ads themselves, however, continued the negative consequences message of the pre-Initiative Campaign, albeit with a sharper, harder hitting focus. If there is indeed a pro-drug meta-message that stems from ads that emphasize negative consequences, it would be reasonable to find that a more effective presentation of negative consequences strengthens the meta-message, which in turn weakens anti-drug norms, and ultimately paves the way for increased initiation.

## Users Analysis

In addition to increasing the resistance of nonuser youth to initiating use of marijuana, the Campaign would also like to encourage quitting or reducing frequency of use among users. Users have not received much attention in previous reports due to sample size concerns; there have not been enough of them, particularly at younger ages, to provide very much statistical sensitivity to change. With the addition of data for Waves 8 and 9, however, there are 1,367 past year users, 71 percent more than in the Waves 1 to 7 sample. This sample size provides sufficient power to detect moderate effects of Campaign exposure on quitting or reducing marijuana use 1 year later, in the full sample of past year users, though not in subgroups. Consequently, effects on users are examined in this, the final report. The policy question asked was: Among adolescent users of marijuana, did higher exposure to the Campaign increase quit rates, reduce frequency of use or, at minimum, slow the increased frequency of use that naturally accompanies maturation. This question can be addressed by a delayed-effects analysis.

Two outcomes were examined: the dichotomous "quit rate," which is commonly used in smoking cessation studies, and an ordinal indicator that takes into account frequency of use as well as use–nonuse. For youth who reported having used marijuana in the exposure year, their frequency of use in the followup year can 1) increase, 2) stay the same, 3) decrease but not to zero, or 4) decrease to zero (i.e., quit). Testing the ordinal as well as the dichotomous outcome is important for two reasons. First, the ordinal version has more statistical power. Second, while complete cessation is clearly the preferred outcome, reducing frequency or preventing increased frequency is also beneficial. If, for example, the Campaign does not significantly increase quit rates, but does slow the rate at which casual users become regular users, it is still an important finding. Casual users are more likely than regular users to age naturally out of drug use, and are less likely to subsequently require treatment for dependence or abuse.

Results from the delayed-effects analysis for the dichotomous and ordinal outcome measures are shown in Tables ES-13 and ES-14, respectively. Key results are as follows:

- The overall weighted quit rate was 24.8 percent; that is, among prior-year users, slightly less than one-quarter reported they were no longer using marijuana. However, as shown by the gammas in Table ES-13, there was no significant association between exposure and quitting for either measure of exposure.

- Across the sample, 34.1 percent used marijuana more frequently than in the prior year, 24.5 percent continued at the same rate, 16.1 percent reduced frequency (but did not quit), and 25.3 percent quit.[9] As with the dichotomous outcome, however, there was no significant association between exposure and change in amount of use for either measure of exposure (see Table ES-14).

[9] These estimates are weighted. The slight difference between the quit rate in the two outcome measures is due to a small number of missing values in the variables required to construct the ordinal measure.

**Table ES-13. Exposure per month and quitting use of marijuana among 12½- to 18-year-old prior users**

| | Percent quitting use | | | | |
|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | Gamma (CI) |
| General exposure | 25.6 | | 27.8 | 25.0 | -0.03 (-0.18, 0.12) |
| Specific exposure | 13.2 | 28.9 | 26.4 | 21.9 | 0.04 (-0.07, 0.15) |

**Table ES-14. Exposure per month and change in use of marijuana among 12½- to 18-year-old prior users**

| | | Percent in each outcome category | | | | |
|---|---|---|---|---|---|---|
| | Outcome category | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | Gamma (CI) |
| General exposure | Increase | 32.2 | | 34.4 | 34.5 | -0.01 (-0.12, 0.09) |
| | No change | 29.5 | | 19.9 | 23.3 | |
| | Decrease | 12.3 | | 17.2 | 16.8 | |
| | Quit | 26.0 | | 28.6 | 25.4 | |
| Specific exposure | Increase | 33.6 | 31.2 | 36.3 | 33.3 | 0.01 (-0.08, 0.09) |
| | No change | 39.2 | 20.5 | 22.0 | 25.0 | |
| | Decrease | 14.1 | 18.9 | 14.4 | (S) | |
| | Quit | 13.2 | 29.5 | 27.2 | 22.0 | |

In sum, the users analysis did not show conclusive evidence that higher exposure to the Campaign has increased quit rates, reduced frequency of use, or slowed rates of increase.

## Campaign Effects on Parents

A continuing theme of the parent Campaign has been to encourage parents to engage with their children to protect them against the risk of drug use. This idea is summarized in the brand, "Parents: The Anti-Drug." The major component has been to encourage parents to monitor their children's behavior by knowing where they are and with whom, and by making sure they have adult supervision. To a lesser extent, the campaign also has encouraged talking between parents and children about drugs. Additionally, although largely restricted to the time period covered by Wave 1 data collection, the Campaign had a substantial level of advertising that encouraged parents to do fun things with their children as a positive part of their engagement with them.

The Evaluation examined evidence for Campaign effects on parents' reports of those three classes of outcomes: monitoring children's behavior, talking with children about drugs, and engaging in fun activities with children. In addition, youth reports of parent monitoring, talking behavior, and fun activities serve as supplementary outcomes for analyses of parent Campaign effects. The format of the youth questions was virtually identical to the questions asked of the parents. The report compares youth and parent trends on these parallel measures, as well as analyses of association, both cross-sectional and delayed, between parent exposure and parenting outcome for both parent and child reports of outcome behaviors. Two further outcomes based on parent reports were also examined: an index of attitude and belief items concerning talk (talk cognitions) and an index concerning monitoring (monitoring cognitions). In addition, the parent analyses look for evidence that parent

exposure is associated with youth outcomes, including all of those considered in the youth effects analysis.

As with effects on youth, the analyses searched for three supportive findings as the basis for a claim for a Campaign effect: a favorable trend on a target outcome, a favorable cross-sectional association between exposure to the Campaign and the outcome, and evidence for a delayed effect association between exposure at one round and outcomes at the next round for the parents interviewed on both occasions. For both the cross-sectional and the delayed-effects analyses, the associations were controlled for confounders. Table ES-15 summarizes the results for all of the parent outcomes on each of these criteria. Each row in this table indicates whether there was a full sample trend, whether there was a full sample cross-sectional association with the general or specific exposure measure, and whether there was a full sample delayed-effects association with the two exposure measures. The three behavioral outcomes are represented by both parent and youth reports. The significance criterion is whether or not the 2000 to 2004 trend or the gamma estimate, respectively, was significant at the $p<0.05$ level. If there was no overall statistically significant effect, but there was a statistically significant effect for subgroups of respondents, this is also indicated.

Key findings are as follows:

- The 2000 to 2004 trend in youth reports of monitoring behavior was favorable and statistically significant for the full sample. The corresponding trend in parent reports of monitoring behavior was favorable and significant among parents of all but the oldest youth (16- to 18-year-olds). There were no overall cross-sectional or delayed-effects associations of either exposure measure with youth-reported monitoring behavior, and no delayed-effects associations with parent-reported monitoring behavior. However, there was a significant favorable cross-sectional association between specific exposure and parent-reported monitoring behavior in the full sample. This effect was not detected in prior reports, and in fact was entirely driven by a strong association that first appeared in 2004 (Wave 9). While still tentative (e.g., it would be more persuasive if corroborated by an analogous effect on youth reports), this result represents the strongest evidence to date for a Campaign effect on the monitoring behavior of parents.

- The 2000 to 2004 trend for monitoring cognition (only available from parent reports) was favorable and statistically significant, and the 2004 estimate is the highest recorded to date for this index. In addition, there was evidence for cross-sectional associations for both general and specific exposure and monitoring cognitions for the full sample. Monitoring cognition has a substantial association with monitoring behavior, and like monitoring behavior, is associated with youth marijuana use and intentions. However, there was no evidence of a delayed-effects association overall and no favorable subgroup delayed effects associations with either of the exposure measures. Without evidence for a delayed effect that would establish the causal order, it remains unclear whether parent ad exposure affects their beliefs about the value of monitoring, or parents' monitoring beliefs affect their attention to and recall of the advertising. Despite this pattern of association with monitoring cognitions, there is no evidence consistent with Campaign effects on monitoring behavior, perhaps the essential outcome for the parent component of the Campaign.

**Table ES-15. Summary of outcomes for parents of 12½- to 18-year-old youth**

| Parent outcomes | All parents of youth aged 12½ to 18 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Trend | | Cross-sectional association | | | | Delayed-effects association | | | |
| | | | General | | Specific | | General | | Specific | |
| | Parent Reports | Youth Reports | Parent Reports | Youth Reports | Parent Reports | Youth Reports | Parent Reports | Youth Reports | Parent Reports | Youth Reports |
| Talking behavior | Favorable | Unfavorable | Favorable | None | Favorable | Favorable | Favorable | None | Favorable | Favorable |
| Talking cognitions | None | NA | Favorable | NA | Favorable | NA | Favorable | NA | No Overall, Whites (F) College (F), | NA |
| Monitoring behavior | No Overall, 14 to 16 (F), Lower Risk (F) | Favorable | No Overall, 12½ to 13 (U), 14 to 18 (F), No College (F) | No Overall, African-Americans (F) | Favorable | None | None | No Overall, Lower Risk (U) | No Overall, Lower Risk (F) | No Overall. 14 to 18 (F), Mothers (F) |
| Monitoring cognitions | Favorable | NA | Favorable | NA | Favorable | NA | No Overall, Higher Risk (U) | NA | None | NA |
| Doing fun activities[1] | Unfavorable | Unfavorable | Favorable | Favorable | Favorable | No Overall, African-Americans (F), Boys (F),Higher Risk (F) | Favorable | No Overall, R1→ R2 (F) | Favorable | None |

[1] Youth reports for trends in fun activities report changes between 2001 and 2004; parent reports for trends in fun activities report changes between 2000 and 2004.

Favorable or (F): Significant result at $p < 0.05$ favorable to Campaign goals.

Unfavorable or (U): Significant result at $p < 0.05$ unfavorable to Campaign goals.

None: No overall significant effect and no significant subgroup effects at $p < 0.05$.

No Overall: No overall significant effect, but significant subgroup effect(s) at $p < 0.05$.

NA: No analysis undertaken.

- Consistent with previous reports, the fun activities association analyses offer support for a Campaign effect, as the pattern for both cross-sectional and delayed effects associations were favorable. All of the associations of both specific and general exposure and the parent reports of fun activities were significant and favorable, while support from youth reports was also favorable though less consistent. However, the trend data for fun activities showed a decline between 2000 and 2004 as well as between 2002 and 2004 in both parent and youth reports. It is possible that the Campaign was having a favorable effect on parent involvement with youth fun activities, but the positive trend that might be expected from that effect was obscured by external factors that were causing a decline. It should also be noted that the Campaign did not focus on this theme since the initial year of Phase III.

- The talking behavior results also provide support for favorable Campaign effects. For the 2000 to 2004 time period, the parent reports showed a positive trend as well as statistically significant and favorable overall associations for both measures of exposure and for both cross-sectional and delayed effects. The youth reports of talking behavior also showed statistically significant favorable overall cross-sectional and delayed effect associations with specific exposure (though not general exposure). On the other hand, trend data based on youth reports of talking behavior were unfavorable. While parents reported more talk about drugs with their children in 2004 than in 2000, youth reported a decrease in such conversations over the same time period. There is no clear explanation for this discrepancy.

- For talking cognitions (based on parent reports only), the association results were consistently supportive of Campaign effects. For three of the four tests of associations, there was a statistically significant and favorable overall association for the 2000 through 2004 period. The fourth—delayed effect, specific exposure—while not significant overall was significant and favorable for White parents and college educated parents. However, the trend data showed no statistically significant changes between 2000 and the first half of 2004, and there was a statistically significant decrease between 2002 and 2004, most notable for parents of 14- to 18-year-old youth. As with fun activities, this may have been caused by non-Campaign factors.

In sum, the analysis provides substantial evidence for a favorable Campaign effect on three of the five parent outcomes: talking cognitions, talking behavior, and fun activities. There was also some evidence for a favorable Campaign effect on the monitoring behavior and monitoring cognitions outcomes; however, the causal ordering is uncertain in these cases due to the absence of delayed effects. The evidence on monitoring cognitions is strong, based on trend data and the positive cross-sectional associations between both general and specific exposure and the monitoring cognition outcome measure, but does not carry over into the delayed effects associations.

In prior reports, the lack of evidence of favorable Campaign effects on monitoring behavior was described as a challenging result from the Campaign's perspective because parenting skills have been the prime focus of the parent advertising almost since the beginning of the Campaign. There is good evidence that in focusing on monitoring behavior, the Campaign chose correctly, in that monitoring behavior has been shown here and in other studies to be a protective factor against initiation of youth drug use. Engaging in fun activities does show this to a lesser extent, but talking behavior does not show it at all. Talking about drugs has not been an explicit platform of the Campaign in Phase III, although it can be seen as an implicit message of some of the parenting skills ads. The relatively recent Early Intervention Initiative can be perceived as an effort to influence both parental monitoring and parental talking cognitions and behaviors. Doing fun activities with children was only an explicit message of the Campaign in the first year. So the areas of apparent favorable effects of the Campaign have been sharpest on talking (both cognition and behavior) and fun activities, areas where the

Campaign has placed comparatively little focus. By contrast, effects have been generally weakest in the area of most focus, monitoring behavior. As noted above, this appears to have changed during the last wave of data collection (first half of 2004), where the cross-sectional association between specific exposure and parent–reported monitoring was favorable and significant for the first time, and strong enough to make the overall association for 2000-2004 significant. At the same time, the cross-sectional effect did not appear for youth reports, and it is not known whether the cross-sectional effect on parent reports will carry over into a delayed effect.

This pattern of results suggests that despite the evidence supporting Campaign effects on parent outcomes, the likelihood of those effects translating into effects on youth behavior may not be high. And that is the pattern that is seen when the evidence for effects of the parent Campaign on youth outcomes is examined (Table ES-16).

**Table ES-16. Summary of the effects of parent exposure on youth outcomes for 12½- to 18-year-old nonusers**

| Youth Outcomes (marijuana) | All parents of nonusing youth aged 12½ to 18 | | | |
|---|---|---|---|---|
| | Cross-sectional association | | Delayed-effects association | |
| | General | Specific | General | Specific |
| Marijuana initiation | NA | NA | No Overall, African Americans (U) | None |
| Definitely not intending to use | No Overall, Higher Risk (F) | None | None | No Overall, Boys (F) |
| Attitudes/Beliefs Index | No Overall, Fathers (F), Higher Risk (F) | None | None | No Overall, Hispanics (F) |
| Social Norms Index | No Overall, Boys (F), Fathers (F) | No Overall, Boys (F), College (F) | No Overall, 14 to 16 (U), Girls (U) | No Overall, Hispanics (F), |
| Self Efficacy Index | No Overall, Mothers (U) | None | No Overall, R1→R2 (U) | None |

Favorable or (F): Significant result at $p < 0.05$ favorable to Campaign goals.

Unfavorable or (U): Significant result at $p < 0.05$ unfavorable to Campaign goals.

None: No overall significant effect and no significant subgroup effects at $p < 0.05$.

No Overall: No overall significant effect, but significant subgroup effect(s) at $p < 0.05$.

NA: As with the youth exposure analyses, the cross-sectional and delayed effects analyses of parent exposure on youth outcomes is restricted to youth who were nonusers at the point of exposure. Therefore, there was no cross-sectional test of exposure on marijuana initiation.

As described earlier, the analysis of youth outcomes yielded a positive trend in youth anti-marijuana attitudes and beliefs over the full Campaign, and a positive trend in intentions to not use marijuana for the 2002 to 2004 time period. However, there is little evidence from Table ES-15 that parent Campaign exposure contributed to those trends, as there were no full sample cross-sectional or delayed-effects associations between either general or specific parent exposure and youth attitudes/beliefs or intention not to use marijuana. Further, there was no other reported full sample favorable youth outcome effect associated with parent exposure. Statistically significant subgroup effects were rare for the 2000 to 2004 time period, although more likely to be favorable to the

Campaign when they appeared. Similarly, the pattern for 2002 through the first half of 2004 provided no evidence for an indirect Campaign effect of parent exposure on youth outcomes during the period of the Marijuana Initiative.

How can one explain this pattern of supportive evidence for Campaign effects of parent exposure on parent behavior, but no clear positive effects of parent exposure on youth outcomes? Three explanations fit these data. First, the claim of Campaign effects on parent outcomes might be mistaken. None of the outcomes had evidence that satisfied all of the a priori criteria for strong claims of effect, and if there were no effect, in fact, one would not expect an indirect effect on youth. Second, talking behavior and talking cognitions, the outcomes with the clearest evidence for effects for parents, were not related to youth marijuana use. Thus, even if there had been a Campaign effect on parent talking cognitions and behavior, it would not have been expected to affect youth outcomes. Third, indirect effects are hard to detect. For instance, if there were a small favorable effect of the Campaign on a parent behavior accompanied by a small favorable effect of that behavior on the youth outcome, the resulting indirect effect would be the product of those two effects. For example, if the effect of Campaign exposure on monitoring behavior were 0.10, and the effect of monitoring behavior on youth marijuana use were 0.20, the expected effect of the Campaign exposure on marijuana use would be the product of those two effects, or 0.02 (0.10 x 0.20). An effect of 0.02 could not be detected by the National Survey of Parents and Youth. The Campaign's indirect effects through parents could be detected only if there had been effects on several of the parent behaviors and each of those were related to the youth outcomes, and the sum of all the individual indirect paths had been large enough as a set to produce a detectable cumulative effect. All of these three explanations remain possible. Each of them may explain the current conclusion about the parent component of the Campaign: there is some evidence consistent with a favorable effect of the National Youth Anti-Drug Media Campaign on parent outcomes, but little evidence that the effect on parents translates into improved outcomes for their children.

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# 1. Introduction

This is the seventh and final report in a series of reports based on the National Survey of Parents and Youth (NSPY), a survey designed to evaluate the National Youth Anti-Drug Media Campaign (the Campaign). The Campaign is part of an effort by the Office of National Drug Control Policy (ONDCP) to educate and enable America's youth to reject illicit drugs by means of an advertising and social marketing program about the dangers of drugs. Other important Campaign goals are to convince youth who are occasional users of drugs to stop using them, to enhance adult perceptions of harm associated with the use of marijuana, and to emphasize to parents and influential adults that their actions can make a critical difference in preventing youth drug use.

This final report is both descriptive and evaluative in content. It reflects a change in scope from the previous report with regard to the youth-targeted Campaign effort. The youth population being analyzed in this report has been changed from 12- to 18-year-olds to 12½- to 18-year-olds.[1] This report includes a delayed effects analysis of the Marijuana Initiative, which was launched in October 2002, as well as a limited examination of the Early Intervention Initiative, which was launched in February 2004. Also added is a new outcome variable—the perception of other youths' use of marijuana, and an analysis of the Campaign effects on marijuana use among users of the drug. In addition, like previous reports, this report examines evidence about the effectiveness of parent-targeted Campaign activities over the longer term.

Chapter 2 describes the Evaluation design and analytic logic. Chapter 3 provides descriptions of message exposure achieved by the Campaign from September 1999 through June 2004, with particular attention to activities conducted between October 2002 and June 2004 (including the Marijuana and Early Intervention Initiatives). Chapter 4 presents evidence about trends in youth use and receipt of offers of marijuana. Chapters 5 and 6 present evidence about effects of the Campaign. Chapter 5 focuses on youth attitudes and beliefs about marijuana use. Specifically, the chapter examines trends in attitudes and beliefs about marijuana and assesses whether youth frequently exposed to Campaign messages are more likely to hold negative cognitions about marijuana. It also addresses whether the Campaign has influenced casual marijuana users to quit or reduce use. Chapter 6 focuses on parent behavior, parental attitudes and beliefs about engagement with their children to prevent drug use, and the effects of parent exposure on youth outcomes. Chapters 5 and 6 examine evidence about changes in the outcome indicators since the beginning of this phase of the Campaign in late 1999 and considers evidence that both current and prior exposure to the Campaign is related to these outcomes.

The first five reports in this series were published semi-annually. The sixth report followed the fifth report by 1 year. These timings responded to the modifications in the Campaign instituted in late fall 2002. The Office of National Drug Control Policy and the evaluators agreed that it would not be possible to evaluate the modified Campaign fairly with data collected only through December 2002, 3 months after the start of the Marijuana Initiative. It was, therefore, decided to delay the sixth report so

[1] This change was necessary when, in 2003, ONDCP requested that a fourth round of data collection be completed (a change from the previous three-round design) because, by Round 4, the number of children in the less than 12½ -year-old category was virtually nil.

that data collected for an additional 6 months, through June 2003, might be included. It was also agreed at that time that this seventh and final report would follow 1 year later.

This introductory chapter reviews the nature of the Campaign, its paid advertising component, other components of the Campaign, the administrative structure of the Evaluation, and the structure of this report.

## 1.1 Nature of the Campaign in Phase III

This report summarizes material from previous reports (Hornik et al., 2000; Hornik et al., April 2001; Hornik et al., October 2001; Hornik et al., May 2002; Hornik et al., November 2002; Hornik et al., December 2003) and updates that information with descriptions of activities undertaken between July 2003 and June 2004. The Campaign is now in Phase III. Phase I involved pilot testing the intervention in 12 metropolitan areas, using then existing Partnership for a Drug-Free America (PDFA) advertisements. During Phase I of the Campaign, ads were placed on television and radio, in newspapers, and on billboards. In Phase II, these advertisements appeared nationwide, in addition to the test areas. Some new advertisements were added to the Campaign. The advertisements appeared not only on television, radio, billboards, and in newspapers and magazines, but also on cable television, Channel One (educational television within schools), in movie theaters, on the Internet, on schoolbook covers, and on basketball backboards. Table 1-A shows the Campaign phases.

**Table 1-A. Campaign phases**

| Phase I<br>Jan 1998 – Jun 1998 | Phase II<br>Jul 1998 – Aug 1999 | Phase III<br>Sep 1999 – Continuing |
|---|---|---|
| ■ Pilot test in 12 metropolitan areas, with 12 sites selected for comparison<br>■ Previously produced ads<br>■ Paid and donated advertising (pro bono ad matching required) | ■ National level intervention<br>■ Previously produced and new ads<br>■ Paid and donated advertising on a full range of media (pro bono ad matching required) | ■ National level intervention<br>■ New ads<br>■ Paid and donated advertising on a full range of media (pro bono ad matching required)<br>■ Partnerships with media, entertainment, and sports industries, and civic, professional, and community groups<br>■ News media outreach through public relations activity |

ONDCP performs overall management of Phase III of the Campaign, in collaboration with the following groups:

- The Partnership for a Drug-Free America (PDFA), which provides the creative advertising for the Campaign through its existing relationship with leading American advertising companies;
- 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;

- Ogilvy (through September 2004), a national advertising agency with responsibility for media buying (as well as for carrying out some supportive research and assuring a coherent advertising strategy);

- Fleishman-Hillard, a public relations firm, which coordinates the nonadvertising components of the Campaign; and

- The Advertising Council, a coordinator of national public interest advertising campaigns, which supervises distribution of donated advertising time to other public service agencies under the "pro bono match" program.

Phase III marked the full implementation of the Campaign. As in the past, an extensive range of media was used to disseminate Campaign messages to a national audience of youth and parents. In addition, Phase III featured a significant interactive media component, involving content-based web sites and Internet advertising. Most of the ads used in Phase III were new, although some existing ads that were considered effective in the past also have been used. New ads have been developed and disseminated according to the National Youth Anti-Drug Media Campaign Communication Strategy Statement, which was developed over the course of a year with the help of hundreds of individuals and organizations with expertise in teen marketing, advertising and communication, behavior change, and drug prevention, as well as to the National Youth Anti-Drug Media Campaign Communication Strategy Statement Supplement, which documents changes to the original statement as of August 2001 and reflects refinements of the Campaign. Additional changes to the process of ad development came as part of the Marijuana Initiative. They are discussed in Section 1.2 below.

The development of the ads has followed a complex process involving four major organizations. The primary supervisor for the production of most of the ads has been PDFA, which has historically led anti-drug advertising efforts. However, since ONDCP uses Federal funds to finance some production costs as well as purchase media time, it has instituted a multifaceted review process for defining broad behavior change strategies and for developing and approving specific ads. Behavior change expertise has come from the BCEP's continuing panel of experts who are responsible for designing behavioral briefs that provide a framework for creative development, specifying objectives and message strategies for each priority audience. The panel has reviewed strategies and advertising executions at bimonthly or more frequent meetings to ensure behavioral relevance. ONDCP has performed overall management of the Campaign. Under that overall leadership, responsibility for media buying, some supportive research, assuring a coherent advertising strategy, and the day-to-day management of the advertising component of the Campaign has been carried out by Ogilvy, a national advertising agency.

Ogilvy has organized the participation (as subcontractors) of five agencies that specialize in communicating with minority audiences. Working with the specialized agencies, Ogilvy has formulated, designed, and managed the implementation of multicultural initiatives. Special attention has focused on sufficiently exposing Campaign messages to African Americans, Asian Americans, Pacific Islanders, Hispanic Americans, American Indians, and Alaska Natives. More than $23 million in paid and negotiated pro bono advertising messages and outreach programs aimed at youth aged 11 to 17, parents, and other youth influencers have been directed toward ethnic audiences each year. African Americans and Hispanics received the dominant share of multicultural advertising exposure—more than 70 percent of the ethnic paid and pro bono investments. Ogilvy also has supervised a substantial research effort to provide ongoing support to the Campaign decisionmaking. This included regular focus groups with target audiences for strategic development and concept

evaluation purposes, continuous mall-based tracking surveys for youth and telephone surveys for parents, and quantitative copy testing conducted across the country with both parents and youth. Ogilvy and its subcontractors have prepared recommendations on advertising content and buying strategies. ONDCP has then reviewed and provided final approval for all major Campaign decisions and for all advertising content.

Phase III of the Campaign has been "an integrated social marketing and public health communications Campaign." Thus, it has attempted to reach the target audience indirectly and directly through advertising. Two critical components of the Campaign in Phase III, under the direction of Fleishman-Hillard, have involved (1) partnerships with civic, professional, and community groups and (2) outreach to the media, entertainment, and sports industries. Through the partner organizations, the Campaign has striven to strengthen local anti-drug efforts. Through outreach, the Campaign has encouraged the news media to run articles that convey Campaign messages. In the early part of Phase III, the pro bono match was used to encourage the entertainment industry to portray drug use in ways that were based on accurate information, including the depiction of the consequences of drug use. Although the explicit tie to the pro bono match has been eliminated to avoid any appearance of government control over content, the Campaign has provided producers, script writers, directors, and journalists access to the latest drug information and high-level experts, through a regular series of briefings. The overarching goal has been to encourage popular culture to dispel myths about drug use and accurately portray consequences of drug use.

It has been expected that any youth may receive anti-drug messages from each of the following sources:

- Exposure to Campaign messages;
- Interaction with friends and other peers;
- Interaction with parents and other influential adults; and
- Involvement with organizations.

Youth exposure to Campaign messages may occur as a result of direct, paid and donated advertising or as a result of content fostered through outreach to the news media and entertainment industries. Further opportunities for exposure to anti-drug messages may be enhanced through personal involvement with organizations that have become partners as a result of Phase III Campaign outreach activities or by interaction with the Campaign's youth website, www.Freevibe.com. Exposure to anti-drug messages through interactions with friends, peers, parents, or other adults may occur as a direct result of either or both of these Campaign efforts. Although it is difficult to measure, exposure may also occur indirectly, as a result of a social environment in which prevention of drug abuse is a salient issue; the Campaign may contribute to this environment.

The following two sections outline many of the activities of the Campaign in Phase III. These accomplishments will provide a sense of the magnitude of Campaign efforts to prevent or reduce drug use through various channels.

# 1.2 Paid and Donated Advertising

## Overview

Table 1-B provides a historical summary of media spending since July 1998 as reported to the evaluators by Ogilvy.

Congress mandated that media organizations accepting Campaign advertising must match Campaign purchases with in-kind advertising time or space, or with other public service of equal value. The match component of the Campaign, coordinated by The Advertising Council, includes public service advertising that promotes support to parents, youth, and organizations that foster positive development for children and youth, and thereby contributes to some of the overall goals of the Campaign.[2]

Chapter 3 presents the Phase III media strategies for youth and parents in detail, including how much advertising was directed through each channel. The Campaign has delivered specific anti-drug messages nationally through television networks ABC, CBS, NBC, FOX, UPN, and the WB; through cable networks; and through national radio networks. On-line advertising was placed on approximately 40 web sites and on America Online. Campaign messages are also disseminated in newspapers and magazines, on home videos, and in movie theaters. Parents are further addressed through billboards, bus shelter placards, and other outdoor advertising.

**Table 1-B. Historical media spending overview July 1998-June 2004 (in thousands)**

| Time period | Jul 1998 to Jun 1999 | Jul 1999 to Jun 2000 | Jul 2000 to Jun 2001 | Jul 2001 to Jun 2002 | Jul 2002 to Jun 2003 | Jul 2003 to Jun 2004 |
|---|---|---|---|---|---|---|
| Net dollars (000) | Phase II (000) | Phase III Year One (000) | Phase III Year Two (000) | Phase III Year Three (000) | Phase III Year Four (000) | Phase III Year Five (000) |
| Original paid budget | $149,500 | $144,000 | $130,000 | $135,300 | $130,000 | $138,000 |
| Final paid budget[1] | $157,501 | $142,962 | $143,235 | $140,514 | $134,091 | $120,522 |
| Special Match[2] | $0 | $0 | $0 | $21,594 | $44,361 | $56,915 |
| Print, Channel One, Out of Home Match[3] | $32,460 | $37,622 | $32,188 | $33,158 | $34,567 | $35,632 |
| Interactive match budget | $3,312 | $4,943 | $3,214 | $4,494 | $3,367 | $4,864 |
| Total value of paid and match Campaign ads | $193,273 | $185,527 | $178,637 | $201,641 | $216,386 | $217,933 |

[1] Paid budget does not reflect final actualized spending for all years.

[2] Special Match: The term refers to pro bono match value fulfilled by TV and radio networks by airing the same paid ad in fulfillment of the pro bono match.

[3] Print, Channel One, and Out of Home Match: This roll-up of the match refers to ads for which 100 percent of the pro bono match is reflected in additional ad space for the same ads.

[2] Much of the material in this section comes from information supplied to the evaluators by the Campaign, particularly Ogilvy.

The Campaign originally targeted youth aged 9 to 18, with a focus on 11- to 13-year-olds, also known as "tweens"; parents of youth in these age ranges; and other influential adults. The paid advertising plan, more specifically, targeted 9- to 17-year-olds. In August 2001, the Campaign shifted their creative focus to 11- to 14-year-olds to allow the Campaign to more effectively reach youth at the time they are most at risk for drug trial (National Youth Anti-Drug Media Campaign Communication Strategy Statement Supplement, August 2001).

In spring 2002, ONDCP initiated another series of changes to the National Youth Anti-Drug Media Campaign. The 2002 report in this series had shown no evidence of Campaign success with youth through June 2002 (Hornik, et al., 2002). The Campaign altered its target age group to primarily focus on 14- to 16-year-olds, who have much higher rates of marijuana initiation than do younger children. More focused advertising was created to attack marijuana use, the most frequently abused drug in this age group (Executive Office of the President, ONCDP official announcement, May 23, 2002). A new series of ads focusing explicitly on the negative consequences of marijuana use, termed the Marijuana Initiative, launched in October 2002 and continued to air through June 2004.

Other changes initiated in spring 2002 included the implementation of more rigorous copy-test procedures, requiring each television advertisement to undergo pretesting before being aired to a national audience, and increased oversight by ONDCP in guiding the development and production of advertisements. Subsequently, there was also a shift away from advertising the Drugs and Terror ad platform that had been featured in some of the youth and adult advertising beginning in January 2002.

Despite this narrowing of the creative target, the ad Campaign was still expected to reach the full youth audience, reaching 90 percent of America's youth at least four times per week during the course of the Campaign (ONDCP Fact Sheet, "Summary of Campaign Accomplishments," March 2000). This plan included both advertising directed toward youth as well as advertising targeted to parents, which may also be seen by youth (often referred to as "spill").

After more than a full-year's emphasis of advertising targeted at the efficacy of monitoring for parents and negative consequences for teens, ONDCP expanded the Campaign's communications goals to include an additional component that was termed "Early Intervention." The Early Intervention Initiative, which was launched during the Super Bowl in February 2004 and continues to the present, is targeted to both parents and teen friends, two of the most critical influencers in a youth's decision to use drugs. The Campaign's goal is to leverage the power of parental and peer pressure to halt drug or alcohol use among teens. For the first time in the Campaign, alcohol use is included in these messages; it was added to demonstrate the realistic patterns of this behavior in teens who also engage in drug use.

The Campaign also, from the start, has designed advertising to be attractive to sensation-seeking youth who have been shown in research as more at risk for drug use (Palmgreen et al., 2001). Sensation seeking is a biologically based trait "based on the idea that persons differ reliably in their preferences for, or aversions to, stimuli or experiences with high-arousal potential" (Zuckerman, 1988, p. 174). Individuals who are high in their need for sensation desire complex and stimulating experiences, and are willing to take risks to obtain them. Several studies show that the variation in sensation seeking predicts behavioral differences, especially illicit drug use.

For both parent and youth audiences, the Campaign has chosen to focus on a limited set of message themes. As Phase III has matured, the Campaign developed a strategic plan to gain maximum awareness for each message platform. Much of the advertising during any one time period (called a

"flight") has focused on one theme or behavioral message platform. The plan has typically included four flights per year, each running 10 to 12 weeks. In each flight, two to three ads have been run, but all of them address one of the themes or message platforms. For much of the Marijuana and Early Intervention Initiatives, at least three to four ads were included in each flight.

## Youth

For youth, the strategic message platforms have evolved since the beginning of the Campaign. Some themes were merged together with the goal of increasing impact (National Youth Anti-Drug Media Campaign Communication Strategy Statement Supplement, August 2001). Campaign themes have included:

- **Resistance Skills and Self-efficacy.** Ads in this platform attempted to enhance personal and social skills that promote positive lifestyle choices. Specifically, they tried to help build confidence that youth can resist drug use. The Campaign reports that this theme was dropped in May 2002, toward the end of the Wave 5 period.

- **Normative Education/Positive Messages.** The normative education theme ads evolved in the late summer of 2001, from instilling the belief that most young people do not use drugs to conveying the message that "cool people don't use drugs." The positive alternatives strategy reinforced positive uses of time as behavioral alternatives to drug use. For both of these platforms, celebrities and peer-to-peer messages were used in the advertisements.

- **Negative Consequences.** This platform attempted to enhance youth perceptions that drug use is likely to lead to a variety of negatively valued consequences, including loss of parental approval, reduced performance in school and as an athlete, and specific social, psychological, aspirational, and health effects. As discussed below, this platform has been the primary focus during the Marijuana Initiative period.

- **Early Intervention.** This initiative, which was launched in February 2004, seeks to motivate youth to intervene with friends who they perceive have a problem with drugs or alcohol. It also tries to convince them of their efficacy to take action and to give them the tools and skills they need to intervene.

In the aftermath of the September 11, 2001 terrorist attacks, a new theme, Drugs and Terror, was targeted to older teens and young adults. The Drugs and Terror ads followed a similar theme of unintended negative consequences: buying drugs may contribute to funding terrorist activities. In contrast with the traditional approach of communicating personal consequences of drug use, these ads were meant to appeal to the current mood of patriotism, thus providing the youth audience with a reason not to use drugs that was "bigger than themselves." PDFA research conducted following the terrorist attacks of September 11, 2001, indicated that providing parents and teens with information about the link between drugs and terror would have a positive impact on anti-drug attitudes (PDFA, December 4, 2001). Between January and June 2002, about 19 percent of youth advertising time was dedicated to specific Drugs and Terror ads. However, the Drugs and Terror theme was largely de-emphasized with the start of the Marijuana Initiative, and its emphasis on more direct and personal negative consequences of marijuana use.

Starting with Phase III, the Campaign incorporated branding to unify its advertising. This began with the parent Campaign, which focused on the idea of "The Anti-Drug" (e.g., Love: The Anti-Drug; Communication: The Anti-Drug). In the fall of 2000, the branding initiative was extended to the youth campaign. The Campaign launched "My Anti-Drug," a multimedia initiative aimed at youth

aged 11 to 17 years. Youth were asked to answer the question, "What's Your Anti-Drug?" with the goal of engaging them in defining their anti-drug. They were encouraged to submit ideas to ONDCP by postcard or by the Web.[3] These ideas, which were incorporated into advertising for 2001 and 2002, suggested activities that might serve as "anti-drugs" and allowed audience members to fill in their own (e.g., Soccer: My Anti-Drug). As reported by ONDCP, the "My Anti-Drug" Campaign's overall goal was "to present positive messages and cause youth to think about the things in their own lives that stand between themselves and drugs."

There have been ads created for the general market, African Americans, American Indians and Alaskan Natives, Asian-Americans and Pacific Islanders, and Hispanics. A series of ads focusing on American Indian audiences was developed as part of ONDCP's $5 million effort to reach American Indian audiences since the beginning of the Campaign. A complete set of television and radio ad descriptions for the ads directed to the general, Hispanic, and African American markets for parents and youth appears in Appendix D of this report. Many of the most recent ads can be viewed or played by visitors to ONDCP's web site: www.mediacampaign.org.

Celebrities also have played a significant role in the advertising effort. Among the celebrities who appeared in anti-drug advertising during Phase III were singers Jimmy Lin, Mary J. Blige, Lauryn Hill, the Dixie Chicks, NSYNC, and the late Scatman John; athletes including tennis stars Venus and Serena Williams; professional skateboarder Andy MacDonald; track star Michael Johnson; Olympic athletes Tara Lipinski, Apolo Ohno, Rosie Fletcher, and Chad Fleisher; members of the U.S. Women's World Cup Soccer Team; and National Football League players Tiki Barber, Eddie George, and Derrick Brookes.

## The Marijuana Initiative – Youth

As mentioned above, substantial changes to the Campaign were announced following a review in spring 2002. The Campaign decided that its youth-targeted messages would shift focus to target marijuana use with hard-hitting advertisements portraying the negative consequences of marijuana use. While marijuana has been the most widely used illicit drug among America's youth, ONDCP has argued that many teens and their parents continue to underestimate the effects of marijuana use. The Marijuana Initiative has sought to highlight the health, social, academic, economic, and legal consequences of marijuana use. Older teens, aged 14 to 16 years, were identified as the primary audience while younger teens (aged 11 to 13 years) were viewed as a secondary target.

Between October 2002 and June 2004, more than 85 percent of youth-targeted television and radio advertisements focused exclusively on the negative consequences of marijuana use (see Chapter 3 and Appendix D for a more detailed description of specific advertisements). The Marijuana Initiative was implemented in two phases. The first phase, designed by the Leo Burnett ad agency, aired from October 2002 through January 2003. The second phase, designed by the McCann Ericksen ad agency, launched with new advertisements in February 2003 and is ongoing. The advertisements frequently featured various scenarios involving two or more teens interacting with implied smoking of marijuana, and highlighted immediate repercussions of their actions (e.g., harming an innocent victim while driving under the influence of marijuana, accidentally firing a gun while playing with it, losing control and putting themselves at risk for other risky behaviors).

[3] To facilitate on-line submissions, the on-line media unit allowed youth to submit their anti-drug ideas as a vote and upload a creative expression articulating their anti-drug in the form of a story or picture file.

To reach the new, primarily older teen audience, the Campaign increased activity on television programs with older teen audiences, placed advertisements in magazines with a large proportion of 14- to 16-year-old readers, and targeted web sites with features thought to appeal to high sensation-seeking older teens. Youth-targeted networks such as the WB, FOX, and UPN were once again used to reach teens, while adult networks were used selectively to reach teens via targeted and relevant programming, such as *Fear Factor* on NBC. Network specials such as the Grammy Awards were used to deliver strong ratings while capitalizing on the excitement generated by these events. In addition, the Campaign targeted multicultural anti-marijuana advertisements specifically to Hispanic and African American older teen audiences through the use of Spanish language television (Univision, Telemundo, and the Hispanic cable network MUN2) and African American teen magazines with a high composition of older teens (e.g., *Hype Hair*, *Honey*, and *Vibe*).

Cinema advertisements and interactive media also have been used to supplement the television advertisements created for the Marijuana Initiative. Negative consequences advertisements were shown in cinemas prior to films rated PG-13 beginning in December 2003. Marijuana Initiative Internet outreach efforts targeting youth have included interactive banner ads and online promotions to sites frequently visited by youth. Consistent with the Campaign's shift in focus toward older teens, www.Freevibe.com was modified to resonate with teens aged 14 to 16. According to Fleishman-Hillard, youth interacting with the *Freevibe.com* site for anti-drug information spend an average of 9 minutes per session. At of the end of June 2004, *Freevibe.com* had registered 24.7 million visitors over the Campaign's history. The average monthly number of site visitors has increased 82 percent since 2003; in the first 6 months of 2004, the site averaged more than 1 million visitors a month. In addition, the Marijuana Initiative employed nontraditional advertising to reach the older teen audience, including messages broadcast through Channel One in schools and school-targeted publications such as *Scholastic Teen Network* and *Weekly Reader*.

## The Early Intervention Initiative – Youth

During 2003, Ogilvy worked with ONDCP to develop a ground-breaking plan for the Campaign's new initiative called Early Intervention. The Early Intervention Initiative represented a major strategic shift in focus, from targeting teens solely with a prevention message to getting their parents and peers to intervene to stop teen use of drugs and alcohol.

Information gathering by Ogilvy involved more than 30 experts in the issues of treatment and intervention. They showed that in order for the Early Intervention effort to be successful with youth, it needed to link the negative consequences message of drug use to an appeal for teens to intervene on behalf of a friend or sibling with a problem, by instilling a sense of "moral obligation" to do so. Factors found to be useful in motivating teens to intervene include one's own self-interest (being put in dangerous positions, risking getting in trouble) and a genuine concern for a friend and for the deterioration of a close friendship. Teens not only acknowledge that use can get out of hand, but surprisingly feel that their role as "friend" can be a dominating, effective force that could inevitably change the course of a friend's life. They do, however, seem to recognize the limits of their own attempts at "intervening" on behalf of a friend, and acknowledge that intervening could result in the end of the friendship as a last resort. The Early Intervention youth ads seek to motivate youth to intervene with friends whom they perceive to have a problem, convince them of their efficacy to take action, and give teens the tools and skills to intervene.

The Early Intervention youth campaign launched with an ad, "Lake," which aired during the post-game show of the Super Bowl. Three additional ads: "Car," "Supermarket," and "Letter" modeled how to step in and confront a friend who is having a problem with drugs or alcohol and these ads were integrated thereafter. A complete set of television and radio ad descriptions appears in Appendix D of this report. Many of the most recent ads can also be viewed on ONDCP's web site: www.mediacampaign.org. The Early Intervention initiative was supplemented with radio, magazines, and mall-boards to provide teens with the skills to help them effectively intervene. Early Intervention Internet youth outreach has included selecting sites based on their ability to deliver to older, edgier, high sensation-seeking teens. Examples include gaming (www.ign.com and www.ea.com), music/entertainment (www.MTV.com and www.Sony.com), sports (www.espn.go.com), teen girl-targeted (www.seventeen.com and www.cosmogirl.com), and the World Wrestling Entertainment site appealing to older teen boys, www.WWE.com.

## Parents

For parents, Campaign themes have included the following:

- **Your Child at Risk.** This platform sent the message to parents, "Every child is at risk for drug use, even yours."
- **Parenting Skills, Personal Efficacy, and Monitoring.** This theme told parents that they can learn simple skills to help their child avoid drugs, including communication and family management. Parents should know where their children are, whom they are with, and when they will be back. For much of Phase III of the Campaign, there has been a predominant and sometimes exclusive emphasis on this platform (see Chapter 3).
- **Perceptions of Harm.** This platform stressed that parents need to be aware of the harmful effects of inhalants and marijuana on their child's life and future.
- **Early Intervention.** This initiative, which was launched in January 2004, stresses the importance of parents intervening at the earliest possible opportunity in their child's life if the child is using drugs or alcohol.

In early 2002, following the September 11th terrorist attacks, the Drugs and Terror ads directed at parents were launched to stimulate discussion between parents and youth about the relationships between terrorist activities and drug money. In fall 2002 and spring 2003, new Drugs and Terror ads aired on television in two phases: September 2002 to November 2002, and December 2002 to May 2003. Both waves of the new Drugs and Terror messages were targeted to parents and other adults with strong influences on youth. The second wave included two advertisements that were first introduced during the 2003 Super Bowl broadcast. The television campaigns were supported by a limited national newspaper effort.

## The Marijuana Initiative – Parents

Recent campaign messages targeting parents focused primarily on one main platform for mass communication: Parenting Skills, Personal Efficacy, and Monitoring. Between June 2002 and June 2004, nearly three-quarters of parent-targeted advertisements focused on this theme, with the vast majority targeting parenting skills and efficacy (discussed in detail in Chapter 3). This focus continued from the previous periods of the parent Campaign, however, an effort was made to add a marijuana-specific component. Media channels for parent-targeted advertising included television, radio, magazines, newspapers, and banner ads online. Print ads were meant to debunk common myths

about marijuana and were tagged with the names of local organizations. Nontraditional advertising included a partnership with the National Football League, which hosted "Drug Awareness Weeks" to support the Marijuana Initiative. The effort included the airing of marijuana prevention ads in NFL stadiums and print ads in game-day programs.

The Marijuana Initiative also engaged community anti-drug coalitions with a "Marijuana Awareness Kit," guides, fact sheets on marijuana for both parents and youth, and a video focused on debunking myths about marijuana use. Each of these resources is available on the Internet at www.mediacampaign.org. According to the Campaign, specific multicultural materials targeted specifically to African American, Hispanic, Asian American, American Indian, Alaskan Native, American Samoan, Puerto Rican, and U.S. Virgin Island parents were implemented throughout 2003 and 2004.

### The Early Intervention Initiative – Parents

Information gathering by Ogilvy on this strategy revealed that parents strongly believe it is important to get involved early on, when they first suspect or know their teen may be using drugs or alcohol. However, they admit that taking action feels difficult and they are often unclear about the right ways to step in. Parents also report a number of barriers that keep them from taking action about their children's use. In addition to helping parents overcome these barriers, empowering them to take action requires sharing the skills and resources to enable them to successfully intervene. Parents need to be able to confidently approach the subject with their children, and be provided the skills and words to do so. All the while, parents must be reminded that the earlier they intervene, the more effective they will be.

The parent Early Intervention campaign also launched during the 2004 Super Bowl with one ad: "Rewind." Additional Early Intervention ads: "Slam," "Rolling Paper," and "Rough Night" were integrated over time to sustain awareness.[4] These ads sought to help parents overcome barriers as well as demonstrate ways to start taking action. Major television networks ABC, CBS, NBC, and Fox were used to reach parents and adults, with programs such as *CSI* and *The District*. Broadcast time on an extensive list of cable networks including A&E, Bravo, USA, History, Travel, and TNN was purchased to deliver major adult audience segments, while simultaneously compensating for the recent viewer declines of network television. The parent Early Intervention campaign was supplemented with radio, magazines, newspapers, and out-of-home advertising to provide additional intervention tools to parents. Special attention was given to supporting new advertising for Spanish-language parents, including the development of in-language parenting brochures and posters as well as media events in Miami and Puerto Rico.

## 1.3 Public Communications Activities

Although advertising is the cornerstone of the Campaign, nonadvertising activities have been considered important to its success. With an annual budget in 2003-2004 for nonadvertising of approximately $7.1 million, public relations contractor Fleishman-Hillard has developed and coordinated such nonadvertising activities for the Campaign. The Campaign has included a comprehensive social marketing component that seeks to reach the audience both directly and

[4] See Appendix D for a brief description of these ads. Most of the recent ads can also be viewed on ONDCP's web site: http://www.whitehousedrugpolicy.gov.

indirectly, through both traditional and nontraditional channels. The nonadvertising Campaign activities have been designed to foster or enhance an environment in which drug use is noticed, recognized as a problem, and discussed. In such an environment, advertising can be expected to have a greater and more lasting impact.[5] This section focuses on these activities during the Marijuana and Early Intervention Initiatives.

## Internet and Other Media Outreach

The Campaign's public communication activities have engaged in targeted media outreach efforts to encourage widespread coverage of the negative consequences of youth marijuana use throughout the Marijuana and Early Intervention Initiatives. The Campaign's youth web site, www.Freevibe.com, was completely redesigned and relaunched in the spring of 2002. The site has allowed youth and other viewers to view information on a variety of drugs and access news on these drugs; and it encourages youth to get involved by sharing their stories and their Anti-Drug. In addition, the web site has recruited many popular movie stars and other celebrities to provide anti-drug testimonials, including Mandy Moore, Kate Hudson, Paul Walker, Anna Paquin, Amanda Bynes, Heather Graham, James Van Der Beek, Jessica Biel, Reese Witherspoon, Jennifer Love Hewitt, Heath Ledger, Beyonce Knowles, David Arquette, Matt Damon, Ashley Judd, Denise Richards, Lucy Liu, and others.

Parent and other adult outreach also increased with the launch of the Marijuana Initiative. The parent web site (www.theantidrug.com) incorporated more information specifically on marijuana. The Campaign's web site (www.mediacampaign.org) targeted community coalitions, youth serving organizations, and others by providing the "Marijuana Awareness Kit," which included key research and facts about the risks of marijuana use. In addition, the web site featured links and information about ordering marijuana resources, including a new marijuana-specific parent pamphlet, "Wake-up to the Risks of Marijuana: A Guide for Parents," as well as suggestions for local outreach and activities, news releases, editorial pieces, fact sheets, feature stories, public service announcement (PSA) scripts, and downloadable media ads. For the summer of 2003, the Campaign held a press conference and conducted special parent outreach, drawing attention to summer as a high-risk time for teens to initiate marijuana use. The initiative included new content on the www.theantidrug.com web site, outreach to print and broadcast media, and mass emails sent to both subscribers to the Campaign's parenting tips list and to other organizations. The Campaign also relaunched the Spanish-language web site, www.laantidroga.com, in September 2002 with extensive drug and substance abuse prevention information and bi-monthly email parenting tips.

In early 2004, www.theantidrug.com web site was redesigned and expanded to incorporate additional content on Early Intervention strategies and resources. Monthly traffic to the web site remained strong and increased for the 2003-2004 year. On average, 380,000 users have visited each month. Accessible in six languages, the web site has cumulatively registered nearly 10.7 million visitors, 4.3 million of them in the past year alone. The Internet site list provided for parents is composed of well-branded sites with strong editorial content such as www.NYTimes.com.

Five national press events were held between July 2003 and June 2004 to generate national media coverage on anti-drug topics, including the release of drug prevention materials for faith leaders, the dangers of driving under the influence of drugs, the announcement of new partnerships and materials to support the Early Intervention advertising initiative, and the increase in drug use over summer

[5] Much of the material in this section was based on information given to the evaluators by the Campaign, particularly Fleishman-Hillard.

months. The Campaign's national media events were complemented with 16 regional reporter background briefings on the negative consequences of youth drug use. These briefings featured medical and behavioral experts, as well as teens in recovery and their parents. The Campaign also continued radio interviews with experts on youth drug use and initiated a series of news reporter conference calls on topics such as the effects of marijuana on teen athletes.

Multicultural outreach included a roundtable on marijuana risks at the annual conference of the National Association of Black Journalists and a similar event in San Francisco for Asian American reporters and community leaders. New information resources developed by the Campaign during this time period included brochures for parents, teens, and adult influencers on the value of Early Intervention in teen drug use; new English/Spanish parenting brochures and posters; and a variety of posters and "backpack cards" for teens about marijuana risks.

## Community Outreach

Previous semiannual reports have noted that the Campaign had formed partnerships with an extensive list of national and local organizations already involved with drug prevention including Community Anti-Drug Coalitions of America (CADCA), National Association of State Alcohol and Drug Abuse Directors, Prevention through Service Alliance, National Drug Prevention League, Youth Service America, ASPIRA, United Indian Tribal Youth Corporation, National Middle School Association, Drug Abuse Resistance Education (D.A.R.E.), National Association for Children of Alcoholics, Child Welfare League of America, National Institute on Alcohol Abuse and Alcoholism, Center for Substance Abuse Treatment, National Association of Student Assistant Professionals, National Inhalants Prevention Coalition, the National Guard Bureau, the Centers for Disease Control and Prevention (CDC), and the National Association of Student Assistance Professionals. The Campaign also has collaborated with a variety of community groups, such as the National Education Association (NEA), Boy Scouts of America, Girl Scouts of America, and multicultural organizations (e.g., the Boys and Girls Clubs of America, PowerUP, and 100 Black Men). Partnerships with these types of organizations were intended to increase the amount of drug-related information in communities, including information about the negative consequences of drug use and how to resist drugs.

At the local level during 2003 and 2004, the Campaign co-hosted town hall events with community prevention experts in six communities (Cleveland, Birmingham, San Diego, Oklahoma City, Santa Barbara, and Phoenix) to build awareness and support for their local youth anti-drug efforts. These events helped generate news media coverage, raise awareness of national and local prevention resources, and mobilize community resources for anti-drug efforts. To broaden this effort, the Campaign held a roundtable at the national meeting of Drug-Free Communities grantees and provided guidance on how local communities could hold their own events.

Working with faith-based institutions, the Campaign has developed materials to help youth leaders incorporate substance-abuse messages and up-to-date information on drug prevention into existing programs. A substance abuse prevention guide, titled "Pathways to Prevention," was developed for faith communities and Fleishman-Hillard reported that a total of 1 million brochures have been distributed. The Campaign provided the Congress of National Black Churches with parenting and Campaign materials to distribute at their substance abuse prevention conference. Also, more than 8,000 parenting brochures were forwarded to the United Church of Christ.

The Campaign continued to work closely with community organizations from 2003 to 2004. Partnership activity during this time period was focused on supporting the Marijuana and Early Intervention Initiatives and included nonprofit organizations such as the American Academy of Pediatrics, the American Medical Association, the American Automobile Association, the American Lung Association, the American Psychiatric Association, the Young Men's Christian Association (YMCA) of the USA, and Students Against Destructive Decisions. Leaders and experts from these organizations participated in press conferences and briefings and, in some cases, facilitated distribution of materials to organization members.

A mission for the Campaign, launched in April 2003, involved linking interested individuals and community groups to local anti-drug coalitions. The ONDCP and the Advertising Council attained this goal through public service announcements, which referred individuals to a web site and a toll-free number. Eligible anti-drug coalitions could register on the site (www.helpyourcommunity.org) at no cost, while individuals could use the site to search for coalitions in their local area.

## Entertainment Industry and Corporate Outreach

The Campaign has continued to foster a relationship with the entertainment industry. In 2003 and 2004, the focus was on supporting the Marijuana Initiative. The Campaign has initiated two major outreach programs for entertainment industry leaders and writers to encourage accurate and convincing portrayals of the consequences of drug use. Between July 2003 and June 2004, the Campaign convened eight roundtables that attracted more than 150 representatives from the television and print entertainment industries. Roundtable topics included the negative consequences of marijuana, methamphetamines, steroid use among teens, drugs and terror, heroin and prescription drugs, and Early Intervention strategies.

Launched in December 2001, www.drugstory.org, the Campaign's web site for television and film screenwriters, has been a research and knowledge source for facts on drugs and their effects, expert contact information, as well as access to first-person accounts and feature stories. The Campaign collaborated with the National Institute on Drug Abuse (NIDA), the Drug Enforcement Administration, the Writers Guild Foundation, medical consultants, treatment and legal experts, and journalists to develop this resource. According to Fleishman-Hillard, more than 500,000 visitors accessed the site from 2003 to 2004 for an average of 7 to 8 minutes.

The Corporate Partnership Initiative, launched in 2001, was designed to enhance the Campaign by engaging the financial and communications resources of America's businesses. The initiative focused on recruiting businesses and employers to include anti-drug information in their own advertising, outreach, and internal communications. This strategy attempts to associate drug prevention messages with high visibility brands that have loyalty among Campaign audiences and increase the overall visibility of anti-drug information. As of June 2004, according to Fleishman-Hillard, more than 40 companies have committed to carrying out drug prevention messages through their own corporate advertising and in the workplace. For example, several airlines, including US Airways, Northwest Airlines, and United Airlines, include Campaign advertisements in video programming that airs during flights. The Campaign also recruited over a dozen corporate partners to distribute anti-drug materials, including Mitsubishi Motors, GEICO, Giant Foods, Goya, and Balfour. Retail outlets, including Safeway and TJ Maxx, have included information on youth drug use prevention in their own advertising and in-store communications. Westfield Corporation Inc., one of the nation's largest owners and operators of regional shopping centers, produced and distributed cards with parenting tips

in its malls during the 2002 holiday season. The Campaign partnered with DKNY Jeans to produce an anti-drug calendar for teens that was distributed through the popular magazine *CosmoGIRL* (1 million copies) and online at www.Freevibe.com (more than 500,000 copies).

The Campaign's @Work program, a collaboration with the Society for Human Resource Management, was designed to take advantage of the workplace as an avenue for reaching parents and other adult influencers with youth drug prevention information. The program has provided Campaign resources and materials to employers for distribution to their employees. The @Work web site offered employee newsletter articles, email parenting tips, and posters and brochures on drug prevention formatted for easy adaptation and customization by employers. During the period between July 2003 and June 2004, the Campaign's @Work program doubled the number of employees who received anti-drug materials for parents at their workplace from 5 to 10 million. Briefings with business and community leaders and targeted outreach to Fortune 200 companies resulted in more than 100 employers and unions participating in the Campaign's @Work program.

In addition, as part of the @Work program, a toll-free number was established that employers could call to obtain free materials for distribution, such as "Keeping Your Kids Drug-Free: A How-To Guide for Parents and Caregivers," a parenting brochure developed with the American Academy of Pediatrics (AAP), and the National Parent Teachers' Association (PTA). This brochure was originally distributed by AAP in the summer of 2001 to its 55,000 members, and the PTA sent sample copies to their 3,000 leaders nationwide encouraging them to order additional copies. Other partners in this program included National Families in Action, the National Family Partnership, the National Fatherhood Initiative, Parenting Coalition International, and National Asian Pacific American Families against Substance Abuse. The brochure continues to be available to employers as well as parents through the web sites www.mediacampaign.org and www.theantidrug.com.

## 1.4 Administrative Structure for the Evaluation

ONDCP implemented the Campaign in three phases, each with an evaluation component. Because of the short time periods for the evaluations of Phases I and II, those evaluations focused primarily on change in awareness of anti-drug ads that are part of the Campaign. ONDCP reported changes in awareness of anti-drug messages presented through the media. Changes in perceptions and attitudes about drug use were expected to occur within 1 to 2 years of full implementation of the Campaign and changes in behavior within 2 to 3 years.

The Phase III Evaluation has been accomplished through a national household-based survey of youth and parents from the same household, including youth aged 9 to 18 years old and their parents. The Evaluation included the full range of youth, starting at age 9, and their parents, so that initial interviews could be conducted with children before drug use was likely to begin and before they entered the "tween" age group. Tweens were initially the primary target age group for the Campaign.

The Evaluation has included a longitudinal component in which youth and parents in the same household were interviewed four times over the Evaluation period. These repeated interviews allowed measurement of aspects of adolescent development and thereby allowed a much better assessment of the causal processes associated with youth drug use than is possible with cross-sectional studies, such as Monitoring the Future and the National Survey on Drug Use and Health (formerly known as the National Household Survey on Drug Abuse). The Evaluation has also assessed awareness of the anti-drug ads that are central to the full implementation of the Campaign.

Westat and the Annenberg School for Communication conducted the Evaluation under contract to NIDA. The funding for the Evaluation was provided by ONDCP from the appropriation for the Campaign. NIDA prepared a tentative research design based on a meeting with experts in the field, and then contracted with Westat and its subcontractors to fully develop the design and carry out the study. Westat has had general responsibility for all aspects of the project and, in particular, for supervising all aspects of sample design, data collection, and data preparation. For prior reports, the Annenberg School for Communication at the University of Pennsylvania, Westat's subcontractor, had the lead responsibility for the study's design, data analysis, and report preparation. However, for the preparation of the current report, Westat took lead responsibility, with Annenberg in a consulting role. A second subcontractor for the first 2 years of the project, the National Development and Research Institute, provided expertise in the development of the drug usage questions and assisted in the preparation of the first special report on historical trends in drug use.

## 1.5 Structure of the Report

This report is organized in two volumes. Volume 1 contains six chapters along with an extensive set of detail tables. Volume 2 contains six appendices.

This chapter provides background on the Campaign. Chapter 2 discusses the model of Campaign action, which is the foundation for the Evaluation design and instrumentation, and describes the Evaluation's sample design, data collection methodology, and analytic framework. Chapter 3 discusses general and specific exposure of youth and their parents to the Campaign. Specific topics include advertising placement activities, parent and youth recall, anti-drug-related education, discussions about drugs and perceptions of media, and community attention to drug use. Chapter 4 discusses trends in youth use of marijuana based on NSPY data and trend data from three other national surveys. Chapter 5 discusses norms, attitudes, beliefs, and intentions of youth toward the use of marijuana; assesses the cross-sectional and longitudinal associations between youth exposure to the Campaign as a whole, as well as to the Campaign's recent Marijuana Initiative and drug beliefs, norms, attitudes, and intentions; and includes, for the first time, the effects of Campaign exposure on marijuana users. Chapter 6 discusses the effects of the Campaign on parental talking with their children about drugs, on parental monitoring practices, and on the frequency of their engaging with their children in fun activities. This chapter also assesses the cross-sectional and longitudinal associations between Campaign exposure and parental behaviors, and between parent Campaign exposure and youth outcomes.

The remainder of Volume 1 provides a large number of detail tables supporting and supplementing each of the text chapters. In some cases, these tables present results from additional variables not presented in the text, and often provide detailed breakdowns of responses by age, gender, ethnicity, sensation-seeking, and a "risk of drug use" score for youth. For parents, there are breakdowns by child age, gender, and other child characteristics, as well as parent education, gender, and ethnicity.

Volume 2 of the report contains the six appendices that provide detailed information about sample design, weighting, confidence intervals, and data suppression (Appendix A); data collection procedures and response rates (Appendix B); methods used to control for the effects of confounding variables (Appendix C); ads in the Campaign (Appendix D); preparation of the exposure and outcome indices, risk scores, and measurement quality (Appendix E); and the National Survey of Parents and Youth Questionnaires for Round 4 (Appendix F).

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# 2. Summary of the Evaluation Plan

The National Youth Anti-Drug Media Campaign (the 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 Campaign Evaluation to determine how successful the Campaign is in achieving these goals and to provide ongoing feedback useful to support decisionmaking for the Campaign. This chapter focuses on the Evaluation study's approach to assessing the Campaign's progress and success. Accordingly, it summarizes the models for Campaign actions and effects in Section 2.1. The next section presents the study's sample design and data collection methodology followed, in Section 2.3, by an overview of the analytic framework and a description of the samples of parents and youth. The chapter concludes with a brief overview of three analysis issues.

## 2.1 Models for Campaign Action

This section includes a presentation of the focus of the Evaluation and an extended presentation of the presumed models for how the Campaign is expected to affect its target audiences. The models underpin the construction of the design and the measuring instruments for the Evaluation.

### 2.1.1 Focus and Scope of the Evaluation

Although there are literally hundreds of questions that the Evaluation can answer, four overarching questions form the central focus of the Evaluation: (1) Is the Campaign getting its messages to the target populations? (2) Are the desired outcomes going in the right direction? (3) Is the Campaign influencing changes in the outcomes? (4) What is learned from the overall Evaluation that can support ongoing decisionmaking for the Campaign? This set of questions is applied to the evaluation of the youth-directed campaign and the parent-focused campaign.

In addition, the Evaluation has the following five major objectives:

- To measure changes in drug-related knowledge, attitudes, beliefs, and behavior in youth and their parents;
- To assess the relationship between changes in drug-related knowledge, attitudes, beliefs, and behavior and self-reported measures of media exposure, including the salience of messages;
- To assess the association between parents' drug-related knowledge, attitudes, beliefs, and behavior and those of their children;
- 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 Campaign; and
- To compare groups of people with high exposure to other groups with low exposure.

The circumstances of the Campaign present a serious challenge to evaluation. Because the Campaign goal is to reach out to youth all across America to help them avoid illicit drug exposure, it was not possible to use experimentation in the Evaluation. Experimentation would require conducting the Campaign in some media markets but not in others. Instead, the Campaign is evaluated by studying natural variation in exposure to the Campaign and how this variation appears to correlate with outcomes predicted by the theoretical model for the Campaign. This means comparing groups of people with high exposure to other groups with low exposure. The Evaluation has been designed to make it very sensitive to variation in Campaign exposure. The primary tool for the Evaluation is a household survey, the National Survey of Parents and Youth (NSPY).

It is possible that there are pre-existing differences between groups that might explain both the variation in exposure and variation in outcomes. To address this issue, NSPY includes many questions on personal and family history, which have been used to adjust or correct, through the use of statistical controls, the association of exposure with outcomes.

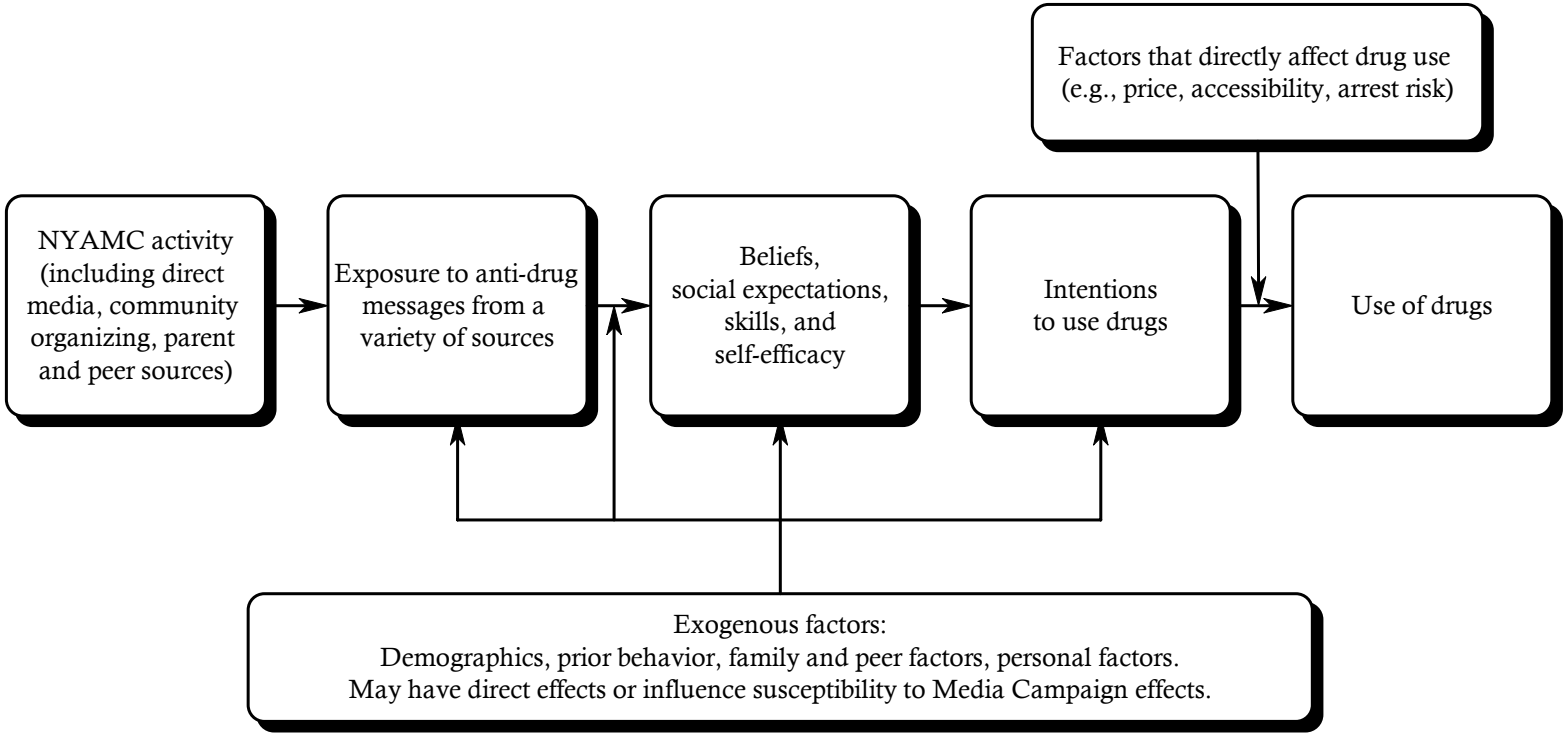
### 2.1.2 Model of Campaign Influence

The development of the overarching Campaign model was based on two foundations: basic theory about communication and health behavior change, and evidence about what influences drug use. The overarching model of Campaign influence can be largely presented in the form of five interrelated figures, each of which describes a component of the overall model in detail. Three of these figures focus on influences on youth drug use. The other two outline influences on parents' actions with regard to their children's drug use. However, these figures cannot portray some complex ideas about how the Campaign may produce its effects. For this reason, five routes by which the Campaign may have influenced behavior are described in text rather than graphically. These five routes of influence reflect current thinking in public health communication theory and have driven the process of data collection and analysis. The figures are presented first, followed by text descriptions of the five potential routes of Campaign influence.

### 2.1.3 Overview of the Figures

Figure 2-A presents the overall model of effects. It includes the model for Campaign influence in broad outline and names the categories of external variables likely to influence the process. All of the Campaign activities (advertising, work with partnership organizations, and 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 2-B. 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. A 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. These influence paths are laid out in some detail in Figure 2-C.

**Figure 2-A. Overall model of Campaign influence**



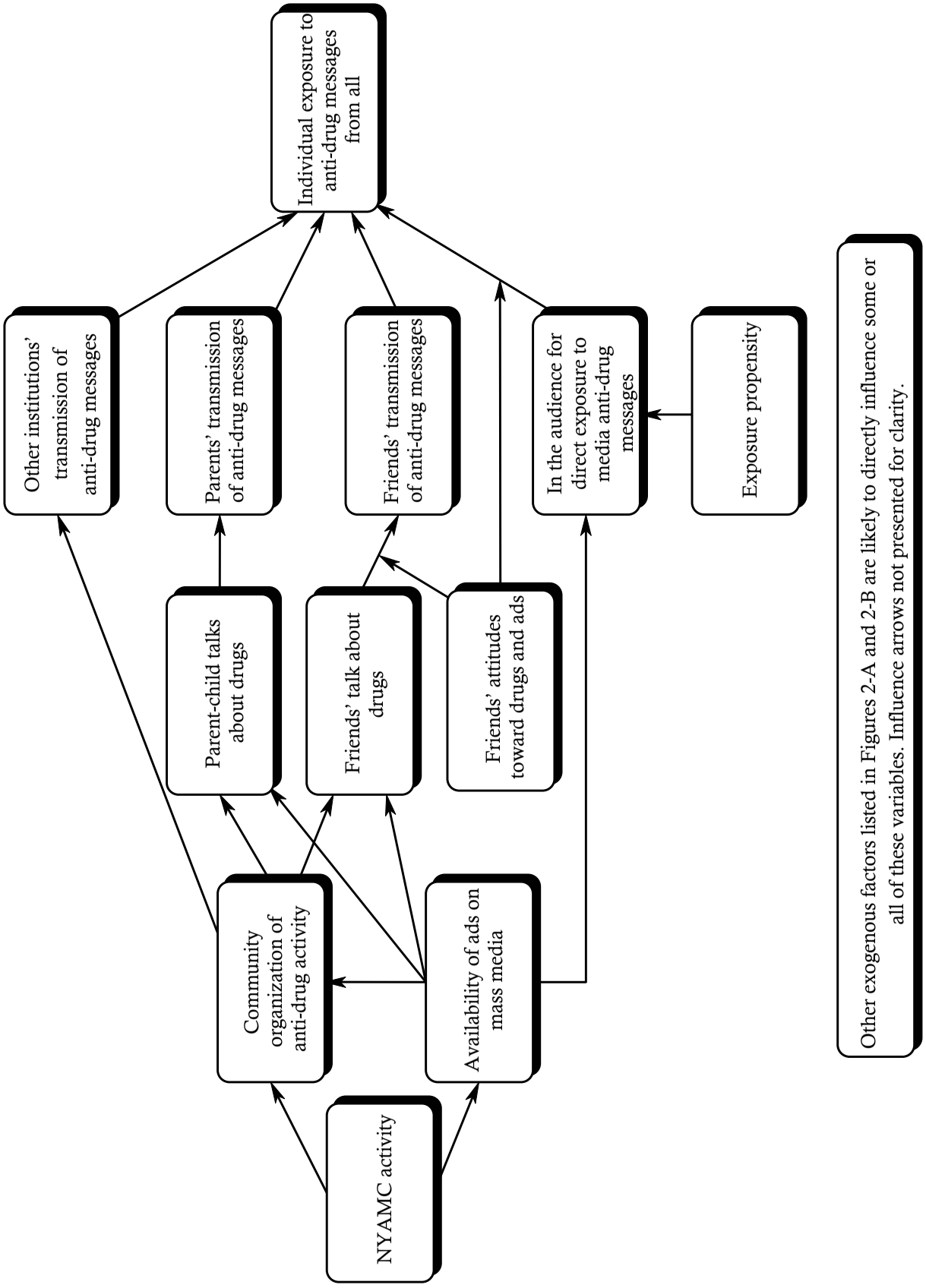
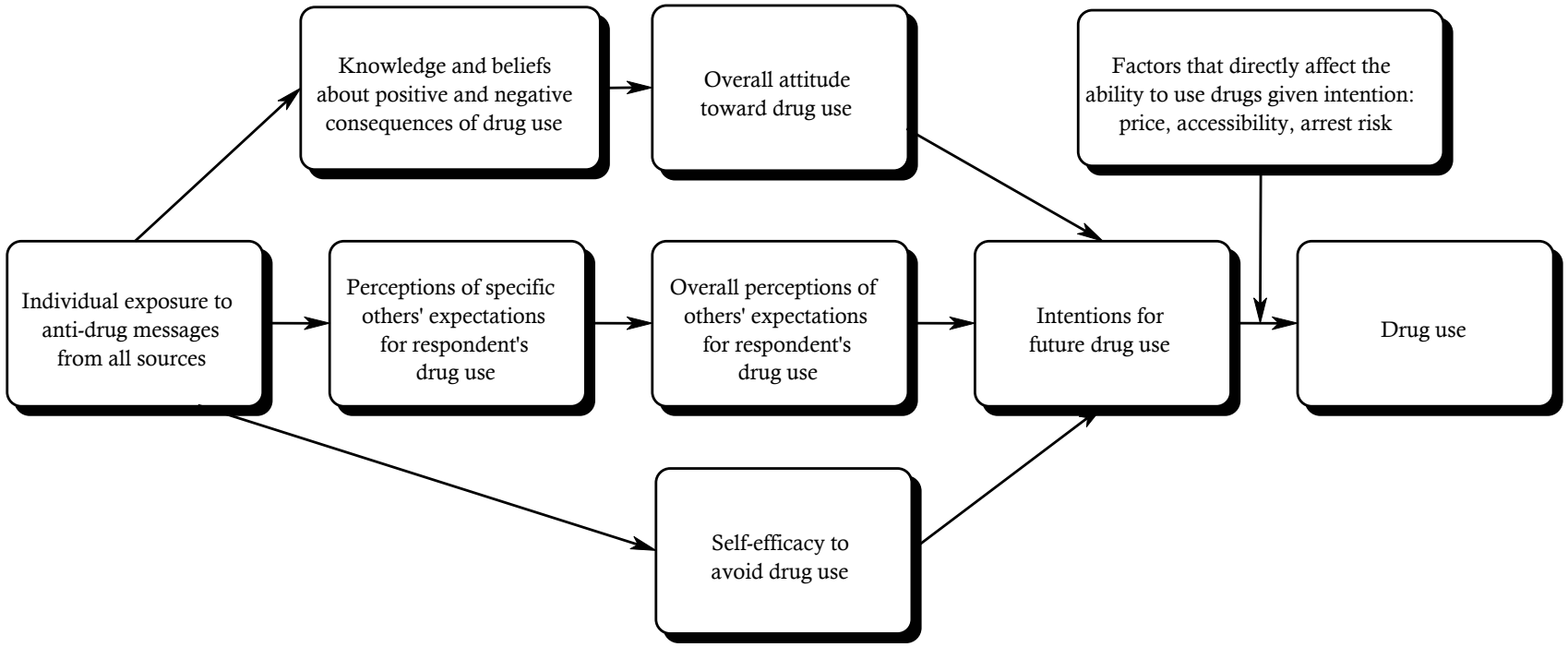



**Figure 2-B. Model of influences on exposure to anti-drug messages**

**Figure 2-C. Model of influences of exposure to drug outcomes**




| Exogenous factors that may influence all variables in this model and may also influence susceptibility to effects of Campaign exposure on all belief outcomes. (Relationships not pictured for clarity.) | | |
|---|---|---|
| Demographics: gender, age, race/ethnicity | Family and peer factors: parental monitoring, family functioning, friends' attitudes and behaviors, involvement with youth engaged in risk behaviors | Personal factors: sensation seeking (Section 2.3.4), academic success, ambitions, religious involvement, drug experience |

## Audience Exposure

Figure 2-B portrays the complex and multiple routes through which the Campaign can work. The youth may receive anti-drug messages from each of the following four sources.

- **Exposure to media messages.** The youth may be directly exposed to Campaign advertisements that appear on television, on the radio, in print, on the Internet, and elsewhere. Direct exposure to unplanned anti-drug media messages is also a possibility, if, for example, the news media increase their coverage of the issue as the result of Campaign activity. The likelihood of direct exposure to anti-drug messages depends on two factors: first, media consumption patterns, and second, the number and nature of advertisements that are placed on that medium in a given time period.

- **Interaction with friends and other peers.** Anti-drug messages may be relayed during conversations with friends. These conversations may have been stimulated by the presence of the Campaign, whether by advertisements or by activities undertaken by other organizations.

  However, although the Campaign might increase the number of drug-related messages heard by respondents through a process of social diffusion, the nature of these messages may not always reflect the intentions of the Campaign. The Campaign may inadvertently stimulate discussion that rejects anti-drug messages or even reinforces pro-drug messages. The attitudes of friends may have an important influence on the valence of message retransmission. For this reason, friends' attitudes are incorporated into the model in Figure 2-B.

- **Interaction with parents.** Anti-drug messages may come from parent-child conversations. One of the Campaign's early emphases was 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.

- **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. These organizations may reach enrolled youth directly or through parents or peers as intermediaries.

## Influence of Exposure on Behavior

Figure 2-C focuses on how exposure to anti-drug messages might influence behavior. The model relies fundamentally on the Theory of Reasoned Action, developed by Martin Fishbein and Icek Ajzen (1975), and is supplemented by the arguments of Albert Bandura (1986) concerning the importance of self-efficacy. The model assumes that intention to undertake an action is the primary determinant of behavior, 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 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 (self-efficacy). Attitude is a function of an individual's beliefs about the expected positive or negative consequences of performing specific behaviors. Perceived social expectations are a function of an individual's beliefs about what each of a number of important others (parents, friends) expect of them. The model assumes that exposure to anti-drug messages will influence beliefs, and thereby influence attitudes and perceived social expectations. Finally, the model assumes that exposure to messages will directly influence self-efficacy, the individuals' belief in their ability to avoid drug use.

Although Figure 2-C specifies drug use as its outcome, use of that general term should be understood as shorthand. The four distinct behaviors on which the Campaign originally planned to focus were: (1) trial use of marijuana, (2) trial use of inhalants, (3) transition from trial to occasional or regular use of marijuana, and (4) transition from trial to occasional or regular use of inhalants. Each of these behaviors may be influenced by different factors. For example, fear of parental disapproval may be a particularly important determinant of the trial use of marijuana, whereas a more important determinant of regular marijuana use may be concern about becoming dependent on the drug. For this reason, each behavior and its determinants are measured distinctly.

## External Factors

All elements of the Campaign's intended process of influence must operate in the context of a series of external factors. These factors are noted in Figure 2-A and presented in greater detail in Figure 2-C. In estimating the size of Campaign effects, such potential confounding influences have been controlled statistically. In addition, some analyses have been conducted to test whether individuals who vary on these external factors are more or less susceptible to Campaign influence.

External factors that will be considered in the Evaluation are parental monitoring, family functioning, friends' attitudes and behaviors, academic success, ambition, religious involvement, and prior drug involvement. Because it is argued that sensation seeking (Section 2.3.4) is an important determinant not only of drug use but also of responsiveness to advertising messages of a particular style, sensation seeking is also measured. Finally, the analyses make use of a risk of marijuana use scale for defining risk subgroups (Section 2.3.5). Risk incorporates sensation seeking, but is more comprehensive, including information about other relevant characteristics such as the child's prior alcohol and tobacco use. The Campaign expected that the higher risk youth would be more likely to show Campaign effects.

## Parent Component of the Campaign

The Campaign seeks to address three distinct parent behaviors, each of which is modeled separately in Figures 2-D and 2-E. The original parent objectives related to three parent behaviors: (1) parent-child talk about drugs, (2) parental monitoring of youth behavior, and (3) support for community anti-drug activity. In addition, during the early period of Phase III, the Campaign encouraged parents to increase their engagement with their children's lives by encouraging the parents to do more fun activities with their children. Over the course of the Campaign, the largest emphasis was on parent monitoring, including the idea that parents are able to intervene. Given their relative importance in the Campaign, the models for the first two behaviors, talk and monitoring, are presented in greater detail. In all models, a box simply labeled "NYAMC activity" represents the Campaign, much as it is described in Figure 2-B.

Model A in Figure 2-D describes a limited set of determinants for parental monitoring behavior. NSPY includes measures of past and intended monitoring behavior. Only two of the determinants of intention to monitor are measured: 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. Those consequences are divided 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).

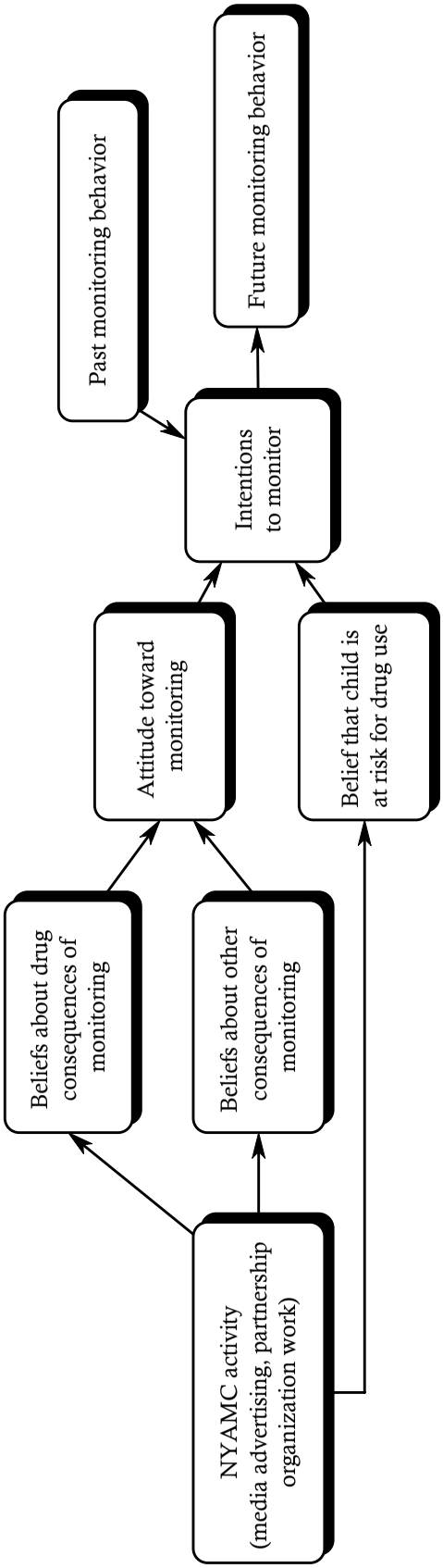



**Figure 2-D. Model A – Effects of parental monitoring**

A decision to increase monitoring may be seen by a parent as having both positive and negative consequences. 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. Model B in Figure 2-E describes a more complete process for the influence of the Campaign on parent-child talk about drugs. Talk has been separated 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. Although both are targets of the Campaign, 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. Attitudes are presumed to reflect three types of beliefs: belief that drug use has negative consequences for the child, belief that the child is at risk for drug use, and belief that parent-child talk is likely to discourage drug use by the child. General social expectations are hypothesized to be a function of the specific social expectations of others that the parent talk with the child. Campaign activity is presumed to affect all of the beliefs, self-efficacy, and specific social expectations for conversation about drugs.

## Routes of Influence

This section presents five overlapping routes through which the Campaign may have influenced behavior. These routes involve several features that are difficult to portray in figures. First, it is possible that there will be time lags between Campaign activities and their effects. Second, it is possible that effects are realized through social interactions and institutions instead of (or in addition to) being realized through personal exposure to 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 Campaign advertisements, youth immediately learn things about particular drugs that lead them to make different decisions about using those drugs. For example, they may learn that trying marijuana has bad consequences so they are less likely to try marijuana. This new knowledge could have immediate consequences, which should be apparent in associations between exposure, beliefs, and behavior. In this way, young people may learn negative and positive consequences of their using a particular drug; social expectations about drug use; and skills and self-efficacy to avoid drug use if they wish.

2. **Delayed learning.** As a direct result of Campaign 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 13-year-olds), where current learning would be expected to influence future behavior, when opportunities to engage in drug use increase.

3. **Generalized learning.** Campaign 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.

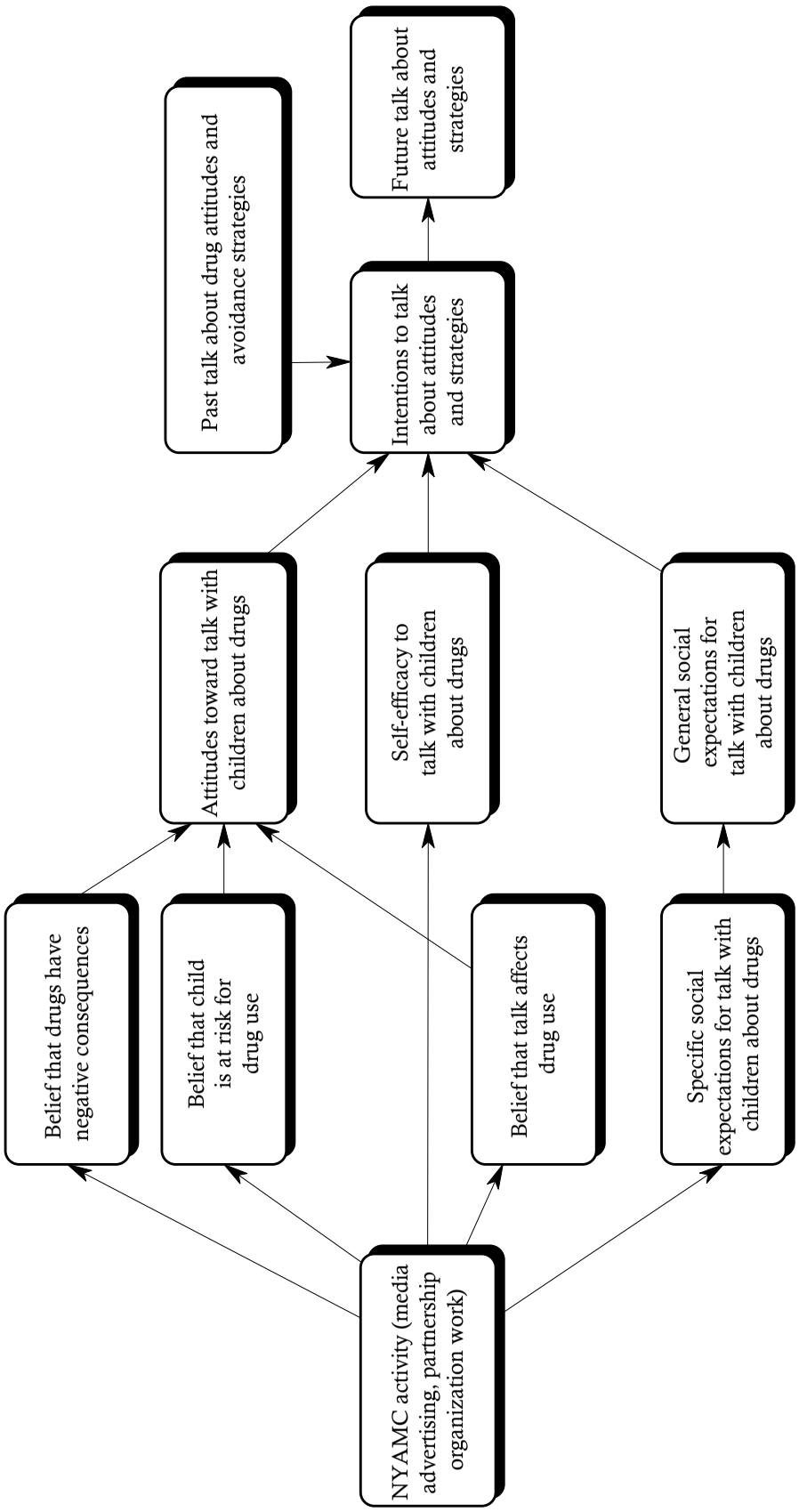



**Figure 2-E. Model B – Effects on parent-child talk**

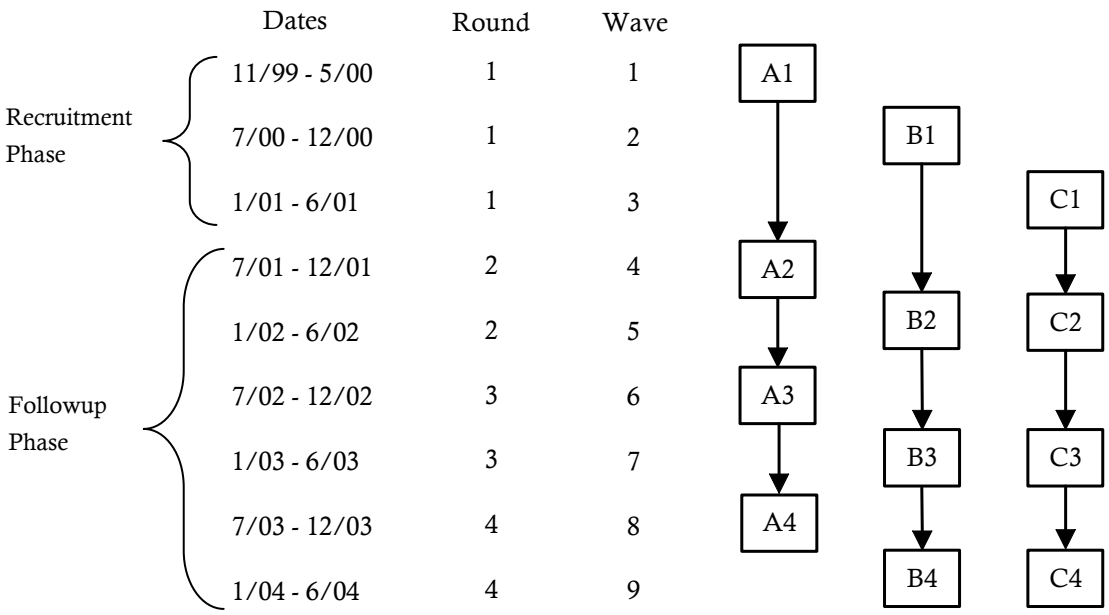
4. **Social diffusion.** The advertisements stimulate discussions among peers and between youth and parents, and these discussions affect cognitions about drug use. The discussions may provide new information about consequences or social expectations, as well as new skills or self-efficacy. That information 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. Discussions may produce or reinforce anti-drug ideas, or they may produce pro-drug ideas (called reactance). For example, the route of influence of the Early Intervention Initiative is through social diffusion. The Early Intervention seeks to motivate and enhance skills of youth to intervene with friends they perceive to have a problem with drugs or alcohol.

5. **Institutional diffusion.** The presence of advertisements (and the other elements of the 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, 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 (movie theaters, music, and entertainment television) may change the level of attention to and the content of drug-related messages. Institutional diffusion can be a slow process, and there might be a relatively long lag between Campaign activities and institutional response, and an even longer lag until the effects on youth beliefs or behavior become apparent.

## 2.2 Sample Design and Data Collection Methodology

Statistics derived from the NSPY are based on data collected over nine waves of data collection spanning a period of 4½ years. Waves 1, 2, and 3 are collectively referred to as the initial recruitment phase (Round 1) and covered the periods November 1999 through May 2000, July 2000 through December 2000, and January 2001 through June 2001, respectively. Waves 4 and 5 are referred to as the first followup phase (Round 2) and covered the periods July 2001 through December 2001 and January 2002 through June 2002, respectively. Waves 6 and 7 are referred to as the second followup phase (Round 3) and covered the periods July 2002 through December 2002 and January 2003 through June 2003, respectively. Finally, Waves 8 and 9 are referred to as the third (and final) followup phase (Round 4) and covered the periods July 2003 through December 2003 and January 2004 through June 2004, respectively. See Figure 2-F for a graphical depiction of the NSPY design. The numbers of completed interviews for youth and parents are summarized in Table 2-A by wave. Also shown are the corresponding numbers of youth–parent dyads for which both the youth and associated parent completed the NSPY interview.

**Figure 2-F. NSPY design**




The age range for sample youth at Round 1 was from 9 to 18 years of age. As the sampled youth aged over later rounds, youth passing the age of 18 dropped out of the study and the original age range of 9 to 18 years of age was curtailed. By Waves 8 and 9, the age range represented in the sample was essentially restricted to youth 12½ to 18 years of age. For this reason, the analyses in this report are confined to the 12½- to 18-year-old age group. The counts corresponding to the 12½- to 18-year-old age group are presented in the lower half of Table 2-A.

The procedures used to select respondents for the NSPY are summarized in Section 2.2.1, with additional details provided in Appendix A. The data collection procedures, which included innovations such as the use of prerecorded television and radio advertisements to aid in measuring respondents' exposure to the Campaign, are described in Section 2.2.2. Sections 2.2.3 through 2.2.5 summarize the statistical procedures used to derive the estimates given in this report including the development of sampling weights to inflate the sample data to national levels, calculation of sampling errors and confidence intervals, and imputation of ad recall for exposure index calculations.

**Table 2-A. Completed interviews by wave**

| Youth age group | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 | Wave 7 | Wave 8 | Wave 9 |
|---|---|---|---|---|---|---|---|---|---|
| 9 to 18 years[1] | | | | | | | | | |
| Youth | 3,298 | 2,361 | 2,458 | 2,477 | 4,039 | 2,267 | 3,587 | 1,983 | 3,143 |
| Parents | 2,230 | 1,617 | 1,657 | 1,743 | 2,872 | 1,636 | 2,616 | 1,483 | 2,377 |
| Dyads | 3,106 | 2,209 | 2,305 | 2,354 | 3,875 | 2,157 | 3,422 | 1,886 | 2,982 |
| 12½ to 18 years[2] | | | | | | | | | |
| Youth | 1,951 | 1,273 | 1,298 | 1,871 | 2,753 | 1,978 | 2,935 | 1,966 | 3,020 |
| Parents | 1,565 | 1,020 | 1,039 | 1,429 | 2,115 | 1,470 | 2,190 | 1,473 | 2,290 |
| Dyads | 1,833 | 1,178 | 1,216 | 1,774 | 2,622 | 1,877 | 2,791 | 1,869 | 2,862 |

[1] Total counts of cases interviewed for the NSPY (see Appendix A).

[2] Age group of cases included in analysis (see Section 2.3 for a discussion on units of analysis).

### 2.2.1 Sampling

Youth and their parents were found by a door-to-door screening of a scientifically selected sample of 81,000 dwelling units, including 34,700 dwelling units in Wave 1, 23,000 dwelling units in Wave 2, and 23,300 dwelling units in Wave 3. The selected dwelling units were clustered within a diverse and nationally representative sample of 90 large geographic areas referred to as primary sampling units (PSUs). Within the 90 PSUs, the selected dwelling units were further clustered within relatively compact areas referred to as "segments." In Wave 1, 1,300 segments were selected within the 90 PSUs, while in each of Waves 2 and 3, approximately 800 segments were selected. The sample of dwelling units was selected in a manner designed to provide efficient and nearly unbiased representation of America's youth and their parents. In general, all types of residential housing were included in the sample. Institutions, group homes, and dormitories, however, were excluded from sampling. The dwelling unit samples were selected only in the three initial (recruitment) waves. In the subsequent followup waves, respondents recruited in Waves 1 through 3 were followed if they lived within or just outside of the boundaries of the 90 sampled PSUs.

Within the selected dwelling units, the sampling was designed to obtain sufficient numbers of youth in each of three targeted age ranges: 9 to 11, 12 to 13, and 14 to 18. These age ranges were judged to be important analytically for evaluating the impact of the Campaign. In households with multiple eligible youth, up to two youth were sampled. The youngest youth (i.e., 9- to 11-year-olds) were included in the three recruitment waves to provide representation of 12- to 14-year-olds in subsequent followup waves. However, by Waves 8 and 9, only youth 12½ to 18 years of age were present in the sample. Hence, to maintain comparability across waves, the analyses in this report focus on youth between the ages of 12½ and 18 years of age.

Parents of the sampled youth were also randomly selected for the study. Parents were defined to include natural parents, adoptive parents, foster parents who lived in the same household as the sampled youth, and stepparents who have lived with the youth for at least 6 months. When there were no parents in the household as defined above, an adult caregiver was identified and sampled. If more than one parent or caregiver was present, one of the eligible parents/caregivers was randomly selected. Thus, no preference was given to selecting mothers over fathers. When there were two sampled youth who were not siblings living in the same household, a parent was selected for each youth. In the followup surveys, if the originally selected parent was no longer eligible (e.g., died, became incapacitated, or moved out of the household), another parent who was considered most knowledgeable about the sampled youth was selected as a replacement.

The response rates achieved for each of the three initial data collection waves were generally similar. For the initial (doorstep) screening to determine the eligibility of the dwelling unit (i.e., whether the dwelling unit contained any youth 9 to 18 years of age), the response rates were uniformly high at around 95 percent for all three waves. Among dwelling units determined to be eligible for the survey in Waves 1 through 3, 74 to 75 percent completed the household enumeration (roster). After selection of youth and parents, the interviewer sought signed consent from a parent to interview the sampled youth and also signed assent from the sampled youth. The interviewer then attempted to obtain extended interviews with both the sampled youth and sampled parent. Among the sampled youth, the response rate for the extended interview was around 91 percent in each of Waves 1 through 3. This meant that 91 percent of the selected youth received parental consent, signed to give their own assent, and completed an extended interview. Among the sampled parents, approximately 88 percent completed the extended interview in Waves 1 through 3.

The nonresponse losses described in this section do not reflect omissions due to undercoverage. In area probability sampling designs such as that employed in NSPY, undercoverage is common and can result from a number of factors including the use of incomplete lists of dwelling units to sample households, misclassification of eligible households in the initial screening (i.e., households with youth 9-18 years of age), and omission of age-eligible youth in the screened eligible households. Undercoverage is distinct from the type of nonresponse described here and is discussed later in Section 2.2.3, where the statistical procedures used to compensate for undercoverage are also described.

For the first followup round (Waves 4 and 5), participants were located and eligibility was determined for 92 percent of the youth and 92 percent of the parents who completed an interview in the initial round (Round 1). Among those youth in the first followup round (Waves 4 and 5) who were still eligible for the study (i.e., were 18 years or younger, not deceased, not institutionalized, etc.), the (conditional) longitudinal interview response rate was 94 percent. Among those parents who were still eligible in the first followup round, the (conditional) longitudinal interview response rate was 92 percent.

For the second followup round (Waves 6 and 7), participants were located and eligibility was determined for 96 percent of the youth and 96 percent of the parents who completed an interview in the prior round (Round 2). Among those youth who were still eligible in the second followup round (Waves 6 and 7), the (conditional) longitudinal interview response rate was 96 percent. Among those parents who were still eligible in the second followup round, the (conditional) longitudinal interview response rate was 95 percent.

For the third followup round (Waves 8 and 9), participants were located and eligibility was determined for 97 percent of the youth and 97 percent of the parents who completed an interview in the prior round (Round 3). Among those youth who were still eligible in the third followup round (Waves 8 and 9), the (conditional) longitudinal interview response rate was 96 percent. Among those parents who were still eligible in the third followup round, the (conditional) longitudinal interview response rate was 95 percent. Detailed information on response rates can be found in Section B.8 of Appendix B.

### 2.2.2 Extended Interview Methods and Content

Questionnaires were developed for children (aged 9 to 11), teens (aged 12 to 18), and parents through the efforts of a NIDA panel of experts and a contractor team that included staff from Westat, the Annenberg School for Communication, and the National Development and Research Institutes.

The youth questionnaire included sections on basic demographics; school and religion; media consumption; extra-curricular activities; personal usage of cigarettes, alcohol, marijuana, and inhalants; expectations for future use of marijuana; feelings of self-efficacy to resist future offers of marijuana use; knowledge of friends' and classmates' use of marijuana; receipt of marijuana offers; family functioning; anti-social behavior of self and friends; approval/disapproval and perceived risk of marijuana and inhalants; perceived ease of parental discussion on drugs and perceived parental reactions to personal drug use; past discussions about drugs with parents, friends, and others; awareness of drug-related media stories and advertising; recollection and assessment of specific Campaign-sponsored anti-drug advertisements on TV and radio; Internet usage; and participation in drug education classes and programs.

The parent questionnaire included sections on media consumption; communication with child; monitoring of child; family functioning; knowledge about child's use of cigarettes, alcohol, marijuana, and inhalants; personal participation in community drug prevention activities; awareness of drug-related media stories and advertising; recollection and assessment of specific Campaign-sponsored anti-drug advertisements on TV and radio; personal usage of cigarettes, alcohol, marijuana, and inhalants; basic demographics; and education, income, and religion. When parents were being asked about their children, each such question was targeted to a specific sampled child and repeated for every sampled child in the household. Other questions that were not about their children were, of course, asked only once.

In later waves, questions were added or deleted to the survey questionnaires as changes to the Campaign evolved. See Appendix B.2 for details.

Prior to beginning the interview, respondents were assured that their data would be held as confidential. To strengthen such assurances, a Certificate of Confidentiality was obtained for the study. Under the certificate, the Federal Government pledged that the Evaluation team could not be compelled by any person or court of law to release a respondent's name or to link a respondent's name with any answers that he or she gave. Interviewers showed a copy of the certificate to respondents prior to the interview upon request.

The extended interviews were administered with the aid of laptop computers that the interviewers carried into the homes. Each interview had sections where the interviewer read the questions out loud and entered the responses into the computer and sections where the respondents donned a set of headphones, listened to prerecorded questions, and then entered their own responses into the computer. The self-administered sections were arranged to promote a feeling of confidentiality for the respondent. In particular, they were designed to allow people to respond honestly to sensitive questions without allowing other members of the household to learn their answers. As part of the parental consent, parents were informed that only the child would see his or her responses. Interviewers were trained to discourage parents from looking at the screens while the youth completed the interview.

The computer played back a prerecorded reading of the questions rather than just having the respondent read the screen in order to facilitate the involvement of slow readers and cognitively-impaired youth. Youth and parents who did not wish to hear the questions read aloud could remove the headphones and complete the interview by simply reading and answering the questions on the screen. A touch-sensitive screen was used so that no typing skills were required. To help the respondent understand multiple choice questions, the computer highlighted the response alternatives while it recited them.

The interview could take place in either English or Spanish. This approach was highly successful. Table 2-B shows the percentage of youth and parents who were unable to complete the questionnaire for reasons of physical or mental disability or because they could speak neither English nor Spanish.

**Table 2-B. Percentage of youth/parents unable to complete interview due to disability/language**

| | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 | Wave 7 | Wave 8 | Wave 9 |
|---|---|---|---|---|---|---|---|---|---|
| Parents | 0.4 | 0.7 | 0.6 | 0.6 | 0.0 | 0.4 | 0.4 | 0.3 | 0.4 |
| Youth | 0.4 | 0.4 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

The laptop computer played the TV and radio advertisements for both youth and parents to help them recall their prior viewing more accurately. In order to limit the response burden for respondents, usually a maximum of four TV ads (not including a ringer ad—an ad that had not actually been shown—or a spill ad—an ad that had been shown but was targeted at the other (parent or youth) audience) were played for each youth and parent. However, there was special advertising aimed at African Americans and at bilingual English/Spanish speakers. In order to measure their recall of the special advertising as well as the general advertising, another two TV ads were sometimes shown to respondents in these groups. For radio ads, up to four ads were played for most parents and most teens, and none for children aged 9 to 11. As with TV ads, for African American respondents and bilingual English/Spanish speakers, another two radio ads were sometimes played in order to measure exposure to special and general advertising.

Appendix D contains a short description of each ad by wave. A random sample of the ads that were scheduled to air in the two calendar months preceding the month of interview was selected for each respondent.[1] As it turned out, air dates sometimes changed between the time that the sampling software was initiated and the date of interview. For analysis purposes, exposure to ads was counted only when the ad aired during the 60 days immediately preceding the date of the interview. In Waves 1 through 3, each interview also contained a ringer TV ad. In Waves 4 through 9, each interview contained a ringer TV ad or a spill TV ad. Youth were shown parent TV ads to assess their spill effects and vice versa. The ringer ad was used to study the accuracy of ad recall. Some analyses of the ringer ad results, presented in Appendix E of this report, show strong evidence for the validity of the NSPY approach to measuring ad recall.

Table 2-C presents the number of television and radio advertisements aired during Waves 1 through 9.

For additional information concerning the data collection methodology and response rates, see Appendix B.

### 2.2.3 Weighting

Weights were developed for analysis to reflect differential probabilities of selection and to compensate for differential response rates and coverage. As indicated in Section 2.2.1 (and discussed in greater detail in Appendix A), the probabilities of selecting youth and their parents for the NSPY varied by age group and household composition. For example, youth in the 12- to 13-year age range generally had larger probabilities of selection than youth in the 14- to 18-year age range. Due to the restriction that no more than two youth could be selected from a household, youth in the 14 to 18 and 9 to 11 age ranges in households with all three age ranges had lower probabilities of selection than those in households with only two of the three age ranges. Similarly, youth with siblings in the same age range had smaller probabilities of selection than youth with no siblings in the same age range. Since only one parent was normally selected per household, parents with spouses generally had smaller selection probabilities than single parents. The initial weights assigned to youth and parents were proportional

[1] The time period of 2 months was selected as a reasonable balancing point between minimization of bias (due to memory decay) and including a long enough period so that a variety of ads and a reasonable number of exposure opportunities could be included. Bias due to memory decay would be minimized by having a very short reference period such as the preceding day. However, such a reference period would likely produce a very unstable estimate of the exposure an individual respondent received typically. Results presented previously have established that the 2-month reference period worked well (Hornik et al., 2001).

**Table 2-C. Television and radio ads aired to youth and parents, by wave**

| | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 | Wave 7 | Wave 8 | Wave 9 |
|---|---|---|---|---|---|---|---|---|---|
| Youth | | | | | | | | | |
| **TV ads** | | | | | | | | | |
| English | 11 | 15 | 9 | 6 | 13 | 15 | 11 | 8 | 8 |
| Spanish | 5 | 3 | 3 | 3 | 2 | 1 | 2 | 1 | 1 |
| Total | 16 | 18 | 12 | 9 | 15 | 16 | 13 | 9 | 9 |
| **Radio ads** | | | | | | | | | |
| English | 15 | 8 | 8 | 8 | 10 | 5 | 7 | 6 | 5 |
| Spanish | 6 | 6 | 3 | 2 | 3 | 1 | 0 | 0 | 0 |
| Total | 21[1] | 14 | 11 | 10 | 13 | 6 | 7 | 6 | 5 |
| Parents | | | | | | | | | |
| **TV ads** | | | | | | | | | |
| English | 16 | 10 | 7 | 3 | 11 | 9 | 16 | 10 | 6 |
| Spanish | 5 | 3 | 3 | 4 | 3 | 2 | 2 | 4 | 5 |
| Total | 21 | 13 | 10 | 7 | 14 | 11 | 18 | 14 | 11 |
| **Radio ads** | | | | | | | | | |
| English | 8 | 4 | 12 | 4 | 5 | 4 | 5 | 4 | 5 |
| Spanish | 3 | 1 | 4 | 5 | 3 | 1 | 1 | 5 | 3 |
| Total | 11[1] | 5 | 16 | 9 | 8 | 5 | 6 | 9 | 8 |

[1] Additional radio ads that were audio versions of TV ads during Wave 1 were not played for survey respondents for reasons given in Chapter 3 of this report.

to the reciprocals of their selection probabilities and included adjustments to compensate for nonresponse at the doorstep and household enumeration phases of the screening interview (e.g., see Section A.2 of Appendix A).

To compensate for nonresponse to the extended interview, the initial weights of respondents were inflated by factors equal to the reciprocals of the (weighted) response rates within specified weighting classes. The weighting classes were developed using predictive data mining techniques known as "multiple additive regression trees" (MART). About 60 block-group-level variables derived from the 2000 Population Census[2] describing characteristics of the segment plus selected person-level (e.g., age, gender, and race/ethnicity) and household characteristics (e.g., number of youth in the household and presence of both parents) were specified as predictor variables in the MART analysis. The MART algorithm then used this information to form classes that were expected to be internally homogeneous with respect to response propensity. Once the appropriate weighting classes were determined, weighted response rates were calculated and used to adjust the initial weights. Further details about the nonresponse adjustment procedures are given in Section A.2 of Appendix A.

The sum of the nonresponse-adjusted weights of the respondents in the sample provides an estimate of the corresponding number of persons in the target population, under the assumption that all persons in the population are covered by the sampling frame. The estimated coverage rate is defined to be the

[2] Prior to the 2004 Report of Findings, 1990 Census data were used for nonresponse adjustment weighting purposes because the results from the 2000 Census were not available at the time. For Waves 8 and 9, when the 2000 Census data were available, all of the required analysis weights were recomputed using the more current information. All of the analyses presented in this report are based on the recomputed (updated) weights. An extensive evaluation suggests that had the updated weights been used in the previous reports, the main conclusions of those reports would not have changed (see Section A.2.6 of Appendix A).

ratio of the sample-based (nonresponse-adjusted) weighted count to the corresponding estimate derived from reliable independent sources. Table 2-D summarizes coverage rates by age group for the three initial recruitment waves, where estimates derived from the Current Population Survey (CPS) are used as the denominators of the coverage rate. Note that the coverage rates are for the entire 9- to 18-year age range included in the three recruitment waves. As can be seen in this table, overall coverage of youth was slightly less than 70 percent for all three waves, with somewhat higher coverage rates for the 12 to 13 age group and lower coverage rates for the 14 to 18 age group. The coverage rates for the 12½- to 13-year-old age range (the youngest age range included in this report) are expected to be roughly similar to the numbers given for the 12- to 13-year age range.

**Table 2-D. Coverage rates by age**

| Age group | Wave 1 Coverage rate (%) | Wave 2 Coverage rate (%) | Wave 3 Coverage rate (%) |
|---|---|---|---|
| 9 to 11 | 70 | 69 | 70 |
| 12 to 13 | 74 | 71 | 75 |
| 14 to 18 | 67 | 67 | 57 |

To compensate for potential biases resulting from undercoverage, the final step in the weighting process was to calibrate the nonresponse-adjusted weights to "known" population counts (i.e., control totals) derived from the CPS. This was accomplished using a poststratification technique known as ratio-raking (or simply, "raking"). Raking is one of several well-known and accepted poststratification techniques. For example, the method is described in Deville and Sarndal (1992), Deville, Sarndal, and Sautory (1993), and Kalton and Flores-Cervantes (2003). The raking algorithm is an iterative form of poststratification in which the respondent weights are successively ratio-adjusted to multiple sets of marginal control totals (referred to as "raking dimensions") until the resulting weighted counts equal the control totals specified for each dimension. Additional details about this adjustment are given in Section A.2 of Appendix A.

In addition to the full-sample weights, a series of replicate weights were developed to permit the calculation of sampling errors and associated confidence intervals. The first step in this process was to define 100 replicates (i.e., subsamples of the full sample) as described in Rizzo and Judkins (2004). After the replicates were created, the full set of weight adjustment procedures outlined above was applied to each replicate. This meant that each set of replicate weights was adjusted for nonresponse and poststratified to specified CPS-based control totals. As a result, each of the 100 sets of replicate weights reflects all of the adjustments used to create the full-sample weights. The replicate weights were then used to obtain standard errors and confidence intervals as described briefly in the following section (and in more detail in Section A.2 of Appendix A).

### 2.2.4 Confidence Intervals and Data Suppression

Ninety-five percent confidence intervals have been provided for every statistic in the Detail Tables that are presented in Volume 1 of this report. These intervals indicate the margin for error resulting from the use of a sample to derive the survey estimates rather than a complete enumeration (census). If the same general sampling procedures were repeated independently a large number of times, and a statistic of interest and its confidence interval were recalculated for each of those independent samples, the "true" value of the statistic would be contained within 95 percent of the calculated confidence intervals.

The confidence intervals reflect the variability due to sampling and the adjustments that were made to the weights. They do not generally reflect measurement variance. The confidence intervals were calculated using estimates of standard errors derived by replication techniques. Using the sets of 100 replicate weights that have been derived for each respondent in the sample as described in Section 2.2.3, 100 separate replicate estimates of a population parameter can be calculated in addition to the full-sample estimate. The variation among the replicate estimates is then used to obtain an estimate of the standard error of the full-sample estimate, which in turn is used to construct the required confidence interval. Additional details on how the standard errors and associated confidence intervals were derived are given in Section A.3 of Appendix A.

Finally, it should be noted that some of the estimates in the Detail Tables are suppressed. An estimate was suppressed if the precision of the estimate was poor. Both sample size and the width of the confidence interval were used to determine whether to suppress an estimate. The criteria used to suppress estimates in this report are documented in Section A.3 of Appendix A.

### 2.2.5 Exposure Index and Imputation of Ad Recall

Because the number of ads that were aired during a specified time period was often greater than the number that could reasonably be shown without jeopardizing the accuracy of recall and completion of the interview, only a sample of ads was shown to each respondent. As noted earlier in Section 2.2.2, the sample was a simple random sample of the general ads. Additional ads were selected at random and shown to African American respondents and bilingual respondents. In order to create a measure of ad recall that was consistent across race and language groups, the decision was made to impute recall for all ads that could have been shown to the respondent but were not. The imputation was based on selecting respondents with similar characteristics and transferring values in what is known as a hot-deck imputation. The donor pools of respondents with similar characteristics were defined in terms of general recall of anti-drug advertisements (measured prior to showing any specific ads), cable subscription (yes/no), and the length of time the ad had been on the air prior to the interview. The imputation procedures are fully documented in Section E.1.2 of Appendix E.

## 2.3 Analytic Framework

The basic unit of analysis for all of the NSPY analyses conducted for this report is a youth in the age range from 12½ to 18 years. The analyses are of two forms: analyses that involve data obtained from the youth interview alone and those that require data from both the youth and parent interview. The first form of analysis includes all youth respondents, whereas the second form requires interview data from both the youth and the parent, that is, from a youth-parent dyad. The sample size for youth-parent dyads is smaller than that for youth because (1) the parent as well as the youth must be a respondent and (2) emancipated youth (i.e., youth who have reached the age of majority) are by definition not eligible for dyad analyses.

Unlike earlier reports, for technical reasons related to weighting (see Section A.2.6 in Appendix A), analyses of parent characteristics in this report are conducted with the dyad as the unit of analysis. Thus results are accurately expressed in the form "The percentage of youth who had a parent with a given characteristic is X" rather than "The percentage of parents with a given characteristic is Y," as would be the case if the parent were the unit of analysis. There are two differences between the two units of analysis. One is that a parent with more than one youth in the age range is counted once for

each youth in a dyad analysis but only once in a parent-level analysis. The other is that a parent in a two-parent family has only half the chance of appearing in the dyad analysis compared with a parent in a single parent family, but this is not the case in a parent-level analysis. About one-third of the youth 12½ to 18 years of age in the NSPY sample are in single-parent families.[3] An examination of the effect of this change in the unit of analysis on the results from earlier NSPY waves indicated that it had little impact on the exposure analyses, but did affect the levels and changes in some estimates of parent characteristics (e.g., the level and change in the percentage using the Internet). Although there are differences in the estimates obtained from dyad- and parent-level analyses, the results of the dyad analyses in this report will be loosely expressed in terms of parents rather than dyads for ease of communication. (See Section A.2.6 of Appendix A for more information about these differences.) Nevertheless, all parent results are based on dyad analyses.

The following subsections summarize the sample sizes for selected subsets of the sample defined by age, gender, race/ethnicity, sensation seeking, risk score, and past marijuana use. Sections 2.3.1 and 2.3.2 provide this information for youth and dyads, respectively. The final four subsections describe the classifications of race/ethnicity, sensation seeking, risk score, and past marijuana use used in the report.

### 2.3.1 Youth

Detail Tables 2-1 and 2-3 summarize the sample sizes (numbers of responding youth) by age and other characteristics, by wave and by round, respectively. Across the three recruitment waves (Round 1), about 40 percent of the youth included in analysis (i.e., 12½- to 18-year-olds) fall in the 12½- to 13-year-old age group, with the remainder nearly evenly split between the 14- to 16-year-old and 17- to 18-year-old age groups. For the followup waves, the (unweighted) age distributions have shifted toward the older groups as a result of the aging of the sample. For example, while about one-third of the sample in Round 2 (Waves 4 and 5) is in the 12½- to 13-year-old age range, less than one-fourth remains in the youngest age group by Round 4 (Waves 8 and 9). Note that no bias is introduced since the weights used in analysis have been properly calibrated to account for the changing age distributions (see Section 2.2.3).

Detail Tables 2-1 and 2-3 also present estimates of the numbers of youth aged 12½ to 18 years old in the nation. These estimates were obtained by summing the weights of the respondents in the analysis files. As can be seen in Detail Table 2-1, the estimated number of youth 12½- to 18-years of age was about 25.2 million in Wave 1 and increased to 27.0 million by Wave 9. As discussed in Section 2.2.1, these estimates exclude youth in institutions, group homes, dormitories, and other types of group housing. The tables also summarize the sample sizes and corresponding population estimates by gender, race/ethnicity, and subgroups defined by risk score, sensation seeking, and use of marijuana. Since the youth weights were calibrated to CPS population estimates, the distributions by gender and race/ethnicity shown in the tables are the same as the corresponding CPS distributions. On the other hand, the distributions by risk score, sensation seeking, and use of marijuana have not been calibrated to independent totals and reflect the responses of the participants in the survey. All of the estimates in these tables are subject to sampling error. Further discussion of the various subgroups used in this report is given in Sections 2.3.3 through 2.3.6.

[3] In addition, about 1 percent of youth in the NSPY are "emancipated" youth and are ineligible for dyad analysis.

### 2.3.2 Dyads

Detail Tables 2-2 and 2-4 summarize sample sizes and corresponding weighted population counts for youth-parent dyads, by wave and by round, respectively, where a dyad is defined to be the combination of a youth and parent. As discussed in Section 2.2.1, the NSPY definition of parent excludes noncustodial parents but does include stepparents, foster parents, and (in some instances) nonparental caregivers living with the sampled youth. The sample sizes shown in these tables are generally smaller than the corresponding sample sizes for youth because both the youth and parent had to complete their respective interviews to be counted as a responding dyad. Also, emancipated youth (who are eligible for and included in the youth analyses) are by definition ineligible for dyad analyses. In the first part of Detail Tables 2-2 and Table 2-4 (i.e., the sections under the heading "youth aged 12½ to 18"), all of the row classifications refer to characteristics of the youth. Thus, the distributions by age and other characteristics of the youth are roughly similar to those in Detail Tables 2-1 and 2-3. However, in the latter part of Detail Tables 2-2 and 2-4 (i.e., the sections under the heading "parents of youth 12½ to 18"), the rows refer to the characteristics of the parent. For example, over the four rounds of the study, the percentage of dyads (youth) associated with a female parent remained fairly constant at around 65 percent. Similarly, the distribution of dyads by race/ethnicity and education of the parent remained relatively stable across the rounds.

For youth with two parents, behavior questions pertaining to the engagement in communication, monitoring, and doing fun activities were worded such that the parent responding was asked how the responding parent and the coparent behaved. On the other hand, the cognition questions were worded such that the parent responding was asked only about his or her views. Thus, the dyad-based estimates given in the Detail Tables supporting Chapters 3 and 6 of this report reflect the assumption that the behaviors of both parents are reflected in the parent's responses, whereas the cognitions refer only to the responding parent. Youth, on the other hand, were asked behavioral questions that contained the phrase "at least one of your parents." Thus, the youth responses to questions about parent behaviors apply to both parents collectively. In addition, the only parent responses that are used in these dyad tabulations are those that are specifically about the sampled youth.

### 2.3.3 Race/Ethnicity

The categories used in all tables are White, African American, and Hispanic. These are short labels for specific categories defined by race and ethnicity. For example, *White* means White but not Hispanic. *African American* also excludes Hispanics. Hispanics can be of any race. Race and ethnicity were asked as two separate questions in the NSPY interview. For older youth, aged 12 to 18, race and ethnicity were typically self-reported. For children aged 9 to 11, race and ethnicity were typically reported by the screener respondent. In both instances, respondents were first allowed to choose multiple "races" from the following five categories: (1) White, (2) African American, (3) Asian, (4) Native Hawaiian or other Pacific Islander, (5) American Indian or Alaska Native. If more than one category was chosen, the respondent was then asked to select the primary category. For those who did not designate a primary category, the interviewer selected a primary category based on observation.

Separate breakouts for the last three categories (i.e., Asian, Native Hawaiian or other Pacific Islander, and American Indian or Alaska Native) are not shown in any of the Detail Tables because of small sample sizes. For example, the total number of interviewed youth (12½- to 18-years of age) in the three categories combined was just 182 for Round 1 (Waves 1 through 3), roughly equally distributed among the three age ranges defined in the tables. For each of the subsequent followup rounds, the

corresponding sample sizes were comparable, ranging from about 180 to 200 per round. Although the numbers are small, there are generally some respondents in these race/ethnicity categories in every age group, and all such respondents are included in the overall estimates presented in this report.

### 2.3.4 Sensation Seeking

Sensation seeking is a biologically based trait "based on the idea that persons differ reliably in their preferences for or aversions to stimuli or experiences with high-arousal potential" (Zuckerman, 1988, p.174). Individuals who are high in the need for sensation desire complex and stimulating experiences and are willing to take risks to obtain them. This drive for novel, complex, and intense sensations and experiences is satisfied by a willingness to take more social risks (e.g., impulsive behaviors, sexual promiscuity), physical risks (e.g., skydiving, bungee jumping, driving fast), legal risks (e.g., getting arrested and put in jail), and financial risks (e.g., paying fines and impulsive purchases) (Zuckerman, 1979, 1994).

Several studies show that the variation in sensation seeking predicts behavioral differences, especially illicit drug use. High sensation seekers are more likely to begin experimenting and using drugs earlier than low sensation seekers, as well as to use higher levels of a variety of different drugs (Donohew, 1988, 1990). High sensation seekers in junior high are four times as likely as low sensation seekers to use marijuana; in senior high, high sensation seekers are three times more likely to use marijuana than low sensation seekers (Donohew, 1988).

Sensation seeking among middle and high school students is generally measured using a 20-item scale developed specifically for adolescents (Stephenson, 1999; Zuckerman, 1979, 1994). More recent evidence suggests that an eight-item scale from the original 20 items has levels of reliability and validity sufficient to replace the 20-item scale (Hoyle, Stephenson, Palmgreen, Lorch, and Donohew, 2000). In a personal communication, Dr. Philip Palmgreen reported a comparison between the eight-item scale and a reduced four-item scale on a sample of 6,529 seventh through twelfth graders surveyed by the Partnership for a Drug Free America in 1999. The eight-item scale had an internal reliability of 0.85, while the four-item scale was reduced only slightly to 0.81. The two correlated at 0.94. This suggests that the four-item sensation-seeking scale is both a valid and reliable predictor of drug use and intention in middle and high school years. The four-item scale was applied in NSPY. It had an internal reliability estimate of 0.78 for 9- to 18-year-olds.

This reduced set of four items on sensation seeking was asked in the youth interviews. Respondents were asked to rank their agreement on a scale of 1 to 5 with the following statements:

a. I would like to explore strange places.

b. I like to do frightening things.

c. I like new and exciting experiences, even if I have to break the rules.

d. I prefer friends who are exciting and unpredictable.

Those with an average response greater than 2.5 were classified as being high sensation seekers. This was the overall median score on the four items. A single threshold was used to facilitate comparisons across groups and time. As expected, given a fixed cutoff that does not vary by age or sex, the prevalence of high sensation seekers was greater among males than females and it increased with age.

### 2.3.5 Risk Score

It is possible that the Campaign may affect youth at higher risk of marijuana differently than those at lower risk. To examine this possibility, a scale of risk of marijuana use was developed with the fourth semiannual report. The risk score is an empirically-derived scale that predicts the risk of using marijuana derived from a number of youth and parent risk factors. Youth are classified into two risk categories—higher and lower risk. The risk score scale incorporates the sensation-seeking measure along with a number of other youth and parent risk factors. The role of the risk categories in moderating the relationship between exposure and outcomes is examined in this report.

A large number of measures were considered candidates for inclusion in the risk score. However, only those variables that were empirically predictive of marijuana use were actually included in the score and weighted according to their observed association with marijuana use, after controlling for other variables. The measures that were included in the final risk score include:

- **Youth covariates**
  - Age
  - Sensation seeking
  - Started smoking 12+ months ago
  - Started drinking 12+ months ago
  - Urbanicity
- **Parent covariates**
  - Marijuana use in past 5 years
  - Cigarette use in past month
  - Had no drink in past month
  - Attendance at religious services
  - Rating of importance of religion
  - Shares parenting with other adult in household

Further details of the methodology used to develop the risk score are presented in Appendix E.

### 2.3.6 Past Marijuana Use

Youth were divided into three categories of marijuana usage, only two of which are shown in most tables. The nonusers include youth who have never tried marijuana. The recent users are youth who have used marijuana in the past 12 months. Youth who have tried marijuana but not smoked it in the past 12 months are called former users. There were too few former users for this category to be used as a separate subgroup for analysis in tables.

## 2.4 Potential Analysis Modes

In order to gauge the impact of the National Youth Anti-Drug Campaign on (1) awareness, (2) attitudes, and (3) behavior, the Evaluation team has to answer three types of questions:

- Is the Campaign reaching its target audiences?
- Is there desirable change in the outcomes addressed by the Campaign, in drug use behavior, and in the beliefs and attitudes that underpin that use?
- How much of the observed changes in outcomes can be attributed to the Campaign?

Section 2.4.1 explains some of the approaches that are used to answer each of these questions.

### 2.4.1 Measuring Exposure to the Campaign

The Campaign publishes information about how much media time it has purchased. More specifically, for each potential audience of youth or parents, information is available on the proportion that would have been potentially exposed for each ad and all ads. These data are summarized as gross ratings points (GRPs), which are the customary unit for measuring exposure to ads within the advertising industry. A fuller explanation for GRP is presented in Chapter 3. The Evaluation team's task with regard to exposure is to measure the extent to which placement of the ads and other Campaign communication efforts broke through into the minds of the audience—that is, are audiences aware of the Campaign and is awareness increasing over time? Can target audiences recall the ONDCP-sponsored ads and other messages that were shown? Audience awareness is assessed in two ways:

- A set of general questions is asked about advertising recall for each medium: radio and television, print, movie theaters, outdoor advertising, and Internet. Each respondent is asked whether and how often he or she recalls seeing anti-drug messages from each source.[4] These measures may be reasonably interpreted as providing a general sense of level of exposure, rather than a precise measure of recent exposure. They ask respondents to summarize a lot of viewing or listening or reading experience and express it in a single number. They are based on a question used consistently in the Monitoring the Future study.
- To improve the precision of the exposure measurement, a second major approach to exposure measurement, the recall of specific Campaign ads, is used. The focus for this type of measure is on radio and television advertising which thus far have represented the largest part of the advertising effort. Through the use of an Audio Computer-Assisted Self-Interview (ACASI) format, each respondent is shown Campaign television and radio ads at full length on a laptop computer brought to the respondent's home by the field interviewer. (See Section 2.2.2 and Appendix B for a description of the NSPY.) All the ads have been broadcast nationally in the 2 months prior to the interview, according to the Campaign. For each respondent, a subsample of the Campaign's recent and ongoing ads (four television and two radio) is shown. Parent-targeted ads are played for parents and youth-targeted ads for youth. Ad samples for African American and bilingual (English/Spanish) respondents are also selected to permit separate evaluations of

[4] See, for example, question D10 in the teen questionnaire. The NSPY questionnaires can be found in Appendix F in Volume 2 of this report and can be found on the NIDA web site.

ads targeted toward these special populations. Respondents are asked whether they have ever seen the ad, how often they had seen the ad recently, and their assessment of the ad.[5]

It is possible that respondents might report that they have seen an ad even though they had not, because they forgot or because they want to be agreeable. If so, and all claims were taken at face value, exposure might be overestimated. Therefore, some respondents have been asked whether they have seen a television ad that has, in fact, never been broadcast, i.e., a ringer ad. This has provided an opportunity to assess the degree to which respondents overclaim exposure (Southwell, et al., 2002.).

In addition, the Evaluation needs to take account of the fact that, while the Campaign is spending much of its budget buying media time, it also seeks to enhance the extent to which anti-drug communication is on the air, more generally. The Campaign is working with national and local organizations; it is working with corporate partners; it is making efforts to disseminate information through mass media outreach and other public relations efforts. To try and capture the extent to which target audiences are aware of these efforts, a series of measures that can detect change in these more general aspects of the public communication environment were developed. Questions asked included the frequency of exposure to drug-related stories in a variety of media channels; the extent to which respondents have heard public discussion of several drug issues; and the amount of talk within families and among friends about drug issues. For all of these measures the Evaluation has examined whether the intensity of Campaign efforts are translating into changes in the perceived public communication environment about drugs. However, the Evaluation design does not permit separate attribution of effects on parent and youth outcomes to the operation of these components of the Campaign.

## 2.4.2 Measuring Changes in Attitudes and Behaviors

The second Evaluation question addressed is whether observed outcomes are moving in the right direction. Models were developed based on existing theories of health behavior change and of communication effects. These suggest how the Campaign might work, if it were successful. They have determined what measures were incorporated into the survey questionnaires. The outcomes being measured capture a wide range of objectives for the Campaign:

- **Behavior:** Trial and regular use of marijuana and of inhalants, primarily, with some additional measurement of alcohol and tobacco use; behaviors of parents—particularly parent-child discussions about drug use and parent monitoring of and engagement with their children's lives; and past behavior and intentions to engage in these behaviors in the near future. In the 2004 Report of Findings, youth reports of parents talking, monitoring, and engaging in fun activities are used to provide complementary information to parent reports of those behaviors.

- **Attitudes and beliefs:** Attitudes and beliefs that research has shown to be closely related to these behaviors. For example, with regard to youth drug use, beliefs about the health consequences, the mental functioning consequences, and the performance consequences of drug use are measured.

- **Social pressures:** Perceived social pressures to engage in these behaviors, for example, to use or not use drugs—what peers are doing, what confidence respondents have in their ability to resist drug use, what parents and friends would say about drug use.

[5] See, for example, question D17 of the teen questionnaire.

The first semiannual report (Hornik, et al., 2000), provides estimates of the simultaneous association of cognitions and behavior, while controlling statistically for the effects of confounding variables. The second semiannual report presents estimates of change in cognitions and behaviors between the first and second halves of 2000 and provides estimates of the association of Campaign exposure with these outcomes. In the third semiannual report, the change analysis was extended through the three initial waves of data collection, focusing on the difference between data collected largely during the first half of 2000 and data collected during the first half of 2001. Analysis of association between exposure and outcomes was done for youth and parents interviewed in all three waves. The fourth semi-annual report was the first permitting examination of longitudinal effects using the Wave 1 sample followed up at 18 months. The fifth semiannual report repeated the analyses of the fourth report, but made use of the followup interviews of youth and parents first interviewed in Waves 2 and 3 along with those first interviewed at Wave 1.

The 2003 report took a divided approach. Partly in response to the lack of favorable results on youth in the prior reports, the Campaign shifted the focus of its efforts for this audience. Major features of this shift included a sharp change in the focus of the ads, with an emphasis on strong anti-marijuana negative consequences messages, and a refocusing of the primary target audience from 12- to 14-year-olds to 14- to 16-year-olds. The youth sections of the report address the effects of this Marijuana Initiative, which started in late fall of 2002, and were limited to examination of trends and of cross-sectional associations between exposure and outcomes. In contrast, the parent-focused part of the Campaign has maintained its central focus on monitoring of youth, so the report includes 3.5 years of trend data, cross-sectional associations of exposure and outcomes, and analysis of delayed-effects of parent Campaign exposure on cognitive and behavioral parent and youth outcomes. Since all youth and parents had been interviewed three times, it was possible to examine both the delayed effects between Round 1 (Waves 1, 2 and 3) and Round 2 (Waves 4 and 5), and between Round 2 and Round 3 (Waves 6 and 7).

The 2004 final report includes a delayed effects analysis of the Marijuana Initiative, which launched in October 2002, as well as an examination of the Early Intervention Initiative that was launched in February 2004. Also added is a new outcome variable—the perception of other kids' use of marijuana and an analysis of the Campaign effects on marijuana use among prior users of the drug. The full set of analyses have been conducted on both youth and parents. The analysis includes 4.5 years of trend data, cross-sectional associations of exposure and outcomes, and analysis of delayed-effects of Campaign exposure on cognitive and behavioral outcomes. Further, since all youth and parents have now been interviewed four times, it has been possible to examine the delayed effects between Round 1 (Waves 1, 2 and 3) and Round 2 (Waves 4 and 5), between Round 2 and Round 3 (Waves 6 and 7), and Round 3 and Round 4 (Waves 8 and 9).

### 2.4.3 Attributing Observed Changes in Attitudes and Behavior to the Campaign

The most difficult task confronting the Evaluation is to make a clear case for or against the influence of exposure to the Campaign on observed attitudes, intentions, and behaviors, both overall and for particular subpopulations of interest. The approach is outlined below.

In this report, the combined data from all waves are used to measure the association of exposure with outcomes. For example, are youth who report heavy exposure to Campaign messages more likely to have desirable beliefs about the negative physical consequences of marijuana than do youth who

report less exposure? A sophisticated statistical technique called "propensity scoring" has been used to reduce the risk that observed differences are the result of the influence of confounding variables rather than the result of the effects of exposure on outcomes. Findings from these analyses are given in Chapter 5 for youth and Chapter 6 for parents. For youth, the cross-sectional analyses focus on whether the Waves 7 through 9 (post-Marijuana Initiative) exposure–outcome associations are favorable to the Campaign, particularly in comparison to the associations that have been detected in the previous waves. For parents, cross-sectional analyses include the entire sample, although differences among years of the Campaign are also examined.

The present report includes examination of evidence for effects among important subgroups of the population. In addition to examining association by year of the Campaign, the report examines evidence for dependence of effects on the child's risk of taking up marijuana and on other characteristics of the youth or his/her parents including age, gender, race/ethnicity, and level of sensation seeking. Evidence for diversity in effects is presented along with the overall results in Chapters 5 and 6, for youth and parents respectively.

The cross-sectional causal analyses are supplemented with longitudinal causal analyses. The same national sample of youth and their parents has been followed for 3 or 4 years. This permits the examination of whether a young person or parent who reported high versus low exposure when first interviewed progressed at a different rate on drug-related beliefs and practices in subsequent waves. Compared to the relatively more simple cross-sectional analysis, this longitudinal analysis capability improves the ability to reject threats to causal claims related to omitted confounding variables. In addition, it permits response to concerns about ambiguity of causal direction (i.e., that the cross-sectional association between exposure and outcomes is the result of outcomes affecting recall of exposure rather than exposure affecting outcomes).

- In the initial three semiannual reports (Hornik 2000; Hornik, May 2001; Hornik, October 2001), examination of exposure effects was confined to direct pathways (i.e., youth exposure on youth outcomes and parent exposure on parent outcomes). As illustrated in Figure 2-D, alternate pathways are also feasible. In the fourth and fifth Semiannual Reports of Findings (Hornik, 2002a and Hornik 2002b), one of these alternative pathways was examined, specifically, the effects of parent exposure on youth behavior. The fifth Semiannual Report specifically examined the effects of parent exposure on youth beliefs and attitudes. As with direct effects, both cross-sectional and longitudinal relationships were analyzed. In the 2003 Report of Findings, the examination was repeated for both delayed round sets, Round 1 to Round 2 and Round 2 to Round 3. In this, the 2004 Report of Findings, this examination is repeated for three delayed round sets, Round 1 to Round 2, Round 2 to Round 3, and Round 3 to Round 4.

- The delayed-effects analyses were conducted for direct effects on parents, direct effects on youth, and indirect effects on youth through parent exposure. As with the cross-sectional analyses, two measures of exposure were examined: general and recall-aided specific.

- In the delayed-effects analysis, as in the cross-sectional analyses, to make sure that any observed delayed-effects associations are not due to the influence of other variables, potential confounding variables are statistically controlled through the use of the propensity score procedure. These controlled confounders include the scores on the outcome variables for each respondent at time of earlier measurement (either Round 1 or Round 2 or Round 3). Because the followup measurement of outcomes is later than the prior measures of exposure, it is possible to claim that any causal relationship between these two measures reflects the influence of exposure on the outcome and not vice-versa. This is not a claim that can be made as confidently from the cross-

sectional analyses when both exposure and outcome are measured simultaneously. This delayed-effects association will capture both the delayed-effects of exposure at the prior measurement round directly on outcome at the followup round, as well as the effects of exposure at the prior measurement round that flow through exposure at the followup round to outcome at the followup round.

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# 3. Exposure to Anti-Drug Messages

This chapter discusses exposure to the National Youth Anti-Drug Media Campaign (referred to as "the Campaign") efforts, both purchased and donated, and exposure to non-Campaign anti-drug efforts during the period from September 1999 through June 2004, that is, from the start of Phase III of the Campaign until the end of the Evaluation. Results are presented for the full period of the Evaluation, termed the Phase III Campaign period. The chapter focuses particularly on youth exposures during the period from October 2002 to January 2004, termed the period of the Marijuana Initiative, and on youth and parent exposures during the period from February 2004 to June 2004, termed the period of the Early Intervention Initiative.

In October 2002, a set of youth advertisements was introduced as part of what is called the Marijuana Initiative. From that point until early 2004, these anti-marijuana themed ads dominated the youth media purchases. A few youth ads that were not part of the Marijuana Initiative were purchased during this period, but they constituted a negligible proportion of the total. The initiative did not affect the contents of the parent ads, which remained mainly concerned with helping them boost youths' personal efficacy and youth monitoring.

At the beginning of February 2004, a set of youth and parent ads was introduced as part of the Early Intervention Initiative. These anti-drug and alcohol themed ads constituted 55 percent of the youth media gross rating points (GRPs, see Exhibit 3-1 that describes GRPs) in Wave 9, with the remaining 45 percent being Marijuana Initiative ads. During this period, the adult GRPs were predominantly (80%) associated with Early Intervention Initiative ads.

The situation is different with the Marijuana Initiative. While the Wave 6 Marijuana Initiative ad data are confounded with data for non-Marijuana Initiative ads, that is not the case with the Waves 7 and 8 data (that is, the year 2003). This chapter therefore examines the Marijuana Initiative ads using data from these two waves only.

The data collected in the National Survey of Parents and Youth (NSPY) cannot be neatly mapped into the periods of the Marijuana and Early Intervention Initiatives for two reasons. First, the survey is composed of nine waves of data collection. Data collection for Wave 1 began in November 1999 and ended in May 2000; the data collection for each subsequent wave was spread over either the first half or the second half of each calendar year (January to June or July to December). The survey ad data can be validly analyzed only in complete waves because the youth and parents from whom data are collected in any subset of months within a wave do not constitute representative samples of their respective populations. Thus it is not possible to produce exposure and assessment estimates for the Marijuana Initiative from Wave 6 of the survey—covering the period from July to December 2002—because that initiative was introduced around the middle of that wave. Similarly, it is not possible to produce estimates for the Early Intervention Initiative from Wave 9—covering the period from January to June 2004—because that initiative was introduced in early February 2004 (and also because an appreciable number of Marijuana Initiative youth ads were broadcast after that date).

## Exhibit 3-1. Gross Rating Points

### What are Gross Rating Points (GRPs)?

GRPs are the customary unit for measuring exposure to ads within the advertising industry. If 1 percent of the target population sees an ad one time, that ad earns one GRP. It is also quite typical to report GRPs on a weekly basis. Then, 100 GRPs is equivalent to an average of one weekly exposure for members of the target population.

For illustrative purposes, consider the following distributions of the numbers of times the members of two target groups of 100 persons each see an ad during a given week:

| Groups | Number of times viewed | | | | | Total number of persons | Total GRPs |
|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | | |
| A | 50 | 0 | 0 | 0 | 50 | 100 | 200 |
| B | 20 | 20 | 20 | 20 | 20 | 100 | 200 |

For both groups, the average number of times the ad is seen is 2, and hence the number of GRPs is 200.

It is common in the advertising industry to report two separate measures: the percentage reached and the average frequency for persons who are reached at least once. For population A, the reach is 50 percent and the average frequency is 4, whereas for population B the corresponding quantities are 80 percent and 2.5.

Note that the average frequency multiplied by the reach gives the number of GRPs (when multiplied by 100). Although the reaches and average frequencies are very different for populations A and B, the product of reach by average frequency produces the same number of GRPs for the two populations.

Exposure to multiple ads, or to ads available through multiple media, is calculated by summing the exposures for each of the individual ads for each medium. GRP estimates are average totals across the relevant population.

GRPs are estimated for each ad based on the projected audience for a particular medium and program. For example, based on television ratings data from Nielsen Media Research, the audience for a particular television program at a particular hour can be estimated. If an ad plays during that program, it is assigned the program's GRPs. For example, if 10 percent of the 12- to 17-year-old population is estimated to be in the audience for program A from 8 to 9 p.m., then an ad played on that program earns 10 GRPs. Parallel projections of audience size are made for all media based on data from a variety of media monitoring companies, and GRP estimates are calculated accordingly. Clearly GRP estimates are accurate only to the degree that the estimates of audience size are accurate. Also, at best, GRPs capture availability of an audience. They do not guarantee that an audience member was actually paying attention.

The second reason that NSPY ad data cannot be neatly mapped into the time periods for the initiatives has to do with the way that the data were collected. As described in more detail in Section 3.2, the NSPY collected two forms of exposure data, termed general and specific exposures. Both forms employed retrospective questions: the general exposure questions asked about numbers of exposures to any anti-drug advertising in recent months and the specific exposure questions asked about specific Campaign ads seen in recent months. Followup assessment questions were asked about the first three television ads that the parent or teen respondent recalled seeing[1]. As a result, the question reference periods do not always fall within the data collection periods. Also, for some respondents the reference period will have overlapped the introduction of an initiative.

The result of these considerations is that separate estimates cannot be made for the Early Intervention Initiative ads from NSPY. Wave 9 can provide estimates only for the combination of Early Intervention Initiative ads with other ads. In the case of television ads for youth, the other ads addressed the Negative Consequences platform. In the case of television ads for parents, the other ads addressed the Parenting Skills/Efficacy/Monitoring platform.

Section 3.1 describes the general advertising placement activities of the Campaign. Since the data for the analyses in this section come from media broadcast reports, the results are mainly presented for the actual initiative periods. However, some results are given for the half-year periods corresponding to the NSPY waves in order to provide a crosswalk between the media and survey data.

Most of the NSPY results are reported separately by survey wave, with results for Waves 7 and 8 being associated with the Marijuana Initiative. Section 3.2 presents statistics regarding the level of ad recall among youth and parents, with some focus on respondents' recognition of specific television and radio ads from the Campaign. This section also provides assessments of the television advertisements shown to youth and parents, which offer one way of gauging the population's judgment of prominent Campaign content. In addition, it includes a discussion of encounters with drug information on the Internet.

Section 3.3 describes youth and parent exposure to other drug information, including drug education classes and discussions about drugs. Section 3.4 reports on youth discussions with parents and friends about anti-drug ads, and Section 3.5 reports on the perception of media and community attention to drug use by both youth and parents. The last section presents a summary and conclusions.

## 3.1 Media Buying Reports

The Campaign has described its goal as expecting to reach 90 percent of the youth audience four times per week, equivalent to an average of 3.6 exposures per week for the entire population of youth. This report does not follow the standard practice of reporting both a reach and an average frequency for those reached for three reasons: It is simpler to report the average for the entire population rather than constantly reporting the two separate numbers; the proportion of youth actually reporting at least some exposure is almost 95 percent across the Campaign; and, of most importance, the expected population average based on all youth is substantively appropriate. The congressionally-mandated audience for the Campaign is all youth, and all of the survey-based evidence, including drug use measures, is based on the entire population. It would be confusing and misleading to present the GRP

[1] Beginning in Wave 6, teen respondents were asked followup assessment questions about the first three television ads that they were shown, regardless of whether they recalled having seen the ad.

data for 90 percent of the population, and all other measures for 100 percent of the population. Thus, in what follows, only the overall average GRP measure is reported.

Estimates of expected Campaign exposure for this report are derived from reports of media time achieved (which includes both paid and donated advertising, as described in Section 1.2) by Ogilvy on behalf of the Campaign for the 58-month period from September 1999 through June 2004. These estimates show that Ogilvy obtained a total of approximately 64,025 GRPs for advertisements intended for general market youth and approximately 54,655 GRPs for advertisements intended for general market parents during this period.[2] (These estimates include Campaign advertisements intended for either general market youth or general market adults; they do not include exposure by youth or parents to advertisements intended for other audiences, often called "spill." They also do not include supplementary targeting efforts intended for special audiences; e.g., Spanish-speaking Hispanics, which are described later.) These totals translate into averages of 254 targeted GRPs for general market youth per week and 216 targeted GRPs for general market parents per week. In turn, such estimates are equivalent to 2.5 (254/100) targeted ad exposures for general market youth and approximately 2.2 (216/100) targeted ad exposures per week for general market parents during the period from September 1999 through June 2004.

During the period of the Marijuana Initiative, from October 2002 through January 2004, enough time and space was purchased to achieve an average of 2.6 (258/100) youth targeted exposures per week, roughly the same as the overall Campaign average. During the period of the Early Intervention Initiative, from February through June 2004, enough time and space was purchased to achieve an average of 3.0 (304/100) youth and 2.8 (281/100) parent targeted exposures per week, roughly a 20 percent increase over the overall Campaign average for youth and a 30 percent increase for parents, though not all GRPs were from ads in that Initiative.

The roughly 20 percent increase for youth and the 30 percent increase for parents in the levels of exposure for the period of the Early Intervention Initiative need to be understood in the context of previous variations in Campaign purchases of GRPs.

The number of GRPs to which youth and parents were exposed has varied over the 58 months of Phase III of the Campaign. The launches of both the Marijuana and Early Intervention Initiatives were periods of increased media purchases. However, the increases are in the same range as in some earlier periods of higher purchases. As depicted in Table 3-A and Figures 3-A and 3-B, youth and parent GRP exposures have shown upward and downward trends during the almost 5 years of measurement, both between and within waves (6-month periods). For both youth and parents, the Campaign has reported that these variations are consistent with planned media allocations.

The Campaign also reported Campaign-related exposure beyond the general market efforts intended for youth and adults. In addition to the estimated general market exposure reported above, youth and parents also could be exposed to advertising intended for people other than themselves.

[2] Ogilvy has provided the Evaluation team with detailed information about the media purchases made, organized by medium, by week, and for many media by the name of the ad. The GRP data presented in this report are derived from that information, supplied in August 2004.

**Table 3-A. Distribution of youth and adult average weekly GRPs across years**

| | Sept 99–Dec 00 | Jan–Dec 01 | Jan–Sep 02 | Marijuana Initiative (Oct 02–Jan 04) | Early Intervention Initiative (Feb–Jun 04) |
|---|---|---|---|---|---|
| Youth | 257 | 245 | 220 | 258 | 304 |
| | Sep 99–Dec 00 | Jan–Dec 01 | Jan–Dec 02 | Jan 03–Jan 04 | Early Intervention Initiative (Feb–Jun 04) |
| Adults | 221 | 212 | 195 | 205 | 281 |

**Figure 3-A. Weekly youth-targeted general market GRPs (September 1999 through June 2004)**

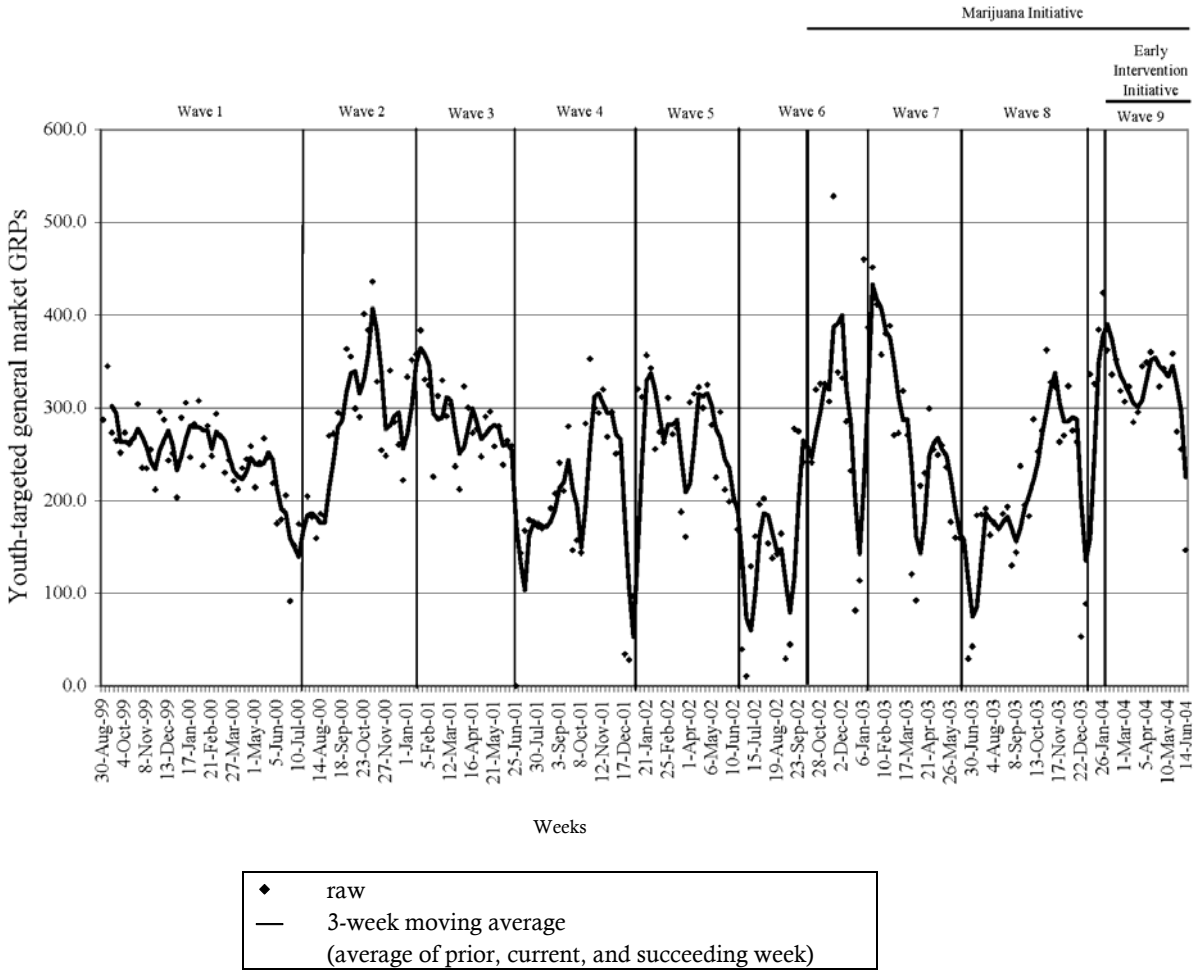
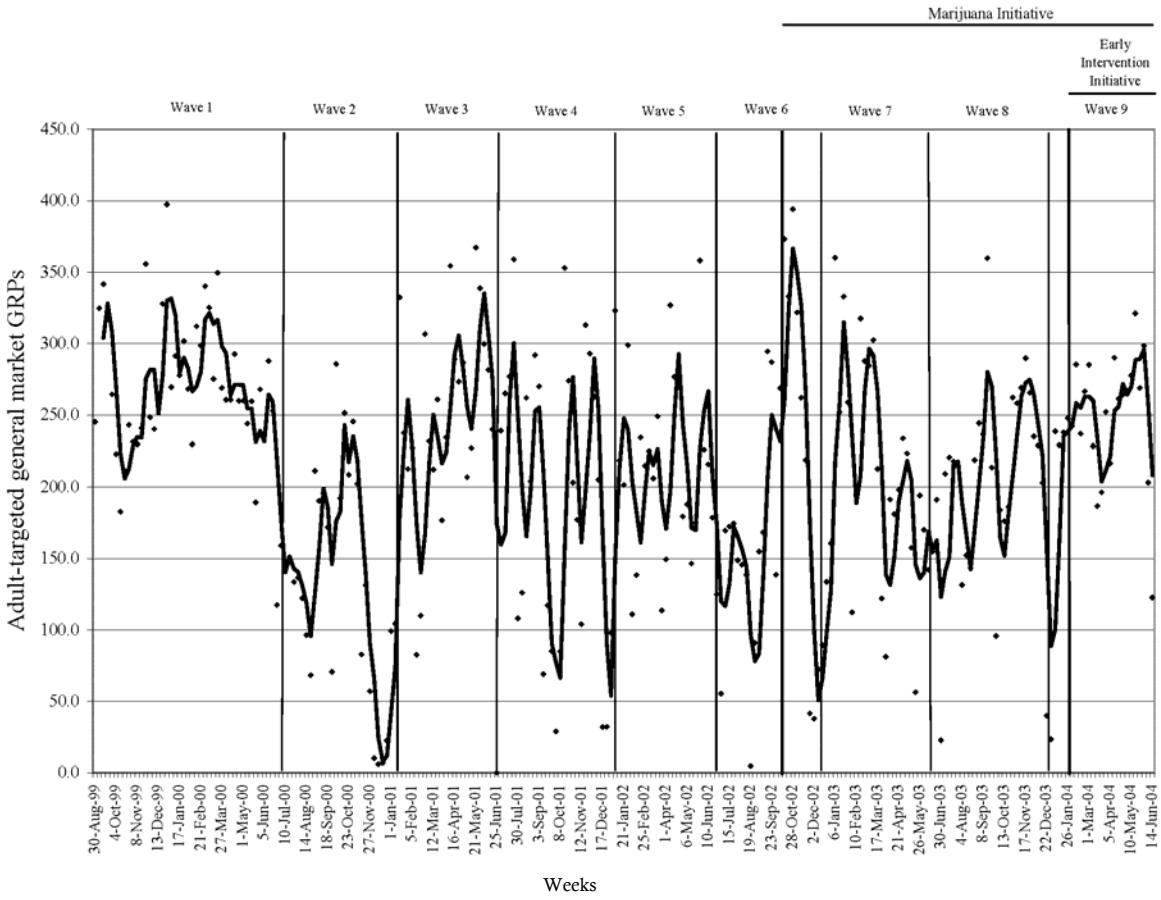


**Figure 3-B. Weekly adult-targeted general market GRPs (September 1999 through June 2004)**




Insofar as youth saw or heard an anti-drug ad intended for parents or vice versa, one could argue that the ad garnered exposure not only among its target audience but also that there was "spill" exposure generated among a secondary audience. Estimates of the potential amount of such spill are substantial. For the period of January to June 2004, youth GRP estimates would increase by approximately 28 percent,[3] if spill exposure to parent advertisements were added to the youth total for 2004. This is worth noting from the standpoint of general awareness of the Campaign's efforts. However, the Campaign has distinguished between youth and parent audiences and has developed explicit and distinct objectives and advertising efforts for each group. In doing so, the Campaign has assumed that the exposure to *particular* targeted messages, rather than to *any* anti-drug messages in general, is crucial. Therefore, much of this report focuses on expected and reported exposure to communication efforts specifically intended for, or targeted toward, each group.

Table 3-B provides some details about the allocation of the youth-targeted and parent-targeted GRPs. The distribution of GRPs across various media reveals the predominance of particular media as sources of GRPs for each of the two audiences.

[3] According to an August 2004 Ogilvy estimate for January through June 2004, there were approximately 10,681 total (targeted + spill) youth GRPs achieved, with spill exposure accounting for 3,002 GRPs.

**Table 3-B. Targeted gross rating points (total, average per week, and by medium)**

| | Phase III Campaign[1] (Sept 99 – Jun 04) | | | | Marijuana Initiative (Oct 02 – Jan 04) | | Early Intervention Initiative (Feb – Jun 04) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Youth GRPs | Percent of Youth GRPs | Parent GRPs | Percent of Parents GRPs | Youth GRPs | Percent of Youth GRPs | Youth GRPs | Percent of Youth GRPs | Parent GRPs | Percent of Parent GRPs |
| TOTAL | | | | | | | | | | |
| All media for 252 weeks (Sep 99 – Jun 04) | 64,025 | 100 | 54,655 | 100 | 17,824 | 28 | 6,072 | 9 | 5,617 | 10 |
| AVERAGE PER WEEK | | | | | | | | | | |
| Television | 129 | 51 | 79 | 36 | 137 | 53 | 148 | 49 | 116 | 41 |
| Radio | 75 | 29 | 61 | 28 | 76 | 30 | 110 | 36 | 88 | 31 |
| Print | 26 | 10 | 30 | 14 | 26 | 10 | 23 | 8 | 36 | 13 |
| Outdoor | 9 | 4 | 38 | 18 | 9 | 3 | 7 | 2 | 22 | 8 |
| Other | 15 | 6 | 8 | 4 | 10 | 4 | 16 | 5 | 19 | 7 |
| All media | 254 | 100 | 216 | 100 | 258 | 100 | 304 | 100 | 281 | 100 |

NOTE: The "other" category for youth includes advertising on the Internet and other nontraditional activities such as postings of flyers; the "other" category for parents includes movie theaters and the Internet.

[1] The Phase III Campaign column includes data from the Initiatives, as appropriate for that audience (parents or youth).

- **Television and radio account for the majority (80%) of GRPs for youth over the entire Campaign. This proportion increased slightly during the Marijuana and Early Intervention Initiatives, when 83 and 85 percent of youth GRPs, respectively, were purchased on television and radio.**

- **For parents, television and radio account for 64 percent of GRPs over the entire Campaign. This proportion grew to 72 percent during the Early Intervention Initiative period.**

Across the Campaign, the average weekly number of youth GRPs purchased for television was 129. It was about 6 percent higher (137) during the period of the Marijuana Initiative and about 15 percent higher (148) during the period of the Early Intervention Initiative. For radio, the average weekly GRPs for the period of the Marijuana Initiative (76) was about the same as the overall average for the Campaign (75), but radio GRPs were 46 percent higher (110) during the period of the Early Intervention Initiative. As a result, radio constituted a larger percentage of television and radio GRPs for youth over time (43% in February to June 2004 vs. 37% overall). This has not been the case for parents, where the average weekly television GRPs rose from 79 over the course of the overall campaign to 116 during the Early Intervention, while the proportional mix of television and radio remained relatively constant (56% television, 44% radio).

Table 3-C provides a more detailed classification of the allocation of the GRPs for youth targeted ads. Of the 51 percent allocated to some form of television over the full Phase III Campaign period, 28 percent went to combined network and cable television, 16 percent to in-school television (largely through the Channel One network), and 7 percent to "spot" television in about 100 metropolitan areas around the country. Of the approximately 30 percent of youth GRPs that went to network and spot radio during the full period, only about one-fifth went to spot radio. During the period of the Marijuana Initiative, greater proportions of both the television and the radio GRPs were allocated to network (and cable television) purchases. During the period of the Early Intervention Initiative, the proportion of youth GRPs from network and cable television rose to its highest level and the

**Table 3-C. Percentage of GRPs by target audience for each medium overall, and for the Initiatives**

**Youth**

| Medium | Phase III Campaign[1] Sept 99-June 04 (%) | Marijuana Initiative Oct 02-Jan 04 (%) | Early Intervention Initiative Feb-Jun 04 (%) |
|---|---|---|---|
| Network and cable television | 28.0 | 34.3 | 38.1 |
| Network radio | 23.9 | 26.9 | 29.0 |
| In-school television | 16.4 | 16.0 | 6.5 |
| Magazines | 10.0 | 10.0 | 7.6 |
| Spot television | 6.5 | 2.6 | 4.1 |
| Spot radio | 5.7 | 2.4 | 7.1 |
| Internet | 3.8 | 4.2 | 5.2 |
| Out of home | 3.6 | 3.6 | 2.3 |
| Nontraditional[2] | 2.1 | 0.0 | 0.0 |

**Adults**

| Medium | Phase III Campaign[1] Sept 99-June 04 (%) | Early Intervention Initiative Feb-Jun 04 (%) |
|---|---|---|
| Network and cable television | 36.0 | 41.2 |
| Network radio | 28.0 | 31.3 |
| Out of home | 17.5 | 7.7 |
| Magazines | 10.0 | 4.4 |
| Newspapers | 4.4 | 8.3 |
| Internet | 4.0 | 7.1 |
| Nontraditional[2] | 0.1 | 0.0 |

[1] The Phase III Campaign column includes data from the Initiative(s), as appropriate for that audience (parents or youth).

[2] Nontraditional media include cinema and flyer postings.

proportion from in-school television purchases declined to its lowest level. The proportions of network and spot radio purchases reached their highest levels as well.

While the Campaign purchased 129 targeted GRPs per week on television for youth, it purchased only 79 such GRPs for adults. As can be seen in Table 3-C, much of the general market adult GRPs came from media other than television, radio, or even print. In fact, overall, 18 percent of all of the adult GRPs came from out-of-home media (billboards, bus shelter placards, etc.). The Campaign purchased out-of-home advertising intended for general market adults in 10 major media markets,[4] which collectively contain roughly a third of the U.S. population. The distribution of adult GRPs was changed appreciably for the period of the Early Intervention Initiative. In that period, the percentages of GRPs allocated to out of home media and to magazines fell by 10 percent and 6 percent respectively; these decreases were counterbalanced by increased percentages for television, radio,

[4] According to Ogilvy, those markets included New York, Chicago, Los Angeles, Philadelphia, San Francisco, Dallas/Ft. Worth, Atlanta, Boston, Detroit, and Washington, DC.

newspapers, and the Internet. The proportion of wider-reach and narrower-reach media used by the Campaign varied somewhat across the Campaign, more so for parents than for youth.

A useful classification of the media outlets is into wider reach versus narrower reach media. For both parents and youth, the wider range media are taken to be all forms of television and radio, except for in-school television for youth; the narrower reach media are taken to be the remainder. Table 3-D presents the proportions of GRPs purchased across time, according to whether the GRPs were purchased on wider- or narrower-reach media.

The overall balance across the entire Campaign between the two types of media is virtually the same for youth and adults: roughly 65 percent of the GRPs went to the wider-reach media and 35 percent went to media with less reach. For youth, the percentage of the purchased GRPs allocated to the wider-reach media increased from about 61 percent in the period before the Marijuana Initiative to 66 percent during that initiative, and increased again to 78 percent during the Early Intervention Initiative period. For parents, the allocation to wider-reach media was also highest (at 73 percent) during the period of the Early Intervention Initiative; before that, the percentage was around 66 percent except at the start of the Campaign (September 1999 to December 2000), when it was only 53 percent.

**Table 3-D. GRPs per week purchased for youth and adults across waves, by reach of the media**

**Youth**

| Reach | Phase III Campaign[1] Sept 99-June 04 | Marijuana Initiative Oct 02-Jan 04 | Early Intervention Initiative Feb-Jun 04 |
|---|---|---|---|
| Wider reach media (network, cable, and spot television; network and spot radio) | 163 (64%) | 171 (66%) | 238 (78%) |
| Narrower reach media (magazines, arcades, Internet, in-school television, etc.) | 91 (36%) | 87 (34%) | 66 (22%) |
| Total per week | 254 | 258 | 304 |

**Adults**

| | Phase III Campaign[1] Sep 99-June 04 | Early Intervention Initiative Feb-Jun 04 |
|---|---|---|
| Wider reach media (network and cable television, network radio) | 140 (65%) | 204 (73%) |
| Narrower reach media (newspapers, magazines, outdoor media, Internet, etc.) | 76 (35%) | 77 (27%) |
| Total per week | 216 | 281 |

[1] The Phase III Campaign data include data from the Initiatives, as appropriate for that audience (parents or youth).

### 3.1.1 Distribution of General Market Ad Platforms

The Campaign strategy for both youth and adults has been to focus on a limited number of themes, or broad messages, called message platforms. Furthermore, the Campaign planned to focus much of the advertising during any particular period on one specific platform so that the message of that period received maximum exposure. The Marijuana Initiative advertising, with its focus on the negative consequences of using marijuana, is classified as within the Negative Consequences platform. Tables 3-E and 3-F outline the major platforms on general market television and radio for youth and parents, respectively. Each ad that was broadcast was associated with a particular platform (or platforms) on the basis of the concepts that it addressed. The tables also list the names of television and radio Campaign ads airing during the period from September 1999 through June 2004, according to their respective platforms. As the Early Intervention Initiative has not had subplatforms, the Initiative itself is listed as a platform. Descriptions of the ads are provided in Appendix D. (Note that a small number of ads represent more than one platform.)

For youth, ads in the Negative Consequences platform received more than half (56%) of the general market television GRPs over the period from September 1999 to June 2004, the period covered by the NSPY. Negative Consequences ads focus on physical or mental health, schooling outcomes of drug use, and the relationship between drugs and terrorism. Beginning in late 2002, this platform began to exclusively focus on the negative outcomes of marijuana use as part of the Marijuana Initiative. About a quarter of youth GRPs went to ads that emphasized the Normative Education/Positive Alternatives platform, which involved the idea that most youth do not use drugs and/or that others expect the youth not to use drugs. This emphasis at least partially reflects the introduction (in late 2000 and early 2001) of a series of "What's Your Anti-Drug?" spots, as part of the launch of a branding effort that stressed the number and variety of youth who do not use drugs (along with their favorite alternative behaviors). From the standpoint of the Campaign, all of these ads fit into the Normative Education/Positive Alternatives platform. Discussion of Resistance Skills (e.g., how to refuse drug offers) received approximately 11 percent of the GRPs, while Early Intervention ads received 7 percent. The distribution of youth radio ads across the behavioral platforms was similar to that of television ads.

For parents, the Parenting Skills platform, which includes Monitoring and boosting Personal Efficacy to intervene with youth, received 71 percent of parent GRPs. The remaining GRPs were divided between ads on other behavioral platforms: Early Intervention (10%), Drugs and Terror (9%), Perceptions of Harm (6%), and Your Child Is at Risk (4%). As with youth, the distributions of GRPs across platforms for parents were similar for television and radio.

- **The Campaign emphasis on different platforms varied sharply across waves[5] for both youth and parents.** Tables 3-G and 3-H present the percentages of television and radio GRPs that were dedicated to each of the major platforms across the nine waves for youth and parents, respectively.

  For youth, the Wave 1, which was spread across three platforms, was replaced by a major focus on Normative Education/Positive Alternatives in Wave 2 (Table 3-G). In Wave 3, there was a division of ads between Normative Education/Positive Alternatives and Resistance Skills, and Negative Consequences messages had largely disappeared. However, in Waves 4 and 5, Negative Consequences returned to represent the focus of the majority of the ads. Normative

[5] The discussion of platforms deals in waves, not years, to capture the change in platforms more effectively.

Education/Positive Alternatives were also highlighted during these waves, with ads on Resistance Skills virtually disappearing. Waves 6, 7, and 8 concentrated almost exclusively on Negative Consequences while Wave 9 was almost evenly split between Early Intervention and Negative Consequences ads. The Negative Consequences ads in Waves 7, 8, and 9 are nearly all Marijuana Initiative ads.

**Table 3-E. Distribution of youth message platforms on general market television and radio**

| Advertising platform | Percentage of television GRPs[1] | Ads in this platform during NSPY 1999-2004 Waves 1-9 | Percentage of radio GRPs[1] | Ads in this platform during NSPY 1999-2004 Waves 1-9 |
|---|---|---|---|---|
| Early Intervention | 7 | Car, Lake, Letter, Supermarket | 9 | Kill Me, Million Reasons, Terrified |
| Negative Consequences including: | 56 | | 54 | |
| Drugs and Terror | 4 | Stacey, Dan, I Helped (Excuses), Sophie, Timmy | 0 | |
| Marijuana Initiative ads played during the October 2002-Jan 2004 period | 25 | Drive-Thru, Den, Couple, Concert,[3] Four Cigarettes. Hello,[3] Water, Dummies, Memorial, Pick Up, Pool, Pregnancy Test, Wallet | 37 | Hello,[3] Train, Concert,[3] Drive, Babysitter, Panic, Chemicals, Firestarter, Look Up, Prom |
| Other Negative Consequences ads | 27 | Two Brothers,[3] Hockey, Mother/Daughter, No Skill, Vision Warrior, Brain, Hello[3] Water,[4] Flash Forward, Coroner | 17 | Two Brothers,[3] Make You Think, Stressed, Brother Jeff, If Pot Were a Person, Money, The First Time, The Rant, Hello,[3] Train |
| Normative Education/ Positive Alternatives | 24 | Mary J. Blige,[3] Drugs Kill Dreams (Williams Sisters),[3] Andy MacDonald, Scatman,[3] Dixie Chicks, DJ, Family, Football, Friends, Icon, Love, Most Teens, Swimming, Tara Lipinski, U.S. Women's Soccer Team, Dance, Music, Famous, Drawing, Music-Mix Tapes, Being Myself/My Future, Tiki Barber,[3] Derrick Brooks, Allan Houston, Apolo,[3] Boxing, Chad,[3] Rosey[3] | 23 | Mary J. Blige,[3] Drugs Kill Dreams,[3] Scatman,[3] What's Yours, What's Yours- Urban, Margot, Alberto, Basketball, Cross-Country, Limericks, Rosey,[3] Chad,[3] Apolo,[3] Tiki Barber[3] |
| Resistance Skills | 11 | Drugs Kill Dreams,[3] How to Say No, No Thanks, Michael Johnson, It's OK to Pass, What I Need | 12 | Drugs Kill Dreams,[3] Excuses, Orientation, What to Say-Boy, What to Say-Girl, Moment of Truth |
| Other | 2 | Ads not associated with the major platforms include Lauryn Hill, Layla, I'm Free, Miss America, and others | 2 | Ads not associated with major platforms |

[1] Some ads were counted in more than one platform, so percentages sum to more than 100 percent.

[2] This table describes general market platform distribution. The Campaign also produced some advertisements exclusively for special audiences, such as Spanish-language ads for Hispanics. television ads exclusively intended for Hispanics included Dummies, Fast Food, Second Trip, You Know How to Say It, Natural High, Mi Mundo, Music, Party, and Test. Such radio ads included Laugh, Weekend, Boy Meets Girl, Typical Story, She Did It, Good Advice, What Happened, and The First Time.

[3] On both television and radio.

**Table 3-F. Distribution of parent message platforms on general market television and radio**

| Advertising platform | Percentage of television GRPs | Ads that were in this platform during NSPY 1999-2004[1] Waves 1-9 | Percentage of radio GRPs | Ads that were in this platform during NSPY 1999-2004[1] Waves 1-9 |
|---|---|---|---|---|
| Early Intervention | 10 | Rewind,[2] Rolling Papers, Rough Night, Slam | 10 | Gag, Hypocrite, I Hate You, Rewind[2] |
| Parenting Skills/Personal Efficacy/ Monitoring | 71 | Clinic, Phone, Office, E-mail, television, Instructions ads (Stay Involved and Praise and Reward), Smoke, My Hero,[2] My Hero-African American,[2] Thanks[2] O'Connor, Anyway You Can, Kitchen, Ananda, Gene, Kid,[2] Party,[2] Loss, Baby, Don't Get Off My Case[2,] Enforcer,[2] Inquisitor,[2] Watchers | 75 | Tree Fort, Cooking Dinner, Basketball, Keep Trying, Desperate, My Hero,[2] Thanks,[2] I Know My Kid, Party,[2] Kid,[2] Don't Get Off My Case,[2], Enforcer,[2,] Inquisitor[2] |
| Your Child at Risk | 4 | Pipe,[2] Roach, Weed, Drugs, Clip,[2] Pot, Bag[2] | 6 | Pipe,[2] Clip,[2] Grass, Bag |
| Perceptions of Harm | 6 | Symptoms, Under Your Nose, Funeral, Deal, Clinic, Needle/Spray Can[2] | 9 | Happy Birthday Steven, Kathy Abel, Symptoms, Needle/Spray Can,[2] Sooner/Later-David, Sooner/Later-Megan |
| Other | <1 | Ads not associated with the major platforms: Car, Derrick Brooks | <1 | Ads unidentified in GRP reports |
| Drugs and Terror Ads[3] | 9 | AK-47, I Helped (excuses), Sophie, Timmy, Dan, Stacey, Okay, Ploy, Moral Loophole, Not that Complicated, Ghost: Office, Ghost: Subway, Legalize it, Environment | 0 | |

[1] This table describes general market platform distribution. The Campaign also produced some advertisements exclusively for special audiences, such as Spanish-language ads for Hispanics. television ads exclusively included for Hispanics included El Pregunton, La Jefa, La Resistencia, Mirrors, Heroes: Alert, Shadow Brochure, Shadow Monitoring, Heroes: Dancing, Heroes: Swimming, Game Show, and Natural High. Such radio ads included El Pregunton, La Jefa , Party, Sharing (Pepperoni), Shadow, and Game Show.

[2] On both television and radio.

[3] These ads constitute unique messages, not a new platform as the messages fall under more than one platform.

**Table 3-G. Percent of GRPs purchased for specific youth platforms across waves (television and radio)**

| | Year 2000 | | Year 2001 | | Year 2002 | | Year 2003 | | Year 2004 |
|---|---|---|---|---|---|---|---|---|---|
| Platform | Wave 1 (%) | Wave 2 (%) | Wave 3 (%) | Wave 4 (%) | Wave 5 (%) | Wave 6 (%) | Wave 7 (%) | Wave 8 (%) | Wave 9 (Jan-Jun) (%) |
| Negative Consequences | 30.9 | 16.4 | 0.0 | 60.2 | 63.2 | 99.3 | 99.9 | 100.0 | 45.8 |
| Drugs and Terror | 0.0 | 0.0 | 0.0 | 0.0 | 19.0 | 2.5 | 0.6 | 0.0 | 0.0 |
| Marijuana Initiative | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 44.1 | 97.9 | 100.0 | 45.8 |
| Other Negative Consequences | 30.9 | 16.4 | 0.0 | 60.2 | 44.2 | 52.7 | 1.4 | 0.0 | 0.0 |
| Normative Education/ Positive Alternatives | 50.2 | 70.3 | 46.0 | 35.6 | 36.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Resistance Skills | 41.3 | 3.0 | 51.5 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Early Intervention | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 54.2 |
| Other | 2.8 | 10.3 | 3.3 | 1.2 | 0.5 | 0.7 | 0.1 | 0.0 | 0.0 |

NOTE: For youth, some ads fell into more than one platform (e.g., Negative Consequences and Resistance Skills). However, the denominator is the actual total, which permits the percentages by category to total more than 100 percent.

**Table 3-H. Percent of GRPs purchased for specific parent platforms across waves (television and radio)**

| | Year 2000 | | Year 2001 | | Year 2002 | | Year 2003 | | Year 2004 |
|---|---|---|---|---|---|---|---|---|---|
| Platform | Wave 1 (%) | Wave 2 (%) | Wave 3 (%) | Wave 4 (%) | Wave 5 (%) | Wave 6 (%) | Wave 7 (%) | Wave 8 (%) | Wave 9 (Jan-Jun) (%) |
| Parenting Skills/ Personal Efficacy/ Monitoring | 54.2 | 98.8 | 48.6 | 91.2 | 77.1 | 85.1 | 83.9 | 100.0 | 19.6 |
| Your Child at Risk | 31.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Perceptions of Harm | 13.6 | <0.1 | 51.4 | 7.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Early Intervention | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 80.4 |
| Other | 1.2 | <0.1 | 0.0 | 1.0 | <0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Drugs and Terror Ads[1] | 0.0 | 0.0 | 0.0 | 0.0 | 22.9 | 14.9 | 16.1 | 0.0 | 0.0 |

[1] These ads constitute unique messages, not a new platform, as the messages fall under more than one platform.

For parents, there was also substantial variation in platform emphasis across waves (Table 3-H). Ads stressing the Perceptions of Harm platform were seen only in Waves 1, 3, and 4. The Your Child at Risk ad platform took a substantial portion of the GRPs only in Wave 1. The Parenting Skills/Personal Efficacy/Monitoring platform has been strongly present across Waves 1 through 8 but dropped dramatically in Wave 9 with the introduction of the Early Intervention Initiative. During Wave 8, all GRPs were dedicated to this platform. During Waves 5, 6, and 7, Parenting Skills/Personal Efficacy/Monitoring ads received the majority of the GRPs, with Drugs and Terror Ads accounting for the remaining GRPs.

### 3.1.2 GRPs Achieved for Minority Audiences

The Campaign reported additional efforts to reach certain minority populations with advertisements developed and intended specifically for them, such as Spanish-language ads for Hispanic audiences, English-language ads featuring African American casts for African American audiences, English-language ads featuring Native American casts for American Indian audiences, and Spanish-language ads for audiences in Puerto Rico (which are unavailable outside Puerto Rico). There are two ways these advertising efforts can affect exposure. They can add to the specific exposure among the target populations and they can add to the overall exposure for the general population. These are considered separately in this discussion.

Table 3-I provides the average weekly numbers of GRPs achieved for each of the minority audiences[6] that were targeted for specific ads from Wave 2 to Wave 9 (GRP data for minority audiences are not available for Wave 1).

**Table 3-I. Estimated average weekly GRPs achieved for specific race/ethnicity groups (Waves 2 – 9)**

| | Youth | | | | Adult | | | |
|---|---|---|---|---|---|---|---|---|
| Wave | General Market | African American | Hispanic | Residents of Puerto Rico | General Market | African American | Hispanic | Residents of Puerto Rico |
| 2 | 261 | 368 | 186 | 109 | 145 | 160 | 80 | 44 |
| 3 | 282 | 412 | 260 | 244 | 231 | 239 | 154 | 112 |
| 4 | 197 | 247 | 153 | 155 | 185 | 182 | 94 | 41 |
| 5 | 255 | 350 | 229 | 162 | 210 | 202 | 137 | 57 |
| 6 | 213 | 283 | 220 | 173 | 181 | 202 | 109 | 50 |
| 7 | 258 | 357 | 260 | 125 | 208 | 227 | 134 | 37 |
| 8 | 238 | 324 | 221 | 147 | 203 | 235 | 155 | 52 |
| 9 | 295 | 395 | 296 | 179 | 238 | 266 | 168 | 66 |

NOTES: GRPs reported do not include spill. GRP data for minority audiences are not available for Wave 1.

- **The average weekly GRPs achieved for African American youth were higher at each wave than the levels achieved for general market youth and for the other youth subpopulations.** The average weekly GRPs achieved specifically for African American youth ranged from a low of 247 GRPs in Wave 4 to a high of 412 in Wave 3.

- **GRPs achieved for Hispanic youth were roughly equal to, or lower than, the levels achieved for general market youth.** They ranged from 153 in Wave 4 to 296 in Wave 9. GRPs achieved for Puerto Rican youth were consistently the lowest of the four youth ethnic groups. They ranged from 109 in Wave 2 to 244 in Wave 3.

- **The average weekly GRPs achieved for African American adults were almost always equal to or higher than the levels achieved for general market adults.** They ranged from a low of 160 in

[6] Television, radio, and print ads for American Indian parents and youth were included in the Phase III Campaign but were not part of the Evaluation. Therefore, GRP data for these ads were not provided to the evaluators.

Wave 2 to a high of 266 in Wave 9 and were lower than general market adults by a few points in only Waves 4 and 5.

- **GRPs achieved for Hispanic adults were consistently lower than those for African-American or general market adults, ranging from 80 in Wave 2 to 168 in Wave 9.** GRPs achieved for Puerto Rican adults ranged from 37 in Wave 7 to 112 in Wave 3 and were consistently the lowest of the four adult ethnic groups.

Table 3-J indicates how much the GRPs achieved for minority audiences in Waves 8 and 9 added to the Campaign's overall exposure in those waves. Minority audience GRPs for Waves 8 and 9 are shown for illustrative purposes, but the results would be similar regardless of the waves shown. The first row reflects the average weekly GRPs reported exclusively for each group in Waves 8 and 9. One hundred GRPs for Hispanic youth, for example, could reflect a one-time reach of all U.S. Hispanic youth. Those GRPs then can be assessed in terms of their contribution to the general population's Campaign experience as indicated in the table.

**Table 3-J. Estimated additional GRPs in the general markets of youth and adults generated by GRPs purchased to reach specific race/ethnicity groups (Waves 8 and 9)**

| | Youth | | | Adult | | |
|---|---|---|---|---|---|---|
| | African American | Hispanic | Residents of Puerto Rico | African American | Hispanic | Residents of Puerto Rico |
| Weekly within-group GRPs for targeted efforts | 360 | 259 | 163 | 251 | 162 | 59 |
| Percentage of U.S. youth or parent population | 16%[1] | 15%[1] | 1%[2] | 13%[1] | 14%[1] | 1%[2] |
| Additional general population GRPs per week | 58 | 39 | 2 | 33 | 23 | 1 |
| Percentage additional weekly general population GRPs | 22% | 15% | <1% | 15% | 10% | <1% |

NOTES: Numbers shown in the corresponding tables in previous reports did not reflect the total GRPs achieved in all media or from the match. Numbers have been corrected to reflect both GRPs purchased and donated. GRPs from spill are not included.

[1] From NSPY. Percentages reflect percent of total U.S. 9- to 18-year-old youth or of total U.S. parents.

[2] From U.S. Census (*www.census.gov*, accessed February 9, 2001). Same percentage used for youth and adults.

The numbers presented reflect the approximate numbers of additional GRPs averaged over the general population resulting from the special targeting efforts during Waves 8 and 9. For African American youth, roughly 360 GRPs were obtained through the targeted efforts among that population in an average week. Given that African American youth constitute approximately 16 percent of the U.S. population of 9- to 18-year-olds, their targeted GRPs contribute an additional estimated 58 GRPs (i.e., 360 x 0.16) to the overall average U.S. youth's Campaign exposure. This addition reflects a 22 percent increase over and above the general market GRPs obtained for youth (267), somewhat altering the larger picture of GRP distribution.

While GRPs from ads aimed at African American youth provided the biggest boost (22%) of the four ethnic subgroups to average Campaign exposure in Waves 8 and 9, GRPs from ads targeted at African American adults and Hispanic youth both added 15 percent to Campaign exposure, while those aimed at Hispanic adults added 10 percent. GRPs aimed at Puerto Rican youth and adults added the least, less than 1 percent, to Campaign exposure.

Data to assess the combined effect of these extra GRPs with the general market GRPs for the specific target populations are not available to the evaluators. If the respective audiences had received a full dose of the general market advertising and then received this focused advertising as an add-on, this would be a major addition. However, this is unlikely to be the case for primary Spanish language speakers. The Spanish language advertising is designed, presumably, to make up for the fact that English language advertising is inaccessible to primary Spanish language speakers. It might be that the GRPs for the Hispanic audience represent a large portion of the Campaign GRPs for primary Spanish speakers, including many Puerto Rican residents, rather than being an add-on. (The Evaluation does not address effects of the Campaign in Puerto Rico.)

For African American audiences and Hispanic bilinguals, the issue is less clear. However, these two minority audiences and the general market audience have different media use patterns. Presumably, the general market GRPs reflect media use across the entire population. Thus, the GRPs reflected in Table 3-J, even for the African American audience, are in unknown portions an add-on to and a make-up for reduced access to the general market GRPs. However, as will be shown below, for most of the Campaign, Hispanic and African American audiences have reported higher total exposure to most Campaign media and this may reflect the add-on effects of these targeted GRPs.

## 3.2 Recall of Exposure from NSPY Questionnaires

To assess exposure to the Campaign, NSPY included two complementary measurement approaches. Both approaches were applied with both youth and parent respondents. This section reports the survey findings on exposure based on both approaches.

Under one approach, all respondents were asked for estimates of how often they had seen or heard anti-drug advertisements in each of the major media in which the Campaign purchased time (including television and radio, newspapers and magazines, outdoor venues, and movies and videos). The questions were modeled after those used in the Monitoring the Future (MTF) study so as to maximize comparability across surveys. The responses to these questions were converted into measures that are intended to provide a general impression of the intensity of recent exposure and which are particularly helpful in comparisons over time and across media.[7] These measures are likely to capture both exposure to advertising from a variety of sources directed to the particular group of respondents (youth or parents) and also "spill" exposure to advertising directed toward the other audience, as well as some pro bono advertising.[8] In addition to the measures for each medium separately, an overall summary general exposure index was computed by summing the measures for all media. The construction of the individual and overall general exposure index are described in Appendix E, Section E.1.1.

[7] See questions D10-D13 of the Teen and Child questionnaires and questions F1-F4 of the Parent questionnaire—all on the NIDA web page.

[8] During Waves 1 through 3, there was a single question that asked about the combination of radio and television exposure, following the MTF model exactly. In Wave 4, in order to separate these two media, half of the sample was given either two questions that addressed each medium separately or the single question that had been used in the previous waves. Since assignment to the two- or one-question sequence was done randomly, it was possible to calibrate the responses to maintain the previous scale. This permits over time comparisons. In Wave 5 and forward, all respondents were given separate radio and television questions, which were then combined into a single radio and television estimate for the over time comparisons, based on the Wave 4 calibration calculations. In Waves 6 through 9, the questionnaire returned to the single question format from Waves 1 through 3.

Under the other approach, questions were included regarding the recognition of specific ads, with the purpose of improving the precision of the measurement of exposure. Television and radio advertising represented a large part of the advertising effort, particularly for youth, and was the focus for this measure. A sample of Campaign television and radio ads was played at full length to each respondent on a laptop computer. The ads were randomly selected from ads that had been broadcast nationally during the 2 calendar months prior to the interview. The respondent was asked about how many times he or she had seen each ad in "recent months." Imputation was used to fill in reasonable projections for any remaining ads that were not sampled and played to that respondent. The actual or imputed responses to the exposure questions were then combined to form a specific exposure index. Section E.1.2 of Appendix E describes the construction of that index and provides evidence on its validity.

In the previous section of this chapter, the comparisons involving the Marijuana and Early Intervention Initiatives focused on the periods from October 2002 through January 2004 and February through June 2004, respectively. For reports on GRPs achieved, this was an appropriate approach. However, in the current section, which turns from GRP data to respondent recall data, the relevant time frame changes. Respondents were asked to recall exposures in recent months for both types of exposure questions and, for the specific exposure questions, respondents were played ads that were broadcast in the previous two calendar months. Youth respondents in the late fall of 2002 may have been recalling exposures of Marijuana Initiative ads, but they also may have been recalling exposures of ads broadcast before the Marijuana Initiative. For that reason, the examination of Marijuana-Initiative-associated recall of exposure focuses on the youth respondents interviewed in Waves 7 and 8 only, that is, from January to December, 2003. By including all respondents from particular waves, the sample is nationally representative and can be compared to nationally representative samples from previous and subsequent waves.

## 3.2.1 General Measures of Exposure

The great majority of youth and parents recalled some exposure to anti-drug advertising, which can include paid, pro bono, and spill. The following two subsections present results for youth and parents, in turn.

### Youth Recall of General Anti-Drug Messages

Table 3-K presents results for the general exposure index of overall recalled exposure to anti-drug ads across all media for youth across all nine NSPY waves. At each wave, only youth aged between 12½ and 18 years of age are included.

**Table 3-K. Overall recalled general exposure by youth to anti-drug ads across all media (November 1999 through June 2004)**

| Exposures per month | Year 2000 | | Year 2001 | | Year 2002 | | Year 2003 | | Year 2004 | All Waves |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave5 | Wave 6 | Wave7 | Wave 8 | Wave 9 (Jan-Jun) | |
| Less than 1 | 6.5 | 5.6 | 5.6 | 7.5 | 6.6 | 4.7 | 5.6 | 9.1 | 6.5 | 6.4 |
| 1 to less than 4 | 17.1 | 15.1 | 17.3 | 17.6 | 15.6 | 18.4 | 14.5 | 18.2 | 18.1 | 16.9 |
| 4 or more | 76.4 | 79.2 | 77.1 | 75.0 | 77.9 | 76.9 | 80.0 | 72.7 | 75.4 | 76.7 |
| Median exposure | 11.4 | 15.5 | 12.1 | 11.9 | 15.9 | 11.3 | 13.3 | 10.0 | 10.7 | 12.0 |

- Across the Campaign, 77 percent of youth reported at least weekly exposure (4 or more times per month) to general anti-drug messages from a combination of sources (Table 3-K). Thus, the purchase of approximately 2.5 targeted general market exposures per week among youth, according to the GRP data in Table 3-B, produced recall of at least one ad per week among three-quarters of the youth population but less than that among the other quarter of the population. The median number of recalled ad exposures by youth was 12 per month. (The median number of ads recalled is the number of exposures such that half the population saw or heard the ads as many or more times and the other half saw or heard them as many or fewer times.) These numbers can be compared, though only roughly and with caution, with the estimates of potential exposure generated from the GRP data. The median recall of 12 ads per month for youth translated into 3.0 (12/4) exposures per week; GRP estimates suggest a similar 2.5 for targeted GRPs alone. Estimates of general recall were largely consistent with the focus of GRP purchases, with roughly 80 percent of youth-targeted GRPs having been purchased for television or radio.

- **Gender and race/ethnicity were related to recall of exposure to specific media in 2003 and early 2004.** Females (58.4%) were significantly more likely than males (51.7%) to report having seen or heard television or radio ads at least weekly in 2003 and in early 2004 (59.7% vs. 50.0%), though over the entire Campaign, the gender differences were not significant. In 2003, White youth (20.2%) were significantly less likely than African American (29.9%) or Hispanic youth (27.9%) to report having seen ads in newspapers or magazines; this finding held for White and African American youth in 2004 and for all three groups across the Campaign. White youth (5.8%) were also significantly less likely than African American (15.7%) or Hispanic youth (11.0%) to report seeing ads in arcades, movie theaters, on video rentals, and on billboards in 2003. These associations are similar to associations seen in 2004 and over the entire Campaign. (Detail Tables 3-28 through 3-31).

- **Recalled exposure varied across different media.** Table 3-L displays the percentages of youth reporting at least weekly exposure to each of the various media employed by the Campaign across the years of the Campaign. While roughly 57 percent of youth recalled seeing or hearing television or radio ads weekly, only around a quarter recalled such frequent exposure to print or outdoor advertising, and less than 8 percent recalled weekly exposure to movie or video messages. These proportions are essentially the same for the Marijuana Initiative and Early Intervention Initiative periods as for the previous period.

**Table 3-L. Recall of general anti-drug advertising at least weekly by medium across all years for youth (November 1999 through June 2004)**

| | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 | |
|---|---|---|---|---|---|---|
| | Waves 1 and 2 | Waves 3 and 4 | Waves 5 and 6 | Waves 7 and 8 | Wave 9 (Jan-Jun) | All Waves |
| Television or radio ads | 57.3 (54.3, 60.3) | 57.1 (54.7, 59.4) | 59.5 (57.5, 61.5) | 55.0 (53.1, 56.9) | 54.7 (52.6, 56.8) | 56.9 (55.4, 58.4) |
| Newspaper or magazine ads | 27.5 (25.4, 29.7) | 24.3 (22.3, 26.3) | 24.6 (23.0, 26.1) | 23.1 (21.5, 24.8) | 22.7 (21.1, 24.4) | 24.6 (23.5, 25.7) |
| Movie or video rental ads | 6.9 (5.8, 8.1) | 6.7 (5.6, 7.9) | 8.9 (8.0, 10.0) | 8.3 (7.4, 9.4) | 8.1 (7.2, 9.2) | 7.8 (7.3, 8.3) |
| Billboard or other public posting ads | 27.0 (25.2, 28.9) | 26.6 (24.6, 28.7) | 27.6 (25.8, 29.5) | 25.0 (23.4, 26.8) | 22.5 (20.5, 24.7) | 26.1 (25.0, 27.2) |

NOTE: Below each year's estimate, the confidence interval for that estimate (at the 95% level) is provided. Significant estimate changes over time can be identified by their nonoverlapping confidence intervals.

- **Youth recall of general anti-drug messages in various media declined significantly in the first half of 2004** (Table 3-L and Detail Tables 3-27 through 3-31). As can be seen in Table 3-L, some significant declines over time were seen in the combined weekly exposure or exposure to each individual media source. There was a significant decline from 59.5 percent to 54.7 percent in the recall of general anti-drug television or radio ads from 2002 to 2004.

- From 2000 to 2004, there was a significant decline (25% to 23%) in the recall of newspaper or magazine ads. Recall of billboards or other public postings declined from 27 percent in 2000 and 28 percent in 2002 to 23 percent in 2004, with all youth age subgroups showing significant declines except those aged 16 to 18. Significant decreases were seen in males (28% to 22%), Whites (24% to 19 %), low risk (27% to 21%), and high sensation seeking youth (28% to 23%) over that period.

## Parent Recall of General Anti-Drug Messages

As described in Section 2.3, the unit of analysis used for all parent analyses in this report is the youth-parent dyad, not the parent, as was used in previous reports. To avoid a cumbersome presentation, the results are loosely expressed in terms of parents, but throughout, this terminology should be more accurately interpreted as being in terms of dyads.

- **Across all waves of the Evaluation, parent reports of weekly exposure from the combination of the sources over the course of the Campaign averaged about 72 percent (Table 3-M).** The Campaign purchased roughly 2.2 targeted general market exposures per week for parents. For parent exposure, the median recall of 9.5 ads per month translates into around 2.4 exposures (9.5/4) per week, which roughly parallels the targeted GRP level.

**Table 3-M. Overall recalled general exposure to anti-drug ads by parents across all media (November 1999 through June 2004)**

| Exposures per month | Year 2000 | | Year 2001 | | Year 2002 | | Year 2003 | | Year 2004 | All Waves |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 | Wave 7 | Wave 8 | Wave 9 (Jan-Jun) | |
| Less than 1 | 6.7 | 6.5 | 8.9 | 6.2 | 8.1 | 4.7 | 4.1 | 5.4 | 4.4 | 6.1 |
| 1 to less than 4 | 20.1 | 22.5 | 22.7 | 25.4 | 23.9 | 21.6 | 21.3 | 21.9 | 21.8 | 22.3 |
| 4 or more | 73.1 | 71.1 | 68.4 | 68.4 | 68.0 | 73.8 | 74.6 | 72.7 | 73.7 | 71.6 |
| Median exposure | 10.2 | 9.7 | 8.8 | 8.0 | 8.3 | 9.6 | 10.1 | 9.6 | 9.7 | 9.5 |

- **Recalled exposure varied across different media.** Table 3-N displays reports of weekly exposure to each of the various media employed by the Campaign. While slightly more than half of parents recalled seeing radio or television ads weekly, about 22 percent recalled such frequent exposure to print, 24 percent recalled exposure to outdoor advertising, and 4 percent recalled weekly exposure to movie or video messages. As with youth, estimates of general recall were largely consistent with the focus of GRP purchases, with 65 percent of parent-targeted GRPs achieved through radio and television.

**Table 3-N. Recall of general anti-drug advertising at least weekly by medium across all waves for parents (November 1999 through June 2004)**

| | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 | All Waves |
|---|---|---|---|---|---|---|
| | Waves 1 and 2 | Waves 3 and 4 | Waves 5 and 6 | Waves 7 and 8 | Wave 9 (Jan-Jun) | |
| Television or radio ads | 50.6 (47.8, 53.4) | 48.8 (46.4, 51.1) | 50.9 (48.7, 53.2) | 51.8 (49.8, 53.9) | 51.9 (49.7, 54.1) | 50.7 (49.2, 52.2) |
| Newspaper or magazine ads | 23.0 (20.8, 25.3) | 20.6 (18.8, 22.5) | 22.6 (20.9, 24.5) | 22.9 (21.0, 24.8) | 21.4 (19.6, 23.4) | 22.2 (21.1, 23.3) |
| Movie or video rental ads | 3.1 (2.6, 3.8) | 4.3 (3.4, 5.5) | 4.3 (3.5, 5.3) | 4.3 (3.6, 5.1) | 4.0 (3.1, 5.1) | 4.0 (3.6, 4.6) |
| Billboard or other public posting ads | 24.5 (22.3, 26.8) | 23.2 (21.4, 25.2) | 25.0 (23.2, 27.0) | 24.5 (22.8, 26.3) | 22.2 (20.0, 24.6) | 24.1 (22.9, 25.2) |

- **Race/ethnicity and education are associated with recall of exposure to specific media.** Across the full Campaign, parents who were college graduates were significantly less likely to report having seen or heard television or radio ads than those with less education, such as some college (43.5% vs. 53.5%). They also were significantly less likely to recall seeing newspaper or magazine ads (16.1% vs. 23.1%), and movie ads (1.3% vs. 3.6%) at least weekly than parents with some college. White parents (48.5%) were significantly less likely than African American (58.7%) or Hispanic parents (54.8%) to report having seen ads on television or having heard them on the radio. The same was true for newspaper and magazines ads, ads in movie theaters or on video rentals, and billboards (Detail Tables 3-33 through 3-36).

The general recall measures, as noted, provide an overall sense of parent and youth exposure across each of the major Campaign media and they correspond, on average, to the GRP data. They are useful for comparisons among media and for comparisons over time. They also provide confirmation that there is some spill exposure, in that ads targeted to a particular audience are also likely to be seen by another group. This is clearest for youth reports of exposure to outdoor media, where recalled exposure is comparable to parents' recall, even though outdoor media buys were primarily targeted at parents.

However, these questions are quite general and depend on respondents' ability to recall and summarize exposure without very much assistance or prompting information. For discussion of estimates with arguably more precision, the chapter now turns to evidence about the specific recall of television and radio ads.

## 3.2.2 Television and Radio Specific Advertising Recall

Respondents were shown a sample of specific Campaign television ads and played a sample of Campaign radio ads in their entirety on their laptop computers. As mentioned previously, each respondent was presented ads that were broadcast nationally in the 2 calendar months prior to the interview and asked whether they had ever seen or heard the ad, how often they had seen or heard the ad in recent months, and how they evaluated the ad. The validity of recall data was a concern in that respondents who did not want to admit to forgetfulness or simply wanted to be agreeable might claim to have seen an ad even if they had not. To assess this tendency in the first three waves, a ringer ad (i.e., an ad never broadcast) was randomly selected from a pool of three ringer ads and was shown to the respondent. In Waves 4 through 9, the pool was changed to five ringer or spill ads and respondents were assigned randomly to see either a ringer or a spill ad (i.e., ads targeted to one audience, e.g., parents, were watched by members of another audience, e.g., youth).

### Television Ad Recall

Across the entire Campaign, about 129 general market youth-targeted television GRPs were achieved per week, on average, indicating that youth respondents should have been exposed to an average of 1.3 (129/100) television ads per week. During the Marijuana and Early Intervention Initiatives, about 137 and 148 GRPs were achieved per week, respectively, indicating that youth exposure should have risen to an average of 1.4 and 1.5 ads per week during those periods (Table 3-B).

Across the entire Campaign for parents, general market television efforts were less substantial, enough to produce an average of 79 GRPs per week, or slightly less than an average of 1 (79/100) weekly television exposures for adults. During the Early Intervention Initiative, about 116 GRPs per week

were achieved, indicating that parent exposure should have risen to an average of about 1.2 ads per week (Table 3-B).

How do those numbers compare with evidence about youth and parent recall of the specific ads that they were shown? The following analyses rely on strict segmentation of ads by the parent–youth dimension and by language. In other words, youth-targeted ads are not considered in the analyses for parents and vice versa. Thus youth–parent "spill" is not reflected in these specific ad recognition results. Similarly, a person who speaks only English or only Spanish was never shown an ad in the opposite language. Bilingual English–Spanish speakers were shown ads in both languages and special efforts were taken to be sure that African American respondents were shown any ads targeted at them.

## Youth Recall of Television Specific Advertising

Across the entire Campaign, 90 percent of youth recalled seeing at least one of the ads that had been broadcast in the previous 60 days. This compares with 93 percent during the Marijuana Initiative (Waves 7-8) and 97 percent during the Early Intervention Initiative (Wave 9) (Table 3-O).

**Table 3-O. Youth recall of specific television ads seen per month across waves (November 1999 through June 2004)**

| Number of times ads seen in recent months | Year 2000 | | Year 2001 | | Year 2002 | | Year 2003 | | Year 2004 | All Waves % |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wave 1 (%) | Wave 2 (%) | Wave 3 (%) | Wave 4 (%) | Wave 5 (%) | Wave 6 (%) | Wave 7 (%) | Wave 8 (%) | Wave 9 (Jan – Jun) (%) | |
| 0 times | 17.7 | 12.8 | 12.6 | 10.9 | 10.7 | 7.5 | 3.1 | 10.1 | 2.7 | 9.7 |
| 0.01 – 0.99 | 7.9 | 7.5 | 4.8 | 4.7 | 6.4 | 4.5 | 2.6 | 5.6 | 2.3 | 5.1 |
| 1 – 3.99 | 39.7 | 41.3 | 34.1 | 29.0 | 35.4 | 30.6 | 17.8 | 34.4 | 21.1 | 31.4 |
| 4 –11.99 | 29.1 | 31.5 | 38.3 | 41.6 | 35.1 | 40.9 | 41.1 | 37.3 | 47.3 | 38.1 |
| 12 or more | 5.5 | 6.8 | 10.2 | 13.8 | 12.3 | 16.4 | 35.5 | 12.7 | 26.6 | 15.7 |
| Median | 2.6 | 2.7 | 3.7 | 4.8 | 3.7 | 4.9 | 8.2 | 3.8 | 6.7 | 4.4 |

The median number of recalled viewings per month of youth-targeted television ads was 4 times across the Campaign; 6 times during Waves 7 and 8, and about 6.5 times during Wave 9 (Table 3-O).

- **Youth recall increased significantly from 2000 to 2001, from 2002 to 2003, and from 2003 to the first half of 2004, both overall and among every subgroup.** While youth television GRPs increased modestly, large and significant increases in recall of Campaign television ads were reported over time and across all the subgroups (Table 3-P and Detail Table 3-1).

  - Increases in the median number of times youth recalled seeing Campaign television ads a month can also be seen in Table 3-O. In 2000 (Waves 1 and 2), the median number of Campaign ads seen was about 2.5 times a month; by 2001, it had risen to about 4 times and it remained at that level in 2002. But by Wave 7, recalled viewings had increased to about 8 times per month, and then declined to 4 in Wave 8. However, in 2004 (Wave 9), it again increased to about 6.5 times a month. Waves 7 and 8 correspond to the period of the Marijuana Initiative and Wave 9 corresponds to the period of the Early Intervention Initiative, both of which were characterized by increased levels of youth television GRPs.

  - In 2000, 37 percent of youth recalled having seen an ad at least weekly; by 2001, that had risen to over half where it remained in 2002. By 2003, recall of an ad rose to 63 percent, and in the first half of 2004, 74 percent of youth recalled seeing a television ad weekly (Table 3-P).

**Table 3-P. Youth recall of having seen television ads at least once per week**

| Having seen television ads at least weekly | Year 2000 Waves 1 and 2 | Year 2001 Waves 3 and 4 | Year 2002 Waves 5 and 6 | Year 2003 Waves 7 and 8 | Year 2004 Wave 9 (Jan-Jun) | All Waves |
|---|---|---|---|---|---|---|
| Overall (%) | 36.5 | 51.9 | 52.4 | 63.1 | 73.9 | 53.8 |
| | (34.3, 38.8) | (49.2, 54.6) | (50.3, 54.5) | (60.7, 65.4) | (72.1, 75.6) | (52.6, 55.1) |
| Television GRPs per week | 133 | 138 | 122 | 137 | 148 | 129 |

- **What is driving this considerable change in recall?** No single explanation is apparent. It is likely that several factors may have contributed to such an increase.
  - One possible explanation is the amount of television GRPs achieved and the associated mix of networks and programs. The only period that did not show a significant increase in recall (2001 to 2002) appears to match an 11 percent decline in achieved television GRPs. From 2000 to 2001, a 4 percent increase in GRPs corresponds to a 42 percent rise in recall levels, while a 12 percent increase in GRPs from 2002 to 2003 results in a 20 percent increase in recall. From 2003 to 2004, an 8 percent increase in television GRPs matches a 17 percent rise in recall.
  - Additionally, the ads that are part of the Marijuana and Early Intervention Initiatives may have been more memorable than earlier ads. The Marijuana Initiative consisted almost exclusively of ads that focused on some dramatic negative consequences of marijuana use. The Early Intervention Initiative is unique in the Campaign's history because its ads were the first to mention alcohol use as well as drug use and to stress youth intervening with other youth who are using drugs or alcohol as soon as a problem is noticed. For youth, ads in these two initiatives were a distinct departure from those that had played previously.
  - Finally, there may have been reinforcement of recall in other ways. Because youth respondents were interviewed four times over the course of the Evaluation, it is possible that the youth in the sample became more atuned to recognizing the Campaign's advertising and hence recalled it more readily. Because the Campaign television ads were also sometimes used in soundtrack versions on radio, the high level of recall of television ads may reflect confusion about the medium on which an ad was seen or heard.

## Parent Recall of Television-Specific Advertising

Across all waves, about three-quarters of parents recalled seeing at least one of the ads that had been playing in the previous 60 days, with the median number of ads recalled per month at less than 4 or about 0.8 per week (Detail Table 3-7 and Table 3-Q). This overall score hides a sharp trend in recall of television ads. In 2000, about 55 percent recalled seeing at least one ad; by 2002, this had grown to 85 percent and by 2003-2004, nearly 90 percent recalled seeing at least one ad. The median number of viewings of parent-targeted television ads in the past month increased similarly, from a median of roughly 1 in 2000, to 4.5 in 2002, and to almost 5 in 2003 before declining slightly to 4 in early 2004.

**Table 3-Q. Parent recall of specific television ads seen per month by wave (November 1999 through June 2004)**

| Number of ads seen per month | Year 2000 | | Year 2001 | | Year 2002 | | Year 2003 | | Year 2004 | All Waves (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wave 1 (%) | Wave 2 (%) | Wave 3 (%) | Wave 4 (%) | Wave 5 (%) | Wave 6 (%) | Wave 7 (%) | Wave 8 (%) | Wave 9 (Jan-Jun) (%) | |
| 0 times | 33.5 | 41.6 | 32.1 | 17.6 | 10.0 | 11.1 | 4.2 | 9.8 | 10.6 | 18.7 |
| 0.01 – 0.99 | 6.8 | 7.3 | 9.6 | 4.0 | 4.6 | 4.0 | 3.2 | 4.8 | 2.9 | 5.2 |
| 1 – 3.99 | 33.1 | 28.2 | 38.6 | 38.1 | 35.3 | 27.8 | 26.0 | 35.7 | 36.5 | 33.2 |
| 4 – 11.99 | 21.6 | 17.8 | 16.9 | 32.9 | 40.8 | 39.3 | 49.0 | 41.2 | 36.7 | 33.1 |
| 12 or more | 5.1 | 5.1 | 3.0 | 7.4 | 9.4 | 17.9 | 17.7 | 8.5 | 13.4 | 9.8 |
| Median | 1.3 | 1.0 | 1.2 | 3.2 | 3.9 | 5.0 | 5.8 | 3.7 | 3.8 | 3.3 |

- **How is this pattern of increasing recall of parent television ads best explained?** As with youth, no single explanation is apparent. It is likely that several factors may have contributed to such an increase.

  - Table 3-R compares the recall of at least one ad per week with the number of television-specific GRPs that the Campaign purchased in each year. There are significant positive increases in recall every year from 2000 through 2002, followed by a significant decrease from 2003 to 2004. The recall changes from 2000 to 2002 track reasonably well with increases in the GRPs, suggesting at least part of the increase in recall can be attributed to the increasing presence of parent television ads. However, the positive recall change from 2002 to 2003 accompanies a decline in parent GRPs as does the declining recall change from 2003 to 2004, with an increased level of television GRPs for adults.

  - Several of the same explanations relevant to youth are also relevant to parents. Parents were repeatedly interviewed over the course of the Evaluation and may have become more atuned to the Campaign's advertising, thus remembering it more readily. There may have been a reinforcement of recall from 2000 to 2003 because radio and television broadcast very similar ads. Thus, high levels of ad recall may reflect confusion about the media on which an ad was heard or seen. There also may have been more efficient ad purchases over the period of the Campaign so that the particular slots and media produced higher effective recall than suggested by the GRPs per se.

  - There was a significant decline in recall levels from 2003 to 2004. For parents, recall of seeing a television ad weekly seemed to cross the 50 percent threshold in 2002 and to vary somewhat since that time, but not in parallel with GRP changes. Perhaps the recall declines from 2003 to 2004 are because the Early Intervention ads for parents were launched in February 2004, just 4 months prior to the end of the Evaluation, and had not been broadcast frequently enough to elicit higher levels of recall.

**Table 3-R. Parent recall of having seen television ads at least once per week**

| Having seen television ads at least weekly | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 | All Waves |
|---|---|---|---|---|---|---|
| | Waves 1 and 2 | Waves 3 and 4 | Waves 5 and 6 | Waves 7 and 8 | Wave 9 (Jan-Jun) | |
| Overall (%) | 24.8 | 30.1 | 53.7 | 58.1 | 50.0 | 42.8 |
| | (23.1, 26.6) | (27.8, 32.5) | (51.2, 56.2) | (56.1, 60.0) | (47.1, 53.0) | (41.6, 44.1) |
| Television GRPs | 48 | 76 | 90 | 65 | 116 | 79 |

## Radio Recall

The Campaign complemented its purchases of television time with purchases of radio time. As previously noted, a sample of radio ads was played for sampled youth and for each sampled parent. Respondents were asked whether they had ever heard each radio ad, and how often, following the question format of the television ads.

Wave 1 radio estimates for youth are not presented in this report because many of the radio ads broadcast during that period were essentially soundtracks from the television ads. Any Wave 1 radio ad that was an audio duplicate of a television ad was not played for Wave 1 youth respondents because of a concern that they would not be able to recall whether they had heard or seen an ad on radio or television, if they had been exposed to it through both media. That confusion would potentially make radio exposure estimates inaccurate. The responses by youth to the questions about the matching television ads are likely to reflect their total exposure through both television and radio. Wave 1 radio estimates for parents are used in this report because the parent radio ads during that period were distinctly different from the parent television ads.

Beginning in Wave 2, however, all radio ads were played for both youth and parent respondents, regardless of whether they were audio duplicates of television ads. Such media source issues did not compromise Wave 2 data as no network radio ads for youth were audio duplicates of a television ad. However, for parents beginning in Wave 3 (early 2001) and for youth beginning in Wave 4 (late 2004), radio ads that were essentially television ad soundtracks received a considerable number of radio GRPs; the corresponding television ads also received a considerable number of GRPs. Parent radio recall estimates for Waves 3 through 9 (2001-mid-2004) and youth radio recall estimates for Waves 4 through 9 (late 2001-mid 2004) may be biased upward compared to previous wave estimates, given the overlap in ads on both media.

## Youth Recall of Radio Specific Advertising

Table 3-S presents data on the youth recall of specific Campaign radio ads. It clearly shows that the extent of recall of radio ads is much less than that of television ads (Table 3-O).

**Table 3-S. Youth recall of radio ads heard per month across waves**

| Number of times ads heard per month | Year 2000 | Year 2001 | | Year 2002 | | Year 2003 | | Year 2004 | |
|---|---|---|---|---|---|---|---|---|---|
| | Wave 2[1] (Jun-Dec) (%) | Wave 3 (%) | Wave 4 (%) | Wave 5 (%) | Wave 6 (%) | Wave 7 (%) | Wave 8 (%) | Wave 9 (Jan-Jun) (%) | All Waves (%) |
| 0 times | 65.0 | 42.2 | 67.1 | 53.8 | 58.0 | 44.7 | 58.9 | 53.6 | 54.0 |
| 0.01 – 0.99 | 10.6 | 17.1 | 10.8 | 13.7 | 10.7 | 11.3 | 11.8 | 12.2 | 12.5 |
| 1 – 3.99 | 21.0 | 28.2 | 18.8 | 24.2 | 25.5 | 30.6 | 22.6 | 26.9 | 25.3 |
| 4 – 11.99 | 3.2 | 11.2 | 3.1 | 7.1 | 5.1 | 12.4 | 6.2 | 6.8 | 7.4 |
| 12 or more | 0.2 | 1.3 | 0.3 | 1.2 | 0.7 | 1.0 | 0.6 | 0.5 | 0.8 |
| Median | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 |

[1] No Wave 1 radio estimates for youth were generated because many of the radio ads were soundtracks from the television ads and were not played for respondents.

- **Overall, 46 percent of 12½ - to 18-year-olds recalled hearing any radio ads.** More than one half of the youth reported no recall of the youth radio ads presented (Table 3-S). Only about 8 percent of youth recalled hearing Campaign radio ads once a week or more (4 or more times in a month).

- **The recall patterns do not match changes in weekly youth radio GRPs.** Table 3-T compares the annual levels of GRPs with the percentage of youth who recalled having heard a radio ad at least once per week. A significant increase in weekly recall from 7.1 percent to 10.1 percent occurred between 2002 and 2003, paralleling radio GRPs, which rose by 14 points (22%). A significant decrease in recall from 10.1 percent to 7.3 percent occurred between 2003 and 2004, in spite of a 34-point (45%) increase in radio GRPs.

**Table 3-T. Youth recall of having heard radio ads at least once per week**

| Having heard radio ads at least weekly | Year 2000 Waves 1 and 2 | Year 2001 Waves 3 and 4 | Year 2002 Waves 5 and 6 | Year 2003 Waves 7 and 8 | Year 2004 Wave 9 (Jan-Jun) | All Waves |
|---|---|---|---|---|---|---|
| Overall (%) | N/A | 7.9 | 7.1 | 10.1 | 7.3 | 8.2 |
| | N/A | (6.9, 9.1) | (6.1, 8.1) | (8.9, 11.4) | (6.2, 8.5) | (7.7, 8.8) |
| Radio GRPs | N/A | 65 | 62 | 76 | 110 | 75 |

The basis for the fluctuation across the Campaign in radio recall is not clear. However, the more important conclusion remains: the overall level of recall of radio ads is quite low, on average, with the great majority of youth not recalling hearing one ad weekly, and more than half not recalling any of the specific radio ads.

## Parent Recall of Radio-Specific Advertising

Table 3-U presents data on parents' recall of specific radio ads. Although somewhat more parents reported such recall than the youth did themselves, the general conclusion of low levels of recall of radio ads remains.

**Table 3-U. Parents who recall specific radio ads heard per month by wave**

| Number of times ads heard in recent months | Year 2000 Wave 1 (%) | Year 2000 Wave 2 (%) | Year 2001 Wave 3 (%) | Year 2001 Wave 4 (%) | Year 2002 Wave 5 (%) | Year 2002 Wave 6 (%) | Year 2003 Wave 7 (%) | Year 2003 Wave 8 (%) | Year 2004 Wave 9 (Jan-Jun) (%) | All Waves |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 times | 50.2 | 53.5 | 41.5 | 45.7 | 54.0 | 48.8 | 37.7 | 34.0 | 38.0 | 44.7 |
| 0.01 to 0.99 | 8.7 | 5.9 | 12.1 | 4.8 | 5.7 | 7.0 | 8.3 | 7.9 | 7.2 | 7.5 |
| 1 to 3.99 | 30.7 | 31.1 | 29.2 | 32.8 | 30.5 | 31.3 | 42.4 | 41.4 | 39.3 | 34.4 |
| 4 to 11.99 | 8.6 | 9.1 | 15.6 | 14.6 | 7.8 | 10.9 | 10.6 | 14.8 | 13.4 | 11.7 |
| 12 or more times | 1.8 | 0.4 | 1.6 | 2.1 | 2.0 | 2.0 | 1.1 | 1.9 | 2.2 | 1.7 |
| Median | 0.0 | 0.0 | 0.4 | 0.5 | 0.0 | 0.3 | 1.1 | 1.2 | 1.1 | 0.4 |

- **Across the entire Campaign, parent recall of a parent radio ad averaged 55 percent.** Parent reports of never hearing even one of the parent radio ads presented averaged 45 percent (Table 3-U).

- **Parent recall of Campaign radio ads has seen significant increases and decreases over time that do not coincide with GRP levels.** Table 3-V shows that in 2000, parent recall of having heard radio ads at least once per week was 10 percent. This increased significantly to 16 percent in 2001, while GRP levels declined by 8 points or 12 percent. Recall levels declined to 11 percent by 2002, which paralleled a 17-point or 28 percent decline in GRPs. From 2002, however, the trend in recall levels has been positive, with a significant increase of 4 percentage points between 2002 and 2004. This rise in recall levels matches a 45-point (102%) increase in radio GRPs over that period. In reviewing the results in Table 3-V, it should be noted that the increasing integration of television and radio messages may have produced higher reports of recall in later years than otherwise would have occurred.

**Table 3-V. Parent recall of having heard radio ads at least once per week**

| Having heard radio ads at least weekly | Year 2000 Waves 1 and 2 | Year 2001 Waves 3 and 4 | Year 2002 Waves 5 and 6 | Year 2003 Waves 7 and 8 | Year 2004 Wave 9 (Jan-Jun) | All Waves |
|---|---|---|---|---|---|---|
| Overall (%) | 9.9 | 16.9 | 11.4 | 14.2 | 15.6 | 13.4 |
| | (8.5, 11.6) | (15.1, 18.9) | (9.8, 13.2) | (12.7, 16.0) | (14.1, 17.2) | (12.5, 14.4) |
| Radio GRPs | 68 | 60 | 43 | 46 | 88 | 61 |

As with youth radio, the basic conclusion is a low level of recall of radio ads by parents. The great majority of parents do not recall hearing ads even once per week, and many do not recall hearing any radio ads at all.

## 3.2.3 Recall of the "Brand"

One of the major innovations of Phase III of the Campaign was the inclusion of a "brand" for the Campaign. A brand is used in many advertising campaigns to provide a recognizable element (a name, a slogan, a unique visual presentation, a unifying concept, or all four) to coordinate components of a Campaign including print, radio, and television advertisements, as well as non-advertising activities. Insofar as the brand is recognized and positively regarded, the familiar presence of the brand may create some initial positive response to any new ad. It also may increase the perception that each ad is part of a larger program, which may influence acceptance of the Campaign's messages.

The Campaign introduced the parent brand first, which involved a series of phrases beginning with a set-up word and ending with a colon and the phrase: "the Anti-Drug," for example, "Communication: The Anti-Drug." The youth brand, introduced at the end of 2000, used a similar approach. In the first series of ads, youth were asked to name what their anti-drug was—meaning what it is that keeps them from using drugs. In a typical ad, a series of blanks would precede the phrase: ⌊_⌋ ⌊_⌋ ⌊_⌋ ⌊_⌋ ⌊_⌋: My Anti-Drug. After the period of the brand launch, the blanks would have a possible response filled in, e.g., "*Music*: My Anti-Drug", as if it were written in by the respondent. Many of the Marijuana Initiative youth advertisements included a variant of the brand phrase, e.g., "Facts: the Anti-Drug" which reflects the change in focus introduced with the Marijuana Initiative. However, while slightly different, the brand phrases used in the Marijuana Initiative were similar enough to the original to expect that recognition of the phrase would continue to grow.

To evaluate the extent to which youth and parents recognized the brand targeted to them, NSPY included a section focusing on brand recall from 2001 to the first half of 2004. This introductory

statement was presented to respondents before presenting the Campaign ads for recall since the ads often included the brand.

Youth were asked:

> "We want to ask you about some brief phrases that might or might not have appeared in the media around here, as part of ads against drug use. In recent months, have you seen or heard the following phrases?

They were then shown "|_| |_| |_| |_| |_|: My Anti-Drug." They were also shown one of two ringer phrases that were not the Campaign brand, as shown below.

When this question was first asked of youth in the first half of 2001, 61 percent of the 12½- to 18-year-old respondents reported recall of the Campaign brand. By 2002, recall had increased to 84 percent, and in the first half of 2004, recall of the brand increased to 89 percent.

In 2001, parents of sampled youth were asked:

> In recent months, have you seen or heard any ads containing phrases such as "Communication: the Anti-Drug" or "Parents: the Anti-Drug"?

From 2002 to mid-2004, parents of sampled youth were asked:

> In recent months, have you seen or heard either of the following phrases:

Parents were then shown the phrase "Parents: The Anti-Drug" and one of two phrases that were not the parent campaign brand.

Among parents in 2001, the Campaign brand was recognized by approximately 45 percent. By 2002, it was recognized by approximately 61 percent. The recognition rate increased again to 90 percent in 2004.

- **It is clear that the Campaign's brand has diffused into the populations of both parents and youth, with increasing recognition rates over time and very high levels of recognition being reached by 2004.**

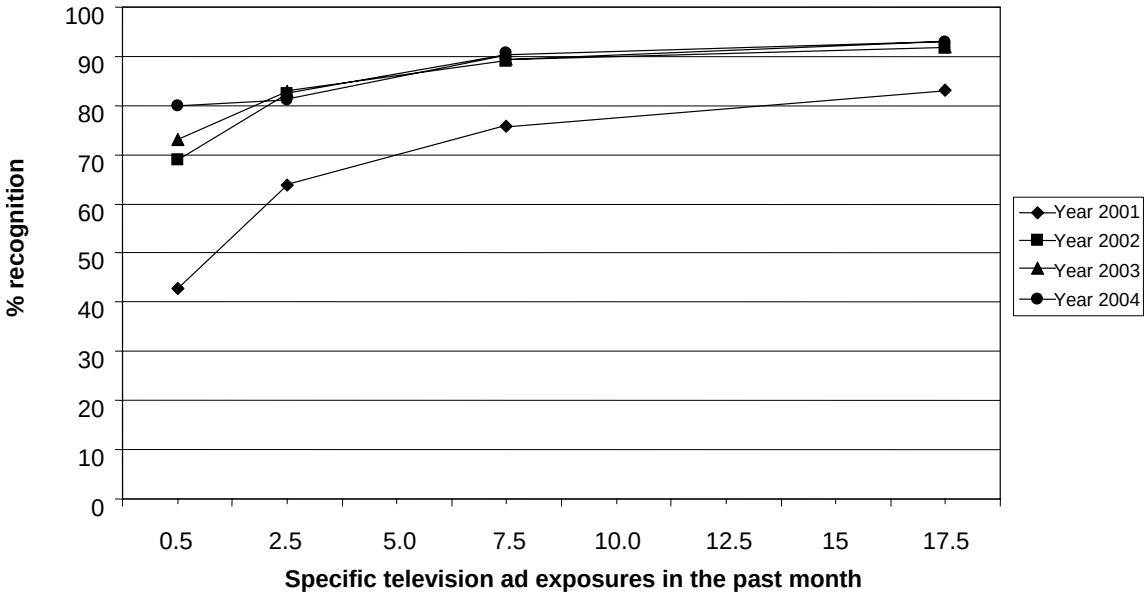
Although the recall rates are high, some caution may be warranted. It is possible that some of the youth and parents reported that they recognized the brand because they wanted to appear knowledgeable, or because the phrase sounded familiar enough that they thought they had heard it, even if they had not. In this situation, even if the brand were not on the air, some percentage of respondents would falsely claim to have heard it. To measure the degree of true brand recognition, the false claims need to be filtered out. Ideally, this would involve measuring brand recognition before the brand was introduced, thus providing an estimate of the percentage of youth and parents who indicate that they recognize the brand, when in fact they did not. These estimates could then be used as a baseline with which subsequent levels of recall would be compared. The difference between the prelaunch and postlaunch recognition levels would then provide an estimate of brand learning. Since it is not possible to estimate recall before the brand was introduced from NSPY, two other approaches have been used to estimate prelaunch brand recognition.

One approach compares the brand recognition rates across levels of the specific ad exposure measure. If the brand recognition claims are reliable, they should be substantially related to the specific

Campaign ad recall claims since the ads often included the brand. Those with more exposure to the ads had many more opportunities to see or hear the brand. (Since evidence for the validity of the specific recall measures is strong,[9] if the brand recognition is associated with it, there would be reason to accept the brand recognition as credible as well.) Furthermore, the percentage of brand recognition among those with the lowest levels of specific Campaign recall can be used as a suggestive estimate of what the upper bound of the prelaunch level of brand recognition might have been.

Figure 3-C presents ad exposure and brand phrase recognition for youth in 2001. In that year the least exposed youth reported 43 percent recognition of the brand, while the group most exposed reported more than 80 percent recognition. In subsequent years the association is weaker. The greater the amount of exposure to the Campaign, the greater is the recognition of the brand, just as would be expected. Using this approach, the estimate of prelaunch level of brand recognition is approximately 43 percent.

**Figure 3-C. Brand phrase recognition by exposure and year among youth**




The second approach used to estimate the prelaunch level of brand recognition was to ask about recognition of phrases that sounded as if they might have been used in the Campaign but were not used. The percentage of youth who reported that they recognized these false phrases in 2001 was used as an alternative estimate of the prelaunch recognition. The two false brands that were played to youth respondents in 2001 were "I'm drug free and I'm doing just fine" and "Drugs—I don't need them."[10] From 2001 through 2004, recognition rates for these two false brands were around 56 percent. This is a surprisingly high rate. Importantly, while recognition of the brand increased each year, recognition of the false brands remained relatively constant. For parents, where the overall recognition during Waves 8 and 9 of the true parent phrase was 90 percent, the recognition of the false phrases was around 49 percent.

[9] Appendix E, Section E.1.3.

[10] "Drugs—I don't need them" was replaced in Wave 5, as discussed in the following paragraph.

Prompted by the idea that the high recognition rates of the false brands were in part a result of the fact that the false brands sound like the Campaign brands and could therefore be easily confused with them, a "new" false brand for youth was introduced in 2002 "Drugs: one word—dead." It was designed to sound less conventional. While around 56 percent of youth respondents in Wave 5 reported having seen or heard the false brand phrase "I'm drug free and I'm doing just fine," only 38 percent in Wave 5 reported having seen or heard the new false brand phrase "Drugs, one word—dead." Given that the Campaign brand phrase is also unusual sounding and looking, like this "dead" phrase, it may be reasonable to assume that the true baseline would have been close to the 38 percent false recognition for this phrase, rather than the 56 percent achieved by the more similar sounding false brands.

In sum, although it is not possible to measure precisely the degree of brand phrase learning, it is clear that some substantial brand recognition has occurred. The possible proxy measures of prelaunch recognition described above are around 38 percent to 43 percent for youth and around 49 percent for parents. The reported recognition levels in 2004 were 89 percent for youth and 90 percent for parents. Subtracting the estimated prelaunch recognition rates from the reported rates for 2004 suggests that 46 percent of youth and 41 percent of parents had recognized the Campaign brand phrase by that time.

### 3.2.4 Television Ad Evaluation

All youth and parent respondents were asked to evaluate a subset of the ads that they were shown[11]. The goal was to assess how individuals interpret and evaluate ads from the Campaign when they see or hear them.

Three positively phrased evaluative questions (whether the ad was attention getting, convincing, or said something important to the respondent) were summed to create a mean positive evaluation score for each ad and summed again for each respondent across a random subset of the ads that they recalled hearing or seeing. Additionally, a single skeptical item (whether the ad exaggerated the problem) was analyzed separately. The five-point scale responses for each question were scored from - 2 to + 2, with 0 representing a neutral response and higher scores indicating a more positive response to the ad (i.e., in the case of the exaggeration item, less belief that the ad exaggerated).

- **The mean ad assessments for parents have varied over the course of the Campaign, whereas those for youth have remained fairly stable.** The mean ad assessments for parents were significantly higher in 2001 and 2004 than in other years for both the three-item evaluation scale score and for the skeptical item scale score (Table 3-W and Detail Table 3-14).

- **Both parents and youth rated the television ads addressed to them favorably on both scales on average (i.e., positive mean scores), with parents consistently rating their ads more favorably than did youth for their ads (Table 3-W).**

- **The mean ad assessments vary across subgroups for both parents and youth**

  - Mean responses from the three age groups of youth interviewed (12½- to 13-year-olds, 14- to 15-year-olds, and 16- to 18-year-olds) ranged from 0.55 to 1.01 averaged across all years. Responses to the "exaggerated the problem" evaluative question were also favorable to the Campaign, with a tendency for youth respondents to somewhat disagree with the notion that

[11]Parents were asked to evaluate the first three television ads that they were shown, if they recalled having seen the ad before. This was also true for youth in Waves 1 to 5. From Waves 6 to 9, youth were asked to evaluate the first three television ads they were shown, regardless of whether they had seen them before.

**Table 3-W. Television ad evaluation scores among parents and youth (November 1999 through June 2004)**

| Group | Year 2000 Waves 1 and 2 | Year 2001 Waves 3 and 4 | Year 2002 Waves 5 and 6 | Year 2003 Waves 7 and 8 | Year 2004 Wave 9 (Jan-Jun) | All Waves |
|---|---|---|---|---|---|---|
| | | | Mean Evaluation Score | | | |
| Parents | 1.08 (1.03, 1.13) | 1.27 (1.24, 1.30) | 1.17 (1.14, 1.20) | 1.20 (1.17, 1.23) | 1.29 (1.26, 1.32) | 1.20 (1.18, 1.22) |
| Youth 12½ to 18 | 0.73 (0.69, 0.78) | 0.73 (0.70, 0.76) | 0.79 (0.76, 0.82) | 0.85 (0.82, 0.88) | 0.83 (0.78, 0.87) | 0.78 (0.76, 0.81) |
| | | | Mean score for the exaggerated the problem ad | | | |
| Parents | 0.97 (0.91, 1.04) | 1.19 (1.13, 1.24) | 1.06 (1.01, 1.11) | 1.07 (1.02, 1.12) | 1.27 (1.23, 1.31) | 1.11 (1.08, 1.13) |
| Youth 12½ to 18 | 0.73 (0.69, 0.78) | 0.72 (0.68, 0.76) | 0.75 (0.71, 0.80) | 0.72 (0.68, 0.75) | 0.77 (0.73, 0.82) | 0.74 (0.71, 0.76) |

Note: The evaluation scale runs from -2 to +2, with +2 being most positive. The exaggeration scale also runs from -2 to +2, with disagreement that an ad exaggerated getting a positive score, so that a higher score is more positive toward the ad.

an ad "exaggerated the problem." The assessment scores across all age groupss ranged from 0.65 to 0.82 (Table 3-W and Detail Tables 3-12 and 3-13).

- There are several other subgroup differences in the youth evaluations of the ads worth noting. Averaged across all waves, the lowest evaluation scores came from youth age 16 to 18 (0.64), Whites (0.74), males (0.68), high sensation-seekers (0.61), and high-risk (0.55). These same groups (except Whites) were also significantly more likely to believe that the television ads "exaggerated the problem" (Detail Tables 3-12 and 3-13).

- Across the Campaign, most demographic subgroups of parents offered largely similar overall assessments of the Campaign television ads, although some differences did appear. Averaged across all waves, females rated the ads more favorably (1.26) than did males (1.09). African American (1.31) and Hispanic (1.38) parents were more favorable in their responses to the television ads than were White parents (1.14). Parents who were college graduates (1.12) were less positive in their ad assessments than were parents with less education (1.21) (Detail Table 3-14).

## 3.2.5 Internet Use and Encounters with Drug Information On-Line

### Youth Internet Use

The vast majority of youth report using the Internet, as shown in Table 3-X (and Detail Table 3-37). In 2004, 91 percent of youth report using the Internet in the past 6 months. Internet use among 12½- to 18-year-olds significantly increased from 86 percent in 2000 to 89 percent in 2001, and then increased slightly thereafter.

- **Race and sensation seeking were associated with Internet use.** In 2004, White youth reported higher rates of Internet use (93 percent) than either African American (86 percent) or Hispanic youth (87 percent). The disparity seen in 2000 with high sensation-seeking youth reporting more contact with the Internet than low sensation-seeking youth is no longer significant by 2004 (Detail Table 3-37).

**Table 3-X. Youth Internet use and encounters with drug information on-line in the past 6 months (November 1999 through June 2004)**

| | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 |
|---|---|---|---|---|---|
| | Waves 1 and 2 (%) | Waves 3 and 4 (%) | Waves 5 and 6 (%) | Waves 7 and 8 (%) | Wave 9 (Jan – Jun) (%) |
| Percent using the Internet at least a few times | 86.0 (84.3, 87.5) | 89.0 (87.6, 90.3) | 89.4 (88.2, 90.4) | 89.6 (88.5, 90.6) | 90.6 (89.2, 91.9) |
| Percent visiting anti-drug Internet site among all youth | 9.3 (8.1, 10.7) | 10.3 (9.0, 11.7) | 8.7 (7.8, 9.6) | 9.5 (8.5, 10.6) | 9.8 (8.4, 11.5) |
| Percent visiting pro-drug Internet site among all youth | 5.3 (4.5, 6.3) | 5.8 (4.9, 6.9) | 5.0 (4.3, 5.8) | 4.6 (3.9, 5.4) | 4.1 (3.3, 5.0) |

- **There were large and significant increases in Internet use among both African American and Hispanic youth between 2000 and 2004.** In 2000, 77 percent of African American youth reported using the Internet, compared to 86 percent in 2004. Similarly, in 2000, 73 percent of Hispanic youth reported using the Internet, compared to 87 percent in 2004. There was no significant increase in Internet use among White youth during the same period (Detail Table 3-37).

- **There was a significant decline between 2000 and 2004 in youth reporting visiting pro-drug sites.** Only 4.1 percent of all youth claimed to have visited a pro-drug site in 2004, a significant decline from a high of 5.8 percent in 2001 (Table 3-X, Detail Table 3-39).

## Parent Internet Use

Parents remained less engaged with the Internet than were youth. In 2004, parents reported less Internet use in the previous 6 months than youth (80% vs. 90%). Parents reporting visits to anti-drug and parenting skill Internet sites has also significantly increased between 2000 and 2004 (Table 3-Y).

**Table 3-Y. Parents who have used the Internet and have encountered drug information on-line in the past 6 months (November 1999 through June 2004)**

| | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 |
|---|---|---|---|---|---|
| | Waves 1 and 2 (%) | Waves 3 and 4 (%) | Waves 5 and 6 (%) | Waves 7 and 8 (%) | Wave 9 (Jan – Jun) (%) |
| Percent using the Internet at least a few times | 61.1 (58.9, 63.3) | 67.3 (64.6, 69.8) | 72.5 (70.6, 74.2) | 75.1 (73.6, 76.5) | 79.5 (77.5, 81.4) |
| Percent visiting anti-drug Internet sites | 7.1 (6.1, 8.3) | 9.3 (8.1, 10.7) | 9.7 (8.2, 11.5) | 10.0 (8.9, 11.2) | 10.6 (9.2, 12.1) |
| Percent visiting parenting skill Internet sites | 8.0 (6.9, 9.1) | 10.1 (8.7, 11.6) | 10.2 (9.0, 11.7) | 11.2 (10.1, 12.5) | 12.2 (10.9, 13.6) |

- **The proportion of parents using the Internet at least a few times increased significantly from 2000 to 2004.**

  - However, there are wide disparities in Internet use by education and race/ethnicity across all years. To cite 2004 as an example, parents who were college graduates (97 percent) reported more use of the Internet in the past 6 months than parents with less than a high school

diploma (39 percent). White parents (90 percent) reported more Internet use than African American parents (67 percent) and Hispanic parents (50 percent) (Detail Table 3-40).

- **Visits to anti-drug sites and parenting skill sites increased significantly among parents from 2000 to the first half of 2004.** There was a 4 percentage point increase in reports of visiting anti-drug sites and a 4 percentage point increase in reports of visiting parenting skill sites from 2000 to the first half of 2004 (Table 3-Y and Detail Tables 3-41 and 3-42). These increases from 2000 to 2004 may be partly a reflection of the overall increase in Internet use.

  - Few parents accessed information about drugs on-line. Among parents in 2004, Internet sites with anti-drug information were visited by 11 percent in the past 6 months and Internet sites that included information about parenting skills were visited by 12 percent in the past 6 months (Table 3-Y and Detail Tables 3-41 and 3-42).

## 3.3 Anti-Drug-Related Education

This chapter has thus far focused on exposure to Campaign-generated messages through mass media or through the Internet. This section shifts the focus from exposure to messages directly attributable to the Campaign to anti-drug messages that come from other institutions. One of the Campaign's methods of influence is to persuade other community institutions to increase their anti-drug efforts. A separate analysis of the environmental context effects of the Campaign on organizations at the national level and on state prevention coordinators is available (Berkowitz, et al., 2002). Evidence that youth and parents are exposed to anti-drug messages from these organizations, and particularly that exposure to those messages is increasing over time, may be seen as evidence supportive of indirect Campaign exposure. It will not be possible to definitively attribute any observed changes to the Campaign, since many forces may influence the actions of these organizations. Still, this analysis provides some information about whether there is broad community change and thus whether indirect effects might have occurred.

This section describes the nature of, and change in, other sources of drug education and information for youth and parents. Young people were asked whether they received drug education in school and outside of school, how frequently they engaged in drug-related conversation with parents and friends, and about the content of those conversations. Youth were also asked whether and how frequently they were exposed to anti-drug stories through a variety of media. Parents were asked about exposure to drug prevention efforts in their communities, including proposed drug laws and enforcement of existing laws, speeches by public officials, and the existence of anti-drug programs. They were also asked about how often they recalled seeing drug-related stories in the media and about their involvement in anti-drug or parental effectiveness programs.

### 3.3.1 Youth In-School and Out-of-School Anti-Drug Education

The majority of youth reported receiving anti-drug education in school during the past year and in previous years. On average across the 4 years, approximately 74 percent of 12½ - to 18-year-olds responded that they had ever attended a drug education class or program in school and 62 percent reported attending such an event within the past year. Out-of-school drug education class and program attendance were much lower; on average, 11 percent reported attending in past years and only 6 percent reported attending in the previous 12 months (Table 3-Z and Detail Tables 3-43 through 3-46).

There was a significant decrease in the percentage of youth who reported ever attending drug education classes or programs in school from 2000 to 2004. The same decline was seen in attending an in-school drug class in the past 12 months. The percentage of youth reporting out-of-school drug education, both past year and lifetime, has fluctuated from year to year, with the lowest levels in 2003 and 2004 (Table 3-Z and Detail Tables 3-43 through 3-46).

- **Ethnicity and a youth's risk propensity have some association with anti-drug class and program exposure.** In 2004, White (70 percent) and African American (72 percent) youth were significantly more likely than Hispanic youth (60 percent) to report having ever attended in-school drug education. In 2004, 17 percent of African American youth reported having ever attended an anti-drug education program out-of-school, compared to 9 percent of White and Hispanic youth. Among lower risk youth, 61 percent reported attending in-school drug education in the past year, compared to 51 percent of higher risk youth (Detail Tables 3-43 through 3-46).

**Table 3-Z. In-school and out-of-school drug education across waves (12½- to 18-year-olds)**

| | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 |
|---|---|---|---|---|---|
| | Waves 1 and 2 (%) | Waves 3 and 4 (%) | Waves 5 and 6 (%) | Waves 7 and 8 (%) | Wave 9 (Jan – Jun) (%) |
| In-school drug education in previous years | 79.7 (77.8, 81.4) | 75.5 (73.4, 77.4) | 71.5 (69.9, 73.0) | 72.5 (70.5, 74.4) | 68.5 (66.4, 70.5) |
| In-school drug education in the past year | 65.9 (63.2, 68.5) | 64.9 (62.0, 67.7) | 61.2 (59.2, 63.2) | 60.8 (58.3, 63.3) | 56.2 (53.2, 59.1) |
| Out-of-school drug education in previous years | 12.0 (10.4, 13.7) | 10.7 (9.3, 12.3) | 11.8 (10.5, 13.2) | 10.1 (8.8, 11.6) | 10.2 (9.0, 11.4) |
| Out-of-school drug education in past year | 7.5 (6.2, 9.0) | 5.9 (4.9, 7.1) | 7.0 (6.2, 8.0) | 5.3 (4.6, 6.1) | 5.2 (4.5, 6.1) |

### 3.3.2 Parenting Skills and Anti-Drug Education

In every year of NSPY, less than a third of parents reported having attended drug prevention or parent effectiveness programs. On average across all of the waves, 28 percent reported attendance at a drug abuse prevention activity in the previous 12 months and 27 percent said that they had attended a parent effectiveness program in the previous year. Between 2000 and 2004, attendance at drug prevention programs significantly declined 5 percentage points and attendance at parent effectiveness programs significantly declined 3 percentage points. Most of the decline occurred between 2002 and 2004, when parent attendance at drug prevention programs declined 3 percentage points and attendance at parent effectiveness programs declined 4 percentage points (Detail Tables 3-76 and 3-77). In 2004, 36 percent of African American parents reported attendance at parent effectiveness programs, significantly higher than either White (23 percent) or Hispanic (18 percent) parents (Detail Tables 3-76 and 3-77).

## 3.4 Discussions about Drugs

In this section, evidence is presented about discussions among youth and parents, and youth and friends concerning drug use and about the drug advertisements. There is discussion about the content of talk about drugs and on the changes in conversations across time.

### 3.4.1 Youth Discussions with Friends and Parents about Drugs

Over the entire Campaign period, there is evidence of change in both parent and youth reports of two or more conversations about drugs in the past 6 months, as shown in Table 3-AA. However, these reported changes had gone in opposite directions, with parents claiming they talked about drugs more with their children and youths claiming they talked less with their parents.

- **The percentage of 12½- to 18-year-old youth reporting two or more drug conversations with parents significantly declined by 5 percentage points from 2000 to early 2004** (Detail Table 3-53 and Table 3-AA).

- **Parent reports of two or more drug-related conversations significantly increased by almost 6 percentage points from 2000 to early 2004** (Table 3-AA).

**Table 3-AA. Drug-related conversations by youth and by parents across waves**

| Percent reporting two or more conversations in the past 6 months | Age Groups | Year 2000 Waves 1 and 2 (%) | Year 2001 Waves 3 and 4 (%) | Year 2002 Waves 5 and 6 (%) | Year 2003 Waves 7 and 8 (%) | Year 2004 Wave 9 (Jan – Jun) (%) |
|---|---|---|---|---|---|---|
| With friends, reported by youth of ages: | 12½ to 13 | 45.4 (42.3, 48.5) | 43.7 (40.3, 47.2) | 42.8 (39.6, 46.1) | 42.2 (38.8, 45.6) | 41.3 (37.6, 45.2) |
| | 14 to 15 | 60.1 (56.1, 64.0) | 64.6 (61.3, 67.9) | 59.7 (56.9, 62.4) | 60.2 (57.3, 63.0) | 58.6 (55.2, 62.0) |
| | 16 to 18 | 69.6 (66.5, 72.6) | 71.1 (68.5, 73.5) | 69.6 (66.9, 72.2) | 66.9 (64.5, 69.1) | 64.5 (61.0, 67.8) |
| | 12½ to 18 | 60.7 (58.7, 62.6) | 62.4 (60.4, 64.3) | 60.0 (58.2, 61.8) | 58.8 (57.1, 60.4) | 57.2 (55.0, 59.4) |
| With parents, reported by youth of ages: | 12½ to 13 | 56.4 (52.8, 60.0) | 52.3 (49.0, 55.5) | 49.9 (46.5, 53.2) | 50.4 (46.6, 54.2) | 50.4 (46.8, 53.9) |
| | 14 to 15 | 55.2 (51.1, 59.2) | 51.1 (47.7, 54.5) | 48.6 (45.5, 51.7) | 47.6 (44.7, 50.6) | 47.7 (44.3, 51.1) |
| | 16 to 18 | 50.6 (46.8, 54.4) | 45.8 (42.2, 49.5) | 47.6 (44.8, 50.3) | 45.5 (42.5, 48.6) | 48.4 (44.9, 51.8) |
| | 12½ to 18 | 53.5 (51.0, 56.1) | 49.2 (47.1, 51.2) | 48.4 (46.6, 50.3) | 47.4 (45.3, 49.5) | 48.6 (46.6, 50.7) |
| With children of ages, reported by parents: | 12½ to 13 | 78.8 (75.4, 81.8) | 82.3 (78.7, 85.4) | 83.2 (80.7, 85.5) | 84.4 (81.5, 86.9) | 85.8 (82.3, 88.7) |
| | 14 to 15 | 80.5 (75.7, 84.5) | 83.6 (80.1, 86.6) | 85.6 (83.2, 87.7) | 83.6 (81.4, 85.5) | 86.1 (83.3, 88.5) |
| | 16 to 18 | 78.6 (75.2, 81.7) | 82.5 (79.6, 85.1) | 84.6 (82.2, 86.8) | 81.7 (79.3, 83.9) | 83.6 (79.9, 86.7) |
| | 12½ to 18 | 79.3 (76.6, 81.8) | 82.9 (80.8, 84.7) | 84.6 (82.9, 86.2) | 82.9 (81.3, 84.4) | 84.9 (83.0, 86.7) |

- **Parents reported higher levels of conversation with their children at all ages than youth reported.** The inconsistency between parent and youth reports is addressed further in Chapter 6, where the effects of the Campaign on parent–child talking are discussed.

In 2004, about 70 percent of youth aged 12½ to 18 reported having had at least one conversation about drugs with friends and about 70 percent also reported at least one conversation about drugs with parents in the previous 6 months; and 43 percent reported having had four or more conversations with parents and about the same percentage also reported four or more conversations with friends about drugs in the past 6 months (Detail Tables 3-47 and 3-48, 3-52 through 3-54). Overall, 57 percent of youth reported two or more conversations in the previous 6 months with friends and 49 percent with

parents in early 2004. In contrast, 85 percent of parents reported two or more conversations with their children (Detail Table 6-10).

- **Age, gender, and ethnicity played a role in conversations with friends about drugs.** In 2004, 65 percent of youth aged 16 to 18 reported having had two or more such conversations with friends whereas only 41 percent of 12½- to 13-year-olds reported such conversations (Table 3-AA and Detail Table 3-48). Females (63 percent) were significantly more likely than males (52 percent) and White youth (60 percent) were significantly more likely than African American youth (50 percent) to report two or more discussions about drugs with friends (Detail Table 3-48).

- **Sensation-seeking and risk score were also associated with conversations with friends about drug use.** In 2004, 69 percent of higher risk youth reported having had two or more conversations with friends about drugs in the past 6 months, compared to 50 percent of lower risk youth. Similarly, 67 percent of high sensation-seeking youth reported having had two or more conversations with friends about drugs in the past 6 months, compared with only 46 percent of low sensation-seeking youth (Detail Table 3-48).

## Changes in Content of Drug Conversations

The significant decline in the proportion of youth reporting two or more conversations about drugs with their friends between 2000 and 2004 shown in Table 3-AA cannot be described as favorable or unfavorable since the content of conversation with friends can be pro- or anti-drug. The content of conversations, in fact, showed a mixed pattern, as described next (Detail Tables 3-49 to 3-51).

In the course of conversations about drug use, youth of all ages discussed the negative consequences that happen because of drugs, but some also spoke positively about drugs. In 2004, nearly 50 percent of young people aged 12½ to 18 reported talking with their friends within the past 6 months about "bad things that happen if you use drugs." More than 25 percent said they had talked about "specific things I could do to stay away from drugs." On the other hand, more than 21 percent had conversations about how "marijuana use isn't so bad" (Detail Tables 3-49 to 3-51).

- **From 2000 to early 2004, there was a significant unfavorable decline of 4 percentage points in the proportion of all youth who reported conversations about "specific things I could do to stay away from drugs"** (Detail Table 3-50). In 2000, 30 percent of the overall sample of youth reported such conversations; in 2004 only 26 percent of youth reported having had these conversations. Among high sensation seekers, there was a statistically significant 7 percentage point decrease in conversations about the "specific things that I could do to stay away from drugs" from 29 percent in 2000 to 22 percent in early 2004. African Americans (37%) and Hispanics (33%) were significantly more likely than Whites (22%) to report having had these kinds of conversations.

- **Overall, there were no significant changes between 2000 and 2004 in the percent of youth having conversations about "bad things that happen if you use drugs."** The percentage of youth reporting having had these conversations in the past 6 months has remained very close to 50 percent across all years in the Evaluation (Detail Table 3-51).

- **From 2000 to 2004, there was a significant unfavorable decline of 2 percentage points in the percentage of 12½- to 18-year-old youth who reported discussions with friends about "marijuana use isn't so bad."** Among males, reports of such conversations significantly declined from 26 percent in 2000 to 20 percent in 2004 (Detail Table 3-49).

The topics of drug conversations with friends were substantially related to youth characteristics.

- **In 2004, there were several statistically significant age differences in saying positive things about drugs.** While only 10 percent of 12½- to 13-year-olds reported engaging in conversation about how "marijuana use isn't so bad," 20 percent of 14- to 15-year-olds and 28 percent of 16- to 18-year-olds have engaged in such conversations. Older youth, those 16 to 18 years old, had more conversations about the "bad things that happen if you use drugs" (52%) than younger teens (45%) (Table 3-AB).

**Table 3-AB. Youth topics of conversation with friends in 2004**

| Age groups | Specific things I could do to stay away from drugs (%) | Bad things that happen if you use drugs (%) | Marijuana use isn't so bad (%) |
|---|---|---|---|
| 12½ to 13 | 31.1 (28.3, 34.0) | 44.5 (41.3, 47.8) | 10.0 (7.7, 12.8) |
| 14 to 15 | 25.2 (22.3, 28.4) | 49.4 (45.9, 52.8) | 19.6 (16.8, 22.7) |
| 16 to 18 | 23.7 (20.9, 26.8) | 52.3 (49.2, 55.5) | 28.1 (25.4, 31.0) |

- **Sensation seeking and risk score were strongly associated with a youth's likelihood of having conversations about how "marijuana use isn't so bad" in 2004.** While 30 percent of high sensation-seeking youth reported having had such conversations in the past 6 months, only 10 percent of low sensation-seeking youth reported having had them. Similarly, only 11 percent of lower risk youth had conversations with friends about how "marijuana use isn't so bad" while 37 percent of higher risk youth had such conversations. Sensation seeking and risk also appear to be associated with other types of drug conversations. Fewer high sensation-seeking youth and higher risk youth had conversations in the past 6 months about "specific things they could do to stay away from drugs" than their low sensation-seeking and lower risk counterparts (Detail Tables 3-49 through 3-51).

- **Race and ethnicity was associated with the types of conversations that youth had about drugs**. Among White youth, 22 percent reported conversations with friends about "specific things they could do to stay away from drugs," compared to 37 percent of African American youth and 33 percent of Hispanic youth (Detail Tables 3-49 through 3-51).

## 3.4.2 Discussions about Anti-Drug Ads

In early 2004, 28 percent of 12½- to 18-year-olds reported having a conversation with their parents and 41 percent reported having a conversation with friends or other adults about the anti-drug ads in the previous 6 months. These percentages were virtually the same in 2000 (Table 3-AC and Detail Tables 3-55 and 3-56). However, this overall lack of change results from two counterbalancing effects. There was a significant increase in the percentage of 16- to 18-year-olds who reported having talked with their parents about the anti-drug ads, up from 19 percent in 2000 to 24 percent in 2004, whereas there was a nonsignificant decrease among youth aged 14 to 15 on this measure. There was a statistically significant decrease in the percentage of 14- to 15-year-old youth who reported talking about the anti-drug ads with friends, down from 43 percent in 2000 to 37 percent in 2004, whereas there was a nonsignificant increase among youth aged 16 to 18 on this measure.

- **Age, ethnicity, sensation seeking, and risk score were significantly related to conversations with parents about the anti-drug ads.** In 2004, 37 percent of youth aged 12½ to 13 reported conversations with their parents about anti-drug ads; this was a significantly higher percentage

**Table 3-AC. Youth conversations about anti-drug ads from 2000 to 2004**

| | Percent with at least one conversation about anti-drug ads in past 6 months | | | | |
|---|---|---|---|---|---|
| | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 |
| Age group and discussion partner | Waves 1 and 2 (%) | Waves 3 and 4 (%) | Waves 5 and 6 (%) | Waves 7 and 8 (%) | Wave 9 (Jan – Jun) (%) |
| Discussions with parents: | | | | | |
| Youth aged 12½ to 13 | 36.6 (33.5, 39.7) | 35.1 (32.0, 38.3) | 34.6 (31.2, 38.2) | 34.9 (31.8, 38.2) | 37.4 (33.2, 41.7) |
| Youth aged 14 to 15 | 30.3 (26.8, 34.0) | 28.3 (25.2, 31.7) | 27.1 (24.5, 29.7) | 26.8 (24.2, 29.5) | 26.4 (23.4, 29.5) |
| Youth aged 16 to 18 | 18.8 (16.0, 22.0) | 21.5 (18.6, 24.7) | 22.7 (20.5, 25.1) | 21.8 (19.8, 23.9) | 23.6 (21.1, 26.3) |
| Youth aged 12½ to 18 | 26.9 (25.2, 28.7) | 27.0 (25.0, 29.1) | 26.9 (25.4, 28.6) | 26.5 (25.1, 27.9) | 27.7 (26.0, 29.4) |
| Discussions with friends and other adults: | | | | | |
| Youth aged 12½ to 13 | 41.6 (37.9, 45.3) | 39.6 (36.3, 43.1) | 39.2 (35.9, 42.6) | 37.5 (34.5, 40.5) | 41.2 (36.5, 46.1) |
| Youth aged 14 to 15 | 42.7 (38.6, 46.9) | 42.2 (38.8, 45.8) | 41.2 (38.5, 44.0) | 40.2 (37.5, 43.0) | 37.2 (34.1, 40.5) |
| Youth aged 16 to 18 | 39.9 (36.2, 43.8) | 38.0 (34.5, 41.5) | 40.0 (36.8, 43.3) | 43.1 (40.6, 45.7) | 44.2 (39.9, 48.5) |
| Youth aged 12½ to 18 | 41.3 (39.1, 43.5) | 39.8 (37.5, 42.2) | 40.2 (38.3, 42.2) | 40.9 (39.4, 42.3) | 41.3 (38.6, 44.0) |

than the 26 percent for the 14- to 15-year-old age group and the 23 percent for the 16- to 18-year-old age group. During the same period, 35 percent of low sensation-seeking youth reported such conversations, compared to 22 percent of high sensation-seeking youth. Similarly, 33 percent of lower risk youth reported anti-drug ad conversations with their parents, compared to 21 percent of higher risk youth. Also, 35 percent of African American youth had such conversations with parents compared to 26 percent of White youth (Detail Table 3-55).

- **Gender was strongly associated with anti-drug ad conversations with friends and adults other than parents.** Females (50%) were significantly more likely than males (33%) to have talked with friends or other adults about the anti-drug ads (Detail Table 3-56).

## 3.5 Perceptions of Media and Community Attention to Drug Use

Both youth and parents were asked about perceived media coverage of drugs and youth. Parents were also asked about how much attention was being paid to drug issues in their communities. These questions were used to understand more clearly the context in which the Campaign operates.

### 3.5.1 Youth's Perceived Media Coverage of Youth and Drugs

Youth see and hear a good deal about drug use among young people in the mass media. The media sources that respondents were asked about included television and radio news; television movies, sitcoms, and dramas; television talk shows; rental and theater movies; and magazines.

- **In 2004, 42 percent of youth aged 12½ to 18 noticed media coverage about drug use among young people at least once a week in at least one of these media.** Over 26 percent noticed such stories weekly on television or radio news, and 21 percent noticed such stories weekly in

television movies, sitcoms, or dramas. Fewer young people noticed such stories weekly in movies (16 percent), television talk shows (14 percent), or in magazines (9 percent) (Table 3-AD and Detail Tables 3-57 through 3-61).

Recall of drug stories on various media is related to race and ethnicity. African American youth were more likely than White youth to recall stories about youth and drugs in all media but movies (Detail Tables 3-57 through 3-61).

- **From 2000 to early 2004 there was an overall statistically significant decrease of 12 percentage points in youth recalling stories about drug use in at least one medium in recent months.** In 2000, 54 percent of youth recalled stories with drug themes; in 2004, only 42 percent of youth recalled such stories There were in fact decreases in the reported weekly exposures to drug-related coverage for all individual media sources from 2000 to the first half of 2004 and all of these decreases except for movies and television dramas were statistically significant (see Table 3-AD). Overall, youth reported fewer exposures to coverage of drug use among young people in the mass media over the period, either because coverage has been reduced or because the youth have reduced their exposure to a given medium.

**Table 3-AD. Youth reporting at least weekly exposure to media stories about drugs across waves**

| | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 |
|---|---|---|---|---|---|
| | Waves 1 and 2 (%) | Waves 3 and 4 (%) | Waves 5 and 6 (%) | Waves 7 and 8 (%) | Wave 9 (Jan – Jun) (%) |
| Television or radio news | 32.6 (30.2, 35.1) | 29.3 (27.1, 31.6) | 25.9 (24.3, 27.6) | 24.7 (23.1, 26.3) | 26.3 (24.5, 28.1) |
| Television dramas, sitcoms, movies | 23.6 (22.0, 25.4) | 23.6 (21.4, 25.8) | 22.1 (20.6, 23.7) | 19.2 (17.8, 20.6) | 21.3 (19.5, 23.2) |
| Television talk shows | 22.7 (20.7, 24.8) | 21.2 (19.2, 23.4) | 18.4 (16.7, 20.4) | 14.8 (13.4, 16.2) | 13.5 (12.1, 15.0) |
| Movies | 18.5 (16.9, 20.2) | 18.7 (16.8, 20.7) | 17.9 (16.6, 19.3) | 16.2 (15.1, 17.3) | 16.4 (14.8, 18.2) |
| Magazines | 12.5 (11.0, 14.2) | 10.3 (8.9, 11.8) | 11.0 (9.9, 12.2) | 8.9 (8.0, 10.0) | 8.9 (7.8, 10.1) |
| At least one source | 53.7 (51.4, 56.0) | 50.6 (48.1, 53.1) | 46.5 (44.4, 48.6) | 41.0 (39.3, 42.7) | 41.7 (39.6, 43.8) |

## 3.5.2 Parents' Exposure to Non-Campaign Anti-Drug or Parenting Messages

Parents report often seeing drug themes presented in the media, with no overall change between 2000 and 2004 (Table 3-AE).

- **There was a significant decline in parent notice of stories about drugs in newspapers at least weekly, and a significant increase in parent notice of stories about drugs in non-news radio programs and on television.** Parents' reports of having noticed such stories in newspapers decreased significantly by 5 percentage points from 2000 to the first half of 2004. Parents' reports of noticing stories about young people and drug use on non-news radio programs increased significantly by 4 percentage points and parents' recall of having noticed such stories in television movies, sitcoms, or dramas increased 5 percentage points from 2000 to the first half of 2004 (Table 3-AE and Detail Tables 3-64 to 3-68).

**Table 3-AE. Parents reporting at least weekly exposure to media stories about drugs across waves**

| | Year 2000 Waves 1 and 2 (%) | Year 2001 Waves 3 and 4 (%) | Year 2002 Waves 5 and 6 (%) | Year 2003 Waves 7 and 8 (%) | Year 2004 Wave 9 (Jan – Jun) (%) |
|---|---|---|---|---|---|
| Television or radio news | 51.3 (48.8, 53.7) | 48.7 (46.3, 51.2) | 48.0 (45.8, 50.3) | 46.4 (44.1, 48.7) | 48.4 (45.9, 51.0) |
| Newspapers | 34.5 (32.1, 37.1) | 32.9 (30.7, 35.2) | 32.0 (30.1, 34.0) | 29.4 (27.7, 31.3) | 29.6 (27.6, 31.6) |
| Television dramas, sitcoms, movies | 30.7 (28.1, 33.4) | 33.6 (31.1, 36.1) | 35.6 (34.1, 37.2) | 35.1 (33.1, 37.3) | 35.9 (33.4, 38.5) |
| Television talk shows | 23.8 (21.7, 26.0) | 23.1 (21.2, 25.1) | 24.5 (23.0, 26.1) | 23.4 (21.8, 25.1) | 24.4 (22.4, 26.6) |
| Radio (not news) | 13.8 (12.1, 15.7) | 15.5 (13.7, 17.4) | 17.8 (16.3, 19.5) | 18.1 (16.7, 19.5) | 17.5 (15.7, 19.4) |
| Movies | 10.5 (9.0, 12.1) | 10.2 (8.8, 11.8) | 12.2 (11.0, 13.6) | 11.9 (10.5, 13.4) | 12.4 (10.9, 14.0) |
| Magazines | 9.0 (7.5, 10.7) | 8.2 (7.0, 9.7) | 10.3 (9.1, 11.6) | 9.4 (8.2, 10.7) | 9.8 (8.2, 11.6) |
| At least one source | 65.1 (62.9, 67.2) | 64.7 (62.4, 66.9) | 63.8 (61.8, 65.7) | 61.6 (59.5, 63.7) | 62.5 (59.9, 64.9) |

In 2004, 48 percent of parents saw or heard stories about drug use on television or radio news programs at least weekly. About 30 percent of parents noticed such stories at least weekly in newspapers, 36 percent noticed such stories at least weekly in television entertainment programs, and 24 percent of parents reported seeing drug-related stories on television talk shows or television news magazines. Fewer parents reported weekly exposure to drug stories from non-news radio, movies, and magazines (Table 3-AE and Detail Tables 3-63 through 3-69).

- **Ethnicity and education were associated with recall of exposure to stories about youth and drugs in the media.** White parents were less likely than African American parents to report having noticed stories dealing with drug use among young people in all media except newspapers. College graduates were less likely to report having noticed stories on all media except magazine and newspaper articles and news programs (Detail Tables 3-63 through 3-69).

## Parent Reports of Local Anti-Drug Activity

Table 3-AF presents parent reports of hearing about various types of local anti-drug activities in the past year for each of the years from 2000 to 2004. There was a significant decline in awareness between 2000 and 2004 for all these activities except for awareness of police crackdowns on drug use, which remained stable over the period. The decline in the parent reports of hearing a lot about drug-related laws proposed by state or local governments within the past year was from 19 percent in 2000 to 14 percent in 2004. The corresponding decline for hearing public officials speak about drugs was from 16 percent in 2000 to 13 percent in 2004; that for hearing anti-drug programs in their community was from 35 percent in 2000 to 24 percent in 2004; and that for hearing a lot about drug-related propositions or referenda on the ballot for public voting was from 9 percent in 2000 to 7 percent in 2004 (Table 3-AF and Detail Tables 3-71 through 3-75).

**Table 3-AF. Reported exposures to drug-related communications in the past year across waves, among parents**

| Measure | Year 2000 Waves 1 and 2 (%) | Year 2001 Waves 3 and 4 (%) | Year 2002 Waves 5 and 6 (%) | Year 2003 Waves 7 and 8 (%) | Year 2004 Wave 9 (Jan – Jun) (%) |
|---|---|---|---|---|---|
| Percentage hearing a lot about anti-drug programs in community in past year | 35.2 (32.7, 37.7) | 30.0 (27.7, 32.4) | 29.6 (27.9, 31.4) | 25.3 (23.6, 27.1) | 24.2 (22.2, 26.4) |
| Percentage hearing a lot about speeches about drugs by public officials in past year | 15.7 (13.8, 17.8) | 14.3 (12.3, 16.4) | 13.2 (11.7, 14.9) | 12.2 (11.0, 13.5) | 13.0 (11.2, 15.0) |
| Percentage hearing a lot about anti-drug laws in past year | 18.5 (16.6, 20.5) | 16.1 (14.3, 18.1) | 17.7 (16.2, 19.4) | 16.0 (14.6, 17.4) | 14.3 (12.6, 16.1) |
| Percentage hearing a lot about drug-related referenda in past year | 8.3 (6.8, 10.2) | 8.6 (7.1, 10.5) | 9.2 (8.1, 10.3) | 8.9 (7.8, 10.2) | 6.5 (5.5, 7.8) |
| Percentage of parents hearing a lot about police crackdowns on drug use or sales in past year | 46.9 (43.6, 50.2) | 44.0 (41.7, 46.3) | 47.2 (45.0, 49.3) | 46.1 (44.1, 48.0) | 45.1 (42.7, 47.5) |

NOTE: For parents with children aged 12½ to 18.

- **Across all years, ethnicity and education are associated with exposure to various types of drug-related activities.** White parents were less likely than Hispanic and African American parents to have heard about each of the five drug activities/controversies except for police crackdowns; African American parents were generally the most likely to have heard about drug-related referenda and about police crackdowns on drug use, while Hispanic parents were generally the most likely to have heard proposed laws, speeches by public officials, and anti-drug programs in their communities (Detail Tables 3-71 through 3-75). Parents with less than a high school education were more likely than all other parents to have heard a lot about each drug activity/controversy (Detail Tables 3-72 and 3-75).

## 3.6 Summary and Conclusions

The data provided to the evaluators by the Campaign describe what media broadcast time has been achieved over the 58-month period from September 1999 to June 2004. On average, the Campaign achieved enough media time to expect the average youth to be exposed to 2.5 directly targeted messages per week, and the average parent to be exposed to about 2.2 messages per week. The number of GRPs achieved varied appreciably over time. An above average number of GRPs was achieved for youth during the Early Intervention Initiative; during this period, the average youth was expected to be exposed to 3.0 messages per week.

The Campaign also varied the emphasis on the behavioral ad platforms in each wave. The available data allowed classification of the Campaign's television and radio ads, which made up 80 percent of all GRPs for youth, although only about 64 percent of all GRPs for parents. For youth, the Normative Education/Positive Alternatives platform was prominent until the start of the Marijuana Initiative in October 2001, after which it disappeared. Resistance Skills were emphasized at the start of the Campaign, were dropped in late 2000, reappeared in early 2001, and were then not included thereafter. The Negative Consequences of Drug Use platform was an early focus of the Campaign but had almost disappeared in early 2001. It was revitalized with the Marijuana Initiative, since the Marijuana Initiative ads fell under that platform; it was virtually the sole focus of the Campaign during the period of that initiative. Only with the introduction of the Early Intervention ads in February 2004 did the Negative Consequences ads again account for less than half of the GRPs.

For parents, the Parenting Skills/Personal Efficacy/Monitoring platform was a strong focus until the start of the Early Intervention Initiative. It was represented in over three-quarters of the GRPs before the Early Intervention Initiative except for a period at the start of the Campaign and in early 2001. The Your Child at Risk platform received only some weight at the start of the Campaign but was then dropped, and the Perceptions of Harm platform was strong only for a period in early 2001. The Drugs and Terror platform was featured in approximately a fifth of the GRPs in the second half of 2002, and a lower proportion in 2003; it was not otherwise represented. Early Intervention ads, which launched in February 2004, accounted for about 80 percent of the parent GRPs in the first half of 2004.

The Evaluation used two types of measures of exposure to Campaign messages. The first, a general exposure measure, combined recall of exposure to anti-drug messages on four media (television and radio, print, outdoor media, and movies/videotapes). Both parents and youth reported high exposure on those measures. The median response was 9.5 exposures per month for parents and 12 exposures per month for youth across all waves. This was probably roughly equivalent to somewhere between 2 to 3 exposures per week for both groups. There was no overall detectable change in reported general exposure over the course of the Campaign, suggesting that this general exposure measure was insensitive to the changes in media purchases.

The second type of exposure measure asked for recalled frequency of viewing specific ads on television and hearing specific ads on the radio, for ads that were on the air in the 60 days prior to the interview. Across all waves, the median number of exposures to television ads reported by parents and youth were 3.3 and 4.4 exposures in the past month, respectively. For both youth and parents, there was a very sharp increase in recalled specific exposure of television ads across the Campaign (with some up and down movement). For parents, weekly television ad exposure increased from 25 percent to 50 percent between 2000 and the first half of 2004, while youth recall on the same measure increased from 37 percent to 74 percent over the same period (Table 3-AG).

**Table 3-AG. Exposure to Campaign advertising by wave**

| Population | Exposure measure: Percent seeing/hearing ads 1 or more times per week | Year 2000 Waves 1 and 2 (%) | Year 2001 Waves 3 and 4 (%) | Year 2002 Waves 5 and 6 (%) | Year 2003 Waves 7 and 8 (%) | Year 2004 Wave 9 (Jan-Jun) (%) | All Waves (%) |
|---|---|---|---|---|---|---|---|
| Parents | General Exposure: Across all media | 72 | 68 | 71 | 73 | 74 | 72 |
| | Specific Exposure: Television ads | 25 | 30 | 54 | 58 | 50 | 43 |
| | Specific Exposure: Radio ads | 10 | 17 | 11 | 14 | 16 | 13 |
| Youth 12½ to 18 | General Exposure: Across all media | 78 | 76 | 77 | 75 | 75 | 77 |
| | Specific Exposure: Television ads | 37 | 52 | 52 | 63 | 74 | 54 |
| | Specific Exposure: Radio ads | N/A[1] | 8 | 7 | 10 | 7 | 8 |

[1] N/A: Radio exposure not measured for youth during Wave 1.

Recall of specific radio ads was assessed for youth during Waves 2 through 9, and for parents across all nine waves. The absolute level of recall of radio ads was much lower than for television ads in both groups across all waves. For youth, Waves 3 and 7 were the high points of radio exposure and still only 13 percent of youth reported weekly exposure. For parents, the percentage who claimed at least weekly exposure varied from 10 percent to 17 percent across the Campaign.

Both youth and parent brand phrases continued to gain increasing recognition across the years, reaching 93 percent and 90 percent, respectively, by the first half of 2004. Because we do not have a true baseline, it is possible that some proportion of this recognition is false.

All youth and parents were asked to provide their assessments of the television ads they had been shown. Both groups remained generally positive. The youth evaluations of the Campaign's later ads were higher than the evaluations of ads broadcast in 2000. Parent ad evaluations climbed significantly higher across the Campaign and remained more enthusiastic than those provided by youth.

In 2004, 90 percent of youth reported using the Internet a few times and 80 percent of parents reported Internet use, rising steadily over the period from 61 percent in 2000. The level of visits was below 10 percent for anti-drug sites and was around 5 percent for pro-drug sites for youth: both levels remained unchanged over the period. Parent claims that they had visited anti-drug sites grew from 2000 to early 2004, but the level remained relatively low at around 10 percent. The same general finding applies also for parenting skill sites, with a similar level of around 10 percent.

In addition to distributing messages directly, the Campaign hopes also to reach its audiences indirectly, through other institutions and routes. While there was a substantial level of exposure to anti-drug messages through many of these other informational sources, there is little evidence that exposure to such messages has increased over the course of the Campaign. Thus it is difficult to claim these complementary exposures as indirect exposures produced by the Campaign. Rather they are best understood as an ongoing context for the Campaign.

The Campaign's efforts with respect to youth organizations has focused on integrating drug prevention messages and strategies into existing organizations' educational programs and extra-curricular activities. In 2004, about 56 percent of the youth reported in-school drug education in the past year. This was a significant decrease from 66 percent in 2000. Youth attendance at out-of-school drug education in the past year was relatively rare at around 11 percent. Parent attendance at drug abuse prevention classes and at parent effectiveness training programs were over the period each around 27 percent; both showed small declines between 2000 and 2004.

Parents reported a good deal of drug-related conversations with their children, with a statistically significant increase from 79 percent in 2000 to 85 percent in the first half of 2004 in the percentage of youth whose parents reported two or more such conversations in the past 6 months. Youth reported a substantial level of such conversations, although less than their parents reported. However, in contrast to the parent reports of increases, youth overall reported a decrease of 5 percentage points in conversations with their parents from 2000 to the first half of 2004.

Both youth and parents were asked about exposure to drug and youth stories across a variety of mass media. Youth reported a substantial decline in exposure to such stories; 54 percent reported that they saw or heard such stories weekly in at least one source in 2000, whereas only 42 percent did so in 2004. Parent reports of exposure to such stories remained about the same across the period from 2000 to 2004. An examination of marijuana-related newspaper coverage from 1994 to 2003 in the context of the Campaign (Jacobsohn, et al., 2004) supports these findings, with no increase seen in newspaper coverage of drugs and youth during the Campaign. Parents reported reasonably high levels of recall of local anti-drug activities, with no change in level for most of them across waves.

With the Marijuana and Early Intervention Initiatives, the Campaign was able to increase the level and focus of its ad purchases and pro bono matches, to concentrate them over time, and then reach a sharp increase in recall, at least for specific television messages. That is a positive result, but it may have been accomplished in the midst of declining support from some of the other potential anti-drug message sources. There is little evidence that anti-drug messages from other institutions were increasing over the course of the Campaign, and in some cases there were declines, including for in-school and out-of school drug education and in youth reports of talking with parents, although parents were reporting a positive trend in such conversations. Exposure to stories in the media concerning youth and drugs, and awareness of local anti-drug activity, also showed small declines.

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# 4. Trends in Youth Marijuana Use

This chapter focuses on trends in youth marijuana use as reported by the National Youth Anti-Drug Media Campaign's (the Campaign's) Evaluation survey—the National Survey of Parents and Youth (NSPY)—and also includes trend data from three other national surveys, Monitoring the Future (MTF), the Youth Risk Behavior Surveillance System (YRBSS), and the National Survey on Drug Use and Health (NSDUH)—previously known as the National Household Survey on Drug Abuse (NHSDA). In addition, data are presented regarding trends in youth reports of marijuana offers. A major consideration in assessing the trend data is the significant redirection of the Campaign that took place in October 2002. The redirection changed the focus of the ads, changed the primary target population to 14- to 16-year-olds, instituted more rigorous copy-test procedures, required each television ad to undergo pretesting before being aired, and increased the oversight of ONDCP in guiding the development and production of the ads. These changes were made in light of the fact that findings from the Evaluation had shown no evidence of Campaign success to that point. The redirected Campaign started with the Marijuana Initiative and that initiative was followed by the Early Intervention Initiative, which was introduced in February 2004. Both of these initiatives were in force for youth during the time of Wave 9 interviews, making it difficult to disentangle the effects of one from the other based on the available 2004 data. For this reason, and because of the limited duration of the Early Intervention Initiative, the trend data cannot provide useful evidence on any effects of that initiative taken alone.

Two forms of trend analyses of marijuana use are reported in this chapter. The first is the standard one used in previous reports. It compares the estimates of marijuana use for the latest year for which NSPY data are available—in this case the first half of 2004 (i.e., Wave 9, a period in which both the Marijuana and Early Intervention Initiatives were in operation)—with estimates for 2000[1] (at the start of the Campaign) and with estimates for 2002 (the closest prior year in which any effects of the redirected Campaign could not have had a noticeable impact on the survey responses).

The second form of trend analysis has been added in this report to examine any effects of the Campaign on marijuana use since its inception. To reflect the redirection of the Campaign in late 2002, the overall trend analysis is separated into two components. The first component compares marijuana use estimates for 2000 with those for 2002 to investigate any changes that may have occurred during the period before the redirection of the Campaign. The second component compares estimates for 2003 and the first half of 2004 combined (i.e., Waves 7, 8, and 9 combined, the period in which the redirected Campaign was in operation) with estimates for 2002. As in the first form of analysis, NSPY estimates for 2002 are chosen for the comparisons because 2002 is the closest year for which the redirected Campaign could not have had a noticeable effect on the survey estimates. This analysis is similar in concept to the 2002 and 2004 comparisons in the first form of analysis. One advantage of this pooled analysis is that it provides change estimates that are closer in nature to the change estimates produced by the other national surveys. Another is that the sampling errors in the

[1] Wave 1 data collection commenced in late November 1999. Because only a relatively few interviews were completed in 1999, for discussion and presentation purposes, these interviews are treated in this report as having occurred in 2000.

estimates are reduced because of the larger sample size obtained by pooling all the data for the Evaluation period of the redirected Campaign.

Evidence will generally be considered favorable (unfavorable) to the Campaign in both these forms of analysis if (a) there is a significant decline (increase) over time in a measure of marijuana use and (b) the change does not appear to be only a continuation of a trend that began earlier. Although a downward (upward) trend in marijuana use is supportive of a positive (negative) Campaign effect, it cannot be considered definitive evidence for or against Campaign effects because there may well be other external forces operating. Those external forces might be causing positive or negative secular trends in marijuana use regardless of the operation of the Campaign.

In examining changes since 2002, the marijuana use analyses focus on recent use (past month, and to some extent, past year) rather than lifetime use, since it is recent use outcomes that are likely to be more sensitive to any effects of the redirected Campaign. Wave 7 interviews were undertaken from January to June 2003, Wave 8 interviews were conducted from July to December 2003, and Wave 9 interviews began in January and ended in June 2004. Thus the redirected Campaign—which was introduced in October 2002—started between 2 and 21 months before the Wave 7 to Wave 9 interviews were undertaken. The effect of the redirected Campaign would therefore be seen primarily in previous month or previous year use. The analyses for the post-2002 period also give a special focus on youth 14 to 16 years old because the Campaign shifted its primary target audience to this age group. However, any effects of the redirected Campaign may also be seen in those older than 16, both because some older youth may have been affected by the Campaign and because some may have been affected while in the 14- to 16-year-old age group, with the effect showing up in NSPY when they were interviewed at an age older than 16.

To obtain as full a picture as possible of the trends in youth marijuana use, data from other national surveys are also examined. Section 4.2 compares NSPY use trends with the trend data up to 2003 or 2004 from the other national surveys.

Section 4.3 examines the trend in youth reports of receiving offers of marijuana. The examination of this trend is important because, as the section shows, offers are closely related to marijuana use.

The final section of the chapter provides a summary of the results on trends in marijuana use and offers.

## 4.1 NSPY Trends in Marijuana Use

Starting with the first form of analysis described above (the standard one used in previous reports), the analyses of the latest wave of NSPY data find no significant change between 2000 and Wave 9 (the first half of 2004) or between 2002 and Wave 9 in lifetime, past year, past month, or regular use of marijuana overall for youth aged 12½ to 18 (Table 4-A). Within the 14- to 16-year-old target age group for the redirected Campaign, there are also no significant changes between 2000 and Wave 9 or between 2002 and Wave 9 in lifetime, past year, past month, or regular use of marijuana.

A handful of subgroup differences show contrasting patterns of change in past month use. Detail Table 4-3 shows that there was a decrease in past month use in the first half of 2004 compared to 2002 for 16- to 18-year-olds, for female 14- to 18-year-olds, and for White 14- to 18-year-olds. However,

**Table 4-A. NSPY trends in marijuana use across measures by age group**

| | Percent reporting use | | | | | | |
|---|---|---|---|---|---|---|---|
| Age groups | Year 2000 (Average for Waves 1 & 2) (%) | Year 2001 (Average for Waves 3 & 4) (%) | Year 2002 (Average for Waves 5 & 6) (%) | Year 2003 (Average for Waves 7 & 8) (%) | Year 2004 (Jan-Jun) (Wave 9) (%) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
| **Lifetime** | | | | | | | |
| 12½ to 13 | 6.1 | 5.3 | 5.7 | 5.4 | 5.0 | -1.1 (-3.8, 1.6) | -0.7 (-3.6, 2.2) |
| 14 to 15 | 15.4 | 19.5 | 18.8 | 18.5 | 17.3 | 1.9 (-2.4, 6.3) | -1.6 (-5.1, 1.9) |
| 16 to 18 | 40.4 | 40.3 | 41.4 | 37.5 | 37.6 | -2.8 (-8.4, 2.7) | -3.8 (-8.6, 1.1) |
| 14 to 16 | 20.6 | 22.4 | 24.1 | 22.3 | 21.8 | 1.1 (-2.3, 4.6) | -2.3 (-5.1, 0.5) |
| 14 to 18 | 29.1 | 30.9 | 31.8 | 29.4 | 29.3 | 0.2 (-3.3, 3.7) | -2.5 (-5.6, 0.6) |
| 12½ to 18 | 23.6 | 24.8 | 25.5 | 23.7 | 23.5 | -0.1 (-2.9, 2.8) | -2.0 (-4.5, 0.5) |
| **Past year** | | | | | | | |
| 12½ to 13 | 3.9 | 3.5 | 3.9 | 4.2 | 3.2 | -0.7 (-2.7, 1.2) | -0.7 (-2.8, 1.4) |
| 14 to 15 | 11.6 | 13.8 | 12.6 | 13.6 | 13.3 | 1.8 (-2.2, 5.8) | 0.7 (-2.3, 3.8) |
| 16 to 18 | 29.2 | 27.1 | 29.1 | 27.5 | 26.2 | -3.0 (-7.7, 1.6) | -3.0 (-7.0, 1.1) |
| 14 to 16 | 15.4 | 15.8 | 17.2 | 16.6 | 16.0 | 0.5 (-2.6, 3.6) | -1.3 (-3.6, 1.0) |
| 14 to 18 | 21.2 | 21.1 | 22.1 | 21.6 | 20.9 | -0.3 (-3.2, 2.6) | -1.2 (-3.8, 1.5) |
| 12½ to 18 | 17.1 | 16.9 | 17.7 | 17.4 | 16.7 | -0.4 (-2.6, 1.9) | -1.0 (-3.1, 1.1) |
| **Past month** | | | | | | | |
| 12½ to 13 | 1.7 | 1.6 | 1.1 | 1.3 | 1.2 | -0.5 (-1.5, 0.5) | 0.1 (-0.9, 1.0) |
| 14 to 15 | 3.9 | 7.2 | 6.4 | 6.2 | 6.8 | **3.0* (0.5, 5.4)** | 0.5 (-1.9, 2.9) |
| 16 to 18 | 14.6 | 13.8 | 16.7 | 14.3 | 12.9 | -1.7 (-5.1, 1.7) | **-3.8* (-6.7, -0.8)** |
| 14 to 16 | 6.0 | 7.5 | 8.5 | 8.1 | 7.8 | 1.8 (-0.1, 3.7) | -0.8 (-2.7, 1.2) |
| 14 to 18 | 9.7 | 10.8 | 12.3 | 10.8 | 10.4 | 0.7 (-1.6, 3.0) | -1.9 (-3.8, 0.1) |
| 12½ to 18 | 7.8 | 8.6 | 9.6 | 8.5 | 8.2 | 0.4 (-1.4, 2.2) | -1.3 (-2.8, 0.1) |
| **Regular** | | | | | | | |
| 12½ to 13 | 0.6 | 0.4 | 0.6 | 0.7 | 0.8 | 0.2 (-0.8, 1.2) | 0.2 (-0.7, 1.1) |
| 14 to 15 | 2.3 | 5.4 | 4.4 | 3.9 | 3.9 | **1.6* (0.2, 2.9)** | -0.5 (-2.1, 1.1) |
| 16 to 18 | 12.6 | 11.6 | 12.4 | 11.5 | 10.6 | -1.9 (-5.3, 1.4) | -1.8 (-4.7, 1.1) |
| 14 to 16 | 4.0 | 5.9 | 5.6 | 5.8 | 5.1 | 1.0 (-0.6, 2.7) | -0.5 (-2.1, 1.0) |
| 14 to 18 | 7.9 | 8.8 | 9.0 | 8.2 | 7.9 | -0.1 (-2.0, 1.9) | -1.2 (-2.9, 0.6) |
| 12½ to 18 | 6.2 | 6.8 | 7.0 | 6.4 | 6.2 | 0.0 (-1.5, 1.5) | -0.8 (-2.1, 0.5) |

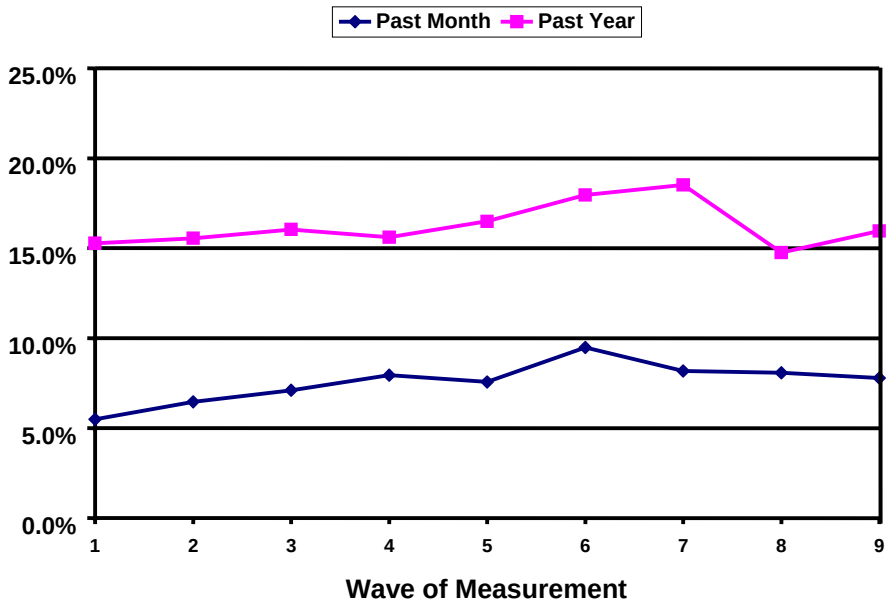
* Indicates a significant change at $p < 0.05$.

there was an increase in past month use in the first half of 2004 compared to 2000 for 14- to 15-year-olds, and for lower risk 14- to 18-year-olds. The increase in past month use of marijuana between 2000 and the first half of 2004 for 14- to 15-year-olds was accompanied by a significant increase in the regular use measure for this population over the same time period (the only significant effect for the subgroup analyses of this measure is presented in Detail Table 4-4). The only significant finding related to past year marijuana use was an increase for lower risk 14- to 18-year-olds between 2000 and the first half of 2004 (Detail Table 4-2). It is important to be careful about claiming too much for these isolated subgroup results: there were 126 tests conducted (three marijuana use measures by two change scores by 24 or 15 subgroups depending on the measure) and finding five significant changes out of all of those subgroup tests may be explained as a chance result.

Given the recency of the redirected Campaign, evidence about trends in lifetime use does not add much to the results concerning the recent use outcomes. Detail Table 4-1 shows significant declines in reports of lifetime use for low sensation seeking 12½- to 13-year-olds, and for White 14- to 18-year-olds in Wave 9 compared to 2002. It also shows a significant increase in lifetime marijuana use for lower risk 14- to 18-year-olds between 2000 and the first half of 2004. However, given that Detail Table 4-1 presents 48 tests, these significant findings could well be simply chance results.

Turning now to the overall trend analyses, Figure 4-A displays estimates across time for both past year and past month marijuana use for the 14- to 16-year-olds. The figure is organized by wave, with each wave encompassing about 6 months, either January to June or July to December, except for Wave 1 which represents November 1999 to May 2000. The figure shows generally upward trends through Wave 6 for past month use and through Wave 7 for past year use, followed thereafter by reversals of those trends in later waves. Expressed in terms of years rather than waves, Table 4-A shows that for both measures there was an increase from 2000 through 2002, followed by a decrease from 2002 through the first half of 2004.

**Figure 4-A. Marijuana use among 14- to 16-year-olds**




To further examine these trends, they are separated into the trends prior to the redirection of the Campaign in late 2002 and the trends thereafter. The trend in the earlier period is examined by comparing NSPY estimates of marijuana use for 2000 and 2002. The trend in the later period is examined by comparing changes in marijuana use from 2002 to the combined 2003/2004 period. The results of these analyses by age group are presented in Table 4-B.

The results for the changes in marijuana use from 2000 to 2002 show no overall significant change for lifetime, past year, or regular use for youth aged 12½ to 18. However, there was an overall significant increase in past month use from 2000 to 2002, counter to the effect the Campaign was seeking to achieve: as can be seen from Table 4-B, this increase occurred with youth aged 14 and older. The table also shows significant increases in lifetime use for 14- to 16-year-olds and in regular use for 14- to 15-year-olds.

**Table 4-B. NSPY marijuana use in 2000, 2002, and 2003/2004 across measures by age group**

| | Percent reporting use | | | | |
|---|---|---|---|---|---|
| Age groups | Year 2000 (Average for Waves 1 & 2)** (%) | Year 2002 (Average for Waves 5 & 6)** (%) | Years 2003/2004 (Average for Waves 7, 8 & 9) (%) (95% CI) | 2000 to 2002 Change (95% CI) | 2002 to 2003/2004 Change (95% CI) |
| Lifetime | | | | | |
| 12½ to 13 | 6.1 | 5.7 | 5.3 (4.2, 6.7) | -0.4 (-2.4, 1.5) | -0.4 (-2.2, 1.5) |
| 14 to 15 | 15.4 | 18.8 | 18.1 (16.5, 19.8) | 3.5 (-0.5, 7.5) | -0.7 (-3.4, 1.9) |
| 16 to 18 | 40.4 | 41.4 | 37.5 (35.4, 39.7) | 1.0 (-4.0, 6.0) | **-3.8* (-7.2, -0.4)** |
| 14 to 16 | 20.6 | 24.1 | 22.2 (20.6, 23.8) | **3.4* (0.4, 6.4)** | -1.9 (-4.0, 0.2) |
| 14 to 18 | 29.1 | 31.8 | 29.4 (27.8, 31.0) | 2.7 (-0.2, 5.6) | **-2.4* (-4.5, -0.2)** |
| 12½ to 18 | 23.6 | 25.5 | 23.6 (22.4, 25.0) | 1.9 (-0.3, 4.1) | **-1.9* (-3.6, -0.2)** |
| Past year | | | | | |
| 12½ to 13 | 3.9 | 3.9 | 3.9 (2.9, 5.2) | 0.0 (-1.5, 1.5) | 0.0 (-1.6, 1.6) |
| 14 to 15 | 11.6 | 12.6 | 13.5 (12.1, 15.0) | 1.0 (-2.1, 4.2) | 0.9 (-1.4, 3.3) |
| 16 to 18 | 29.2 | 29.1 | 27.0 (24.9, 29.3) | -0.1 (-4.5, 4.3) | -2.1 (-4.9, 0.8) |
| 14 to 16 | 15.4 | 17.2 | 16.4 (15.0, 17.9) | 1.8 (-0.7, 4.3) | -0.8 (-2.7, 1.0) |
| 14 to 18 | 21.2 | 22.1 | 21.3 (19.9, 22.9) | 0.9 (-1.5, 3.3) | -0.7 (-2.6, 1.1) |
| 12½ to 18 | 17.1 | 17.7 | 17.2 (16.0, 18.4) | 0.6 (-1.2, 2.4) | -0.5 (-2.0, 1.0) |
| Past month | | | | | |
| 12½ to 13 | 1.7 | 1.1 | 1.2 (0.7, 2.0) | -0.6 (-1.4, 0.3) | 0.1 (-0.8, 1.1) |
| 14 to 15 | 3.9 | 6.4 | 6.4 (5.4, 7.5) | **2.5* (0.2, 4.7)** | 0.0 (-1.7, 1.7) |
| 16 to 18 | 14.6 | 16.7 | 13.8 (12.3, 15.4) | 2.1 (-1.1, 5.2) | **-2.9* (-5.0, -0.7)** |
| 14 to 16 | 6.0 | 8.5 | 8.0 (7.1, 9.1) | **2.6* (0.4, 4.7)** | -0.5 (-2.0, 0.9) |
| 14 to 18 | 9.7 | 12.3 | 10.7 (9.7, 11.8) | **2.5* (0.4, 4.7)** | **-1.6* (-3.1, -0.1)** |
| 12½ to 18 | 7.8 | 9.6 | 8.4 (7.6, 9.3) | **1.8* (0.1, 3.4)** | **-1.2* (-2.3, 0.0)** |
| Regular | | | | | |
| 12½ to 13 | 0.6 | 0.6 | 0.7 (0.4, 1.4) | 0.0 (-0.6, 0.5) | 0.1 (-0.5, 0.7) |
| 14 to 15 | 2.3 | 4.4 | 3.9 (3.3, 4.6) | **2.1* (0.6, 3.6)** | -0.5 (-1.6, 0.6) |
| 16 to 18 | 12.6 | 12.4 | 11.2 (9.8, 12.7) | -0.1 (-3.0, 2.7) | -1.3 (-3.4, 0.9) |
| 14 to 16 | 4.0 | 5.6 | 5.5 (4.8, 6.5) | 1.6 (-0.2, 3.3) | -0.1 (-1.1, 1.0) |
| 14 to 18 | 7.9 | 9.0 | 8.1 (7.3, 9.0) | 1.1 (-0.5, 2.8) | -0.9 (-2.2, 0.3) |
| 12½ to 18 | 6.2 | 7.0 | 6.3 (5.7, 7.0) | 0.8 (-0.5, 2.1) | -0.7 (-1.6, 0.3) |

* Indicates a significant change at $p < 0.05$.

** Confidence intervals for the year 2000 and year 2002 estimates are given in Detail Tables 4-1, 4-2, 4-3, and 4-4.

Subgroup analyses also found a number of significant changes, all but one of which were increases in marijuana use from 2000 to 2002. The one decrease was in past month use for males aged 12½ to 13, in contrast to the increases in other age subgroups for this measure: the estimate fell by 1.6 percent, from 2.2 percent to 0.6 percent, with a confidence interval of (-2.8 to -0.4).

The other significant subgroup changes between 2000 and 2002 all occurred in the 14- to 18-year-old age group and all were increases (see Detail Tables 4-1, 4-2, 4-3, and 4-4). For lifetime use, significant changes occurred for females—an increase of 4.2 percent (0.1 to 8.3) and for lower risk takers—an increase of 3.3 percent (0.8 to 5.9). For past year use, the one significant change was for females—an

increase of 4.1 percent (0.7 to 7.6). For past month use, significant changes occurred for females—an increase of 4.8 percent (1.9 to 7.7); Whites—an increase of 3.5 percent (0.9 to 6.0); lower risk takers—an increase of 1.2 percent (0.1 to 2.3); and low sensation seekers—an increase of 2.6 percent (0.8 to 4.4). For regular use, significant changes occurred for females—an increase of 2.9 percent (0.4 to 5.4) and for lower risk takers—an increase of 0.9 percent (0.1 to 1.6). Given the many significance tests that were conducted for subgroups, the significant differences that are reported here could well be chance results.

The pooled analyses for the post-redirection period found a number of significant changes in lifetime use and in past month use between 2002 and 2003/2004, but none for past year or regular use. For both lifetime and past month marijuana use, there were significant decreases for the 12½- to 18-year-old, 14- to 18-year-old, and 16- to 18-year-old age groups. Also, in both cases the decreases were largest for the 16- to 18-year-olds.

Further analyses of the 14- to 18-year-old age group by subgroup found some significant changes between 2002 and 2003/2004 by gender, race/ethnicity, and sensation seeking. For lifetime marijuana use, significant effects were found for the following three subgroups of the 14- to 18-year-olds:

- Males (a change estimate of -2.9 percent (-5.6 to -0.1) from 32.1 percent in 2002 to 29.3 percent (27.4 to 31.3) in 2003/2004);
- Whites (a change estimate of -3.0 percent (-5.6 to -0.4) from 32.9 percent in 2002 to 29.9 percent (28.0 to 31.9) in 2003/2004); and
- High sensation seekers (a change estimate of -3.4 percent (-6.1 to -0.6) from 41.0 percent in 2002 to 37.6 percent (35.5 to 39.8) in 2003/2004).

For past month marijuana use, significant effects were found for the following three subgroups of the 14- to 18-year-olds:

- Females (a change estimate of -2.5 percent (-4.5 to -0.4) from 12.4 percent in 2002 to 10.0 percent (8.6 to 11.6) in 2003/2004);
- Whites (a change estimate -2.8 percent (-4.6 to -0.9) from 13.4 percent in 2002 to 10.6 percent (9.4 to 12.0) in 2003/2004); and
- High sensation seekers (a change estimate of -2.3 percent (-4.4 to -0.2) from 17.1 percent in 2002 to 14.8 percent (13.4 to 16.4) in 2003/2004).

Recognizing that many tests were conducted, the significant results in Table 4-B, together with the subgroup significant results, suggest that there may have been an upward trend in past month marijuana use between 2000 and 2002 and a downward trend in lifetime and past month marijuana use between 2002 and 2003/2004, the period of the redirected Campaign. However, as discussed earlier, trend results alone cannot be definitive evidence of a Campaign effect because of the possibility that any trends observed are due to external forces. Other evidence of a Campaign effect is also needed before a change can be safely ascribed to the Campaign.

## 4.2 MTF, NSDUH, and YRBSS Trends in Marijuana Use

The trend data presented above reflect the findings of NSPY for periods both before and after the launch of the Marijuana Initiative. All three of the major complementary sources of drug use data supported by the Government have now published results from the post-Marijuana Initiative period. In order to provide a context for interpreting the NSPY results, this section presents trend results for marijuana use from three national surveys: the Monitoring the Future (MTF) study, sponsored by NIDA; the National Survey on Drug Use and Health (NSDUH), sponsored by the Substance Abuse and Mental Health Services Administration; and the Youth Risk Behavior Surveillance System (YRBSS), sponsored by the Centers for Disease Control and Prevention. Several extensive discussions of the differences in methodologies of these surveys, and of the differences in the absolute levels of marijuana use estimates obtained from them, have been published (e.g., Hornik et al., 2002; Cowan, 2001; Harrison, 2001; Fendrich and Johnson; 2001). Consistently, the two in-school surveys (MTF and YRBSS) have tended to provide estimates of marijuana use that are higher than those from the in-home surveys (NSDUH and NSPY).

The MTF study is conducted every spring using nationally representative samples of 8th, 10th, and 12th graders in their classrooms. Students in both public and private schools are represented. Data collection is via a self-administered paper-and-pencil questionnaire. The number of schools sampled has been approximately 400 in recent years, and the number of responding students approximately 50,000. From 1991 to 2004, the MTF has maintained a student response rate of between 82 and 91 percent in participating schools, varying by grade level. In 2003 and 2004, in contrast to previous years, participating schools were paid a monetary incentive for their cooperation in the study. This led to increases in the school participation rate from 49 percent to 53 percent in 2003 and 62 percent in 2004, which could have affected survey estimates. Since individual student respondents were probably unaware of the payment of the incentive, it was not likely that this affected their personal responses.

Table 4-C presents MTF estimates of marijuana use for the period 1999 to 2004. The year-to-year comparisons that MTF reports indicate significant decreases in past year and past month use between 2001 and 2002 for 10th graders, in past year use between 2002 and 2003 for 8th graders, and in past month use between 2003 and 2004 for 8th graders. These significant decreases in marijuana use appear to follow a pattern of decline in all three usage measures over this period (Table 4-C).

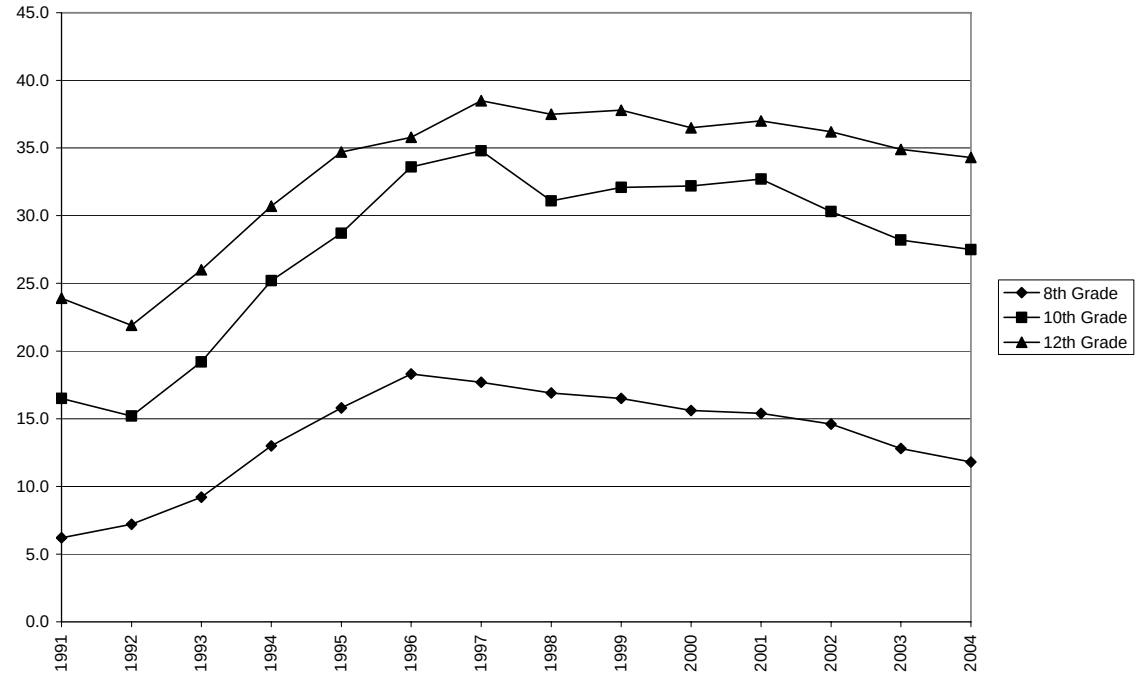
After reaching a peak in 1996 among 8th graders and in 1997 among 10th and 12th graders, the MTF study shows that past year marijuana use has declined for the 8th and 10th graders overall, and possibly for the 12th graders. These longer-term trends are displayed in Figure 4-B. For the 8th graders, the reported decline from 1996 to 2004 is about 54 percent of the climb from 1991 to 1996 (in 1991 annual use was 6.2%, rose to 18.3% in 1996, and fell to 11.8% in 2004); for the 10th graders the decline from 1997 to 2004 is about 37 percent of the climb from 1992 to 1997, while for the 12th graders the 1997 to 2004 decline is about 25 percent of the 1992 to 1997 climb. The 14-year trends for lifetime and past month use are similar, with sharp increases in the early 1990s followed by stabilization and some declines starting in 1996.

**Table 4-C. MTF lifetime, past year, and past month marijuana use in 1999 – 2004**

| Use measure | Grade | Percentage reporting use | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1999 (%) | 2000 (%) | 2001 (%) | 2002 (%) | 2003 (%) | 2004 (%) |
| Lifetime | | | | | | | |
| | 8th | 22.0 | 20.3 | 20.4 | 19.2 | 17.5 | 16.3 |
| | 10th | 40.9 | 40.3 | 40.1 | 38.7 | 36.4 | 35.1 |
| | 12th | 49.7 | 48.8 | 49.0 | 47.8 | 46.1 | 45.7 |
| Past year | | | | | | | |
| | 8th | 16.5 | 15.6 | 15.4 | 14.6 | **12.8*** | 11.8 |
| | 10th | 32.1 | 32.2 | 32.7 | **30.3*** | 28.2 | 27.5 |
| | 12th | 37.8 | 36.5 | 37.0 | 36.2 | 34.9 | 34.3 |
| Past month | | | | | | | |
| | 8th | 9.7 | 9.1 | 9.2 | 8.3 | 7.5 | **6.4*** |
| | 10th | 19.4 | 19.7 | 19.8 | **17.8*** | 17.0 | 15.9 |
| | 12th | 23.1 | 21.6 | 22.4 | 21.5 | 21.2 | 19.9 |

* Indicates a significant change at $p < 0.05$ from the previous year.

**Figure 4-B. Past year marijuana use among 8th, 10th, and 12th graders: MTF 1991 – 2004**




The general pattern of declines in the MTF results for 2002 to 2004—including the significant declines in past year use between 2002 and 2003 and in past month use between 2003 and 2004 for 8th graders—appears to be consistent with the general pattern of NSPY results for this period. However, the MTF results suggest the possibility of a decline from 2000 to 2002 in past year and past month use for 10th graders, whereas the NSPY results suggest an increase in past month marijuana use in this period.

Even accepting that the MTF declines in past year marijuana use between 1996/1997 and 2004 for 8th graders and between 2001 and 2004 for 10th graders displayed in Figure 4-B accurately represent usage trends, they still do not provide sufficient evidence to confidently claim an effect for the Campaign. The observed declines could alternatively reflect influences independent of the Campaign. It can be seen from Figure 4-B that for the 8th graders the decline began in 1996 and appears to have accelerated slightly after 2002, the start of the Marijuana Initiative. The 12th grade respondents show a smaller overall decline than do the 8th grade respondents; but whatever decline is present for this older age group, it appears to be, on average, steady starting in 1997, without a clear shift with the onset of the Phase III Campaign or with the start of the Marijuana Initiative. These findings make attribution of either of these declines to the Campaign tenuous.

The NSDUH is an annual survey that provides information on the use of illicit drugs, alcohol, and tobacco by the civilian, noninstitutionalized population of the United States aged 12 years and older. Until 1999, the survey collected data by self-administered questionnaires given to a representative sample of the population in face-to-face interviews at their place of residence. Since 1999, the NSDUH interview has been carried out using a computer-assisted interviewing methodology. Because of the major redesign of the sample and data collection method in 1999, estimates for 1999 to 2001 are generally not comparable with estimates from 1998 and earlier. As a result of further improvements to the survey in 2002, the 2002 data constitute a new baseline for tracking trends in substance use and other measures. Therefore, estimates from 2002 and 2003 should not be compared with estimates from 2001 and earlier to assess changes in substance use over time. The NSDUH estimates are particularly relevant for comparison with NSPY, since both surveys were conducted in households, unlike the MTF and YRBSS surveys, which were conducted in schools. Over each 12-month period, the NSDUH interviewed approximately 68,000 people, including samples in every state, and with an oversample of youth in the 12- to 17-year-old age range. Youth in this age range composed approximately one-third of the sample each year. For 2003, the weighted household screening response rate was approximately 91 percent. In screened households, the weighted interview response rate among 12- to 17-year-olds was approximately 90 percent (Substance Abuse and Mental Health Services Administration, 2004, p. 100).

Table 4-D presents NSDUH patterns of marijuana use among select age groups for 1999 to 2003. No significant changes are reported for any of the three measures of marijuana use between 1999 and 2000. However, between 2000 and 2001, significant increases in lifetime, past year, and past month marijuana use were found for 12- to 17-year-olds. Similar increases in lifetime and past year marijuana use were found for the older youth (16 to 17 years old), along with an increase in past year use for 14- to 15-year-olds. These increases are compatible with the NSPY results, where past month use increased significantly from 2000 to 2002.

**Table 4-D. NSDUH lifetime, past year, and past month marijuana use in 1999 – 2003**

| Age groups | Lifetime (%) | | | | | Past year (%) | | | | | Past month (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1999 | 2000 | 2001 | 2002 | 2003 | 1999 | 2000 | 2001 | 2002 | 2003 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 14 to 15 | 17.6 | 17.5 | 18.8 | 19.6 | 18.5 | 13.5 | 13.3 | **14.8*** | 15.7 | 14.7 | 6.9 | 6.9 | 7.6 | 7.6 | 7.2 |
| 16 to 17 | 34.3 | 34.0 | **36.4*** | 38.6 | 37.2 | 25.5 | 24.5 | **27.6*** | 29.0 | 28.1 | 13.2 | 13.7 | 14.9 | 15.7 | 15.6 |
| 12 to 17 | 18.7 | 18.3 | **19.7*** | 20.6 | **19.6*** | 14.2 | 13.4 | **15.2*** | 15.8 | 15.0 | 7.2 | 7.2 | **8.0*** | 8.2 | 7.9 |

NOTE: Estimates for 1999 to 2001 are not comparable to estimates for 2002 to 2003 due to changes in survey methodology.

* Indicates a significant change at $p < 0.05$ from the previous year.

The only significant change reported from 2002 to 2003 was a decrease of 1 percent in lifetime use for 12- to 17-year-olds. This finding is also consistent with the NSPY significant decrease of 2 percent in lifetime use for 12½- to 18-year-olds between 2002 and 2003/2004 noted earlier.

The YRBSS is designed to determine the prevalence of health risk behaviors among American youth. It includes national, state, and local school-based surveys of representative samples of 9th through 12th grade students. Since 1991, the surveys have been conducted every 2 years, usually during the spring semester, and provide data representative of students in public and private high schools in the United States. The 2003 national YRBSS survey had more than 15,000 respondents, with an overall response rate of 67 percent (Brener et al., 2004).

The YRBSS study found significant decreases in lifetime and past month marijuana use between 1999 and 2001 among all students in 9th to 12th grades, but no significant changes between 2001 and 2003 (YRBSS does not ask about past year use). Usage estimates from the past four waves of the study are presented in Table 4-E below. For ease of comparison, the estimates are presented by reported youth age, rather than by grade level. Since all students who were 18 or older were classified into a single age group, some youth who were in relevant grades but older than 18 are included in the 16 to 18 and 14 to 18 age categories in the table.

**Table 4-E. YRBSS lifetime and past month marijuana use in 1997, 1999, 2001, and 2003**

| Age groups | Lifetime (%) | | | | Past month (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1997 | 1999 | 2001 | 2003 | 1997 | 1999 | 2001 | 2003 |
| 14 to 15 | 38.5 | 34.4 | 32.3 | 31.2 | 21.9 | 21.2 | 18.6 | 18.4 |
| 16 to 18 | 51.2 | 53.9 | 48.2 | 45.6 | 28.2 | 29.6 | 26.9 | 24.5 |
| 14 to 16 | 42.7 | 41.8 | 37.3 | 35.7 | 24.3 | 24.5 | 21.7 | 19.9 |
| 14 to 18 | 47.1 | 47.2 | **42.4*** | 40.1 | 26.2 | 26.7 | **23.9*** | 22.2 |

* Indicates a significant change at $p < 0.05$ from the previous year.

As a summary, consider past month marijuana use, which all four data sources address. YRBSS shows a significant decline in use between 1999 and 2001 for its sample of 14- to 18-year-olds, and a nonsignificant decline between 2001 and 2003. MTF does not show significant changes in use between 1999 and 2001, but does show a general pattern of declines since 2001, with significant declines for 10th graders between 2001 and 2002 and for 8th graders between 2003 and 2004. NSDUH shows a significant increase in use between 2000 and 2001 for its sample of 12- to 17-year-olds, but no significant changes on this measure between 2002 and 2003. NSPY shows a significant increase in use between 2000 and 2002 for 12½- to 18-year-olds, but decreasing use, particularly for 16- to 18-year-olds, between 2002 and 2003/2004.

Some of the differences between surveys, particularly in years when one study finds a significant effect but the others find no significant trends, may be attributed to the relative magnitudes in their sampling errors of change estimates. The confidence limits around change estimates may often include the changes reported by the other studies. The only real contradictory finding is the earlier YRBSS claim of a decline between 1999 and 2001, while over the same period NSDUH claims an increase in use, and in this case the age groupings are not exactly comparable. The MTF claim of a decline among 10th graders (typically 15- to 16-year-olds) between 2001 and 2002, while not replicated by NSPY, is within the statistical confidence limits of NSPY. Perhaps the correct conclusion from these comparative analyses is that the set of surveys has not established firm evidence for consistent trends over the 1999 to 2002 period.

Since the Campaign was redirected in late 2002, there is an indication that recent marijuana use may have decreased. Both MTF and NSPY found some significant declines since 2002. The NSDUH and YRBSS results show declines, but nonsignificant ones, for this period. While the recent downward trends are encouraging, the magnitude of the drop in marijuana use since 2002 is not large.

In general, declines in trends alone, while certainly desirable and consistent with Campaign goals, are an inadequate basis for making a claim that the Campaign was the cause of such declines. The logic of inference for this Evaluation requires the presence of three types of evidence to support a claim of positive Campaign effects: favorable trends, evidence that those most exposed to the Campaign hold the strongest anti-drug views, and evidence that those most exposed to the Campaign are least likely to initiate marijuana use or accede to pro-drug beliefs subsequently. Favorable trends are the least persuasive of these three types of evidence. The same logic also applies, of course, in reverse for increasing usage trends.

## 4.3 Marijuana Offers

This section reviews the evidence about trends in youth reports of receiving offers of marijuana. Such offers are an important behavioral outcome, both because the Campaign has aired some messages that encourage resistance to these offers and because offers are closely related to marijuana use. The association between offers and use is also examined.

Table 4-F presents the proportion of youth within each age group that reported never receiving offers and receiving offers in the previous 30 days, by year. The table shows significant increases among all youth aged 12½ to 18 in never receiving offers, and significant decreases among the same population in recent offers, from both 2000 and 2002 to the first half of 2004. The table also shows the strong age gradient of offers, with offers increasing in the higher age categories.

**Table 4-F. NSPY trends in youth reports of marijuana offers**

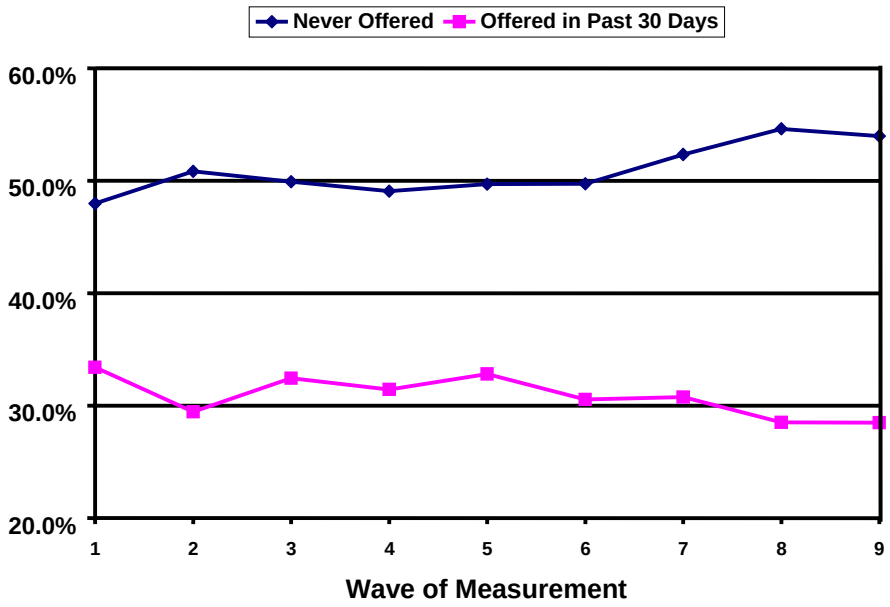
| Age groups | Year 2000 (%) | Year 2001 (%) | Year 2002 (%) | Year 2003 (%) | Year 2004 (Jan-Jun) (%) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
|---|---|---|---|---|---|---|---|
| Never received offers | | | | | | | |
| 12½ to 13 | 78.8 | 79.3 | 80.1 | 80.9 | 82.9 | 4.1 (-0.1, 8.3) | 2.8 (-1.2, 6.7) |
| 14 to 15 | 53.9 | 54.1 | 54.2 | 58.6 | 59.8 | **5.9* (1.4, 10.4)** | **5.6* (1.5, 9.7)** |
| 16 to 18 | 29.1 | 28.9 | 29.8 | 34.6 | 34.8 | **5.6* (0.9, 10.4)** | **5.0* (1.0, 9.0)** |
| 14 to 16 | 48.7 | 48.3 | 49.1 | 52.3 | 54.5 | **5.8* (1.7, 9.8)** | **5.4* (1.9, 8.8)** |
| 14 to 18 | 40.3 | 40.3 | 40.1 | 44.8 | 45.0 | **4.7* (1.2, 8.1)** | **4.9* (1.9, 7.9)** |
| 12½ to 18 | 49.4 | 49.5 | 49.7 | 53.5 | 54.0 | **4.6* (1.8, 7.4)** | **4.3* (1.9, 6.6)** |
| Received offers in the past 30 days | | | | | | | |
| 12½ to 13 | 11.1 | 10.8 | 10.9 | 11.0 | 9.0 | -2.1 (-4.8, 0.6) | -1.9 (-4.9, 1.1) |
| 14 to 15 | 26.8 | 28.2 | 28.0 | 25.4 | 25.5 | -1.3 (-5.9, 3.3) | -2.5 (-6.3, 1.4) |
| 16 to 18 | 46.7 | 47.0 | 45.8 | 43.1 | 40.7 | **-5.9* (-10.6, -1.3)** | **-5.1* (-9.5, -0.6)** |
| 14 to 16 | 30.9 | 32.5 | 30.7 | 30.1 | 28.8 | -2.1 (-5.9, 1.7) | -1.9 (-5.3, 1.4) |
| 14 to 18 | 37.7 | 38.5 | 38.2 | 35.5 | 34.5 | **-3.2* (-6.4, 0.0)** | **-3.7* (-6.8, -0.7)** |
| 12½ to 18 | 31.4 | 31.9 | 31.7 | 29.6 | 28.5 | **-2.9* (-5.5, -0.4)** | **-3.2* (-5.5, -0.8)** |

* Indicates a significant change at $p < 0.05$.

As shown in Detail Table 4-5, all of the age subgroups studied, with the exception of 12½- to 13-year-olds, showed significant increases in the percentages never having received offers from both 2000 and 2002 to the first half of 2004. Subgroups of 14- to 18-year-olds that showed significant increases in never having received offers between 2002 and the first half of 2004 are males and females, Whites and African Americans, lower risk youth, and both high and low sensation seekers. The largest increase was for African Americans in this age group, from 37 percent in 2002 to 46 percent in 2004. Significant declines in offers in the past 30 days were found among 14- to 18-year-olds (males, Whites, all) and 16- to 18-year-olds, both from 2000 to the first half of 2004 and from 2002 to the first half of 2004 (Detail Table 4-6). In addition, significantly fewer higher risk 14- to 18-year-olds reported recent offers in the first half of 2004 compared to 2002.

Figure 4-C displays the percentages of 12½- to 18-year-olds never offered marijuana and the percentages offered in the past 30 days by survey wave. It shows clear increases in never having received an offer between Waves 6 and 7, and between Waves 7 and 8, during the period of the Marijuana Initiative.

**Figure 4-C. Offers of marijuana for 12½- to 18-year-olds**




The decline in the proportion of youth who claim to have received an offer in the past month started in Wave 5 and leveled off in the first half of 2004. This decline is a positive trend because youth who are never offered marijuana are substantially less likely to initiate use than are youth who do receive offers. The relationship between offers and use is presented in the next subsection.

To further examine the trends in offers, separate analyses were conducted to examine changes between 2000 and 2002, and between 2002 and 2003/2004. The results, displayed in Table 4-G, clearly show no significant changes in either never having received offers or having received offers in the past 30 days between 2000 and 2002. In addition, there were no significant changes in either measure during this period for any of the subgroups studied. In contrast, there were significant changes overall for both measures between 2002 and 2003/2004. For never having received offers, this change applied to all age groups except for the 12½-to 13-year-old age group. (There were also no significant subgroup changes for this age group.) For recent offers, the overall decrease was concentrated in 14- to 18-year-olds.

**Table 4-G. NSPY trends in youth reports of marijuana offers before and after 2002**

| Age groups | Year 2000 (%) | Year 2002 (%) | Year 2003/2004 (%) (95% CI) | 2000 to 2002 Change (95% CI) | 2002 to 2003/2004 Change (95% CI) |
|---|---|---|---|---|---|
| Never received offers | | | | | |
| 12½ to 13 | 78.8 | 80.1 | 81.6 (79.4, 83.7) | 1.3 (-2.4, 5.1) | 1.5 (-1.2, 4.2) |
| 14 to 15 | 53.9 | 54.2 | 59.0 (57.0, 60.9) | 0.3 (-3.9, 4.5) | **4.8* (1.5, 8.1)** |
| 16 to 18 | 29.1 | 29.8 | 34.7 (32.5, 36.9) | 0.6 (-3.3, 4.6) | **4.9* (2.4, 7.4)** |
| 14 to 16 | 48.7 | 49.1 | 53.0 (51.3, 54.8) | 0.4 (-3.6, 4.4) | **3.9* (1.4, 6.4)** |
| 14 to 18 | 40.3 | 40.1 | 44.9 (43.2, 46.5) | -0.2 (-3.5, 3.0) | **4.8* (2.9, 6.6)** |
| 12½ to 18 | 49.4 | 49.7 | 53.7 (52.1, 55.2) | 0.3 (-2.3, 3.0) | **3.9* (2.4, 5.4)** |
| Received offers in the past 30 days | | | | | |
| 12½ to 13 | 11.1 | 10.9 | 10.3 (8.7, 12.3) | -0.2 (-2.6, 2.2) | -0.6 (-2.9, 1.8) |
| 14 to 15 | 26.8 | 28.0 | 25.4 (23.5, 27.4) | 1.2 (-3.1, 5.5) | -2.6 (-5.6, 0.5) |
| 16 to 18 | 46.7 | 45.8 | 42.3 (39.7, 44.8) | -0.9 (-5.3, 3.5) | -3.5 (-7.5, 0.5) |
| 14 to 16 | 30.9 | 30.7 | 29.7 (27.9, 31.5) | -0.2 (-3.5, 3.1) | -1.0 (-3.4, 1.4) |
| 14 to 18 | 37.7 | 38.2 | 35.2 (33.4, 37.0) | 0.5 (-2.4, 3.5) | **-3.0* (-5.5, -0.6)** |
| 12½ to 18 | 31.4 | 31.7 | 29.2 (27.8, 30.7) | 0.3 (-2.0, 2.5) | **-2.4* (-4.3, -0.6)** |

* Indicates a significant change at $p < 0.05$.

For the 14- to 18-year-old age group, the pooled analyses identified significant increases in never having received offers for the same subgroups as the 2002 to Wave 9 comparison. The two comparisons showed minor differences in the effects for recent offers, with the pooled analyses finding an additional significant decrease for African Americans, but no significant decrease for higher risk youth between 2002 and 2003/2004.

## The Relationship of Offers and Use of Marijuana

Whereas cross-sectional data on the association between offers and marijuana use does not enable one to make any claims as to directionality, longitudinal data allow one to clarify whether receiving offers precedes use or is only a correlate of it. Table 4-H presents the percentages of nonusers who reported receiving offers, and of nonusers who reported not receiving offers at one survey round and who reported initiating marijuana use at the following round. This analysis, which incorporates all four rounds of the survey, includes only youth who indicated that they had not used marijuana at one round and who were 12½ to 18 years old at the followup round.

**Table 4-H. Marijuana initiation at followup round by marijuana offers received at prior round among nonusers at prior round by age group**

| | Age group at followup round | | | | | |
|---|---|---|---|---|---|---|
| | 12½ to 13 | | 14 to 15 | | 16 to 18 | |
| | Ever received offer at prior round | | Ever received offer at prior round | | Ever received offer at prior round | |
| Initiated marijuana use by followup round (%) | No | Yes | No | Yes | No | Yes |
| | 2.8 | 20.7 | 7.5 | 29.2 | 9.5 | 27.6 |

Across age groups, nonusers who reported ever having received marijuana offers at one round were much more likely to have initiated marijuana use at the following round than were nonusers who

reported never having received an offer. As can be seen in Table 4-H, 29 percent of 14- to 15-year-olds who had never used marijuana and who reported having received an offer at one round had used marijuana by followup, whereas only 8 percent of nonusers in this age group who reported never having received an offer had used marijuana by followup. Among the youngest group, the comparable percentages are 21 and 3 percent. Although the rates of marijuana initiation are markedly higher for nonusers who had received offers, these results do not take into account the possibility that the youth who received offers were different from those who did not, with respect to other characteristics that may alternatively explain subsequent drug use. It is also important to note that, while receiving offers is closely related to use, most of those who received offers did not report use. Almost three-quarters of the oldest nonusers who reported ever receiving marijuana offers at one round had still not initiated marijuana use by the following round.

## Summary

The NSPY did not find statistically significant changes in marijuana use for youth 12½ to 18 years old between 2000 and the first half of 2004, or between 2002 and the first half of 2004. However, those overall results hide a more complex pattern of changes. The more detailed NSPY analysis showed a statistically significant increase in past month marijuana use between 2000 and 2002 for 12½- to 18-year-olds. In general there were increases, although generally nonsignificant, for older youth aged 14 to 18 across all measures of marijuana use. In contrast, the analyses of the changes from 2002 to 2003/2004 combined found statistically significant decreases overall in both lifetime and past month marijuana use, decreases that were concentrated in the 16- to 18-year-old age group.

The 2002 to 2003/2004 analyses were conducted to evaluate changes that might have occurred since the Campaign was redirected in late 2002 with the introduction of the Marijuana Initiative, using all the survey data available since that redirection, and to provide estimates for a time period that is more comparable to the time periods for which estimates are available from three other national drug use surveys. The year 2002 was chosen as the benchmark year because it was the closest prior year for which NSPY data would not be noticeably affected by the redirection.

How are the NSPY statistically significant increases from 2000 to 2002 and decreases from 2002 to 2003/2004 to be interpreted? Could either or both of the changes really be simply a matter of chance? The relevant evidence for this possibility is the comparison of the NSPY results with the parallel results for three other major national surveys of drug use among adolescents. Examination of these other survey results leads to some uncertainty about the NSPY increase from 2000 to 2002, but supports the NSPY decrease from 2002 to 2003/2004.

The data from the school-based surveys—the MTF and YRBSS—provide a possible justification for discounting the statistically significant increase in the pre-Marijuana Initiative period found in NSPY, since the results from both of these surveys suggest that this increase may not be real. MTF shows general decreases for 8th and 10th graders and no trend for 12th graders on all marijuana measures between 2000 and 2002, with statistically significant decreases for 10th graders in past year and past month use between 2001 and 2002. YRBSS shows general declines from 1999 to 2001, with statistically significant decreases for 14- to 18-year-olds for both lifetime and past month use. However NSDUH—the other household survey—shows increases between 2000 and 2001 across all age groups and measures, many of which are statistically significant. Methodological changes in 2002 make the comparisons between 2001 and 2002 uninformative for the NSDUH. The NSDUH results showing an increase from 2000 to 2001 are consistent with the statistically significant NSPY increase from 2000 to

2002. The conflicting findings from the two school-based surveys with those from the two household-based surveys leave the nature of the change in marijuana use between 2000 and 2002 uncertain.

Note that if the significant NSPY change from 2000 to 2002 were due to an unduly high estimate for 2002, this would explain away both the increase from 2000 to 2002 and the decrease from 2002 to 2003/2004. The conclusion would then be that NSPY found no firm evidence of a change in marijuana use over the full period.

In contrast to the 2000 to 2002 change, the evidence for a decrease between 2002 and 2003/2004 is more consistent across the four surveys. Each of the three other surveys shows decreases across all measures and all age groups for this period (for 2001 to 2003 for YRBSS and for 2002 to 2003 for NSDUH), although the only statistically significant year-to-year decreases are those for past year use between 2002 and 2003 and past month use between 2003 and 2004 by MTF 8th graders and for lifetime use between 2002 and 2003 by 12- to 17-year-olds in the NSDUH. While the results from the several surveys are not entirely consistent, combining the evidence from NSPY and these other surveys suggests it is likely that a small decline in marijuana use occurred since the start of the redirected Campaign.

If there was a decrease between 2002 and 2003/4, can it be attributed to the Campaign? This is not a question that can be answered in this chapter. The existence of trends alone does not permit attribution of cause in a context when outside forces are likely to be affecting behavior. In this regard, it may be noted that the declines observed in the MTF and the YRBSS started before 2002; indeed the declines in MTF started before Phase III of the Campaign. By examining whether initiation of marijuana use and the cognitive measures that are postulated to be precursors of drug use are related to Campaign exposure, Chapters 5 and 6 address the question of attribution of effects to the Campaign more directly.

The NSPY data indicate that no statistically significant changes occurred between 2000 and 2002 in youth having ever received offers of marijuana or having received an offer in the past 30 days. In contrast, the NSPY data provide clear evidence of increases in youth never having received offers of marijuana since the Campaign was redirected in late 2002. This was evident for 12½- to 18-year-olds and for all age subgroups studied, other than 12½- to 13-year-olds. This positive finding was accompanied by a corresponding decrease in the number of youth aged 12½ to 18 years old who had received offers in the past 30 days. These findings are relevant because offers are highly related to subsequent use. However, the findings cannot be definitively ascribed to the Campaign because they may be caused by other factors.

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# 5. Campaign Effects on Youth

The primary audience for the National Youth Anti-Drug Media Campaign (the Campaign) is young people, with a focus on those youth seen as particularly vulnerable to initiation of drug use. The objectives of the Campaign include reducing the number of young people who try marijuana at all, and reducing the number of trial users who go on to regular use. Current regular users are not a primary target audience for the Campaign.

The Campaign expects to influence youth directly through its heavy promotion of anti-drug messages with advertising and other efforts. This chapter focuses on the assessment of this direct path of effect. Chapter 4 presented analyses of changes in marijuana use during Phase III of the Campaign. However, as noted in Chapter 4, any increase or decrease that occurred cannot be simply and unambiguously attributed to the Campaign. Other evidence needs to be examined before attribution can be made, and one purpose of Chapter 5 is to provide this evidence by examining whether the amount of Campaign exposure at one round of the survey is associated with the likelihood of marijuana initiation by the next round (section 5.5.2). In addition, this chapter focuses back one step in the process of change, to the cognitive precursors of behavior outlined in the Campaign model laid out in Chapter 2. Now, the question is posed: Is there evidence that the Campaign is influencing intentions to use marijuana, beliefs and attitudes about the outcomes of marijuana use, perceived social norms about marijuana use, or self-efficacy to turn down marijuana?

Although the Campaign has at times focused on a variety of drugs (methamphetamines, club drugs like Ecstasy, inhalants, and others), the major focus has been on drugs overall and marijuana specifically. Aside from alcohol and nicotine, marijuana is the illicit drug by far the most likely to be used by youth. In the past reports, there was no evidence to support a positive effect of the Campaign on youth behavior and cognitions toward marijuana use. Rather, the data as of 2002 provided some support for an unfavorable effect such that higher exposure to Campaign messages was associated, after a delay, with more pro-drug outcomes. In light of these results and other factors, ONDCP made a decision to shift the focus of the youth campaign exclusively to marijuana, and to feature stronger negative consequence ads as described in Chapters 1 and 3. The Campaign has concentrated its recent efforts on the Marijuana and Early Intervention Initiatives, in hopes that these initiatives would improve the results. This chapter serves to evaluate the findings on youth's cognitions from the Campaign as a whole, and also to evaluate effects from more recent efforts—specifically, the Marijuana Initiative introduced in late 2002 and the Early Intervention Initiative introduced in early 2004.

Most of this chapter focuses on current nonusers of marijuana. However, an additional analysis has been carried out to examine any impact the Campaign may have had on the marijuana use of youth who have used marijuana in the past year. The results of that analysis are presented in section 5.6.

## 5.1 The Logic of Inferences About Effects

It would be desirable to show that target outcomes, including improved cognitions about marijuana use, are trending in a direction consistent with Campaign objectives. However, any observed positive

trend may reflect only external forces other than the Campaign. There are many forces in society that potentially affect adolescent drug use (e.g., drug prices, drug availability, content of popular media) and a favorable trend alone cannot permit unambiguous attribution to the Campaign. An observed lack of a favorable trend might also miss real Campaign effects. The Campaign might be successfully keeping the level of drug use and its cognitive precursors from getting worse as the result of other negative forces, or it might be that this study lacked the statistical sensitivity to detect a small change. Still, despite these ambiguities, it will be easier to accept Campaign effects in the context of favorable trends rather than to have to explain why the lack of favorable trends is still consistent with a Campaign effect. Given that the trend between 1992 and 1998 toward increased drug use justified the Campaign, finding a reversal of that trend is desirable.

The trend evidence most relevant to claims about the Marijuana and Early Intervention Initiatives is change between 2002 and the first half of 2004, while the trend evidence most relevant to claims about the entire Campaign is change between 2000 and the first half of 2004.[1] Both are examined in detail in this chapter. As laid out above, the absence of such changes does not preclude the possibility of a significant effect of the Marijuana or Early Intervention Initiatives, and the presence of such changes does not equate to Campaign effects, but overall such evidence is certainly desirable.

For a favorable trend, in the anti-drug direction, to be more credibly linked to the Campaign, the presence of a second class of evidence is required: that youth who were more exposed to the Campaign do "better" on the desired outcomes (e.g., that youth who reported seeing Campaign ads two or three times a week are more likely to believe, for instance, that there are negative outcomes of marijuana use than those who reported ad exposure less than once a week). However, even if such associations were to be found, the results would be subject to three concerns. First, there is the risk that the observed association between exposure and outcomes is the result of other variables that affect them both; for example, youth who do less well in school are more likely to turn to drugs and also may spend more time watching television and thus seeing ads. The threat to an inference of Campaign effects from these other variables is addressed directly through the implementation of statistical controls for potential confounding variables. The procedure used for that purpose, propensity scoring, is described in detail in Appendix C.

Second, the absence of an association between exposure and outcome does not permit definitive rejection of all Campaign effects. Chapter 2 recognized the possibility of effects not detectable through comparisons between more and less well-exposed individuals. To the extent that effects are shared in social networks, or diffused through changes in institutional practices, they are sometimes not completely detectable through individual-level comparisons.

The third concern in making inferences from a cross-sectional association is that the association might be the result of the influence of outcomes on exposure rather than exposure on outcomes. For example, is it possible that youth with a negative view of drugs are more likely to remember anti-drug advertising? This could explain the association just as well as the thesis that exposure to that advertising affected their view of drugs. This concern, called the threat of reverse causation, cannot be eliminated under most circumstances with cross-sectional data. However, the explanatory power of significant associational results can be bolstered if data are available that provide evidence of causal order. For this task, longitudinal analysis, primarily delayed-effects analysis, has been critical. The

[1] Note that all references to 2004 in this chapter cover the first half of 2004 only. Also note that because only a small number of cases in Wave 1 were completed in 1999, for discussion and presentation purposes this report treats all Wave 1 cases as having being completed in 2000.

delayed effects analysis tests whether Campaign exposure at one measurement wave affects outcomes at a subsequent measurement wave, again controlling for potential confounders of the exposure—outcome relationship. This report presents the first chance to examine delayed effects of the Marijuana Initiative because youth who were interviewed at Wave 7 in the first half of 2003, shortly after the start of that Initiative, have now been reinterviewed at Wave 9 (in the first half of 2004). An examination of Round 1 to 2 delayed effects found apparent unfavorable influences of the Campaign prior to its redirection (Hornik et al., 2002); it is now possible to examine whether delayed effects (favorable or unfavorable) are present for the period covering the Marijuana Initiative.

In sum, the best evidence consistent with a Campaign effect will show 1) a favorable trend in the outcome and 2) favorable cross-sectional associations of reported Campaign exposure with the target outcomes statistically controlled for likely confounders, and 3) favorable delayed-effect associations controlled for likely confounders. In addition, any evidence that trends, cross-sectional associations, or delayed-effect associations are significant and favorable in the period covering the Marijuana and Early Intervention Initiatives (Waves 7 through 9), where they were nonsignificant or unfavorable in earlier periods, provides even greater confidence in attributing such results to the effect of exposure to those initiatives.

The overall analysis focuses on effects among current nonusers of marijuana who are 12½ to 18 years old. In addition to increasing the resistance of these youth to initiating use of marijuana, the Campaign would also like to encourage quitting or reducing frequency of use among users. Users have not received a great deal of attention in previous reports due to sample size concerns; there have not been enough of them, particularly at younger ages, to provide very much statistical sensitivity to change. With the addition of data for Waves 8 and 9, however, there are 1,367 past year users, 71 percent more than in the Waves 1 to 7 sample. This sample size provides sufficient power to detect moderate effects of Campaign exposure on quitting or reducing marijuana use 1 year later in the full sample of past year users, though not in subgroups. Consequently, effects on users are examined in this final report.

In addition to the overall analysis, this chapter presents trend and cross-sectional, associational results for subgroups of nonusing youth. The subgroup analyses are used for two purposes. If there is an overall effect for all 12½- to 18-year-olds, there is a search for evidence that the effect is concentrated in, or is absent from, particular subgroups. If there is no overall effect, the subgroups are examined to see if there is evidence of effect for only a subpopulation. As with the previous report, this chapter includes subgroup analyses by youth's risk for marijuana use with youth classified as "higher" or "lower" risk. These subgroups are described later in this chapter and in further detail in Appendix E. Differences in subgroups are noted when they show a consistent pattern. All trend and cross-sectional analyses are fully presented in the Detail Tables and summarized in the text.

The chapter contains a large number of analyses designed to examine Campaign effects using several different analytic approaches and conducting analyses both for the full sample and for many different subgroups. Statistical tests of significance are used for each analysis to establish whether any effects observed might be simply the result of sampling error. In assessing the findings from these significance tests, it needs to be recognized that, even if there were no Campaign effects whatsoever, some of the large number of tests will produce significant results. Thus, for example, in the simplified case of 100 completely independent statistical tests with no effect present for any of them, one would expect that five of the tests would be significant if a 5 percent significance level is used. Considerable caution should therefore be exercised in assessing an isolated significant effect when many tests are conducted.

For this reason, in interpreting the many analyses in this chapter, consistent patterns of effects are highlighted and isolated significant effects are downplayed.

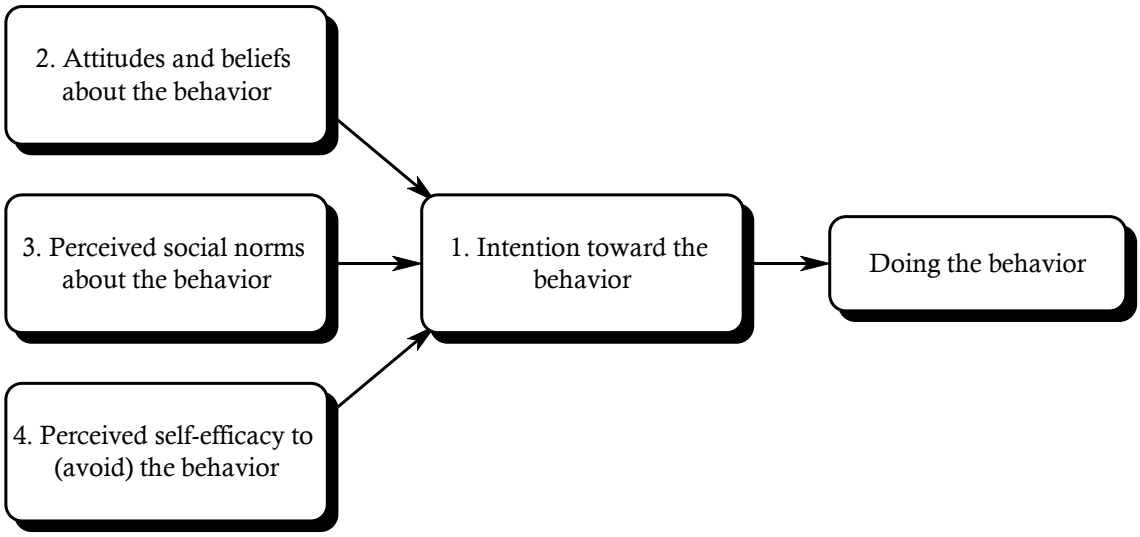
## 5.2 Descriptions of Cognitive Indices

The Detail Tables provide information about trends in a total of 34 cognitive outcomes related to use of marijuana. In order to present that information efficiently, and to maximize the power of the analyses, this chapter presents that information largely through the use of a small number of summed indices, or scales, that reflect the expected theoretical model of Campaign effects. The use of these scales provides several advantages:

- Summed indices are, in general, more reliable than single measures, thus allowing easier detection of meaningful trends and associations;
- Using a small number of indices reduces the risk of chance findings of statistical significance when a very large number of tests are examined—a risk compounded when subgroups are to be examined for possible differential effects;
- Given the particular structure of the youth questionnaire, in which not all respondents are asked identical sets of questions, the use of summed indices permits a sharp increase in the numbers of respondents eligible for particular analyses, again increasing sensitivity to any true effects; and
- A theory-driven analysis featuring a small number of indices allows for a focused presentation of results.

In Chapter 2, the basic theoretical model underpinning the Evaluation was presented. The model argues that if the Campaign were to be successful, it would affect behavior through one or more of the paths depicted in Figure 5-A.

**Figure 5-A. The expected relationships among cognitive outcomes**




The analysis of marijuana cognitive outcomes focuses on four measures that correspond to the expected four predictors of behavior, plus a fifth measure that captures perceptions of "other kids' use of marijuana."

- **Intentions to use marijuana at all in the next year.** The question asked how likely it was that the respondent would use marijuana even once or twice in the next year, and permitted answers of definitely not, probably not, probably yes, and definitely yes. A substantial majority, approximately 86 percent, of current nonusers aged 12½ to 18 responded, "definitely not." In the analyses below, those responding "definitely not" are compared to the 14 percent of nonusers who were not definite in their intended rejection of use. Intentions are a very strong predictor of future behavior. Of nonusers at one round of measurement who said "definitely not" to any use of marijuana over the next year, 9 percent had initiated use by the followup round (12 to 18 months later). Of those who said anything other than "definitely not," the rate of initiation was 39 percent.

- **Attitudes and beliefs about marijuana.** All youth respondents were asked questions about how likely it was that a series of specific consequences would result if "you" use marijuana, either regularly (every month or almost every month) or once or twice over the next year. The eight consequences asked about for "once or twice" use included "Upset my parents," "Get in trouble with the law," "Lose control of myself," "Start using stronger drugs," "Be more relaxed," "Have a good time with friends," "Feel better," and "Be like the coolest kids." The eight consequences asked about for regular use included "Damage my brain," "Mess up my life," "Do worse in school," "Be acting against my moral beliefs," "Lose my ambition," "Lose my friends' respect," "Have a good time with friends," and "Be more creative and imaginative." Each respondent who had not used marijuana in the past year was asked about one of the two eight-belief consequences, chosen at random. All youth were also each asked two questions that assessed overall attitude toward either "once or twice" use or regular use. All the youth who had used marijuana in the past year were asked about the consequences of and attitudes toward regular use.

  The development of the Attitudes/Beliefs Index from these questionnaire items is described in detail in Appendix E. An index was constructed from each of the two sets of belief consequences and overall attitude items, with each index standardized to a mean of 100 and a standard deviation of 100 for 12- to 18-year-old nonusers at Wave 1.[2] A respondent's score on the the overall index was then taken to be his or her score on the index for the items that he or she answered. The overall Attitudes/Beliefs Index, as expected, was substantially associated with the intention to use marijuana in the next year. Only about 25 percent of those with the lowest scores on that index said "definitely not" to marijuana use in the next year, as compared with 100 percent of those with the highest scores on the index.

- **Perceived social norms.** The perceived Social Norms Index was formed in a parallel way to the Attitudes/Beliefs Index. There were five parallel questions that assessed social normative pressure with regard to each of "once or twice" and regular use of marijuana. They asked about the perception of friends' use of marijuana, other peers' use of marijuana, parents' disapproval of "your" marijuana use, friends disapproval of "your" marijuana use, and disapproval of "your" marijuana use by most people important to you, in each case in the context of "once or twice" use or regular use over the next year. Using a regression model, the questions were then weighted according to their ability to predict the intention to use marijuana once or twice in the next year. The indices for nonusing youth randomly assigned to answer the "once or twice" or regular use questions were both set to a mean of 100 and a standard deviation of 100 for 12- to 18-year-old nonusers at Wave 1. The youth who had previously used marijuana and who had been asked the social norm questions about regular use were assigned index scores using the weights developed for the nonusers. Once again, all respondents were then assigned their score on the overall index based on their scores on the separate indices.

  The perceived Social Norms Index was substantially correlated with intentions, although the relationship was not quite as strong as that between the Attitudes/Beliefs Index and intention. (See Appendix E for details.)

[2] The indices were not recalibrated for the 12½- to 18-year-old sample used in the present report. However, this has no impact on significance tests of trends and associations.

- **Self-efficacy to refuse marijuana.** All respondents were asked the same five questions about their confidence that they could turn down the use of marijuana under various circumstances. ("How sure are you that you can say no to marijuana, if you really wanted to, if: You are at a party where most people are using it; A very close friend suggests you use it; You are home alone and feeling sad or bored; You are on school property and someone offers it; You are hanging out at a friend's house whose parents aren't home.") Using a regression model, the five questions were used to predict the intention to use marijuana once or twice in the next year. Each question was then weighted in the overall index reflecting the coefficient of the item in the predictive equation. As with the other indices, to ease interpretation, responses were standardized to a mean of 100 and a standard deviation of 100 for Wave 1 12- to 18-year-old nonusers. The new index predicted intentions, but less powerfully than the other two indices. (See Appendix E for details.)

- **Perceptions of other kids' use.** As described in Chapter 2, this report adds a new outcome variable for youth analyses—the perception of other kids' regular use of marijuana. As noted earlier, the delayed effects analyses presented in the Fifth Semi-Annual Report found evidence of possible unfavorable effects of Campaign exposure on outcomes measured 1 year later. A possible mechanism for such effects is that the Campaign may be increasing youth perception that others use marijuana and that may adversely affect their behavior. Some supportive evidence for this hypothesis is that there are strong cross-sectional and prospective relationships between this perception and marijuana use. To examine this hypothesis further, perception of other kids' use is being treated as an outcome parallel to the other youth cognitive outcomes in this report.[3] Possible responses to this item (how many kids in same grade or age group have used marijuana regularly) were "none," "a few," "some," "most," or "all." For analysis purposes, the categories were dichotomized into a few or none versus some or more.

## 5.3 Trends in Drug Attitudes and Beliefs, and Intentions about Use of Marijuana among 12½- to 18-Year-Old Nonusers

This section covers trends in intentions about trial use, attitudes and beliefs, perceived social norms, self-efficacy about use, and perceptions of other kids' use across NSPY waves. The trends are broken out by age. The section also discusses the evidence for diversity in trends across various subgroups.

All indices are scaled so that a higher score indicates stronger anti-marijuana attitudes, beliefs, and intentions.

### 5.3.1 Intentions About Marijuana Trial Use by Age and by Year

As shown in Table 5-A, over the entire 2000[4] to 2004 period there is no statistically significant change for the full 12½- to 18-year-old sample, or for any of the age groups, in intentions to not use marijuana once or twice among prior nonusers. However, there is a statistically significant favorable change for the full 12½- to 18-year-old sample in intentions to not use marijuana once or twice among prior nonusers between 2002, the period of the campaign prior to the Marijuana Initiative, and 2004, following the Marijuana Initiative and Early Intervention Initiative. As indicated in the table, the change was greatest among older youth (Table 5-A and Detail Table 5-1). Not surprisingly, the overall trend is a rough mirror image of that seen for past-month marijuana use in Chapter 4; that is, intentions to not use went down slightly from 2000 to 2002, and up slightly from 2002 to 2004.

[3] This item had always been part of the general social norm index, but effects of this item by itself were not previously examined.

[4] Actual Wave 1 data collection commenced in late November 1999 and only a very small number of interviews were completed in 1999. Therefore, for presentation and discussion purposes only, all Wave 1 data are treated as having been collected between January and June 2000.

**Table 5-A. Trends in intentions to not use marijuana once or twice for nonusers, by youth age**

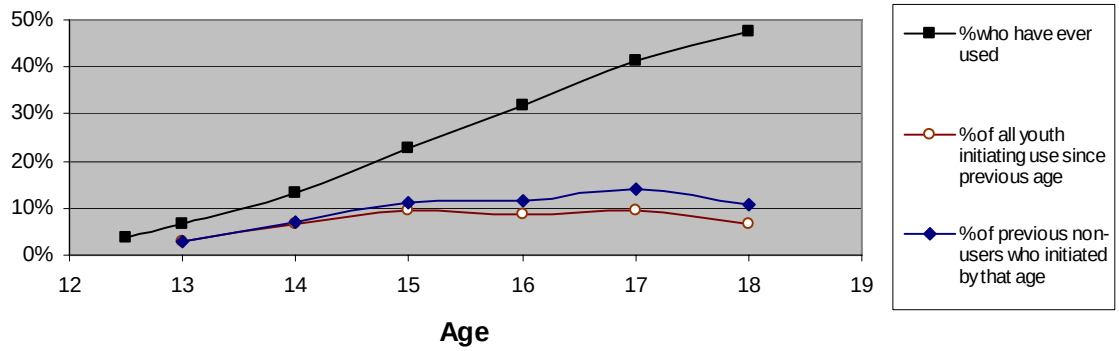
| | Percent of nonusers saying "definitely not" | | | | | | |
|---|---|---|---|---|---|---|---|
| Age groups | Year 2000 (%) | Year 2001 (%) | Year 2002 (%) | Year 2003 (%) | Year 2004 (Jan to Jun) (%) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
| 12½ to 13 | 91.3 | 89.3 | 90.6 | 90.5 | 91.8 | 0.4 (-1.9, 2.7) | 1.1 (-1.3, 3.6) |
| 14 to 15 | 84.6 | 83.8 | 83.8 | 83.7 | 85.2 | 0.6 (-3.5, 4.6) | 1.4 (-1.6, 4.4) |
| 16 to 18 | 85.0 | 83.5 | 82.5 | 85.3 | 86.2 | 1.2 (-2.4, 4.8) | 3.7 (-0.1, 7.5) |
| 14 to 16 | 84.7 | 82.7 | 83.7 | 84.2 | 85.6 | 0.9 (-2.2, 4.1) | 1.9 (-0.6, 4.3) |
| 14 to 18 | 84.8 | 83.6 | 83.2 | 84.5 | 85.7 | 0.9 (-1.6, 3.5) | **2.6* (0.3, 4.8)** |
| 12½ to 18 | 86.7 | 85.3 | 85.4 | 86.3 | 87.5 | 0.8 (-1.0, 2.6) | **2.1* (0.5, 3.7)** |

* Between-year difference significant at $p < 0.05$.

Note: The question asked was, "How likely is it that you will use marijuana, even once or twice, over the next 12 months? When we say marijuana, we mean marijuana or hashish."

The table provides two other pieces of information. First, most nonusing youth, regardless of age, do not intend to use marijuana even once or twice in the next year. These reported intentions are consistent with the reported behavior of the population. It is possible to compare the levels of lifetime use reported by each age level, and from that information estimate what the annual rate of initiation is among nonusers. The trend in lifetime use of marijuana and the proportion of prior nonusers who became users each year appear in Figure 5-B. For 12½- to 13-year-olds, the annual rate of marijuana initiation over the subsequent year is about 3 percent; for 14- to 15-year-olds it is 8 percent; and for 16- to 18-year-olds it is 8 percent.

**Figure 5-B. Use of Marijuana by Age**




Second, there was some age association in these responses, with 14- to 18-year-olds less likely to report "definitely not" than 12½- to 13-year-olds, but not a consistent decline when comparing 12½- to 13-year-olds with 14- to 15-year-olds and 16- to 18-year-olds. However, the age effects were understated in this table, because the table presents only the responses of nonusers. Consider, for example, the data for the first half of 2004 (i.e., Wave 9). Table 5-A shows that 92 percent of all 12½- to 13-year-old, 85 percent of all 14- to 15-year-old, and 86 percent of all 16- to 18-year-old nonusers said "definitely not" to this question in the first half of 2004. However, since 38 percent of 16- to 18-year-olds in Wave 9 were prior users, the numbers presented here are not reflective of the intentions of all youth in the age group. In Wave 9, among nonusers, 92 percent of all 12½- to 13-year-olds, 85 percent of all 14- to 15-year-olds, and 86 percent of all 16- to 18-year-olds reported "definitely not" to this question. Among both prior and nonusers in Wave 9, 87 percent of all 12½- to 13-year-olds, 74 percent of all 14- to 15-year-olds, and 62 percent of all 16- to 18-year-olds reported "definitely not" to this question. Among all youth there is a clear gradient of intentions by age.

## 5.3.2 Attitudes/Beliefs by Age and by Year

As seen in Table 5-B, the results for the Attitudes/Beliefs Index show that over the entire 2000 to 2004 period there was a statistically significant favorable change for the full sample, which was particularly strong for the 12½- to 13-year-old age group. When restricted to the 2002 to 2004 period, the trend results showed no significant changes overall or for any of the age subgroups (Detail Table 5-2).

**Table 5-B. Trends in Attitudes/Beliefs Index about marijuana use among nonusers by youth age**

| | Mean score on Attitudes/Beliefs Index | | | | | | |
|---|---|---|---|---|---|---|---|
| Age groups | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 (Jan to Jun) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
| 12½ to 13 | 124.77 | 118.40 | 130.41 | 131.05 | 134.27 | **9.50* (0.08, 18.91)** | 3.86 (-4.52, 12.24) |
| 14 to 15 | 100.79 | 102.20 | 102.72 | 103.83 | 104.60 | 3.82 (-6.88, 14.51) | 1.88 (-6.14, 9.91) |
| 16 to 18 | 92.54 | 84.99 | 95.07 | 95.16 | 99.37 | 6.82 (-5.30, 18.95) | 4.30 (-7.04, 15.65) |
| 14 to 16 | 98.27 | 95.58 | 101.91 | 101.23 | 103.17 | 4.89 (-3.96, 13.75) | 1.25 (-5.72, 8.23) |
| 14 to 18 | 96.99 | 94.05 | 98.94 | 99.42 | 101.87 | 4.88 (-3.07, 12.82) | 2.94 (-3.60, 9.47) |
| 12½ to 18 | 105.06 | 101.30 | 108.49 | 108.82 | 111.35 | **6.29* (0.36, 12.23)** | 2.86 (-2.36, 8.09) |

* Between-year difference significant at $p < 0.05$.

Note: The index is standardized so that 12- to 18-year-old nonusers had a mean and standard deviation of 100 at Wave 1.

Table 5-B does show a clear age gradient, despite the exclusion of marijuana users from the analysis, with older nonusers expressing weaker anti-marijuana sentiments than younger nonusers. For example, in the last wave of data collection (first half of 2004), 12½- to 13-year-olds had an index score of 134, 14- to 15-year-olds had an index score of 105, while 16- to 18-year-olds had an index score of 99.

## 5.3.3 Perceived Social Norms about Marijuana Use by Age and by Year

The results for the Perceived Social Norms Index showed no overall trends and no significant changes for any of the age subgroups, from 2000 to 2004 or from 2002 to 2004. It is worth noting, however, that the unfavorable trends reported in the Fifth Semi-Annual Report (Hornik et al., 2003) are gone. At that time, social norms against marijuana use showed a significant decline from 2000 to the first half of 2003 for the full sample, as well as for 12- to 13-year-olds, 14- to 16-year-olds, and 14- to 18-year-olds, and also a significant change in the 2002 to the first half of 2003 period for the 12- to 13-year-olds, also in the pro-drug direction. Table 5-C presents the current results with additional detail presented in Detail Table 5-3.

Once again, the age gradient is clear, with older nonusers exhibiting more pro-drug norms than younger nonusers. The 16- to 18-year-olds scored an average of 89 in the first half of 2004; the 14- to 15-year-olds scored 96, and the 12½- to 13-year-olds scored 135, even though marijuana users were excluded from the table.

**Table 5-C. Trends in Social Norms Index about marijuana use among nonusers by youth age**

| | Mean score on Social Norms Index | | | | | | |
|---|---|---|---|---|---|---|---|
| Age groups | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 (Jan to Jun) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
| 12½ to 13 | 134.94 | 126.80 | 137.41 | 133.71 | 134.83 | -0.11 (-9.16, 8.94) | -2.57 (-11.88, 6.73) |
| 14 to 15 | 96.87 | 99.77 | 94.53 | 97.77 | 95.54 | -1.32 (-12.43, 9.79) | 1.02 (-8.52, 10.56) |
| 16 to 18 | 83.75 | 72.19 | 82.30 | 73.69 | 89.44 | 5.69 (-7.18, 18.56) | 7.14 (-3.51, 17.78) |
| 14 to 16 | 93.01 | 88.68 | 93.20 | 90.22 | 92.75 | -0.27 (-8.43, 7.89) | -0.45 (-8.32, 7.42) |
| 14 to 18 | 90.83 | 86.72 | 88.49 | 85.51 | 92.36 | 1.53 (-5.70, 8.75) | 3.87 (-2.84, 10.59) |
| 12½ to 18 | 103.64 | 98.65 | 103.33 | 99.83 | 104.79 | 1.15 (-5.05, 7.34) | 1.46 (-3.89, 6.81) |

Note: The index is standardized so that 12- to 18-year-old nonusers had a mean and standard deviation of 100 at Wave 1.

## 5.3.4 Perceived Self-Efficacy to Refuse Marijuana Use by Age and by Year

The Perceived Self-Efficacy Index was the summed scale of five questions that dealt with the youths' confidence that they could turn down marijuana in a variety of circumstances. For the full sample, the change results for both periods are nonsignificant. However, the self-efficacy results suggest a 4-year change favorable to the Campaign among the youngest youth (12½- to 13-year-olds) although that reflects an up and down pattern across the years, and no significant increase since the period prior to the Marijuana Initiative. The 2003 report cited a favorable trend from 2002 to the first half of 2003 for one group, the 16- to 18-year-olds, but that was not sustained into 2004 (Table 5-D and Detail Table 5-4). Moreover, an unfavorable trend appeared in the 2002 to 2004 period for the primary target of the Marijuana and Early Intervention Initiatives, 14- to 16-year-olds.

The pro-drug age gradient seen in the prior measures was not seen in self-efficacy. In fact, older nonusers, 16- to 18-year-olds, rated their self-efficacy to refuse marijuana as higher than younger nonusers (12½- to 15-year-olds). It may be that nonusers who have successfully resisted marijuana into their late teens are more confident of their ability to continue resisting than are younger, less experienced teens.

## 5.3.5 Perceptions of Other Kids' Use of Marijuana by Age and by Year

The results provide no evidence of long-term or recent change in perception of other kids' use, as operationalized in this analysis. As seen in Table 5-E, there were no significant changes for the full sample of 12½- to 18-year-olds or any of the age subgroups for the 2000 to 2004 or 2002 to 2004 time periods.

**Table 5-D. Trends in Self-Efficacy Index among nonusers by youth age**

| | Mean score on Self-Efficacy Index | | | | | | |
|---|---|---|---|---|---|---|---|
| Age groups | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 (Jan to Jun) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
| 12½ to 13 | 101.09 | 91.85 | 106.99 | 99.13 | 109.47 | **8.37* (0.11, 16.64)** | 2.48 (-6.81, 11.76) |
| 14 to 15 | 95.96 | 105.88 | 101.52 | 102.81 | 92.05 | -3.91 (-15.57, 7.75) | -9.47 (-19.79, 0.84) |
| 16 to 18 | 111.82 | 103.04 | 110.43 | 120.05 | 113.45 | 1.63 (-8.87, 12.13) | 3.01 (-7.13, 13.16) |
| 14 to 16 | 99.12 | 102.33 | 104.69 | 107.07 | 95.97 | -3.14 (-12.62, 6.33) | **-8.71* (-16.54, -0.89)** |
| 14 to 18 | 103.26 | 104.54 | 105.93 | 111.58 | 103.21 | -0.05 (-7.56, 7.46) | -2.72 (-9.92, 4.48) |
| 12½ to 18 | 102.63 | 100.76 | 106.25 | 107.88 | 105.04 | 2.41 (-3.34, 8.16) | -1.21 (-7.17, 4.75) |

* Between-year difference significant at $p < 0.05$.

Note: The index is standardized so that 12- to 18-year-old nonusers had a mean and standard deviation of 100 at Wave 1.

**Table 5-E. Trends in perceptions of other kids' regular use of marijuana among nonusers by youth age**

| | Percent of nonusers saying "none" or "a few" | | | | | | |
|---|---|---|---|---|---|---|---|
| Age groups | Year 2000 (%) | Year 2001 (%) | Year 2002 (%) | Year 2003 (%) | Year 2004 (Jan to Jun) (%) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
| 12½ to 13 | 85.9 | 84.2 | 83.4 | 83.8 | 86.1 | 0.2 (-3.1, 3.4) | 2.7 (-0.8, 6.3) |
| 14 to 15 | 55.9 | 58.9 | 54.7 | 55.7 | 53.7 | -2.1 (-8.3, 4.0) | -0.9(-5.3, 3.4) |
| 16 to 18 | 35.8 | 39.6 | 36.9 | 36.2 | 38.2 | 2.4 (-2.6, 7.4) | 1.3 (-4.7, 7.3) |
| 14 to 16 | 51.2 | 53.3 | 50.2 | 49.2 | 48.6 | -2.6 (-8.1, 2.8) | -1.6 (-5.2, 2.0) |
| 14 to 18 | 46.5 | 49.7 | 45.8 | 45.7 | 45.6 | -0.9 (-5.1, 3.2) | -0.2 (-3.8, 3.4) |
| 12½ to 18 | 57.8 | 59.7 | 56.9 | 56.7 | 57.2 | -0.6 (-3.7, 2.5) | 0.3 (-2.3, 2.9) |

A steep age gradient is apparent throughout the Campaign, with the 12½- to 13-year-olds more likely to have reported "none" or "a few" than the 14- to 16-year-olds who were in turn more likely to have reported "none" or "a few" than the 16- to 18-year-olds. Recall that this sample includes only nonusing youth. The age gradient would likely be steeper still for all youth, because users are more likely to perceive that others also use, and users are more prevalent in the older age brackets.

## 5.3.6 Evidence for Diversity in Trends in Cognitions about Marijuana Use

The diversity effects analyses address two complementary questions. When there was not evidence of a significant overall trend, was there evidence of such a trend for a subgroup, in addition to the age subgroup effects described above? Alternately, when there was overall evidence of trend, did any subgroup show a different trend? Altogether, there are seven subgroups of three grouping variables (two sexes; three race/ethnicity groups; two risk groups[5]). These groups are examined across five

[5] The Detail Tables present trend information for higher and lower risk groups and sensation-seeking groups. The risk group variable incorporates the sensation-seeking variable as well as other predictors of drug use. To avoid redundancy of reporting, the text includes consideration of only the risk subgroups.

measures, making a total of 35 trend comparisons for each of the two periods (2000 to 2004 and 2002 to 2004). Consequently, there are 70 tests overall.

For the Attitudes/Beliefs Index, there was an overall favorable trend from 2000 to 2004. This effect was found for various subgroups in addition to the full sample; it was particularly strong for 12½- to 13-year-olds, boys, African Americans, and lower risk youth (Detail Table 5-4). No other outcome showed favorable trends in the full sample from 2000 to 2004; there was, however, a favorable change on the Self-Efficacy Index among 12½- to 13-year-olds. Only one unfavorable trend appeared from 2000 to 2004; that was on social norms for females (Detail Table 5-3).

In the period reflecting the more recent Campaign initiatives (2002 to 2004), there were statistically significant favorable trends on intentions to not use marijuana for the full sample. Changes were particularly notable among older youth, Whites, and lower risk-takers. No other outcome showed favorable trends in the full sample or any subgroups from 2002 to 2004. As reported above, one outcome—self-efficacy to refuse marijuana—showed an unfavorable trend among 14- to 16-year-olds. There were no other unfavorable trends in any of the five outcomes in the full sample or in any subgroups for the 2002 to 2004 period.

The second form of evidence—cross-sectional data—is considered next.

## 5.4 Cross-Sectional (Concurrent) Associations of Anti-Drug Advertising Exposure with Attitudes, Beliefs, and Intentions about Marijuana Use among 12½- to 18-Year-Old Nonusers

The next step in the analysis turns to the examination of associations of recalled exposure and the five major outcomes. In contrast to the trend data, the associational evidence speaks directly to the influence of individual exposure to the Campaign. Chapter 3 described the two types of exposure measures available for analysis. One, called general exposure, represents the sum of recalled exposure in recent months to anti-marijuana advertising in four different types of sources (television and radio, movies and videos, print media including newspapers and magazines, and outdoor media). Some of that exposure could have represented recall of ads directed to parents, and some recall of ads presented by other institutions. The specific exposure measure sums the recalled exposure to the youth-targeted individual Campaign television ads that had been on the air in the 60 days before the interview.

Table 5-F presents the exposure levels for the 12½- to 18-year-old nonuser population (i.e., across Waves 1 through 9), which is the focus of the analyses reported below. The very similar distribution of exposure for the full population can be found in Detail Tables 3-2 and 3-27.

**Table 5-F. Exposure per month reported by 12½- to 18-year-old nonusers**

| | <1 exposure (%) | 1 – 3 exposures (%) | 4 – 11 exposures (%) | 12+ exposures (%) |
|---|---|---|---|---|
| General exposure | 23.3 | | 24.8 | 51.9 |
| Specific exposure | 15.1 | 30.7 | 38.2 | 16.1 |

The general exposure measure displays substantially higher levels than does the specific exposure measures. For example, 52 percent of youth reported general exposure 12 or more times per month, but 16 percent reported specific exposure at that level. There are three factors that may contribute to

that difference: the general exposure measure includes more sources than the specific exposure measure; the general exposure measure allowed recall of advertising that was directed to other audiences, while the specific exposure measure focused only on television[6] ads directed to the youth; and finally, the general exposure measure may be less demanding since it did not require the respondent to claim that he or she had seen a specific ad. One might speculate, therefore, that it is at greater risk of inflated reporting. Since the two measures may capture different aspects of exposure, the evidence of association is presented for both of them, with the interpretation strengthened when both show the same pattern of effects.

The general exposure association tables compare estimates for the levels of the various outcome measures for youth who reported exposure less than 4 times per month, 4 to 11 times per month, and 12 or more times per month. There were very few youth who reported no exposure so they could not be considered separately. The specific exposure tables include four categories, since it was feasible to break out the lowest exposure group into those who recalled exposure less than 1 time per month and those who recalled ad exposure 1 to 3 times per month.

In the exposure analyses that follow, the estimates are corrected for the influence of confounder variables using the propensity scoring procedures described in Appendix C. They are what the estimates at each level of exposure would have been like had youth at each level been similar on measured confounder variables that were associated with exposure.

All cross-sectional analyses of exposure include data from all nine waves, but are restricted to 12½- to 18-year-olds who reported never using marijuana.[7] Each of the detail tables that present these associational results (Detailed Tables 5-33 through 5-42) also provides estimates for subgroups of that population defined by youth characteristics (age, gender, race/ethnicity, risk of marijuana use, and sensation-seeking).

Each table presents three different measures of potential Campaign effect. The first part of each table reports results for the association between a specified outcome (e.g., intention to not use marijuana even once or twice in the next year) and exposure for the entire sample from Wave 1 to Wave 9, called All Cases. The initial columns contain the mean level or percentage for the specified outcome for each of the three general or four specific exposure levels. The next column presents an estimate of an ordinal measure of association between exposure and outcome for all cases, a confidence interval for that measure, and an indication of whether the measure is statistically significant from zero. Significant results are printed in bold. The measure of association used is the gamma coefficient. Like the Pearson correlation coefficient, gamma varies from –1 to +1, with zero being no relationship.[8]

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[6] The measures of specific exposure include only reports of exposure to television advertising. During Wave 1, the measure of exposure to radio advertising excluded ads that were only audio versions of television ads, which were the great majority of the ads. It was not meaningful to include specific radio exposure with the television exposure in the specific exposure index for that wave. Although all radio ads were asked about in Waves 2 through 9, and the exposure to them is reported in Chapter 3, they were not included in the exposure index for the analyses reported in this chapter so that comparability across waves could be maintained. However, recall of television advertising was, in any case, much greater than recall of radio ads, so it is unlikely that this exclusion is substantially affecting the associations reported here (Detail Tables 3-2 and 3-17).

[7] These analyses treat all interviews as separate observations, although Waves 8 and 9 are followup to Waves 6 and 7, Waves 6 and 7 are followup to Waves 4 and 5, and the Waves 4 and 5 interviews were done with youth first interviewed in Waves 1 through 3. The lack of independence in the observations is taken into account in the calculation of standard errors from the sample through the replication methods employed with the WESVAR program.

[8] Unlike the Pearson correlation, gamma does not assume that both exposure and the outcome are measured as interval level variables. It is appropriately used to estimate associations between ordered variables. In reports prior to the Fifth Semi-Annual Report, this association was estimated with the Spearman rho coefficient for magnitude and the Jonkheere-Terpstra test for significance. Starting with the Fifth Semi-Annual Report, a change was made to a procedure for estimating both the

The second measure of a potential Campaign effect addresses the possible effect in the first six waves of NSPY, from the start of the Campaign until the end of 2002. The table presents the gamma coefficient for all youth for Waves 1 to 6, together with a confidence interval and indication of the association's statistical significance. The third measure is its counterpart and reports only on results from Waves 7 to 9. The comparison of these two groups allows for effective assessment of the period of the Marijuana and Early Intervention Initiatives, though it does not attempt to distinguish their separate impacts.

## 5.4.1 Overall Analyses of Five Cognitive Measures by Exposure

After controlling for confounders by propensity scoring, there were no statistically significant cross-sectional associations between either exposure measure and intentions to not use marijuana for the entire Wave 1 through Wave 9 population of 12½- to 18-year-old youth, nor for the separate Waves 1 to 6 and Waves 7 to 9 time periods (Table 5-G and Detail Tables 5-33 and 5-34). A positive gamma would be a favorable result for the Campaign; it would signal that youth with higher exposure were more likely to say "definitely not" when asked whether they were likely to use marijuana in the next year. Table 5-G presents the percentages of youth who reported "definitely not" for each of the exposure subgroups for the entire sample and the matching overall gamma. It also presents the Waves 1 to 6 and Waves 7 to 9 gammas, but without the parallel percentage information. The corresponding Detail Tables 5-33 and 5-34 present the parallel percentages of those who reported "definitely not" by exposure subgroups for the Waves 1 to 6 and Waves 7 to 9 samples as well.

**Table 5-G. Exposure per month and intentions to not use marijuana reported by 12½- to 18-year-old nonusers**

| Percent saying "definitely not" to likelihood of using marijuana even once or twice: average= 86.1% | | | | | | | |
|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases gamma (CI) | Waves 1-6 gamma (CI) | Waves 7-9 gamma (CI) |
| General exposure | 86.9 | | 85.1 | 86.2 | -0.01 (-0.06, 0.05) | -0.02 (-0.09, 0.05) | 0.03 (-0.03, 0.10) |
| Specific exposure | 87.5 | 86.3 | 85.0 | 87.4 | -0.02 (-0.07, 0.03) | -0.02 (-0.09, 0.05) | -0.01 (-0.09, 0.06) |

There was also no statistically significant cross-sectional association between general exposure and the Attitudes/Beliefs Index over the entire course of the Campaign or the pre-Marijuana Initiative waves (Table 5-H). There was, however, a significant favorable association during the period covered by the Marijuana and Early Intervention Initiatives (Waves 7 to 9). There was no corresponding relationship between specific exposure and the Attitudes/Beliefs Index (Detail Tables 5-35 and 5-36).

magnitude and the statistical significance of a single commonly reported coefficient, Goodman and Kruskal's gamma, in the context of the complex sample design. Using a single coefficient and statistical test provides a clearer presentation approach. Moreover, gamma was found to produce virtually identical inferences about the nature of the observed associations as the previous two-part procedure. The gamma coefficient is also used in this report, but with a modification from that used in the last two reports. In those reports, each exposure group was weighted up to represent the total population whereas in this report each exposure group is weighted up to represent only its proportion of the total population. With steady trends of the outcome measure over exposure levels, the revised gamma should be more sensitive to effects.

**Table 5-H. Exposure per month and Attitudes/Beliefs Index among 12½- to 18-year-old nonusers**

| Mean score on Attitudes/Beliefs Index: average = 106.6 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases gamma (CI) | Waves 1-6 gamma (CI) | Waves 7-9 gamma (CI) |
| General exposure | 104.53 | | 105.33 | 108.65 | 0.02 (-0.01, 0.04) | 0.00 (-0.03, 0.03) | **0.05* (0.02, 0.08)** |
| Specific exposure | 109.94 | 105.13 | 103.26 | 112.12 | 0.00 (-0.02, 0.02) | 0.00 (-0.03, 0.03) | 0.01 (-0.02, 0.04) |

* Gamma significant at $p < 0.05$.

The results for the cross-sectional association of Campaign ad exposure and the Social Norms Index are presented in Table 5-I. There were no significant overall effects of either measure of exposure for youth aged 12½ to 18 for any of the three time periods. (See also Detail Tables 5-37 and 5-38.)

**Table 5-I. Exposure per month and Social Norms Index among 12½- to 18-year-old nonusers**

| Mean score on Social Norms Index: average =101.7 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases gamma (CI) | Waves 1-6 gamma (CI) | Waves 7-9 gamma (CI) |
| General exposure | 100.60 | | 100.42 | 102.34 | 0.00 (-0.03, 0.02) | -0.01 (-0.04, 0.02) | 0.01 (-0.02, 0.05) |
| Specific exposure | 111.56 | 100.42 | 101.12 | 103.26 | -0.02 (-0.04, 0.01) | -0.03 (-0.06, 0.01) | -0.01 (-0.04, 0.03) |

The cross-sectional results for the self-efficacy scale were essentially consistent with the Social Norms Index. There were no statistically significant cross-sectional associations of general exposure and the Self-Efficacy to Refuse Marijuana Index, of specific exposure and Self-Efficacy over the entirety of the Campaign, or in Waves 1 to 6, or in Waves 7 to 9 (Table 5-J and Detail Tables 5-39 and 5-40).

**Table 5-J. Exposure per month and Self-Efficacy to Refuse Marijuana Index among 12½- to 18-year-old nonusers**

| Mean score on Self-Efficacy Index: average =104.5 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases gamma (CI) | Waves 1-6 gamma (CI) | Waves 7-9 gamma (CI) |
| General exposure | 101.70 | | 102.71 | 107.47 | 0.03 (-0.00, 0.07) | 0.03 (-0.01, 0.07) | 0.03 (-0.02, 0.09) |
| Specific exposure | 106.44 | 102.94 | 103.78 | 110.26 | 0.02 (-0.01, 0.05) | 0.02 (-0.02, 0.07) | 0.01 (-0.03, 0.06) |

The cross-sectional results for perceptions of other kids' regular use of marijuana are presented in Table 5K (Detail Tables 5-41 and 5-42). In contrast to the other cognitive outcomes, the tests of this variable yielded a consistently significant unfavorable association across the entire Campaign period and for both measures of exposure. Only the Waves 1 to 6 general exposure test was nonsignificant, but the gamma was still negative and sizable, and the confidence interval just barely crossed zero. The distribution of percentages across exposure categories was strictly monotonic for both exposure types, in line with the significant all-cases gammas.

**Table 5-K. Exposure per month and perceptions of other kids' regular use of marijuana among 12½- to 18-year-old nonusers**

| | Percent saying "none" or "a few" | | | | | | |
|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases gamma (CI) | Waves 1-6 gamma (CI) | Waves 7-9 gamma (CI) |
| General exposure | 61.1 | | 57.1 | 56.5 | **-0.06* (-0.10, -0.02)** | -0.05 (-0.10, 0.00) | **-0.07* (-0.13, -0.01)** |
| Specific exposure | 63.7 | 59.3 | 56.5 | 56.4 | **-0.07* (-0.12, -0.03)** | **-0.06* (-0.11, -0.00)** | **-0.10* (-0.17, -0.03)** |

* Gamma significant at $p < 0.05$.

In conclusion then, the tables provide little supportive evidence that concurrent Campaign exposure is associated either favorably or unfavorably with any of the original four cognitive outcomes (intentions, attitudes/beliefs, social norms, and self-efficacy) for the full sample of 12½- to 18-year-olds. The one significant effect was the favorable association between general exposure and the Attitudes/Beliefs Index in the Wave 7 to Wave 9 period. However, given that specific exposure expressly captures recalled exposure to the youth-targeted individual Campaign television ads, whereas general exposure is much broader,[9] it follows that the Marijuana and Early Intervention Initiatives—if effective—would more likely have changed associations with specific exposure than with general exposure. It is questionable, therefore, whether an association with only general exposure reflects Campaign influence. Moreover, neither of the other two predictors of intentions, nor intentions itself, showed any association. The absence of effects suggests that both for the overall Campaign, and specifically for the period of the Marijuana and Early Intervention Initiatives, youth exposure to advertising has not had a statistically significant impact on these outcomes for 12½- to 18-year-olds as a whole.

In contrast, the newly added variable—perceptions of other kids' use of marijuana—shows a significant unfavorable association that is consistent across the entire Campaign period and both measures of exposure. However, because of the vulnerability of cross-sectional associations to reverse causation (see Section 5.1), it is premature at this point to claim the Campaign caused the association. This issue is examined further in the delayed-effects analyses given in Section 5.5.

The next section presents whether, apart from overall effects, there is any evidence of association for subgroups of the population.

## 5.4.2 Evidence of Diversity of Associations by Age of Youth, Risk Group, Gender, and Race/Ethnicity

In examining the diversity of associations, there are nine subgroups of four grouping variables (two sexes; three race/ethnicity groups; two risk groups[10], and two nonoverlapping age groups (12½ to 13 and 14 to 18). These groups were examined across three periods (all cases, Waves 1 to 6, Waves 7 to 9) and two exposure types (general and specific). Consequently, there are 54 (9x3x2) tests for each of

[9] As noted previously, general exposure covers anti-marijuana advertising in four different types of sources (television and radio, movies and videos, print media including newspapers and magazines, and outdoor media). Some of that exposure could have represented recall of ads directed to parents, and some recall of ads presented by other institutions.

[10] The Detail Tables present trend information for higher and lower risk groups and sensation-seeking groups. The risk group variable incorporates the sensation-seeking variable as well as other predictors of drug use. To avoid redundancy of reporting, the text includes consideration of only the risk subgroups.

the five outcome measures for a total of 270 tests. These are summarized here by outcome, based on Detail Tables 5-33 through 5-42.

**Intentions to not use marijuana at all in the next year.** As noted above (Table 5-G), there were no significant associations in the all-cases sample or Waves 1 to 6 and 7 to 9 subsamples. There also were no significant associations in any subgroups.

**Attitudes and beliefs about marijuana.** As noted above (Table 5-H), there was an overall favorable association with general exposure for the period of Waves 7 to 9, which also included some subgroup effects in the same direction; the effect was particularly pronounced for older youth, boys, Whites and Hispanics, and lower risk youth. Over the full Campaign (all cases), there were favorable associations with general exposure among Hispanics only. There were no subgroup effects for specific exposure.

**Perceived social norms.** Over the full Campaign (all cases), there was an unfavorable association with specific exposure for high sensation-seekers. There were no subgroup effects for general exposure.

**Self-efficacy to refuse marijuana.** Over the full Campaign and for Waves 1 to 6 and 7 to 9 separately, there were no overall significant associations with either general or specific exposure. Over the full Campaign and in the Waves 7 to 9 period, there were favorable associations with general exposure among the higher risk youth. Over the full Campaign and in the Waves 1 to 6 period, there were favorable associations with specific exposure among 12½- to 13-year-olds.

**Perceptions of other kids' use.** In light of the consistent unfavorable associations across the entire Campaign period and both measures of exposure reported above (Table 5-K), it is not surprising that the unfavorable associations extend across most major subgroups of age, sex, race/ethnicity, and risk. There were no instances of significant favorable associations among the 54 subgroup tests for this outcome.

In sum, there were 216 subgroup tests covering the four original cognitive outcomes. Of these (excluding those associated with the overall general exposure effect on attitudes and beliefs), fewer than 10 were significant, about equally split between favorable and unfavorable. Given the large number of tests, the small number of significant results, and the inconsistent direction of those results, chance would seem the most likely explanation. The results for the newly added outcome, perceptions of other kids' use, are clearly different. Significant effects extended to most major subgroups, and all of these subgroup effects were, like the overall effect, in an unfavorable direction (higher Campaign exposure associated with increased perceptions of other kids' marijuana use).

The third form of evidence—longitudinal data—is considered next.

## 5.5 Longitudinal Associations of Anti-Drug Advertising Exposure with Attitudes, Beliefs, and Intentions about and Initiation of Marijuana Use among 12½- to 18-Year-Old Nonusers

This section presents the results of analyses of the delayed effect of exposure at one round of data collection on outcomes at the following round. The outcomes are the five cognitive measures as well as actual initiation of marijuana use. The tables below present the overall average delayed effects combining all three of the one-round delayed effect analyses (so a youth who was interviewed at Rounds 1, 2, 3, and 4, would provide three cases for the analysis, Round 1 to Round 2, Round 2 to

Round 3, and Round 3 to Round 4) as well as the delayed effects by round or wave. It is already known (as reported in the Fifth Semi-Annual Report) that the Round 1 to 2 delayed effects analyses did not show effects favorable to the Campaign, and possibly indicated unfavorable effects.

There is particular interest in examining whether there is evidence of a Wave 7 to 9 delayed effect, because Wave 7 was the first complete wave covering exposure to the Marijuana Initiative. The 2003 Report of Findings featured focused analysis of the Marijuana Initiative, including trend data and cross-sectional association data, but data to support a delayed effect analysis of the Marijuana Initiative were not available until Wave 9. The delayed effects for the Round 3 to Round 4 are therefore divided into two components, Wave 6 to 8 and Wave 7 to 9, and these components are presented separately in the tables. In view of the redirection of the Campaign between Waves 6 and 7, it is more appropriate to give the separate wave results than the combined results for Round 3 to Round 4. However, it should be noted that the Wave 6 to 8 analyses are based on a relatively small sample size and hence the estimates have relatively large sampling errors.

## 5.5.1 Overall Analyses of Five Cognitive Measures by Exposure

There was a significant unfavorable delayed-effect association between general exposure and intentions to not use marijuana when the analysis is pooled across all three exposure rounds. Breaking this effect out by round and wave, as in Table 5-L, indicates that it is entirely driven by exposure during the interview in Round 1, which spanned from January 2000 through June 2001. There is no evidence that subsequent periods of general exposure, either before or after the Marijuana Initiative began, led to similar effects. Specific exposure gammas for the Round 1 exposure period were also in an unfavorable direction, although they did not quite reach statistical significance. (See also Detail Tables 5-43 and 5-44.)

**Table 5-L. Delayed effects of exposure on intentions to not use marijuana reported by 12½- to 18-year-old nonusers**

| | Percent saying "definitely not" | | | | Gamma (CI) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases | Round 1 →Round 2 | Round 2 →Round 3 | Wave 6 →Wave 8 | Wave 7 →Wave 9 |
| General exposure | 82.3 | | 78.2 | 78.4 | **-0.07 * (-0.13, -.01)** | **-0.16* (-0.27, -0.06)** | 0.01 (-0.07, 0.9) | 0.03 (-0.10, 0.15) | -0.02 (-0.15, 0.10) |
| Specific exposure | 84.0 | 78.8 | 77.6 | 78.5 | -0.02 (-0.07, 0.03) | -0.05 (-0.13,0.03) | 0.01 (-0.06,0.09) | 0.00 (-0.13,0.13) | -0.01 (-0.12,0.10) |

* Gamma significant at $p < 0.05$.

There was no significant delayed effect of either exposure type on the Attitudes/Beliefs Index overall. In addition, the effect did not reach significance in any individual round of delayed-effect associations (Table 5-M and Detail Tables 5-45 and 5-46).

**Table 5-M. Delayed effects of exposure on Attitudes/Beliefs Index among 12½- to 18-year-old nonusers**

| | Mean score on Attitudes/Beliefs Index | | | | Gamma (CI) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases | Round 1 →Round 2 | Round 2 →Round 3 | Wave 6 →Wave 8 | Wave 7 →Wave 9 |
| General exposure | 100.29 | | 91.81 | 95.24 | -0.01 (-0.04, 0.02) | -0.03 (-0.08, 0.02) | 0.02 (-0.03, 0.07) | -0.02 (-0.09, 0.08) | 0.01 (-0.05, 0.07) |
| Specific exposure | 105.57 | 94.75 | 91.29 | 90.40 | -0.02 (-0.04, 0.00) | -0.01 (-0.05, 0.02) | 0.00 (-0.04, 0.03) | -0.04 (-0.11, 0.03) | -0.03 (-0.08, 0.02) |

For the Social Norms Index, there was no overall delayed effect of general exposure, but there was a just statistically significant unfavorable effect for the Round 1 exposure period (Table 5-N and Detail Tables 5-47 and 5-48). With specific exposure the unfavorable effects were more pervasive. The overall effect was statistically significant and—unlike the case of general exposure and intentions in Table 5-L—was not driven only by an earlier phase of the Campaign. In particular, the negative delayed-effect gamma for Wave 7, the first full wave of the Marijuana Initiative, was statistically significant and sizable.

**Table 5-N. Delayed effects of exposure on Social Norms Index among 12½- to 18-year-old nonusers**

| | Mean score on Social Norms Index | | | | Gamma (CI) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases | Round 1 →Round 2 | Round 2 →Round 3 | Wave 6 →Wave 8 | Wave 7 →Wave 9 |
| General exposure | 95.33 | | 87.02 | 87.68 | -0.03 (-0.06, 0.00) | **-0.06* (-0.12, -0.01)** | 0.02 (-0.03, 0.06) | -0.03 (-0.11, 0.05) | -0.02 (-0.07, 0.03) |
| Specific exposure | 107.06 | 91.30 | 83.30 | 76.86 | **-0.05* (-0.08, -0.02)** | -0.04 (-0.08, 0.00) | **-0.05* (-0.10, -0.00)** | -0.04 (-0.11, 0.02) | **-0.10* (-0.15, -0.04)** |

* Gamma significant at $p < 0.05$.

There was no statistically significant delayed effect of either exposure type on self-efficacy to refuse marijuana. As with intentions, the specific exposure gamma for the Round 1 exposure period was unfavorable, though did not quite reach statistical significance (the confidence interval just barely crossed zero) (Table 5-O and Detail Tables 5-49 and 5-50).

**Table 5- O. Delayed effects of exposure on Self-Efficacy to Refuse Marijuana Index among 12½- to 18-year-old nonusers**

| | Mean score on Self-Efficacy Index | | | | Gamma (CI) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases | Round 1 →Round 2 | Round 2 →Round 3 | Wave 6 →Wave 8 | Wave 7 →Wave 9 |
| General exposure | 97.99 | | 95.49 | 98.21 | -0.01 (-0.05, 0.03) | -0.05 (-0.10, 0.01) | 0.02 (-0.04, 0.09) | -0.01 (-0.09, 0.07) | 0.03 (-0.04, 0.10) |
| Specific exposure | 107.30 | 95.18 | 96.36 | 91.37 | 0.00 (-0.04, 0.03) | -0.03 (-0.08, 0.03) | 0.01 (-0.06, 0.07) | 0.09 (-0.01, 0.19) | -0.06 (-0.14, 0.01) |

There were no significant delayed effects of general exposure on perceptions of other kids' regular use of marijuana (Table 5-P and Detail Tables 5-53 and 5-54). There were, however, pervasive unfavorable effects of specific exposure on this outcome (although the effect of Round 2 exposure is small). The more that youth were exposed to the Campaign the more likely they were to develop a belief subsequently that other youth were users. That this result directly mirrors the effects on the Social Norms Index presented above is not entirely surprising given that perceptions of other kids' regular use is a component of the Social Norms Index. However, the same parallelism had not been observed in the cross-sectional effects described in Section 5.4. There were no statistically significant cross-sectional associations between either exposure measure and the Social Norms Index at any point in the Campaign. In contrast, significant unfavorable associations between both exposure types and perceptions of other kids' use were pervasive. As with social norms, the negative delayed-effect gamma for Wave 7, the first full wave of the Marijuana Initiative, was particularly large.

**Table 5-P. Delayed effects of exposure on perceptions of other kids' regular use of marijuana among 12½- to 18-year-old nonusers**

| | Percent saying "none or few" | | | | Gamma (CI) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases | Round 1 →Round 2 | Round 2 →Round 3 | Wave 6 →Wave 8 | Wave 7 →Wave 9 |
| General exposure | 55.1 | | 54.7 | 52.9 | -0.03 (-0.08, 0.02) | -0.01 (-0.09, 0.08) | -0.05 (-0.11, 0.01) | -0.10 (-0.22, 0.01) | -0.01 (-0.10, 0.08) |
| Specific exposure | 63.2 | 54.6 | 51.1 | 50.4 | **-0.06* (-0.11, -0.02)** | **-0.08* (-0.15, -0.00)** | -0.04 (-0.10, 0.01) | -0.03 (-0.14, 0.07) | **-0.12* (-0.23, -0.01)** |

* Gamma significant at $p < 0.05$.

## 5.5.2 Overall Analyses of Initiation[11] of Marijuana Use by Exposure

Beyond the question of delayed effects on nonusers' cognitive outcomes about marijuana, there is the question of whether the Campaign influenced actual initiation of marijuana use. Summary results are shown in Table 5Q (see also Detail Tables 5-51 and 5-52). There were no statistically significant effects of general exposure, either overall or by round, though the direction of the gamma was unfavorable throughout (although the gamma for Round 2 exposure is very small). For specific exposure, there was no overall effect, but there was a statistically significant and sizable unfavorable effect of the Wave 7 exposure period, which corresponds with the Marijuana Initiative.

**Table 5-Q. Delayed effects of exposure on use of marijuana among 12½- to 18-year-old nonusers**

| | Percent initiating use | | | | Gamma (CI) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases | Round 1 →Round 2 | Round 2 →Round 3 | Wave 6 →Wave 8 | Wave 7 →Wave 9 |
| General exposure | 10.7 | | 11.2 | 12.5 | 0.07 (-0.01, 0.15) | 0.08 (-0.05, 0.20) | 0.01 (-0.11, 0.13) | 0.14 (-0.03, 0.32) | 0.08 (-0.11, 0.28) |
| Specific exposure | 10.8 | 12.6 | 11.5 | 13.2 | -0.02 (-0.13, 0.08) | 0.02 (-0.09, 0.14) | 0.00 (-0.12, 0.12) | 0.03 (-0.16, 0.10) | **0.20* (0.04, 0.35)** |

* Gamma significant at $p < 0.05$.

## 5.5.3 Evidence of Diversity of Delayed-Effect Associations by Age of Youth, Risk Group, Gender, and Race/Ethnicity

In examining the diversity of delayed-effect associations, there are nine subgroups of four grouping variables (two sexes; three race/ethnicity groups; two risk groups, and two nonoverlapping age groups (12½ to 13 and 14 to 18). These groups are examined across five periods (all cases, Round 1 to Round 2, Round 2 to Round 3, Wave 6 to Wave 8, and Wave 7 to Wave 9) and two exposure types (general and specific). The many subgroup associations are summarized here by outcome, based on Detail Tables 5-43 through 5-54.

**Intentions to not use marijuana at all in the next year.** As noted above (Table 5-L), there was a significant unfavorable delayed-effect association with general exposure for the pooled sample, which appears to have been entirely driven by exposure during interview Round 1 (January 2000 through

[11] A youth is deemed to have initiated use of marijuana if the youth responded "No" to the question "Have you ever, even once, used marijuana?" at one round and responded "Yes" to the same question at the following round.

June 2001). In contrast, there was a significant favorable effect of general exposure on Hispanics for Wave 7 to Wave 9. The direction of the overall delayed effects from pooled-round and Round 1 recalled specific exposure period were also unfavorable, though falling short of statistical significance. The effects did reach statistical significance among Hispanics, however, for both these periods. There also were unfavorable delayed effects of specific exposure among 12½- to 13-year-olds for the pooled rounds and Wave 7 to Wave 9 (Detail Tables 5-43 and 5-44).

**Attitudes and beliefs about marijuana.** As noted above (Table 5-M), there were no statistically significant delayed effects on attitudes and beliefs for either exposure measure in the pooled sample or in any round. For general exposure, there was a significant unfavorable association among 14- to 16-year-olds for Round 1 to Round 2 and a significant favorable association among boys for Round 2 to Round 3. For specific exposure, there was an unfavorable association among lower risk youth and among 12½- to 13-year-olds for the pooled rounds (Detail Tables 5-45 and 5-46).

**Perceived social norms.** As noted above (Table 5-N), there was no overall delayed effect of general exposure on the social norms index, but there was a statistically significant unfavorable effect for the Round 1 exposure period. There was also an unfavorable delayed effect of general exposure for 12½- to 13-year-olds and Hispanics pooled across rounds, as well as for lower risk youth in Wave 7 to Wave 9. With respect to the measure of specific exposure, there was an unfavorable effect throughout the Campaign (though barely falling short of significance in the Round 1 to Round 2 exposure period). The strongest unfavorable effect of specific exposure was for Wave 7 to Wave 9, the first full wave of the Marijuana Initiative. There were many statistically significant subgroup associations with specific exposure, but with one exception all were consistent with the overall associations reported above (Detail Tables 5-47 and 5-48). The single exception was the strong unfavorable Wave 7 to Wave 9 delayed effect association between specific exposure and perceived social norms for girls accompanied by a nonsignificant association for boys.

**Self-efficacy to refuse marijuana.** As noted above (Table 5-O), there were no statistically significant delayed effects of either exposure measure on self-efficacy to refuse marijuana. With respect to subgroups, there were significant unfavorable effects of general exposure for lower risk youth in the pooled sample and in Round 1 to Round 2, and for girls in Round 1 to Round 2. In contrast, there were favorable effects of general exposure among higher risk youth in Round 2 to Round 3 and for Hispanics in Wave 7 to Wave 9. There was one statistically significant favorable and two unfavorable delayed-effects associations of specific exposure on youth self-efficacy to refuse marijuana. The association was favorable for higher risk youth in Wave 7 to Wave 9, unfavorable for White youth in Round 1 to Round 2, and just statistically significant and unfavorable for lower risk youth in Wave 7 to Wave 9 (Detail Tables 5-49 and 5-50).

**Perceptions of other kids' use.** As noted above (Table 5-P), there was not a significant delayed effect of general exposure overall on perceptions of other kids' regular use of marijuana. There were statistically significant unfavorable effects among 12½- to 13-year-olds in the pooled sample and in Round 2 to Round 3, and among Hispanics and lower risk youth in both the pooled sample and Round 3 to Round 4 (Table 5-P and Detail Tables 5-53 and 5-54). There were consistent statistically significant unfavorable effects of specific exposure on this outcome across all Rounds (Round 2 to Round 3 excepted), most demonstrably for Wave 7 to Wave 9, the first full wave of the Marijuana Initiative. The unfavorable associations extend across several subgroups. There were no instances of significant favorable associations among the various subgroup tests for this outcome.

**Initiation of use of marijuana.** As noted above (Table 5-Q and Detail Tables 5-51 and 5-52), there is a significant unfavorable effect of specific exposure for the Wave 7 exposure period, which corresponds with the Marijuana Initiative. That effect was particularly pronounced among 12½- to 13-year-olds, girls, Whites, and high sensation-seekers. With respect to additional subgroup effects, there were unfavorable effects of general exposure for 14- to 16-year-olds and Whites, when pooled across rounds.

### 5.5.4 Can the Results from the Delayed-effects Analysis be Due to a Statistical Artifact?

There are several threats to a causal claim that the Campaign in general, and the Marijuana Initiative in particular, produced an unfavorable effect. The first is that the unfavorable findings in the delayed-effects analysis are an artifact of the complex propensity scoring methodology used to adjust for confounder effects, or possibly an error in its application. Both possibilities can be investigated by rerunning the analyses with the confounder adjustments removed.[12]

Comparisons of adjusted and unadjusted gammas for delayed effects of exposure for the five cognitive measures, plus initiation of use, are presented in Table 5-R for all cases, Wave 6 to Wave 8, and Wave 7 to Wave 9. Across both exposure measures, all associations that were statistically significant when adjusted for confounders remained significant when unadjusted, i.e., when confounder controls were removed. Further, several associations that were nonsignificant when adjusted became statistically significant when unadjusted, always in an unfavorable direction. In sum, these results make it clear that the unfavorable delayed-effect associations did not result from the procedures used to adjust for confounders. Rather, there is a definite pattern showing that the unadjusted associations are more unfavorable than the adjusted ones, including the effect of specific exposure during Wave 7 (when the Marijuana Initiative was fully implemented) on initiation of use during Wave 9.

In view of the sizable unfavorable adjusted effect of Wave 7 specific exposure on initiation of use in Wave 9, all of the Wave 7 to Wave 9 delayed effects for specific exposure were examined in greater detail. Table 5-S presents the specific exposure distributions of each outcome for Wave 7 to Wave 9, with and without confounder controls, along with their associated gammas. Without the confounder adjustments, all six outcomes showed a strictly monotonic dose–response relationship with exposure level in an unfavorable direction. With confounder adjustment, the monotonicity was either attenuated ( self-efficacy, perceptions, and initiation of use) or it was no longer present (intentions to not use, attitudes/beliefs, and social norms). Figure 5-C illustrates the difference between the adjusted and unadjusted slopes for initiation of use, computed by regressing initiation on exposure. As shown, the unadjusted slope is steeper.

[12]The survey weights that are needed to produce population estimates are retained.

**Table 5-R. Comparison of delayed effects of exposure per month on all outcomes reported by 12½- to 18-year-old nonusers, with and without confounder adjustment**

| Outcome | Exposure measure | All cases gamma (CI)[1] | | Wave 6→8 gamma (CI) | | Wave 7→Wave 9 gamma (CI) | |
|---|---|---|---|---|---|---|---|
| | | Adjusted | Unadjusted | Adjusted | Unadjusted | Adjusted | Unadjusted |
| Intentions not to use | General exposure | **-0.07 * (-0.13, -0.01)** | **-0.14* (-0.19, -0.08)** | -0.02 (-0.15, 0.10) | -0.03 (-0.14, 0.09) | -0.02 (-0.15, 0.10) | **-0.12* (-0.22, -0.01)** |
| | Specific exposure | -0.02 (-0.07, 0.03) | **-0.07* (-0.11, -0.04)** | 0.00 (-0.13, 0.13) | -0.06 (-0.18, 0.06) | -0.01 (-0.12, 0.10) | **-0.09* (-0.17, -0.01)** |
| Attitudes/ beliefs | General exposure | -0.01 (-0.04, 0.02) | **-0.04* (-0.06, -0.01)** | 0.00 (-0.03, 0.03) | -0.02 (-0.07, 0.03) | 0.01 (-0.05, 0.07) | -0.02 (0.06, 0.03) |
| | Specific exposure | -0.02 (-0.04, 0.00) | **-0.04* (-0.05, -0.02)** | -0.04 (-0.11, 0.03) | -0.04 (-0.10, 0.02) | -0.03 (-0.08, 0.02) | **-0.04* (-0.08, -0.00)** |
| Social norms | General exposure | -0.03 (-0.06, 0.00) | **-0.08* (-0.11, -0.05)** | -0.03 (-0.11, 0.05) | -0.04 (-0.11, 0.03) | -0.02 (-0.07, 0.03) | **-0.07* (-0.12, -0.03)** |
| | Specific exposure | **-0.05* (-0.08, -0.03)** | **-0.09* (-0.11, -0.06)** | -0.04 (-0.11, 0.02) | **-0.08* (-0.14, -0.02)** | **-0.10* (-0.15, -0.04)** | **-0.14 * (-0.19, -0.09)** |
| Self efficacy | General exposure | -0.01 (-0.05, 0.03) | -0.01 (-0.05, 0.02) | 0.01 (-0.09, 0.07) | 0.02 (-0.06, 0.09) | 0.03 (-0.04, 0.10) | -0.01 (-0.07, 0.05) |
| | Specific exposure | 0.00 (-0.04, 0.03) | -0.03 (-0.06, 0.00) | 0.09 (-0.01, 0.19) | 0.06 (-0.03, 0.14) | -0.06 (-0.14, 0.01) | **-0.10* (-0.16, -0.03)** |
| Perceptions of others' use | General exposure | -0.03 (-0.08, 0.02) | **-0.12* (-0.16, -0.08)** | -0.10 (-0.22, 0.01) | 0.15 (-0.01, 0.31) | -0.01 (-0.10, 0.08) | **-0.13* (-0.21, 0.04)** |
| | Specific exposure | **-0.06* (-0.11, -0.02)** | **-0.12* (-0.15, -0.08)** | -0.03 (-0.14, 0.07) | **-0.15* (-0.26, -0.10)** | **-0.12* (-0.23, -0.01)** | **-0.18* (-0.26, -0.10)** |
| Initiation of use | General exposure | 0.07 (-0.01, 0.15) | **0.10* (0.03, 0.18)** | 0.14 (-0.03, 0.32) | 0.15 (-0.01, 0.31) | 0.08 (-0.11, 0.28) | 0.15 (-0.02, 0.33) |
| | Specific exposure | -0.02 (-0.13, 0.08) | 0.03 (-0.04, 0.09) | -0.03 (-0.16, 0.10) | 0.02 (-0.13, 0.16) | **0.20* (0.04, 0.35)** | **0.25* (0.13, 0.37)** |

* Gamma significant at $p < 0.05$.

[1] A positive gamma represents a favorable effect, except in the case of "percent initiating use of marijuana," where a positive gamma represents an unfavorable effect (higher exposure associated with higher initiation rate).

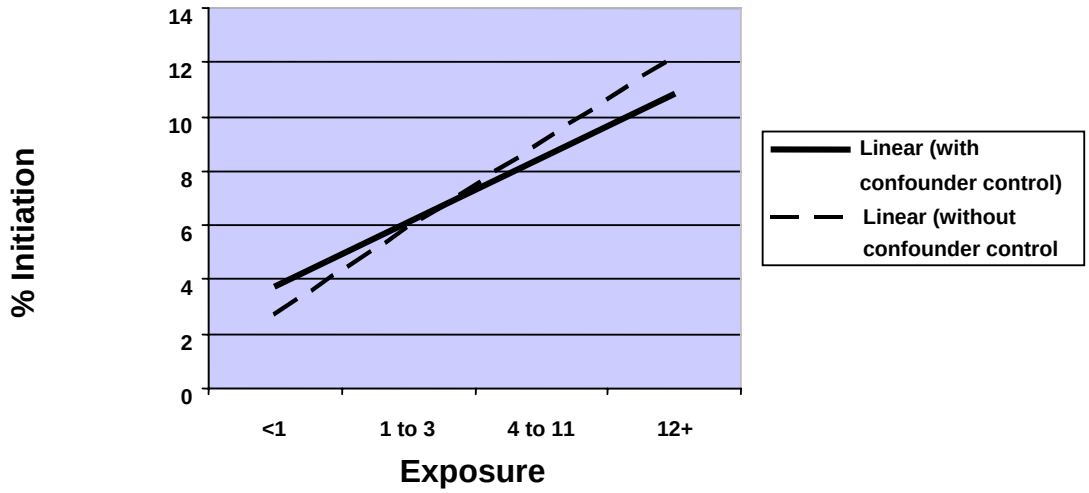
**Table 5-S. Delayed effects of specific exposure on all outcomes among 12½- to 18-year-old nonusers for Wave 7 to 9, with and without confounder adjustment**

| Outcome | Confounder adjustment | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | Gamma (CI)[1] |
|---|---|---|---|---|---|---|
| Intentions not to use | Adjusted | 87.8 | 80.9 | 82.8 | 84.5 | -0.01(-0.12, 0.10) |
| | Unadjusted | 89.1 | 83.5 | 82.8 | 81.0 | **-0.09* (-0.17, -0.01)** |
| Attitudes/ beliefs | Adjusted | 115.58 | 98.90 | 101.20 | 93.81 | -0.03 (-0.08, 0.02) |
| | Unadjusted | 117.67 | 107.07 | 101.00 | 95.52 | **-0.04* (-0.08, -0.00)** |
| Social norms | Adjusted | 126.96 | 97.34 | 99.36 | 89.92 | **-0.10* (-0.15, -0.04)** |
| | Unadjusted | 128.37 | 107.91 | 99.15 | 80.05 | **-0.14 * (-0.19, -0.09)** |
| Self efficacy | Adjusted | 104.86 | 102.74 | 96.35 | 93.44 | -0.06 (-0.14, 0.01) |
| | Unadjusted | 110.68 | 106.80 | 96.50 | 89.08 | **-0.10* (-0.16, -0.03)** |
| Perception of others' use | Adjusted | 70.4 | 58.5 | 58.5 | 54.2 | **-0.12* (-0.23, -0.01)** |
| | Unadjusted | 68.2 | 62.3 | 58.6 | 49.7 | **-0.18* (-0.26, -0.10)** |
| Initiation of use | Adjusted | 2.0 | 8.4 | 8.5 | 9.7 | **0.20* (0.04, 0.35)** |
| | Unadjusted | 1.7 | 7.4 | 8.5 | 12.1 | **0.25* (0.13, 0.37)** |

* Gamma significant at $p < 0.05$.

[1] A positive gamma represents a favorable effect, except in the case of "percent initiating use of marijuana," where a positive gamma represents an unfavorable effect (higher exposure associated with higher initiation rate).

**Figure 5-C. Dose–response slopes for delayed effects of specific exposure on initiation in the Wave 7 to Wave 9 delayed effect, with and without confounder adjustment**




While the confounder adjustment procedures did not "cause" the unfavorable effects, it is possible that they underadjusted for confounder bias. If in reality there was no effect or even a slight favorable effect of the Campaign, yet the confounder adjustment procedure underadjusted for confounder bias, the analysis could yield an unfavorable result that was in fact spurious. There are two common scenarios in which this could happen: 1) if the potential measured confounders that were included in the adjustment were not adequately controlled by the process, and 2) if an unmeasured confounder that is correlated with exposure was the true cause of the observed unfavorable association.

**Scenario 1:** With respect to scenario 1, the confounder control method used in this analysis—propensity scoring—is designed to remove the effects of measured confounding variables from the

association between outcomes and exposures. It is possible to diagnose the success of that process by showing that the potential confounders do not vary across the adjusted exposure categories. This property is referred to as balance. If a confounder has been successfully balanced, it will have the same average score across all exposure levels, once exposure propensity has been controlled. If confounders are not balanced, results can be biased. The ability to assess balance is an important advance of propensity scoring over traditional analysis of covariance (Rosenbaum and Rubin, 1984). In the present analyses, a number of tests of balance were conducted on a large number of variables (more than a hundred variables, including some variables that were not in the original model, plus interactions and quadratic terms). (See Appendix C for details.) Overall, the number of covariates out of balance was very small (fewer than 5% of the variables tested for balance).

The propensity scoring model for the delayed-effects analysis was developed for all cases, with the inclusion of balance requirements for Waves 1 to 6 and Wave 7. However, the marked change in the distribution of specific exposure in later rounds toward greater exposure observed in Table 3-O motivated a continuing concern about whether balance was adequately achieved for Wave 7. Specifically, in the early waves, reports of less than one exposure per month were commonplace, while reports of 12 or more exposures were relatively rare. By Wave 7 the pattern was reversed; reports of 12 or more exposures were commonplace, while reports of less than one exposure were rare.[13] In the Wave 7 exposure period, only 159 youth—6 percent of the nonuser sample—reported less than one exposure per month.

To address this concern, two sensitivity analyses were undertaken to assess the robustness of the delayed-effects findings. The first involved collapsing the two lowest exposure categories (< one exposure/month; one to three exposures/month) which resulted in a more balanced exposure distribution. In the case of Wave 7 to Wave 9, collapsing resulted in 596 nonusers in the lowest exposure category, or 24 percent of the nonuser sample at Wave 7. In this combined category, 5.5 percent of the nonusers in Wave 7 reported initiation in Wave 9. The initiation rates for the 4 to 11 and the 12+ exposure groups are unchanged from those shown in Table 5-S. Table 5-T compares the original four-level exposure gammas given in Table 5-S for the six youth outcome measures against the gammas observed for the new three-level (collapsed) exposure categories. As can be seen, the original results from the Wave 7 to Wave 9 delayed-effects analysis are upheld. The three gammas that were statistically significant under the four-level exposure measure were still significant under the three-level exposure measure. In addition, the gamma for self-efficacy to refuse marijuana is also significant and unfavorable. In all cases, the magnitude of the significant gammas were slightly larger (in absolute value) under the three-level exposure measure.[14] In sum, the findings were robust to the collapsing of the first two exposure categories. Consequently, there is no evidence from this analysis that the separation of the lowest exposure category unduly influenced the results from the Wave 7 to 9 delayed-effects analysis.

Despite the above findings, concern remained that the propensity adjustments being based on global models capturing the "average" properties of the overall exposure distribution were suboptimal for the exposure distribution of Round 3. Given the importance of Round 3 for this report, it was decided to conduct the second sensitivity analysis of balance in which a special propensity model was fit to Round 3 exposure only. This analysis would be unaffected by the shifting exposure problem because the delayed-effect analysis would focus only on exposure for Round 3 (data from Rounds 1 and 2

[13]Details on the exposure distributions by wave are covered in Chapter 3.

[14]The standard errors were slightly larger as well; this would be expected given the reduced heterogeneity of the independent variable.

were not used). The three-level version of exposure was used—again with the lowest category being less than four exposures per month—because of the small sample size in the less than one exposure per month category.[15] This analysis yielded gammas that were slightly less unfavorable for Wave 7 to Wave 9 than the standard analysis results. The significant unfavorable Wave 7 to Wave 9 effects for the Social Norms Index and perception of other kid's use remained. However, the effect for initiation of use was not significant. In sum, the special Round 3 model reduced the size of the unfavorable effects but did not eliminate them, nor did it change any nonsignificant effects into statistically significant favorable effects.

**Table 5-T. Comparison of four-level and three-level delayed effects of specific exposure among 12½- to 18-year-old nonusers in Round 3 to Round 4**

| | Round 3→Round 4 gammas (CI) | | Wave 6→Wave 8 gammas (CI) | | Wave 7→Wave 9 gammas (CI) | |
|---|---|---|---|---|---|---|
| | Four-level specific exposure | Three-level specific exposure | Four-level specific exposure | Three-level specific exposure | Four-level specific exposure | Three-level specific exposure |
| Intentions to use | -0.01 (-0.09,0.08) | -0.06 (-0.18,0.06) | 0.00 (-0.13, 0.13) | -0.05 (-0.23,0.14) | -0.01 (-0.12, 0.10) | -0.07 (-0.21,0.07) |
| Attitudes/ beliefs | -0.03 (-0.08,-0.01) | -0.06 (-0.12,0.01) | -0.04 (-0.11, 0.03) | -0.05 (-0.14,0.04) | -0.03 (-0.08, 0.02) | -0.07 (-0.14,0.00) |
| Social norms | **-0.07* (-0.12,-0.02)** | **-0.09* (-0.16,-0.02)** | -0.04 (-0.11, 0.02) | -0.04 (-0.13,0.05) | **-0.10* (-0.15, -0.04)** | **-0.13* (-0.21,-0.06)** |
| Self efficacy | 0.02 (-0.05,0.08) | -0.02 (-0.10,0.06) | 0.09 (-0.01, 0.19) | 0.06 (-0.06,0.18) | -0.06 (-0.14, 0.01) | **-0.10* (-0.19,-0.01)** |
| Perception of others' use | -0.08 (-0.16,0.01) | -0.08 (-0.19,0.02) | -0.03 (-0.14, 0.07) | 0.00 (-0.14,0.14) | **-0.12* (-0.23, -0.01)** | **-0.17* (-0.29,-0.05)** |
| Initiation of use | 0.07 (-0.02, 0.16) | 0.11 (-0.02,0.23) | -0.03 (-0.16, 0.10) | 0.00 (-0.20,0.21) | **0.20* (0.04, 0.35)** | **0.23* (0.03,0.42)** |

* Gamma significant at $p < 0.05$.

In examining the estimates from Wave 7, concern was also triggered by the observation that outcome estimates in the lowest exposure category (less than one exposure per month), in addition to being based on small numbers of youth, were well outside the range of values previously observed. For example, only 2.0 percent of nonusers in the lowest exposure category from Wave 7 reported having initiated use by Wave 9, compared to 12.7 and 10.9 percent in the prior two rounds, respectively, adjusted for confounders (Detail Table 5-52). The pattern was the same for the cognitive measures, where youth in the lowest exposure category from Wave 7 reported substantially stronger anti-drug intentions, attitudes, norms, etc. than their counterparts from Rounds 1 and 2 (Detail Tables 5-44, 5-46, 5-48, 5-50, and 5-54).

Even with the small sample size in the lowest category for specific exposure, the outlier values in that category are potentially highly influential in determining the magnitude of the gamma coefficients. As reported earlier, the Wave 7 to Wave 9 gamma for initiation was positive (unfavorable) and significant, suggesting that higher exposure to the Marijuana Initiative led to increased rates of initiation. As seen in Table 5-S, however, outside the lowest exposure category, the unfavorable dose–response relationship is largely absent in the confounder-adjusted analysis. Put another way, the

[15]The basic iterative process (the steps include initial model specification and estimation, testing of balance, respecification and reestimation, and retesting of balance) that guided the development of the pooled delayed-effect model was implemented to develop the special Round 3 three-level propensity model.

lowest exposure category appears to be responsible for the unfavorable gamma. Given that only 6 percent of the Wave 7 nonuser sample is in that category, however, and that 94 percent of the sample does not conform to the unfavorable dose–response relationship, the meaningfulness of gamma to represent the substance of the findings comes into question.

The 2 percent rate of initiation in the lowest specific exposure category is of particular concern. Given the small sample size on which the rate is based, it is of course subject to substantial sampling error so that its confidence interval is from 0.4 percent to 9.7 percent (that sampling error is taken into account in the delayed effects analyses). Nevertheless, the rate is extremely low. While there was no evidence of a problem that might warrant permanent exclusion (e.g., checks revealed no evidence that the low rate is the result of procedural errors such as faulty interviewing or quality control), there remains the possibility that this small group of youth is distinctive in some way that the confounder controls did not adequately handle. An analysis was therefore conducted to determine whether the delayed-effect results held up if the youth in the lowest specific exposure category (less than one exposure per month) were excluded from the Wave 7 to Wave 9 delayed-effects analysis.

The findings from this analysis were as follows. For all nonusers, the unfavorable effect on the Social Norms Index, although reduced, remained statistically significant (gamma=-0.07; CI:-0.13, -0.01), while the effects on initiation (gamma=0.04, CI:-0.14, 0.21) and on perceptions of other kids' use (gamma=-0.07; CI:-0.18, 0.04) became nonsignificant though still in an unfavorable direction. Comparisons of the effects by age group with the effects for the full sample yielded some similarities and some differences. With the exclusion of the under-one exposure group, there was a favorable effect for older youth on the measure of intention not to use marijuana (gamma=0.13; CI: 0.01, 0.26). However, the unfavorable effect on this measure remained for 12½- to 13-year olds, although now not statistically significant (gamma=-0.24; CI: -0.51, 0.04). Also, the unfavorable effect for 12½- to 13-year-olds for initiation remained statistically significant (gamma=0.55; CI: 0.41, 0.68) as did that for the Attitudes/Beliefs Index (gamma=-0.10; CI: -0.19, -0.01). In summary, while the exclusion of youth in the lowest exposure category attenuated the unfavorable delayed-effect findings of the standard analysis, a number of unfavorable findings remain significant, particularly for 12½- to 13-year-olds. Nevertheless, lacking an explanation for the unusually low rate of marijuana initiation among youth in the lowest exposure category, concern remains.

Each analysis described above in this section was intended to investigate whether the unfavorable delayed effects could have resulted from a statistical artifact. While the possibility can never be categorically ruled out, examination of the most likely threats did not yield anything to overturn the basic finding of unfavorable delayed effects. Caution is still warranted given the very low initiation rate in the lowest exposure category in the Wave 7 to Wave 9 delayed-effects analysis. As noted earlier, extensive checking and rechecking turned up no evidence that the data are somehow in error; at the same time we have no substantive explanation for their occurrence.

**Scenario 2:** The lack of an explanation for the unexpectedly low outcome rates in the lowest specific exposure category described and examined above brings the discussion to the threat posed by Scenario 2, which is more substantive in character. Is it possible that there is some unknown and unmeasured covariate not included in the propensity model that could have influenced recall of exposure to the television advertising at time 1 and outcomes at time 2? One can never be sure, of course; that is the difference between a randomized experiment and an observational study. It is always possible that some unmeasured variable accounts for an observed effect even if all the measured covariates are

perfectly balanced.[16] However, such an unmeasured variable would have to have a particular character. One obvious possibility would be that youth with more interest in marijuana, with more negative beliefs and perceived social norms, paid more attention to the advertising. However, insofar as this can be examined, that does not appear to be a viable explanation. With the exception of perceptions of other kids' use, there were no cross-sectional associations between exposure and the outcomes. Thus the unmeasured variable would have to be one that suggests that youth who reported high exposure at earlier rounds would have had a different trajectory regardless of that exposure, that the exposure was only an indicator of the already present tendency to move toward a more pro-drug position. The difference in trajectories would have to be not associated with any of the other variables that were measurable at earlier rounds, including projected risk of drug use, which predicted a great deal of the transition to drug use, and which was not associated with exposure levels.

## 5.6 Longitudinal Associations of Anti-Drug Advertising Exposure with Continuing use of Marijuana among 12½- to 18-Year-Olds Who Used in the Past Year

In prior reports, our analyses focused almost entirely on nonusers of marijuana. This reflected the high priority of the Campaign toward preventing initiation of use and the limited statistical power available to examine the population of users. However, after completion of nine waves of data collection, there is a sufficient number of interviews with users of marijuana to support analysis within this subset of youth. There are many possible analyses that could be done with users. However, the policy question believed to be of highest interest is: Among adolescent users of marijuana, did higher exposure to the Campaign increase quit rates, reduce frequency of use or, at minimum, slow the increased frequency of use that naturally accompanies maturation? This question can be addressed by a delayed-effects analysis.

Two versions of the reduction in use variable were examined. The first is the "quit rate," which is commonly used in smoking cessation studies. This is simply the dichotomous outcome, quit versus not quit. The question here is, among youth who reported use of marijuana in the exposure year, did higher exposure increase the likelihood of nonuse in the followup year, controlling for confounders?[17] The second version takes into account frequency of use as well as use–nonuse. For youth who reported having used marijuana in the exposure year, their frequency of use in the followup year can 1) increase, 2) stay the same, 3) decrease but not to zero, or 4) decrease to zero. Note that category 4 is equivalent to quitting in the dichotomous version of the variable. Testing the ordinal as well as the dichotomous outcome is important for two reasons. First, the ordinal version has more statistical power. Second, while complete cessation is clearly the preferred outcome, reducing frequency or preventing increased frequency is also beneficial. If, for example, the Campaign does not significantly increase quit rates, but does slow the rate at which casual users become regular users, it is still an

[16]This unmeasured covariate (i.e., confounder) problem is related to the internal validity threat of *selection-maturation* (Cook and Campbell, 1979), which often must be confronted in quasi-experimental studies of youth. Here, such a threat occurs if the highest exposure groups have differential rates of "normal growth" between the exposure and outcome rounds. Practically speaking, this is likely to occur if the measured variables do not fully capture the "selection" process producing the various exposure levels. This can never be definitively ruled out without an experimental design.

[17]One technical point warrants mention. Users represent a different population than nonusers, and are likely to differ across a number of potential confounders. Therefore, the delayed-effect propensity models were constructed to control for confounders in the general and specific exposure measures on both the nonuser and user samples. Were it not possible to balance the users across exposure levels, effect estimates from the user analysis would potentially be biased. Fortunately, balance was achieved among the users, so this is not an issue.

important finding. Casual users are more likely than regular users to age naturally out of drug use, and are less likely to subsequently require treatment for dependence or abuse.

Results for the dichotomous outcome can be seen in Table 5-U. The overall weighted quit rate was 24.8 percent; that is, among prior-year users, slightly less than one-quarter reported they were no longer using marijuana. However, as seen in the gammas, there was no significant association between exposure and quitting for either measure of exposure.

**Table 5-U. Exposure per month and quitting use of marijuana among 12½- to 18-year-old prior users**

| | Percent quitting use | | | | |
|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | Gamma (CI) |
| General exposure | 25.6 | | 27.8 | 25.0 | -0.03 (-0.18, 0.12) |
| Specific exposure | 13.2 | 28.9 | 26.4 | 21.9 | 0.04 (-0.07, 0.15) |

NOTE: These estimates are weighted. The slight difference between the quit rate in the two outcome measures is due to a small number of missing values in the variables required to construct the ordinal measure.

Results for the ordinal outcome can be seen in Table 5-V. The percentages represent the frequency distribution across the four outcome categories by level of exposure, for each of the two exposure measures. Across the sample, 34.1 percent used marijuana more frequently than in the prior year, 24.5 percent continued at the same rate, 16.1 percent reduced frequency (but did not quit), and 25.3 percent quit. As with the dichotomous outcome, there was no significant association between exposure and improvement for either measure of exposure.

**Table 5-V. Exposure per month and change in use of marijuana among 12½- to 18-year-old prior users**

| | | Percent in each outcome category | | | | |
|---|---|---|---|---|---|---|
| | Outcome category | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | Gamma (CI) |
| General exposure | Increase | 32.2 | | 34.4 | 34.5 | -0.01 (-0.12, 0.09) |
| | No change | 29.5 | | 19.9 | 23.3 | |
| | Decrease | 12.3 | | 17.2 | 16.8 | |
| | Quit | 26.0 | | 28.6 | 25.4 | |
| Specific exposure | Increase | 33.6 | 31.2 | 36.3 | 33.3 | 0.01 (-0.08, 0.09) |
| | No change | 39.2 | 20.5 | 22.0 | 25.0 | |
| | Decrease | 14.1 | 18.9 | 14.4 | (S) | |
| | Quit | 13.2 | 29.5 | 27.2 | 22.0 | |

NOTE: These estimates are weighted. The slight difference between the quit rate in the two outcome measures is due to a small number of missing values in the variables required to construct the ordinal measure.

Results were examined by round to assess whether Campaign influence on quitting or reducing changed over the course of the Campaign. No significant effects were found, favorable or unfavorable, for either outcome measure or exposure measure. Thus, the analysis did not yield evidence that higher exposure to the Campaign has increased quit rates, reduced frequency of use, or slowed rates of increase.

## 5.7 Summary and Discussion of Trend and Cross-sectional Results for Marijuana Cognitions, and Longitudinal Results for Cognitions and Use

Tables 5-W and 5-X summarize the key findings of this chapter. For each type of analysis (trend, cross-sectional association effects, and delayed effects), the results are summarized for the Campaign as a whole and for the Campaign since its redirection in late 2002. In Table 5-W, for trends, 2000 to 2004 represents the Campaign as a whole, while 2002 to 2004 represents the redirected Campaign.[18] For cross-sectional effects, the "All waves" columns represent the Campaign as a whole, while the "Waves 1→6" columns represent the original Phase II Campaign, and the "Waves 7→9" columns represent the redirected Campaign, for general and specific exposure, respectively. Similarly, for the delayed effects in Table 5-X, the "All rounds" columns represent the Campaign as a whole, while the "Rounds 1→2," "Rounds 2→3," and "Waves 6→8" columns represent the original Phase III Campaign, and the "Waves 7→9" columns represent the redirected Campaign. For trends and cross-sectional associations, the redirected Campaign covers both the Marijuana and Early Intervention Initiatives, while for delayed effects, it covers only the Marijuana Initiative.

**Table 5-W. Summary of trend and cross-sectional analyses among 12½- to 18-year-old nonusers**

| Outcome | Trend | | Cross-sectional effects | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | General | | | Specific | | |
| | 2000-2004 | 2002-2004 | All waves | Waves 1→6 | Waves 7→9 | All waves | Waves 1→6 | Waves 7→9 |
| Intentions not to use | – | F | – | – | – | – | – | – |
| Attitudes/beliefs | F | – | – | – | F | – | – | – |
| Social norms | – | – | – | – | – | – | – | – |
| Self efficacy | – | – | – | – | – | – | – | – |
| Perception of others' use | – | – | U | – | U | U | U | U |

F - Significant favorable effect (p<0.05)

U - Significant unfavorable effect (p<0.05)

– - Not significant

[18] As noted previously, all references to 2004 in this chapter cover only the first half of 2004.

**Table 5-X. Summary of delayed-effects analyses among 12½- to 18-year-old nonusers at exposure round**

| Outcome | Delayed effects | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | General | | | | | Specific | | | | |
| | All rounds | Rounds 1→2 | Rounds 2→3 | Waves 6→8 | Waves 7→9 | All rounds | Rounds 1→2 | Rounds 2→3 | Waves 6→8 | Waves 7→9 |
| Intentions not to use | U | U | — | — | — | — | — | — | — | — |
| Attitudes/beliefs | — | — | — | — | — | — | — | — | — | — |
| Social norms | — | U | — | — | — | U | — | U | — | U |
| Self efficacy | — | — | — | — | — | — | — | — | — | — |
| Perception of others' use | — | — | — | — | — | U | U | — | — | U |
| Initiation of use | — | — | — | — | — | — | — | — | — | U |

F - Significant favorable effect ($p<0.05$)

U - Significant unfavorable effect ($p<0.05$)

— - Not significant

## 5.7.1 Trends

As shown, two of the cognitive outcomes yielded statistically significant trends in the overall sample, both in a direction favorable to the Campaign. The Attitudes/Beliefs Index registered a significant favorable change between 2000 and the first half of 2004, which was particularly strong for the 12½- to 13-year-old age group. Among the attitudes that changed, nonusers in 2004 were significantly more likely than in 2000 to disapprove of occasional marijuana use by others and to perceive that using marijuana would "Be acting against my moral beliefs."

There was no evidence that this favorable trend accelerated when the Campaign was redirected in late 2002, nor was there significant movement among the new target population of 14- to 16-year-olds. When restricted to the 2002 to 2004 period, the trend results for the Attitudes/Beliefs Index showed no significant changes overall or for any of the age subgroups.

The one statistically significant favorable overall trend since the Campaign was redirected in 2002 was in intentions to not use marijuana. For the full sample of 12½- to 18-year-olds, the proportion of nonusing youth saying they would "definitely not" try marijuana over the next 12 months increased by 2.1 percentage points between 2002 and 2004. The resulting proportion—87.5 percent—was the highest since the National Survey of Parents and Youth (NSPY) began in November 1999. Among older nonusers—who are historically at greater risk—the 2002 to 2004 increase was significant and still larger (2.6 percentage points). Because of the strong relationship between intention to use and subsequent initiation (see Section 5.2), any change in intentions is important.

Additional analyses of individual item responses provide insight into factors driving the change in intentions. Nonusers in 2004 were significantly more likely than in 2002 to disapprove of occasional marijuana use by others and to perceive others as risking harm by using marijuana occasionally. In addition, 12½- to 13-year-old nonusers in 2004 were significantly more likely than in 2002 to cite "Damage my brain" and "Lose my ambition" as possible outcomes of regular marijuana use, while 14- to 18-year-old nonusers were more likely to cite "Mess up my life" and "Do worse in school". In general, youth reported greater concern about the negative consequences of marijuana use than at any time since NSPY began.

## 5.7.2 Cross-sectional Association Effects

The cross-sectional association analyses provide no evidence that the favorable trend in youth intentions was influenced by Campaign exposure. This does not prove that the trend was not due to the Campaign; it is possible that the effect occurred but was insensitive to exposure levels, in which case the associational analyses would not detect it. This is unlikely, however, for two reasons. First, as described in Section 5.1, a favorable trend alone cannot permit unambiguous attribution of effect to the Campaign, and claims of an effect are much more vulnerable to alternative explanations when uncorroborated by associational evidence. Second, the thesis that exposure quantities do not matter, i.e., that seeing ads 12 or more times per month is no different than seeing ads once per month, is inconsistent with both communications theory generally and the theory of impact articulated by Campaign planners specifically.

None of the cognitive outcomes registered favorable cross-sectional association effects for the Campaign as a whole. One of them—the Attitudes/Beliefs Index—registered a favorable cross-sectional effect of general exposure for the Wave 7 to 9 period, which included the Marijuana and Early Intervention Initiatives and related redirections of the Campaign. This effect was particularly strong among older youth, boys, Hispanics, and lower risk youth. However, because the Marijuana and Early Intervention Initiatives were more likely to change associations with specific exposure, and no association with specific exposure was found, it is questionable whether an association only with general exposure reflects Campaign influence. Moreover, neither of the other two predictors of intentions specified in Figure 5-A, nor intentions themselves, showed any association with exposure. The absence of such effects, both for the overall Campaign and specifically for the period of the Marijuana and Early Intervention Initiatives, does not support a claim that youth exposure to Campaign advertising has impacted these outcomes.

In contrast, the newly added outcome—perceptions of other kids' use of marijuana—showed a significant unfavorable association with both measures of exposure for the Campaign as a whole, as well as the redirected Campaign. The unfavorable associations extend across most major subgroups of age, sex, race/ethnicity, and risk. It is notable that the unfavorable cross-sectional effects appear for this outcome. A component of the Social Norms Index, it was specifically included in the 2004 Report of Findings analysis plan to test the theory that exposure to the Campaign increases youth perception that others use marijuana, which in turn may affect their own use behavior. It was known from analyses of NSPY data through Wave 7 that there is a strong cross-sectional and prospective relationship between this perception and marijuana use. Consequently, it was hypothesized that perceptions of other kids' use may be the mechanism that explains the unfavorable delayed effects on youth outcomes previously reported.

As noted in Section 5.4.1, because of the vulnerability of cross-sectional associations to reverse causation, the cross-sectional effect alone on perceptions of other kids' use does not permit a strong claim that the Campaign caused the association. However, tests for delayed effects of exposure on perceptions of other kids' use of marijuana also were statistically significant, greatly reducing the vulnerability to reverse causation. Delayed effects are reviewed next.

### 5.7.3 Delayed Effects

All of the delayed effects that are statistically significant were unfavorable. These include intentions to not use marijuana (general exposure: all rounds and Round 1 to Round 2), social norms and perceptions of other kids' use of marijuana (specific exposure: all rounds, Round 1 to Round 2, and Wave 7 to Wave 9), and initiation of use (specific exposure, Wave 7 to Wave 9). With respect to initiation in this sample of youth who had not previously reported marijuana use, there was no significant overall effect for general or specific exposure, but there was a significant unfavorable effect of specific exposure from the Wave 7 exposure period, which coincides with the Marijuana Initiative. This last finding is of particular concern, since it suggests that the Marijuana Initiative may have rekindled the unfavorable delayed effects that were first seen in the Round 1 to Round 2 analysis (Hornik et al., 2002a; 2002b), but were not seen in Round 2 to Round 3. Moreover, in Round 1 to Round 2 the unfavorable effects that reached statistical significance were limited to the cognitive outcomes, while in Round 3 to Round 4/Wave 7 to Wave 9, they extend to initiation as well.

The unfavorable effects are counterintuitive, and therefore warranted special scrutiny. Section 5.5.4 presented a number of diagnostic analyses; each was intended to investigate whether the unfavorable delayed effects could have resulted from a statistical artifact. While the possibility can never be categorically ruled out, examination of the most likely threats did not support overturning the basic finding of unfavorable delayed effects. However, concern remains over the unknown origin of the very low initiation rate in the lowest exposure category for Wave 7 to Wave 9 because this group contributed to the statistically significant unfavorable effect between specific exposure and initiation of marijuana use.

If the results from the delayed-effects analysis are real, why are they occurring? Unfavorable delayed effects were first detected in the Fourth Semi-Annual Report of Findings on Wave 1 to Wave 4 and were again detected in the Fifth Semi-Annual Report of Findings on Wave 2, 3 to Wave 5 (or when combined with the earlier results, the Round 1 to Round 2).

Some of the strongest results—then and now—relate to social norms. With specific exposure the unfavorable effects are pervasive. The overall delayed effect of specific exposure is significant, all three exposure rounds show unfavorable gammas (though Round 2 is nonsignificant), and the negative delayed-effect gamma from the Round 3 exposure period is primarily driven by Wave 7, the first full wave of the Marijuana Initiative. Is it possible that the Campaign, while its explicit message is anti-drug, provides a second implicit message—that the use of drugs is widespread? The Campaign's communication plan had proposed using messages that would say that most kids don't use drugs. But, in fact, there were very few messages broadcast during Waves 1 through 7 that put this idea forward. Contrarily, the messages that were broadcast—negative consequences, normative positive consequences, and resistance skills—all have as an implicit assumption that drug use is a problem. Is it possible that youth took from these messages a "meta-message" that drug use is widespread and therefore represents normative behavior?

When the negative delayed effects were first observed (Round 1 to Round 2), we speculated that this "meta-message" was a possible mechanism behind the observed unfavorable delayed effects, i.e., that the Campaign may be increasing youth perception that others use marijuana and that perception may, in turn, adversely affect their own behavior (Hornik et al, 2002b). Some supportive evidence for this mechanism came from the strong cross-sectional and prospective relationship between this perception and marijuana use. As described earlier, perception of other kids' use was added to the other youth cognitive outcomes in this report in part to examine this mechanism further. The finding of a strong unfavorable cross-sectional relationship between exposure and this outcome is consistent with the mechanism.[19] If the meta-message is that drug use is widespread, higher exposure to Campaign ads should cause an immediate effect on the perception that other kids regularly use marijuana (cross-sectional association between exposure and perceptions). This perception eventually leads to a more generalized pro-marijuana social norm (delayed-effect association between specific exposure and Social Norms Index) and greater likelihood of actual initiation (delayed-effect association between specific exposure and use). Since the hypothesized causal chain is exposure to perceptions to initiation, another relationship must be observed, namely, an association between perceptions in the exposure round (time 1) and use in the outcome round (time 2). This was examined. Across the pooled sample of nonusing youth, those who responded that "some," "most," or "all" of their peer group had used marijuana regularly were almost 2½ times as likely to report initiation of use a year later than those who responded "none" or "a few" (21% vs. 9%).

There is one scenario in which the above logic fails. It assumes that exposure at time 1 causes perceptions of other kids' use at time 1. While less likely, it is at least possible that causality runs the other way, i.e., that perceptions of other kids' use affects the level of exposure recalled. There is also a delayed-effect association between exposure at time 1 and perceptions at time 2. Given the temporal sequence of a delayed effect, reverse causation is not possible. However, since perceptions at times 1 and 2 are correlated, it is possible that perceptions at time 1 cause both exposure at time 1 and perceptions at time 2. That is, neither the cross-sectional nor the delayed-effect relationship between exposure and perceptions is necessarily caused by exposure. This has important implications. If exposure does not cause perceptions, then the theory that perception is the mediational link between exposure and use unravels, in which case the unfavorable delayed effect of exposure on use could be spurious. This is because time 1 perceptions could be causing both time 1 exposure and time 2 use, either directly or through time 2 perceptions. Either way, the inference that exposure causes use would be incorrect.

This scenario can be tested by controlling for the possible influence of time 1 perceptions in the delayed-effect analysis of time 1 exposure on time 2 perceptions. From this test, it can be determined whether time 1 exposure and time 2 perceptions remain associated, over and above any influence of time 1 perceptions on either. This association, if found, would rule out the possibility that the exposure-perceptions relationship is solely the result of reverse causation (perceptions causing exposure). If not found, the causal direction would remain ambiguous, and the delayed effect of exposure on use would potentially be suspect. The test confirmed the original finding: with the possible influence of time 1 perceptions controlled for, the delayed-effect tests of specific exposure on perceptions of other kids' use remained statistically significant and unfavorable for the full sample,

[19]The finding was also unprecedented in this evaluation in that no cross-sectional association had appeared for any other youth outcome.

Round 1 to Round 2, and most importantly, Wave 7 to Wave 9. Therefore, the delayed-effect results are not an artifact of reverse causation.[20]

Why were the unfavorable delayed effects strongest for the Marijuana Initiative? At this point, any explanation is based on speculation, but one explanation consistent with the meta-message mechanism is as follows: We have been characterizing the Marijuana Initiative as one phase of a "redirected Campaign." The youth ads themselves, however, continued the negative consequences message of the pre-Initiative Campaign, albeit with a sharper, harder hitting focus. If there is indeed a pro-drug meta-message that stems from ads that emphasize negative consequences, it would be reasonable to find that a more effective presentation of negative consequences strengthens the meta-message, which in turn weakens anti-drug norms, and ultimately paves the way for increased initiation.

### 5.7.4 Users Analysis

For the first time in this Evaluation, questions of Campaign influence on youth who had already begun using marijuana were addressed through a delayed-effects analysis. Two outcomes were examined: the dichotomous "quit rate," which is commonly used in smoking cessation studies, and an ordinal indicator that takes into account frequency of use as well as use–nonuse. The analysis did not yield conclusive evidence that higher exposure to the Campaign has increased quit rates, reduced frequency of use, or slowed rates of increase.

## 5.8 Conclusion of Overall Youth Campaign Effects

Overall, the results are mixed. Some positive trends in youth outcomes occurred over the period covered by NSPY, though evidence linking them to Campaign exposure is weak. In particular, the proportion of nonusing youth saying they would "definitely not" try marijuana over the next 12 months was significantly higher in 2004 than in 2002, the last year prior to the redirected Campaign, which included the Marijuana and Early Intervention Initiatives. On the other hand, the associational analyses provide no evidence to support a claim that the favorable trend in youth intentions was influenced by Campaign exposure. Still, because of the strong historical relationship between intention to use and subsequent initiation, any change in intentions is important and augurs well for reduced initiation rates in the near future.

Youth attitudes and beliefs also became more anti-marijuana over this period, particularly within the 12½- to 13-year-old age group. Unlike the change in intentions, the change in attitudes and beliefs was accompanied by a favorable cross-sectional effect of general exposure for the Wave 7 to 9 period, which included the Marijuana and Early Intervention Initiatives and related redirections of the Campaign. However, because the Marijuana and Early Intervention Initiatives were logically more likely to change associations with specific exposure first, and no association with specific exposure was found, it is questionable whether an association only with general exposure reflects Campaign influence. The two other original cognitive outcomes—social norms and self-efficacy—showed neither trends nor cross-sectional associations with exposure for the overall sample, whether examined for the redirected Campaign or the Campaign as a whole. In sum, the data do not support claims of favorable

[20]There are several acceptable methods to perform this test. The method selected was to regress time 2 perception onto time 1 perceptions and create a new variable from the residuals. The new variable, which literally represented time 2 perceptions with the influence of time 1 perceptions subtracted out, was then substituted for the unadjusted time 2 perceptions variable in the delayed-effect analysis of perceptions.

Campaign influence on any of the four original cognitive outcomes. Moreover, the newly added variable—perceptions of other kids' use of marijuana—shows a significant unfavorable cross-sectional association with both measures of exposure for the Campaign as a whole as well as for the redirected Campaign, and the unfavorable associations extend across most major subgroups of age, sex, race/ethnicity, and risk. It appears possible that perceptions of other kids' use of marijuana may be the mediating mechanism, the "link" as it were, between Campaign exposure and unfavorable delayed effects on marijuana social norms and initial use.

Unfavorable delayed effects were found for social norms, perceptions of other kids' use, and—for the exposure period covering the Marijuana Initiative—initiation of use itself. Caution is warranted given the very low initiation rate in the lowest exposure category in the Wave 7 to Wave 9 analysis, for which no satisfactory explanation has emerged. That said, the unfavorable delayed effects were observed in prior reports (Hornik et al., 2002a; 2002b) before this anomaly occurred. To the extent we could determine, these effects are real, and there is at least one viable mechanism that explains them.

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# 6. Campaign Effects on Parents

A continuing theme of the parent Campaign, both before and after the launch of the Marijuana Initiative, has been to encourage parents to engage with their children to protect them against the risk of drug use. This idea is summarized in the brand, Parents: The Anti-Drug. The major component has been to encourage parents to monitor their children's behavior by knowing where they are and with whom, and by making sure they have adult supervision. To a lesser extent, the Campaign also has encouraged talking between parents and children about drugs. These monitoring and communications themes were also incorporated into the Early Intervention ads targeted at parents, which started to be aired in February, 2004.[1] Additionally, although largely restricted to the time period covered by the Wave 1 data collection, the Campaign had a substantial level of advertising that encouraged parents to do fun things with their children as a positive part of their engagement with them.

The report examines evidence for Campaign effects on those three classes of outcomes based on parent reports: monitoring children's behavior, talking with children about drugs, and engaging in fun activities with children. Youth were also asked about the degree to which they were monitored, the amount of talk with their parents about drugs, and their engagement in fun activities with a format of the questions that was virtually identical to the questions asked of parents. Youth and parent trends on these parallel measures are examined and compared. Cross-sectional and delayed-effects associations between parent exposure and parenting outcomes are presented for both parent and youth reports of outcome behaviors since, as will be shown, both are predictive of youth marijuana initiation.

The analyses benefit from the availability of longitudinal samples of parents that address concerns about causal direction. The previous report examined followup data with parents interviewed at Round 1 (including Waves 1, 2, and 3) and reinterviewed at Round 2 (Waves 4 and 5), as well as data from parents who were interviewed at Round 2 and reinterviewed at Round 3 (Waves 6 and 7). The current report adds data from parents who were interviewed at Round 3 and reinterviewed at Round 4 (Waves 8 and 9).

This chapter first discusses the logic supporting claims of Campaign effects and presents the primary outcome variables. Section 6.2 examines changes in the levels of those outcome variables over the nine waves of data collection. Sections 6.3 and 6.4 present the evidence for cross-sectional and delayed-effects associations of exposure to Campaign advertising with the outcome variables. Section 6.5 reviews results from cross-sectional and delayed-effects analyses of parent exposure on youth outcomes. Finally, Section 6.6 brings together the trend, associational, and delayed-effects analyses and discusses conclusions about Campaign effects.

[1] The Early Intervention Initiative represented a major strategic shift in Campaign focus. Its focus for parents was on encouraging them to intervene early to stop youth use of drugs and alcohol.

## 6.1 The Logic of Inference and the Development of Parent Outcome Scales

It would be desirable to show that target outcomes are trending in a direction favorable[2] to Campaign objectives: more monitoring, more talking, and more fun activities. This would be desirable even though trend data, by themselves, are not definitive with regard to inferences about Campaign effects, recognizing that forces external to the Campaign may be influencing trends either for better or for worse.

Second, it would be desirable to show that parents who were more exposed to the Campaign were more likely to display favorable outcomes than parents who were less exposed. For example, were parents who reported seeing Campaign ads two or three times a week more likely to have talked with their children about drugs than were parents who reported ad exposure less than once a week? In the analyses, the observed associations are controlled for a large number of confounder variables that might have influenced both exposure and outcome and, therefore, might have been the true cause of the observed association. (See Appendix C for the propensity score methodology that was used.)

Using cross-sectional data, a favorable association of reported exposure to the Campaign, with the target outcomes statistically controlled for likely confounders, is the best evidence consistent with a Campaign effect. If this is accompanied by evidence of a favorable trend in the outcome, the argument that there was a Campaign effect is strengthened. However, the threat of reverse causation, a major concern with cross-sectional analyses, is that the association might be the result of the influence of outcomes on exposure rather than exposure on outcomes. This report employs delayed-effects analyses to provide a clearer understanding of the causal order between exposure and outcomes, and presents data on exposure in Rounds 1, 2, and 3 matched with outcomes measured at Rounds 2, 3, and 4, respectively. As explained in Chapter 2, delayed-effects analyses involve examining the association between exposure measured at one round and outcome measured at the next round, statistically controlling for values of the outcomes at the earlier round, as well as other confounders. Two types of analyses are reported. First, overall delayed effects are assessed for the sample of pooled cases in which exposure was measured at Round 1, 2, or 3 and outcomes were measured at Round 2, 3, or 4, respectively. This analysis looks for overall delayed effects capitalizing on the maximum sample size available. Second, delayed-effect associations are reported by pairs of rounds separately: the effects of Round 1 exposure on Round 2 outcomes, of Round 2 exposure on Round 3 outcomes, and of Round 3 exposure on Round 4 outcomes. This form of analysis examines whether delayed effects are consistent across rounds.

As described in Section 2.3, the unit of analysis used for all parent analyses in this report is the youth–parent dyad. If a parent had two children in the 12½- to 18-year-old sample (e.g., one 12½ to 13 and one 14 to 18), the parent was asked separate behavior and cognitions questions for each child. The two sets of answers are represented in different dyads. To avoid a cumbersome presentation, the results are loosely expressed in terms of parents, but this terminology should be more accurately interpreted as being in terms of dyads. Thus, for example, a percentage estimate is to be interpreted as "the percentage of youth who have a parent with the given characteristic."

[2] Throughout this chapter, both trends and associations consistent with Campaign objectives are called "favorable." Trends and associations that go in the opposite direction from those expected by the Campaign are called "unfavorable."

Consistent with the rest of the report, the overall analyses focus on youth aged 12½ to 18. In addition to the overall analysis, this chapter presents trend, cross-sectional associations, and delayed-effects associations for subgroups of youth defined by age, as well as by gender, race/ethnicity, and risk for marijuana use, and by responding parent's gender and educational level. The cross-sectional associations are also presented according to year of current interview, while the delayed-effects associations are presented according to previous interview round. Subgroup analyses are used for two purposes. If there is an overall effect, there is a search for evidence that the trend or the association is significantly larger or smaller for particular subgroups. If there is no overall effect, the subgroups are examined to see if there is evidence of an effect for only a subpopulation.

The primary analyses presented focus on five summed outcome measures covering the three classes of outcome (talking, monitoring, and fun activities): talking behavior, talking cognitions, monitoring behavior, monitoring cognitions, and fun activities undertaken. These outcome measures summarize responses to 21 individual items. Trends in all the individual items are presented in the Detail Tables, but this chapter focuses on these five summed outcome measures. There are three reasons for this focus on only five parent outcomes. First, the combination of multiple items into a single index may increase the sensitivity of the outcome measures in detecting effects. Multi-item indices are ordinarily more reliable than single item measures. Second, the greater number of results that are presented, the more likely it is that some results will be significant at the conventional ($p = 0.05$) level by chance alone. By focusing on a smaller number of outcomes, particularly when it comes to subgroup analyses, the risk of making inferences on the basis of rare and misleading statistically significant results is reduced. Third, the presentation of just the five distinct outcomes is more focused, allowing the results to be more easily interpreted.

The construction of the three behavioral indices follows the procedures used in previous reports.[3] The Talking Behavior Index, with a range of 0 to 3, assigns one point to parents for each of the following: talking with their son or daughter about drugs at least twice in the previous 6 months, having discussed family rules about drug use, and having discussed specific things that their child could do to stay away from drugs. The Monitoring Behavior Index, which also varies from 0 to 3, assigns points to parents for saying that they "always or almost always" knew what their child was doing when he or she was away from home, for saying that they had a pretty good idea about their child's plans for the coming day, and for saying that their child never spent free time in the afternoon hanging out with friends without adult supervision. The monitoring behavior and talking behavior questions were also asked of youth, so that youth and parent responses could be directly compared. The Fun Activities Index combined the responses of parents to questions about the frequency of in-home joint projects and activities, and of going together to out-of-home activities. Parents who reported performing these activities a combined total of three or more times each week were assigned an index score of 1, with everyone else assigned zero. For the three behavior indices the parent (or care giver) respondent was asked to report the combined total of behaviors engaged in by him- or herself and their spouse (if any). Youth were asked to report the number of behaviors performed by their parent(s).

[3] For youth with two parents, behavior questions pertaining to the engagement in communication, monitoring, and doing fun activities were worded such that the parent responding was asked how the responding parent and the coparent behaved. On the other hand, the cognition questions were worded such that the parent responding was asked only about his or her views. Thus, the dyad-based estimates given in the Detail Tables supporting Chapters 3 and 6 of this report reflect the assumption that the behaviors of both parents are reflected in the parent's responses, whereas the cognitions refer only to the responding parent.

The two cognitive indices were constructed on a different basis, and parallel to the way the youth indices described in Chapter 5 were created. Responses to the belief and attitude items, presented in Figure 6-A, were summed with weights reflecting their power to predict the behavioral scales just described. Thus the eight items that addressed beliefs and attitudes about monitoring were entered into a multinomial logistic regression equation predicting the parent score on the monitoring behavior scale. Similarly, the seven items that addressed self-efficacy about and general attitudes toward talking with youth were used to predict the parent-child talk behavior scale. For these two indices the respondent parent (or care giver) reported only for him- or herself. Youth were not asked corresponding questions.

**Figure 6-A. Beliefs and attitudes about monitoring and talking**

Monitoring Cognitions:

1. Closely monitoring {CHILD NAME}'s daily activities is:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| a. Extremely bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely good |
| b. Extremely unpleasant | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely pleasant |
| c. Extremely unimportant | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely important |

Please indicate how much you disagree or agree with each of the following statements. Think about the next 12 months.

2. Closely monitoring {CHILD NAME }'s daily activities will:

| | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| a. Make it more likely that {CHILD NAME } will do well in school | 1 | 2 | 3 | 4 | 5 |
| b. Make me feel like I am doing my job as a parent | 1 | 2 | 3 | 4 | 5 |
| d. Make it less likely that {CHILD NAME } will try any drug, even once or twice | 1 | 2 | 3 | 4 | 5 |
| e. Make it less likely that {CHILD NAME } will use any drug *nearly every month* | 1 | 2 | 3 | 4 | 5 |
| f. Make {CHILD NAME } feel I am invading {his/her} privacy | 1 | 2 | 3 | 4 | 5 |

Talking Cognitions:

Discussing drug use in the *next 12 months* with {CHILD NAME}, would be:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| a. Extremely bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely good |
| b. Extremely unpleasant | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely pleasant |
| c. Extremely unimportant | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely important |

How sure are you that you would be able to talk about illicit drug use with {CHILD NAME}, under each of the following circumstances:

| | Very unsure | Unsure | Neither sure nor unsure | Sure | Very sure |
|---|---|---|---|---|---|
| a. If {CHILD NAME} asked me questions about drug use in general? | 1 | 2 | 3 | 4 | 5 |
| b. If {CHILD NAME} asked me what specific things {he/she} could do to stay away from drugs? | 1 | 2 | 3 | 4 | 5 |
| c. If {CHILD NAME} and I had been having conflicts over other things not related to drugs, and our relationship was tense? | 1 | 2 | 3 | 4 | 5 |
| d. If {CHILD NAME} asked me about my own past use of drugs? | 1 | 2 | 3 | 4 | 5 |

The substantive logic for this approach reflects the underlying models of the Campaign presented in Chapter 2. The beliefs and attitudes are important not for their own sake, but only insofar as they account for behavior. By weighting them according to their predictive strength, they make up an index of cognitions maximized for its ability to account for behavior. This strategy of weighting beliefs and attitudes permits an argument that if the Campaign affects these cognitive outcomes, it also forecasts effects on behavior. Since the weighted summed scores have no natural metric, both scales were standardized so that the entire population of parents at Wave 1 had a mean of 100 and a standard

deviation of 100. This standardization provides a useful metric for comparing the magnitude of change over time and between groups.

The previous reports have demonstrated the cross-sectional associations between the cognitive indices and their respective behavioral outcomes, which the addition of Wave 9 data only confirms. The association between monitoring cognitions and behavior is particularly strong, with parents at the low end of the monitoring cognition scale performing, on average, only 0.7 of the three monitoring behaviors whereas those at the high end perform 2.1 of the three behaviors. The association between talking cognitions and behavior is also substantial, with parents at the low end of the talking cognitions scale reporting, on average, 1.1 of the three talking behaviors while those at the high end report 2.7 of the three behaviors.

The five outcome measures are used because they are seen as fair indicators for assessing the success of the Campaign for parents. In particular, the Campaign has focused on encouraging parents' monitoring behavior; the behavioral and belief measures related to that outcome are central to this presentation. However, for the Campaign, each of these outcomes is important only to the extent that it has an important influence on youth behavior. The analyses that follow show that in the case of monitoring and engaging in fun activities, there is strong support for this connection; but the evidence does not support the claim that parents talking with their children about drugs reduces the risk of drug use.

The analyses that establish the predictive power of parent and youth reports of parenting behavior focus on youth–parent dyads where the youth reported no use of marijuana. Then parents who had higher and lower scores on a particular parenting outcome (e.g., monitoring behavior) at the time of that measurement are compared with regard to the likelihood of their children's initiation of marijuana use by the time of the followup measurement, 12 to 18 months later. The figures presented below demonstrate the basic associations. In addition, a multivariate analysis was conducted to make sure that the observed association of the parenting outcome and youth marijuana initiation was not an artifact of some confounder. Those analyses controlled for age and other characteristics of youth that put them at risk of marijuana initiation.

Figure 6-B presents the associations between youth and parent reports of parent monitoring behavior at one round of data collection and youth reports of marijuana initiation at the following round. For both parent and youth reports there was a statistically significant and strong favorable relationship between monitoring behavior and youth marijuana (non-)use, which holds up even after controlling for youth age (not shown). Using parent reports, only 4 percent of youth whose parents reported performing the three monitoring behaviors at one round had initiated marijuana use by the following round, while 19 percent of youth whose parents reported no monitoring behaviors at one round had initiated marijuana use by the following round. Similarly, less than 1 percent of youth who reported that their parents performed the three monitoring behaviors at one round had initiated marijuana use by the next round, as compared to 18 percent of those who reported that their parents did not engage in any of the three monitoring behaviors.

Figure 6-C presents the association between parent reports of monitoring cognitions and youth initiation of marijuana at the following round. The results are similar to those for monitoring behavior: only 7 percent of youth whose parents scored on the high end of the Monitoring Cognitions Index reported marijuana initiation at the subsequent round versus 18 percent of youth whose parents scored on the low end at the earlier round.

**Figure 6-B. Youth marijuana initiation at followup round by parent monitoring behavior at previous round (parent and youth reports)**

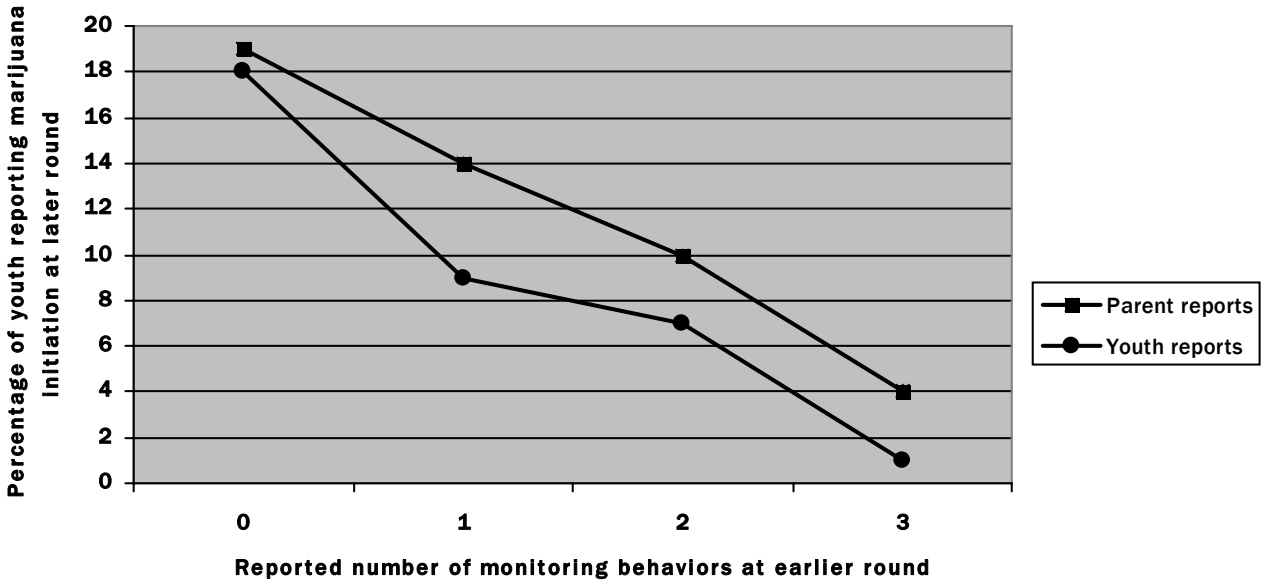
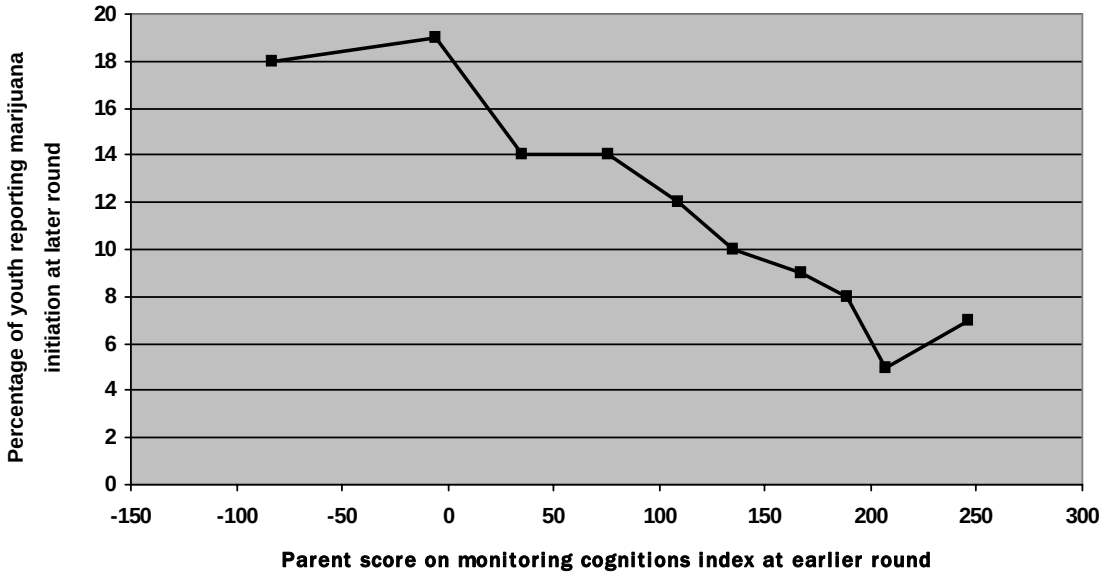
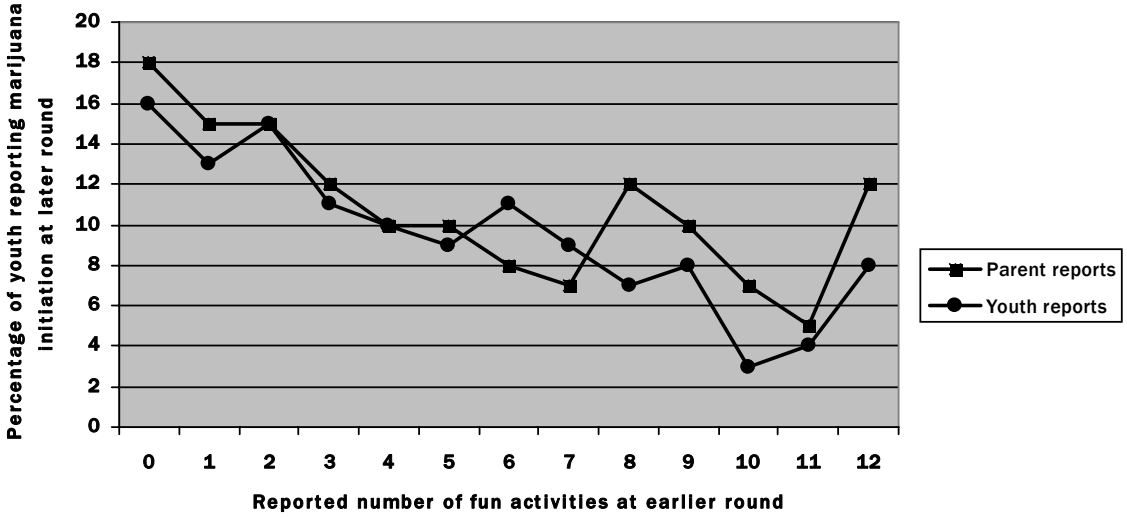



**Figure 6-C. Youth marijuana initiation at followup round by parent monitoring cognitions at previous round (parent reports)**




The delayed-effects association between involvement in fun activities at one round and youth marijuana initiation at the next round was also substantial and statistically significant, whether parent reports or youth reports were used (Figure 6-D). Based on parent reports, 18 percent of youth whose parents reported no fun activities in the preceding week at the earlier round reported marijuana initiation at the followup round, as compared to 12 percent of youth whose parents reported having engaged in three or more fun activities at the earlier round. Similarly, 16 percent of youth who reported no engagement in fun activities with their parents reported subsequent marijuana use as compared to 8 percent of youth who reported three or more fun activities with their parents.

**Figure 6-D. Youth marijuana initiation at followup round by reported fun activities at previous round (parent and youth reports)**




By contrast, there is no delayed-effects association between youth reports of talking behaviors and youth marijuana initiation, and a significant delayed-effects association in an unexpected direction between parent reports of talking behaviors and youth marijuana initiation (Figure 6-E). Subsequent marijuana initiation for youth was 7 percent for parents who engaged in no household conversation about drugs in the previous round and 13 percent for parents who engaged in all three talking behaviors. However, it is unlikely that parent talking "causes" marijuana initiation; it is more likely that youth on a trajectory toward subsequent initiation (e.g., those associated with known users) stimulated greater talk by parents. Youth reports of talking showed no monotonic trend; marijuana initiation was 11 percent both for youth who reported that their parents engaged in no conversations about drugs at the previous round as well as for youth who reported that their parents engaged in all three talking behaviors. In addition, there was no statistically significant association between parent talking cognitions and youth subsequent marijuana initiation; youth whose parents had earlier reported unfavorable talking cognitions were as likely to initiate marijuana use subsequently as were youth whose parents scored high on talking cognitions (Figure 6-F).

In summary, the parent reports of monitoring behaviors and cognitions, and youth reports of monitoring behaviors showed similar patterns in predicting future marijuana use. For all three measures, earlier reports of monitoring behavior or cognitions showed statistically significant favorable associations with subsequent marijuana use. There were also strong favorable associations between parent and youth reports of parents engaging in fun activities with their children and marijuana initiation. However, while youth reports of parent talking behavior were not associated with later marijuana use, parent reports of their own talking behavior were unexpectedly unfavorably associated with subsequent marijuana use.

The next section examines evidence for trends on the five outcomes over the period from the start of Phase III of the Campaign until the end of the Evaluation in mid-2004.

**Figure 6-E. Youth marijuana initiation at later round by talking behavior at previous round (parent and youth reports)**

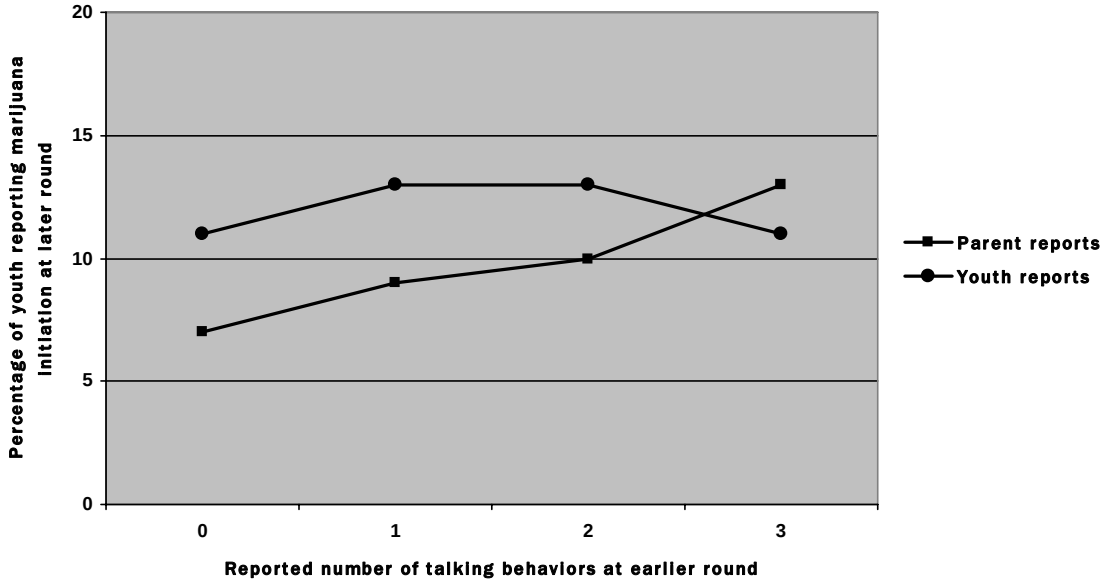
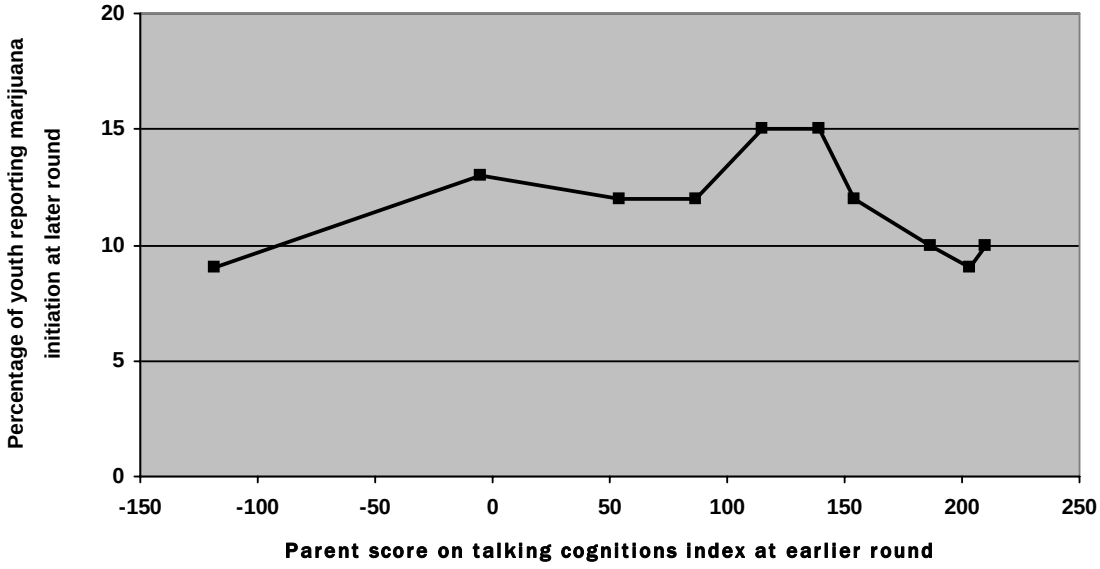



**Figure 6-F. Youth marijuana initiation at later round by parent talking cognitions at previous round (parent reports)**




## 6.2 Trends in Outcomes

This section examines trends in monitoring behaviors and cognitions, talking behaviors and cognitions, engagement in fun activities, and evidence for diversity in observed trends. The analyses focus on changes between year 2000 and Wave 9 (January to June 2004) and changes between year 2002 and Wave 9.

## 6.2.1 Monitoring Behaviors

Table 6-A presents evidence of changes in monitoring behavior, as reported by parents, over the study period. It includes the results of tests for statistical significance of the differences between estimates for 2000 (Waves 1 and 2)[4] and the first half of 2004 (Wave 9), and between estimates for 2002 (Waves 5 and 6) and the first half of 2004. While there are significant changes between 2000 and 2004 for some age groups, there are no statistically significant changes between 2002 and 2004. The following conclusions can be drawn from this table (Detail Table 6-3).

**Table 6-A. Parental monitoring behavior by child age (parent reports)**

| | Mean number of monitoring behaviors (0 to 3) | | | | | | |
|---|---|---|---|---|---|---|---|
| Age group | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 (Jan-Jun) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
| 12½ to 13 | 1.60 | 1.77 | 1.75 | 1.78 | 1.82 | **0.22* (0.11, 0.33)** | 0.07 (-0.04, 0.17) |
| 14 to 15 | 1.47 | 1.46 | 1.55 | 1.54 | 1.55 | 0.08 (-0.02, 0.18) | 0.01 (-0.09, 0.11) |
| 16 to 18 | 1.17 | 1.22 | 1.17 | 1.17 | 1.16 | -0.01 (-0.13, 0.11) | -0.01 (-0.11, 0.09) |
| 14 to 16 | 1.42 | 1.44 | 1.44 | 1.48 | 1.51 | **0.09* (0.00, 0.17)** | 0.07 (-0.01, 0.14) |
| 14 to 18 | 1.31 | 1.33 | 1.33 | 1.33 | 1.32 | 0.01 (-0.07, 0.10) | -0.01 (-0.08, 0.06) |
| 12½ to 18 | 1.38 | 1.43 | 1.43 | 1.44 | 1.44 | 0.06 (-0.01, 0.13) | 0.01 (-0.05, 0.07) |

* Change significant at $p < 0.05$.

First, focusing on the entire population of 12½- to 18-year-olds, after a slight rise between 2000 and 2001, the average number of parent monitoring behaviors was stable from 2001 to 2004; the test of change between 2000 and 2004 was not statistically significant. There were statistically significant favorable changes for younger youth, specifically, monitoring increased among parents of 12½- to 13-year-olds and 14- to 16-year-olds. Thus, the overall conclusion is that in the first half of 2004, parents reported that they monitored their 12½- to 16-year-old children more than in 2000, but not so for their 16- to 18-year-olds.

Second, parents monitor youth of different ages to different degrees. Older youth are monitored much less than younger youth. Detail Tables 6-11 through 6-13 present the data for each of the three behaviors that make up the scale. Parents reported that they always or almost always know where their children are when they are away from home for 73 percent of 12½- to 13-year-olds; the corresponding percentage for 16- to 18-year-olds is only 51 percent. Likewise, parents reported that they always or almost always know their child's plans for the coming day for 70 percent of 12½- to 13-year-olds as compared with 49 percent of 16- to 18-year-olds. Finally, parents claimed that their child never spends time with other children without adult supervision for 39 percent of 12½- to 13-year-olds, versus 15 percent for 16- to 18-year-olds.

A third conclusion on monitoring behavior can be reached by comparing the results in Tables 6-A to those based on youth reports given in Table 6-B (Detail Table 6-3). This comparison shows that youth reported that their parents engage in these behaviors less frequently than parents reported, at every age. As specific examples, while only 50 percent of 12½- to 18-year-old youth said that their

[4] Wave 1 data collection started in November 1999. Because only a relatively few interviews were completed in 1999, for discussion and presentation purposes these interviews are treated as having occurred in 2000.

**Table 6-B. Parental monitoring behavior by child age (youth reports)**

| Mean number of monitoring behaviors (0 to 3) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Age group | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 (Jan-Jun) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
| 12½ to 13 | 0.99 | 1.04 | 1.13 | 1.16 | 1.17 | **0.18* (0.09, 0.28)** | 0.05 (-0.05, 0.15) |
| 14 to 15 | 0.87 | 0.89 | 0.92 | 0.94 | 0.93 | 0.06 (-0.03, 0.15) | 0.01 (-0.07, 0.09) |
| 16 to 18 | 0.76 | 0.70 | 0.75 | 0.74 | 0.76 | 0.00 (-0.08, 0.09) | 0.01 (-0.05, 0.08) |
| 14 to 16 | 0.84 | 0.85 | 0.89 | 0.90 | 0.92 | **0.08* (0.01, 0.16)** | 0.02 (-0.03, 0.08) |
| 14 to 18 | 0.81 | 0.79 | 0.82 | 0.82 | 0.83 | 0.02 (-0.04, 0.09) | 0.01 (-0.03, 0.06) |
| 12½ to 18 | 0.85 | 0.85 | 0.89 | 0.90 | 0.91 | **0.06* (0.01, 0.11)** | 0.02 (-0.02, 0.06) |

* Change significant at $p < 0.05$.

parents always or almost always knew where they were when they were away from home, 60 percent of parents claimed they knew their child's whereabouts; only 32 percent of youth claimed that parents always or almost always knew their plans for the coming day as compared with 58 percent according to the parent reports; and, finally, only 9 percent of youth reported they never spent time alone with other children without adult supervision, as compared with 25 percent according to the parent reports. Thus it is clear that youth report a lower level of monitoring than do parents. However, for the Evaluation of the Campaign, the more important question is whether trends in monitoring reported by youth parallel those reported by parents. Both reports show no trend for 16- to 18-year-olds, but statistically significant positive change in monitoring behaviors among parents of 12½- to 13-year-olds and 14- to 16-year-olds. Thus, the youth trend data are broadly consistent with the parent trend data.

## 6.2.2 Monitoring Cognitions

Parents reported significant increases in monitoring cognitions from 2000 to 2004. As shown in Table 6-C, the change was statistically significant for all youth aged 12½ to 18 and for every age subgroup (Detail Table 6-1). The increases occurred throughout the period, but were greatest between 2000 and 2002; there was no significant change in monitoring cognitions from 2002 to 2004 for all youth aged 12½ to 18 or for any age subgroup.

**Table 6-C. Parental monitoring cognitions by youth age**

| Mean Index score[1] | | | | | | | |
|---|---|---|---|---|---|---|---|
| Age group | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 (Jan-Jun) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
| 12½ to 13 | 112.99 | 122.17 | 121.98 | 126.81 | 125.05 | **12.06* (3.03, 21.09)** | 3.07 (-5.96, 12.10) |
| 14 to 15 | 93.16 | 97.45 | 107.86 | 107.10 | 114.17 | **21.01* (10.14, 31.88)** | 6.31 (-0.80, 13.42) |
| 16 to 18 | 62.17 | 71.02 | 76.82 | 76.84 | 76.55 | **14.38* (4.35, 24.40)** | -0.27 (-10.62, 10.08) |
| 14 to 16 | 88.63 | 93.08 | 101.43 | 102.86 | 105.34 | **16.71* (7.50, 25.92)** | 3.91 (-3.83, 11.65) |
| 14 to 18 | 76.38 | 83.24 | 90.11 | 89.68 | 92.18 | **15.8* (8.09, 23.51)** | 2.07 (-4.77, 8.91) |
| 12½ to 18 | 85.06 | 92.56 | 97.81 | 98.63 | 100.01 | **14.95* (8.63, 21.28)** | 2.20 (-3.78, 8.17) |

[1] The scale has a mean of 100 and a standard deviation of 100 for all parents at Wave 1.

* Change significant at $p < 0.05$.

Trends in the individual questions that make up the monitoring cognitions scale are presented in Detail Tables 6-39 through 6-44 and Detail Table 6-51. Many of the individual questions show a parallel pattern of change.

## 6.2.3 Talking Behaviors

Table 6-D summarizes the information about parent reports of parent–child conversations about drugs (Detail Table 6-4). Parents could earn up to three points if they reported talking about drugs at least twice in the past 6 months, family rules about drugs, and specific things a youth could do to avoid drugs.

**Table 6-D. Parent–child talk about drugs by youth age (parent reports)**

| Mean number of talking behaviors (0 to 3) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Age group | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 (Jan-Jun) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
| 12½ to 13 | 2.27 | 2.39 | 2.44 | 2.47 | 2.51 | **0.25* (0.13, 0.36)** | 0.07 (-0.03, 0.17) |
| 14 to 15 | 2.28 | 2.38 | 2.47 | 2.44 | 2.52 | **0.24* (0.11, 0.37)** | 0.06 (-0.03, 0.14) |
| 16 to 18 | 2.19 | 2.33 | 2.37 | 2.31 | 2.39 | **0.19* (0.08, 0.30)** | 0.02 (-0.09, 0.13) |
| 14 to 16 | 2.30 | 2.41 | 2.45 | 2.43 | 2.50 | **0.20* (0.10, 0.31)** | 0.05 (-0.03, 0.13) |
| 14 to 18 | 2.23 | 2.35 | 2.41 | 2.37 | 2.44 | **0.21* (0.13, 0.29)** | 0.03 (-0.04, 0.10) |
| 12½ to 18 | 2.24 | 2.36 | 2.42 | 2.39 | 2.46 | **0.22* (0.15, 0.29)** | 0.04 (-0.02, 0.11) |

* Change significant at $p < 0.05$.

The table shows a steady pattern of increasing talk from 2000 through the first half of 2004, except for a slight decline among 14- to 18-year-olds from 2002 to 2003. The change tests yielded statistically significant increases from 2000 to 2004 overall and for youth in every age subgroup. The changes from 2002 to 2004—while positive in the full sample and all age subgroups—were relatively small and not statistically significant.

Parents widely claimed to do a good deal of talking about drugs with their children, with an overall average of 2.5 out of the three measured talking behaviors in 2004. As with the monitoring results above, parents reported more frequent talk with younger children than with 16- to 18-year-olds.

The 2003 Report of Findings found that youth report less talking behavior than do their parents for the same talk questions. The current results repeat that finding (Table 6-E and Detail Table 6-4), with youth reporting much lower absolute levels of talk with their parents about drugs. Youth reported on average approximately 1.3 out of the three talking behaviors in 2004, as compared with the average of 2.5 based on parent reports. While the parent reports show a statistically significant increase from 2000 to 2004 overall and for all five age subgroups, the youth reports show a statistically significant decrease overall as well as for 14- to 18-year-olds. As will be discussed below, there is evidence that the upward parent-reported trends for all youth aged 12½ to 18 complement a strong cross-sectional association between exposure and talking behavior.

In addition to questions about general talk with youth about drugs, all parents and youth were asked whether they had ever talked specifically about the anti-drug ads with the other group. Only 28 percent of 12½- to 18-year-olds reported such conversations themselves, as compared with 58 percent according to the parent reports. There is evidence that the rate of conversations about the anti-drug ads reported by parents increased from 2000 to the first half of 2004. Youth reports, however, showed no statistically significant change over this same period (Detail Table 6-24).

**Table 6-E. Parent–child talk about drugs by youth age (youth reports)**

| Mean number of talking behaviors (0 to 3) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Age group | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 (Jan-Jun) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
| 12½ to 13 | 1.69 | 1.57 | 1.53 | 1.48 | 1.56 | -0.13 (-0.26, 0.01) | 0.04 (-0.09, 0.16) |
| 14 to 15 | 1.56 | 1.41 | 1.38 | 1.36 | 1.32 | **-0.25* (-0.38, -0.11)** | -0.06 (-0.18, 0.07) |
| 16 to 18 | 1.33 | 1.26 | 1.26 | 1.22 | 1.25 | -0.09 (-0.20, 0.02) | -0.01 (-0.11, 0.09) |
| 14 to 16 | 1.52 | 1.38 | 1.35 | 1.33 | 1.35 | **-0.17* (-0.27, -0.06)** | 0.00 (-0.08, 0.08) |
| 14 to 18 | 1.44 | 1.33 | 1.31 | 1.28 | 1.28 | **-0.16* (-0.24, -0.08)** | -0.03 (-0.10, 0.04) |
| 12½ to 18 | 1.50 | 1.39 | 1.36 | 1.33 | 1.34 | **-0.15* (-0.23, -0.08)** | -0.02 (-0.07, 0.04) |

* Change significant at $p < 0.05$.

## 6.2.4 Talking Cognitions

Table 6-F presents the data about the index for parent attitudes and beliefs about talking with their children about drugs (Detail Table 6-2). Unlike the Talking Behavior Index based on parent reports, there were no statistically significant increases for all youth or for any age subgroup between 2000 and 2004. The Talking Cognitions Index increased overall from 2000 to 2002 after which it decreased significantly between 2002 and the first half of 2004, most notably among parents of 14- to 18-year-olds.

**Table 6-F. Parent cognitions about talk about drugs by youth age**

| Mean Index score[1] | | | | | | | |
|---|---|---|---|---|---|---|---|
| Age group | Year 2000 | Year 2001 | Year 2002 | Year 2003 | Year 2004 (Jan-Jun) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
| 12½ to 13 | 110.68 | 111.11 | 108.00 | 110.05 | 115.68 | 5.00 (-5.20, 15.20) | 7.68 (-1.95, 17.31) |
| 14 to 15 | 107.46 | 110.68 | 110.95 | 102.13 | 103.66 | -3.80 (-13.85, 6.25) | -7.29 (-15.59, 1.01) |
| 16 to 18 | 81.88 | 91.58 | 92.78 | 83.34 | 82.60 | 0.72 (-11.01, 12.45) | **-10.18* (-20.15, -0.21)** |
| 14 to 16 | 105.47 | 109.49 | 108.16 | 98.76 | 100.42 | -5.05 (-13.61, 3.50) | **-7.74* (-15.06, -0.43)** |
| 14 to 18 | 93.61 | 100.41 | 100.56 | 91.31 | 91.35 | -2.26 (-10.00, 5.48) | **-9.21* (-15.44, -2.98)** |
| 12½ to 18 | 97.65 | 102.97 | 102.36 | 95.83 | 97.14 | -0.51 (-6.86, 5.84) | **-5.22* (-10.42, -0.01)** |

[1] The scale has a mean of 100 and a standard deviation of 100 for all parents at Wave 1.

* Change significant at $p < 0.05$.

## 6.2.5 Fun Activities

During the early period of Phase III, corresponding to the Wave 1 data collection period, the Campaign encouraged parents to engage in fun activities with their children. However, this theme was not emphasized in later advertising. Table 6-G summarizes parent reports of claims to do at least three or more activities with their child each week, either at home or out-of-home (Detail Tables 6-5, 6-16, and 6-17). The trends suggest a general decline since 2000, with statistically significant unfavorable changes between 2000 and the first half of 2004 for parents of all youth aged 12½ to 18 and for parents of 14- to 18-year-olds. The first half of 2004 yielded the lowest percentages to date. Since the fun activity theme was emphasized only during Wave 1 of the Campaign, if there had been any positive effect, it would likely have already been present when respondents were first interviewed. The

downward trend after 2000 may reflect the subsequent change in Campaign focus, or may have been due to unknown and unrelated factors.

**Table 6-G. Parents doing three or more fun activities per week with their child by youth age (parent reports)**

| Age group | Year 2000 (%) | Year 2001 (%) | Year 2002 (%) | Year 2003 (%) | Year 2004 (Jan-Jun) (%) | 2000 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
|---|---|---|---|---|---|---|---|
| 12½ to 13 | 73.9 | 74.7 | 73.4 | 70.3 | 70.5 | -3.4 (-8.6, 1.8) | -2.9 (-7.8, 2.1) |
| 14 to 15 | 68.4 | 64.5 | 66.4 | 66.2 | 62.6 | **-5.8* (-11.2, -0.4)** | -3.8 (-8.2, 0.7) |
| 16 to 18 | 51.5 | 51.9 | 51.6 | 52.8 | 47.7 | -3.9 (-9.3, 1.6) | -3.9 (-9.2, 1.3) |
| 14 to 16 | 65.3 | 63.6 | 63.1 | 64.0 | 59.6 | **-5.7* (-10.1, -1.4)** | -3.5 (-7.2, 0.3) |
| 14 to 18 | 59.3 | 57.7 | 57.9 | 58.5 | 53.9 | **-5.4* (-9.1, -1.7)** | **-4.0* (-7.5, -0.6)** |
| 12½ to 18 | 62.7 | 61.8 | 61.7 | 61.3 | 57.8 | **-4.9* (-8.2, -1.6)** | **-3.8* (-6.7, -0.9)** |

* Change significant at $p < 0.05$.

Starting in 2001, the fun activities questions were also asked of youth. Initially, the proportion of youth claiming to do three or more activities was near that based on parents' reports. However, parent and youth reports appear to diverge in 2003 and 2004. While the parent reports were similar from 2000 to 2003 with a decline in 2004, the youth reports of fun activities were generally stable only between 2001 and 2002 and then declined significantly for youth aged 14 and above for the 2002 to 2004 period. Both parent and youth reports of fun activities are associated with the age of the youth. Such activities were reported by both parents and youth for about two-thirds of 12½- to 13-year olds but for less than half of 16- to 18-year-olds in the first half of 2004 (Table 6-H and Detail Table 6-5).

**Table 6-H. Parents doing three or more fun activities per week with their child by youth age (youth reports)**

| Age group | Year 2001 (%) | Year 2002 (%) | Year 2003 (%) | Year 2004 (Jan-Jun) (%) | 2001 to 2004 Change (95% CI) | 2002 to 2004 Change (95% CI) |
|---|---|---|---|---|---|---|
| 12½ to 13 | 66.3 | 66.5 | 65.3 | 66.1 | -0.2 (-5.5, 5.1) | -0.4 (-4.9, 4.1) |
| 14 to 15 | 58.5 | 56.9 | 53.9 | 54.6 | -4.0 (-8.9, 1.0) | -2.3 (-6.4, 1.7) |
| 16 to 18 | 47.4 | 49.2 | 45.1 | 44.0 | -3.3 (-8.6, 1.9) | -5.2* (-9.5,-0.9) |
| 14 to 16 | 56.2 | 55.8 | 51.4 | 52.7 | -3.5 (-7.6, 0.7) | -3.1 (-6.8, 0.6) |
| 14 to 18 | 52.4 | 52.5 | 48.8 | 48.3 | **-4.1* (-7.8, -0.4)** | **-4.1* (-7.1, -1.2)** |
| 12½ to 18 | 55.7 | 55.8 | 52.8 | 52.5 | **-3.2* (-6.3, 0.0)** | **-3.3* (-5.8, -0.9)** |

* Change significant at $p < 0.05$.

## 6.2.6 Evidence for Diversity in Trends

Is it possible that the overall patterns presented above might vary for subgroups of youth? There are two circumstances of interest: when there is no overall significant trend but a particular subgroup does show a significant trend, and when subgroups show different trends. The above presentation outlined the diversity of trends among youth of different ages. This section focuses on diversity in terms of

youth's gender, race/ethnicity, and risk for marijuana use, as well as the parent's gender and educational level.[5]

## Diversity of Trends for Monitoring Behavior and Cognitions

As shown in Table 6-A, there was a favorable but not statistically significant change for parent reports of monitoring behavior across the entire sample for the 2000-2004 period with no change for the 2002 to 2004 period. However, there was a statistically significant favorable increase in parent-reported monitoring behavior for 12½- to 13-year-olds and a just significant increase for 14- to 16-year-olds for 2000 to 2004. Only one of the 13 subgroups examined[6] (parents of lower risk youth) showed a statistically significant (favorable) change between 2000 and the first half of 2004 and only one subgroup (girls) showed a significant (favorable) change between 2002 and the first half of 2004 (Detail Table 6-3). For youth-reported monitoring behavior, Table 6-B shows a statistically significant favorable change from 2000 to 2004 among the entire sample of 12½- to 18-year-olds, as well as a significant favorable change for youth aged 12½ to 13 and 14 to 16 for this period. The 2000-2004 change was also significant and favorable for 2 of the 11 subgroups[7] (African American and lower risk youth). There was no significant change between 2002 and 2004 for youth-reported monitoring for the entire sample, for any age subgroup, or for any other subgroup.

There were statistically significant favorable changes for parent reports of monitoring cognitions between 2000 and 2004 overall and for every age subgroup. Detail Table 6-1 shows that 10 of the 13 subgroups examined had a statistically significant change in monitoring cognitions during this time period. The changes were favorable for all subgroups and, given the levels of sampling error, the evidence does not permit a claim for differential trends in parent-reported monitoring cognitions across these subgroups. However, there were no significant changes between 2002 and 2004 overall or for any age subgroup; similarly, there were no significant changes for this period for any other subgroup.

Although there is no clear evidence of differential trends across subgroups, it is worth noting that the actual monitoring behaviors and cognitions, averaged across the nine waves, are different by subgroups. For both parent and youth reports, there are statistically significant, consistent differences with regard to monitoring behavior by youth gender, race/ethnicity, and risk score. Averaging across the nine waves, according to parent reports, girls (1.53 on the 0 to 3 scale) were more highly monitored than were boys (1.32). White and Hispanic youth were also more highly monitored than were African Americans (1.44 and 1.47 versus 1.34).

Perhaps the most noteworthy subgroup differences in the levels on monitoring behaviors and cognitions were found between youth in the higher and lower risk groups, which held up even after controlling for youth age. Table 6-I presents the nine-wave averages of parent reports of monitoring behaviors and monitoring cognitions by youth age and risk group. Only youth who had never used marijuana are included in these analyses of differences by risk group so as to avoid making inferences

[5] Although results are also stratified by sensation seeking in the Detail Tables, that measure has considerable overlap with the risk score measure; as a result, this and subsequent sections discuss only observed differences by risk score.

[6] Throughout Section 6.2.6, trends in parent reports of behavior (monitoring, talking, and fun activities) and cognitions (monitoring and talking) are compared by youth gender, race/ethnicity, risk, parent gender, and parent education.

[7] Throughout Section 6.2.6, trends in youth reports of parent behavior (monitoring, talking, and fun activities) are compared by youth gender, race/ethnicity, risk, and parent education.

where reverse causation might be a greater concern. All six of the comparisons (high versus low risk group for each monitoring outcome within age category) yielded statistically significant differences when controlled for youth age. According to parent reports, youth at higher risk across all age groups were monitored less and by parents who held less favorable views regarding monitoring.

**Table 6-I. Parent monitoring behaviors and cognitions by child age and risk**

| Youth characteristic | | Parent reports averaged across nine waves: | |
|---|---|---|---|
| Age group | Risk | Monitoring behavior mean (CI) | Monitoring cognitions mean (CI) |
| 12½ to 13 | Higher | **1.28* (1.16, 1.30)** | **82.50* (71.86, 93.13)** |
| | Lower | **1.79* (1.74, 1.84)** | **126.71* (123.36, 130.07)** |
| 14 to 15 | Higher | **1.14* (1.14, 1.28)** | **74.39* (67.35, 81.43)** |
| | Lower | **1.64* (1.59, 1.68)** | **115.96* (112.02, 119.91)** |
| 16 to 18 | Higher | **1.02* (0.97, 1.08)** | **58.68* (53.46, 63.91)** |
| | Lower | **1.49* (1.43, 1.56)** | **101.63* (95.00, 108.27)** |

* Mean significantly different from that of other risk group at $p < 0.05$.

## Diversity of Trends for Talking Behavior and Cognitions

As shown in Table 6-D, according to parent reports, the amount of talking behavior increased significantly between 2000 and 2004 overall and in every age subgroup, but there were no statistically significant changes between 2002 and 2004. All the subgroups (13 of 13) also showed significant increases between 2000 and 2004, with comparable rates of increase within the bounds of sampling error (Detail Table 6-4). The observed change in parent reports of talking behavior between years was widely shared across these subgroups.

Table 6-E showed an opposite pattern of trends in youth reports of parental talking behavior among 12½- to 18-year-olds—youth reports of talking behavior declined between 2000 and 2004. Almost half of the subgroups (5 of 11) also showed statistically significant declines in youth reports of talking behavior in this period (Detail Table 6-4). Although subgroups vary in their estimated rates of change, the variation was within the bounds of sampling error. Similar to parent reports, there were no significant changes in the youth reports between 2002 and 2004.

Parent talking cognitions, as presented in Table 6-F, showed no statistically significant change from 2000 to the first half of 2004 for the entire sample of youth aged 12½ to 18, for any age subgroup or for any other subgroup. However, there was a significant unfavorable change from 2002 to 2004 for the entire sample, for older age groups and for female, Hispanic, and higher risk youth (Detail Table 6-2). The rate of change varies across subgroups, but the variation is within the bounds of sampling error.

There were a few significant subgroup differences in absolute levels of talking behavior and cognitions averaged across the nine waves. Mothers were more likely to report household talk than were fathers (2.45 vs. 2.23); mothers also reported significantly more favorable talking cognitions than did fathers (108 vs. 83). According to parents, African American and Hispanic youth experienced more household talk than White youth (2.48 and 2.53 vs. 2.33); parental talking cognitions were also significantly more favorable for African American and Hispanic than for White youth (125 and 123 vs. 89). Although youth at higher and lower risk experienced similar levels of parental talking

behavior (2.38 vs. 2.37 on 3-point scale), parental talking cognitions were significantly lower for higher risk than lower risk youth (91 vs. 110).

Given that parental monitoring and talking behaviors did not feature in the construction of the Risk Index, finding consistent differences between higher and lower risk youth for parent reports of monitoring behavior but not talking behavior is striking. According to parent reports, youth at higher risk for marijuana use consistently experience fewer monitoring behaviors than youth at lower risk, whereas household talking behavior does not vary by risk category. Youth at higher risk have parents with both less favorable monitoring and less favorable talking cognitions than youth at lower risk.

Looking at the risk model more closely (see Appendix E), the strongest predictors of marijuana use are youth cigarette use, sensation-seeking, age, and alcohol use. Parental factors that are incorporated into the risk measure and have significant effects are parental cigarette use and family structure. Perhaps parents who have negative attitudes and beliefs about monitoring their youth have children who use cigarettes, have higher sensation-seeking tendencies, are older, and use alcohol, and this is also reflected in the parents' monitoring behavior.

### Diversity of Trends for Reports of Fun Activities

Statistically significant unfavorable changes were found from 2000 to 2004 and from 2002 to 2004 in parent reports of fun activities for 12½- to 18-year-olds (Table 6-G). The changes between the estimates for 2000 and the first half of 2004 were statistically significant and unfavorable for three age subgroups as well as for 8 of the other 13 subgroups; the differences in the changes by subgroup were within the bounds of sampling error. Youth reports of fun activities showed similar unfavorable changes from 2001 to 2004 and from 2002 to 2004 (Table 6-H).

### Summary of Trend Data

In summary, the trend data provide evidence of favorable change for monitoring behavior between 2000 and 2004 as reported by youth, and a less definitive change in monitoring as reported by parents. While parents report a favorable increase in talking behavior between 2000 and 2004, youth reports show an unfavorable decrease. Both parents and youth report a decrease in fun activities with the decrease somewhat greater between 2002 and the first half of 2004 than between 2000 and 2002. Parents report an increase in monitoring cognitions but there is no significant change in talking cognitions between 2000 and 2004.

In general, there is no clear evidence of consistent trend differences for particular subgroups. However, child risk for marijuana use yields differences in absolute levels of parental and child reports of monitoring. This chapter next turns to the complementary evidence about the association of Campaign exposure and these outcomes.

## 6.3 Cross-sectional Association of Advertising Exposure with Parent Outcomes

Chapter 3 described the general and specific exposure measures that were used for the exposure analyses. The general exposure measure is the sum of recalled exposure in recent months to advertising in four different types of sources (television and radio; movies and videos; print media, including newspapers and magazines; and outdoor media). The specific exposure measure sums the

recalled exposure to the individual radio and television ads that had been on the air in the 60 days before the interview. The general exposure measures display substantially higher levels than do the specific exposure levels. For example, a parent general exposure of 12 or more times per month was reported for around 43 percent of the full sample, whereas the corresponding figure for specific exposure was only 17 percent. There are three factors that may contribute to that difference: the general exposure measure included more sources than the specific exposure measure; the general exposure measure allowed for recall of advertising that was directed to other audiences including youth, while the specific exposure measure focused only on ads directed to the parent; and finally, the general exposure measure may be less demanding since it did not require the respondent to claim that he or she had seen a specific ad. One might speculate, therefore, that general exposure was at greater risk of inflated reporting. At the same time, the specific exposure measure may yield underestimates because some respondents may not have recalled an ad at the time of the interview, but in fact they had seen or heard and attended to the ad when it aired. Because the two measures may capture different aspects of exposure, evidence of exposure-outcome associations are presented for both exposure measures, with claims about effects strengthened when both show the same pattern of effects.

The general exposure association tables employ a classification of exposure into three groups: parents who reported fewer than 4 exposures per month, those who reported between 4 and 11 exposures per month, and those who reported 12 or more exposures per month. Since there were very few parents who reported no exposure, they could not be considered separately. The specific exposure tables include four categories, since it was feasible to break out the lowest exposure group into those who recalled less than 1 exposure per month and those who recalled 1 to 3 exposures per month. Table 6-J presents the distributions for both general and specific exposure for 12½- to 18-year-olds (Detail Tables 6-54 and 6-55).

**Table 6-J. Parent exposures per month for 12½- to 18-year-old youth across nine waves**

| | <1 exposure | 1 – 3 exposures | 4 – 11 exposures | 12+ exposures |
|---|---|---|---|---|
| General exposure | 28.4% | | 28.8% | 42.8% |
| Specific exposure | 16.1% | 27.9% | 38.5% | 17.5% |

In all exposure analyses, the effects are corrected for the influence of confounder variables using the propensity scoring procedures described in Appendix C. The effects reported are based on estimates of what people at each level of exposure would have been like had they all been similar on variables that were associated with exposure.

All analyses are restricted to parents of 12½- to 18-year-olds. As in Chapter 5, the gamma coefficient is used to estimate the magnitude of ordinal association between exposure and an outcome variable. Gamma varies from –1 to +1, with estimates closer to either end showing stronger associations, and a gamma of zero showing no association. When the 95 percent confidence interval for gamma does not include 0, the association between exposure and outcome is statistically significant at the $p < 0.05$ level.

In addition to the parent-reported outcomes, youth reports of parent monitoring and talking behavior will be used as supplementary outcomes for analyses of parent Campaign effects. As noted in the previous section, in the case of talking behavior a positive trend was reported by parents while a negative trend was reported by youth. Also shown above, both parent and youth reports of monitoring behavior predicted youth initiation of marijuana use in similar ways but predicted differently for talk

behavior (Section 6.1). Thus both the parent and youth reports deserve attention. Accordingly, both cross-sectional and delayed-effects associational analyses of parent exposure and outcomes will use the youth as well as the parent reports of parent-child interactions.

The detail tables also provide estimates for subgroups of that population defined by youth characteristics (age, gender, race/ethnicity) and parent characteristics (gender, education), and by year.

### 6.3.1 Cross-sectional Association of Monitoring Behavior and Cognitions Scales with General and Specific Exposure

In the cross-sectional analyses, neither the general nor the specific exposure measure was associated with youth reports of monitoring behavior, but specific exposure measure was favorably associated with parent reports of monitoring behavior. Table 6-K presents the summary data for both exposure measures using parent reports, with the full version in Detail Tables 6-60 and 6-61. Table 6-L shows the summary data for the exposure measures using youth reports, with additional detail in Detail Tables 6-96 and 6-97. Consistent with the trend data, across parent exposure levels youth reported significantly lower levels of monitoring than did parents.

**Table 6-K. Cross-sectional association of exposure per month and monitoring behavior by parents of 12½- to 18-year-old youth (parent reports)**

| Mean number of monitoring behaviors, with overall average of 1.42 across nine waves | | | | | |
|---|---|---|---|---|---|
| | <1 exposure | 1 – 3 exposures | 4 – 11 exposures | 12+ exposures | Gamma (CI) |
| General exposure | 1.41 | | 1.41 | 1.44 | 0.02 (-0.01, 0.05) |
| Specific exposure | 1.42 | 1.38 | 1.43 | 1.49 | **0.03* (0.00, 0.06)** |

**Table 6-L. Cross-sectional association of exposure per month and monitoring behavior by parents of 12½- to 18-year-old youth (youth reports)**

| Mean number of monitoring behaviors, with overall average of 0.89 across nine waves | | | | | |
|---|---|---|---|---|---|
| | <1 exposure | 1 – 3 exposures | 4 – 11 exposures | 12+ exposures | Gamma (CI) |
| General exposure | 0.89 | | 0.88 | 0.89 | 0.00 (-0.02, 0.03) |
| Specific exposure | 0.85 | 0.90 | 0.87 | 0.92 | 0.02 (-0.01, 0.05) |

Parent reports of cognitions about monitoring did show statistically significant positive associations with general and specific exposure. These data are presented in Table 6-M, which summarizes the information presented in Detail Tables 6-56 and 6-57.

**Table 6-M. Cross-sectional association of exposure per month and monitoring cognitions by parents of 12½- to 18-year-old youth (parent reports)**

| Mean score on Monitoring Cognitions Index, with overall average of 94.4 across nine waves | | | | | |
|---|---|---|---|---|---|
| | <1 exposure | 1 – 3 exposures | 4 – 11 exposures | 12+ exposures | Gamma (CI) |
| General exposure | 89.08 | | 89.74 | 100.64 | **0.05* (0.03, 0.07)** |
| Specific exposure | 90.88 | 87.90 | 94.88 | 106.42 | **0.05* (0.02, 0.07)** |

* Significant at $p < 0.05$.

### 6.3.2 Cross-sectional Association of Talking Behavior and Cognitions Scales with General and Specific Exposure

With both the general and specific exposure measures, parents of 12½- to 18-year-olds who reported more exposure to the Campaign's messages were significantly more likely to report talking to their children. Table 6-N presents the evidence for the association with talking behaviors based on parent reports, with the complete results in Detail Tables 6-62 and 6-63. The association between parental-specific exposure and talking behaviors was just statistically significant when youth reports of talking were used. However, the association for the general exposure measure was not statistically significant (Table 6-O and Detail Tables 6-98 and 6-99).

**Table 6-N. Cross-sectional association of exposure per month and talking behaviors by parents of 12½- to 18-year-old youth (parent reports)**

| Mean number of talking behaviors, with overall average of 2.37 across nine waves | | | | | |
|---|---|---|---|---|---|
| | <1 exposure | 1 – 3 exposures | 4 – 11 exposures | 12+ exposures | Gamma (CI) |
| General exposure | 2.22 | | 2.37 | 2.50 | **0.18* (0.14, 0.21)** |
| Specific exposure | 2.28 | 2.27 | 2.42 | 2.53 | **0.15* (0.11, 0.18)** |

* Significant at $p < 0.05$.

**Table 6-O. Cross-sectional association of exposure per month and talking behaviors by parents of 12½- to 18-year-old youth (youth reports)**

| Mean number of talking behaviors, with overall average of 1.40 across nine waves | | | | | |
|---|---|---|---|---|---|
| | <1 exposure | 1 – 3 exposures | 4 – 11 exposures | 12+ exposures | Gamma (CI) |
| General exposure | 1.38 | | 1.40 | 1.42 | 0.02 (-0.01, 0.05) |
| Specific exposure | 1.30 | 1.39 | 1.39 | 1.47 | **0.04* (0.01, 0.07)** |

*Significant at $p < 0.05$.

Table 6-P provides closely parallel parent information for cognitions about talking. Parental cognitions about talking were statistically significant and positively associated with both measures of exposure. Gamma estimates for the associations between general and specific exposure with talking behavior and talking cognitions were larger than those for the associations with monitoring behavior and monitoring cognition (Detail Tables 6-58 and 6-59).

**Table 6-P. Cross-sectional association of exposure per month and talking cognitions by parents of 12½- to 18-year-old youth (parent reports)**

| Mean score on Talking Cognitions Index, with overall average of 99.47 across nine waves | | | | | |
|---|---|---|---|---|---|
| | <1 exposure | 1 – 3 exposures | 4 – 11 exposures | 12+ exposures | Gamma (CI) |
| General exposure | 84.64 | | 92.69 | 116.92 | **0.13* (0.10, 0.15)** |
| Specific exposure | 88.05 | 90.54 | 103.11 | 117.68 | **0.09* (0.06, 0.11)** |

* Significant at $p < 0.05$.

### 6.3.3 Cross-sectional Association of Fun Activities with General and Specific Exposure

Table 6-Q shows a positive significant association between both general and specific exposure and parents reporting engaging in three or more activities per week with their children (Detail Tables 6-64 and 6-65). Youth reports of fun activities also show a positive significant association with parental general exposure and a near-significant association with parental specific exposure, with the lower CI of gamma just barely crossing zero (Table 6-R and Detail Tables 6-100 and 6-101).

**Table 6-Q. Cross-sectional association of exposure per month and parents doing three or more fun activities with their child per week for 12½- to 18-year-old youth (parent reports)**

| Percentage, with overall average of 61% across nine waves | | | | | |
|---|---|---|---|---|---|
| | <1 exposure | 1 – 3 exposures | 4 – 11 exposures | 12+ exposures | Gamma (CI) |
| General exposure | 57 | | 62 | 65 | **0.11* (0.07, 0.15)** |
| Specific exposure | 57 | 59 | 63 | 68 | **0.12* (0.08, 0.15)** |

* Significant at $p < 0.05$.

**Table 6-R. Cross-sectional association of exposure per month and parents doing three or more fun activities with their child per week for 12½- to 18-year-old youth (youth reports)**

| Percentage, with an overall average of 60% across nine waves | | | | | |
|---|---|---|---|---|---|
| | <1 exposure | 1 – 3 exposures | 4 – 11 exposures | 12+ exposures | Gamma (CI) |
| General exposure | 53 | | 55 | 56 | **0.04* (0.00, 0.08)** |
| Specific exposure | 54 | 53 | 55 | 56 | 0.04 (-0.00, 0.07) |

### 6.3.4 Evidence for Diversity in Cross-sectional Associations

This section examines subgroup effects in order to assess whether there may be differential effects among subgroups for each of the parent and youth reports of outcomes. First, in situations where there was no overall evidence of an association, is there evidence that there were effects on some important subgroups? Second, in the presence of overall associations, is there evidence that these are significantly different among subgroups? In general, there is no firm evidence of differential associations in Detail Tables 6-56 through 6-65 across subgroups.

For parents' reports of outcomes, 9 of the 10 overall association analyses were statistically significant: the associations of both general and specific exposure with the talking cognitions and behavior, with reports of fun activities, and with monitoring cognitions, and the association of specific exposure only with monitoring behavior. Many of the 180 subgroup analyses[8] also yielded significant results and, given the sampling errors in the subgroup estimates, there was no clear evidence of differential effects by subgroup. A possible exception occurs with parent cognitions about talking with their children,

[8] Subgroup comparisons for the relationship between campaign exposure and parent reports of behaviors (monitoring, talking, fun activities) and cognitions (monitoring, talking) were conducted by youth age (2 groups), gender (2 groups), youth risk (2 groups), and race/ethnicity (3 groups); by parent gender (2 groups) and education (2 groups); and by year (5 groups) totaling 18 subgroups for each of the 5 outcome measures, by 2 measures of exposure (18 x 5 x 2 = 180). Since several of the age categories presented in the Detail Tables overlap, comparisons were made only between two, mutually exclusive age groups: 12.5 to 13 and 14 to 18. Risk-taking-level data are not provided in the Detailed Tables.

where there was no association with specific exposure for African American and Hispanic youth but a sizable and statistically significant association for White youth (Detail Table 6-59); however, this differential effect was not present for the association with general exposure.

The one analysis of parent reports where the overall association was not statistically significant was that between general exposure and monitoring behavior. Although there were some subgroup associations for this outcome, they are difficult to interpret. Of the 16 comparisons involved, 3 showed a statistically significant association as measured by gamma: 14- to 18-year-olds and parents with less than college education showed significant positive associations, while 12½- to 13-year-olds had a significant negative association.

Of the six overall associations of parental exposure and youth reports of parent behaviors, two were statistically significant: specific exposure and parent talking behavior and general exposure and fun activities.. Of the 108 subgroup analyses[9] conducted for youth reports of behavioral outcomes, only five showed a significant association. Given the many comparisons, some would be expected to be statistically significant by chance.

In summary, although some of the estimated subgroup associations do differ to some degree from the general patterns, there is no clear and consistent evidence for differential subgroup effects of Campaign exposure. The subgroup estimates were often subject to sizable sampling errors, which may plausibly explain the differences observed.

## 6.4 Delayed-effects Analyses of Parent Outcomes

This report incorporates evidence from four rounds of data collection: Round 1 (Waves 1, 2, and 3), Round 2 (Waves 4 and 5), Round 3 (Waves 6 and 7), and Round 4 (Waves 8 and 9). The delayed-effects analyses examine the association between exposure measured at an earlier round and outcome measured at the following round, statistically controlling for confounders as well as for outcomes. Two types of analyses are reported. First, overall delayed effects are assessed for the sample of pooled cases (for which exposure was measured at Round 1, 2, or 3 and outcomes were measured at Round 2, 3, or 4). This analysis examines if there are overall delayed effects capitalizing on the maximum sample size available. Second, delayed-effect associations are reported by pairs of rounds separately: the effects of Round 1 exposure on Round 2 parent outcomes, of Round 2 exposure on Round 3 outcomes, and of Round 3 exposure on Round 4 outcomes. The individual round-to-round analyses permit examination of whether delayed effects are consistent across rounds. Unlike the case with the delayed effects youth analyses, no Wave 7 to Wave 9 analyses are reported for parents. The Wave 7 to Wave 9 analyses were conducted for youth in order to examine the effect of the Marijuana Initiative. However, the parent Campaign was not affected by that initiative.

The focus of delayed effects analyses presented here is parent outcomes for youth who were interviewed at Round 1, 2, or 3 *and* who were 12½ to 18 years old at Round 2, 3, or 4 when they were reinterviewed. Additional analyses of parent exposure on youth outcomes are further restricted to

[9] Subgroup comparisons for the relationship between Campaign exposure and youth reports of behaviors (monitoring, talking, fun activities) were conducted by youth age (2 groups), gender (2 groups), youth risk (2 groups), and race/ethnicity (3 groups); parent gender (2 groups) and education (2 groups); and by year (5 groups) totaling 18 subgroups for each outcome, by 3 parental outcome measures and 2 measures of exposure (18 x 3 x 2 = 108). Since several of the age categories presented in the Detail Tables overlap, comparisons were made only between two, mutually exclusive age groups: 12½ to 13 and 14 to 18.

youth who reported that they had not used marijuana at the earlier round. The analyses use the same two parent exposure measures presented in the preceding section, general and specific exposure, reported for Rounds 1, 2, and 3. As with the cross-sectional analyses, because the two measures may capture different aspects of exposure, the evidence of delayed-effects association is presented for both, with the interpretation strengthened when both show the same pattern of effects. In all exposure analyses, the effects are corrected for the influence of outcomes measured at an earlier round and confounder variables using the propensity scoring procedures described in Appendix C. They are what the estimates at each level of exposure would have been like had parents at each level been similar on measured variables that were associated with exposure.

### 6.4.1 Delayed-effects Association of General and Specific Exposure with Monitoring Behavior and Cognitions Scales

The previous reports found that neither the general nor the specific exposure measures at Rounds 1 or 2 were associated with subsequent parent reports of monitoring behavior at Rounds 2 or 3. This remains true for 12½- to 18-year-olds overall, and by pairs of rounds, with the addition of parent exposure data from Round 3 and parent monitoring data from Round 4. Table 6-S presents the summary results for both exposure measures. Thus the results from the cross-sectional analyses showing a favorable effect of parent reports of monitoring behavior do not extend to the delayed-effects analysis. This was to be expected, given that the cross-sectional effects did not appear until Wave 9.

**Table 6-S. Delayed-effects association of exposure per month and monitoring behavior by parents of 12½- to 18-year-old youth (parent reports)**

| | Mean number of monitoring behaviors at later round (Round 2, 3, or 4), by parent exposure per month at earlier round (Round 1, 2, or 3), with an overall mean of 1.44 | | | | Gamma (CI) | | | |
|---|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases | Round 1 →Round 2 | Round 2 →Round 3 | Round 3 →Round 4 |
| General exposure | 1.48 | | 1.42 | 1.43 | -0.02 (-0.05, 0.01) | -0.03 (-0.09, 0.02) | 0.01 (-0.04, 0.05) | -0.03 (-0.08, 0.03) |
| Specific exposure | 1.44 | 1.42 | 1.43 | 1.52 | 0.02 (-0.01, 0.05) | 0.04 (-0.01, 0.10) | 0.02 (-0.03, 0.06) | 0.03 (-0.04, 0.09) |

Out of a total of 96 tests (Detailed Tables 6-70 and 6-71),[10] there was one statistically significant delayed-effect subgroup association for general exposure and one significant association for specific exposure. It is likely that these two statistically significant results reflect chance associations.

Table 6-T presents the summary data for both measures of parent exposure and youth reports of parent monitoring behavior, with additional detail in Detail Tables 6-102 and 6-103. The results parallel those for parent reports of monitoring behavior. Neither measure of parent exposure was significantly associated with subsequent youth reports of parent monitoring behavior. Across the two

[10]Subgroup comparisons for the relationship between Campaign exposure and delayed effects parent reports of behaviors (monitoring, talking, fun activities) and cognitions (monitoring, talking) were conducted by youth age (2 groups), gender (2 groups), youth risk (2 groups), race/ethnicity (3 groups); parent gender (2 groups) and education (2 groups); and round (3 groups) totaling 16 subgroups for each outcome, by 3 rounds and 2 measures of exposure (16 x 3 x 2 = 96). Since several of the age categories presented in the Detail Tables overlap, comparisons were made only between two, mutually exclusive age groups: 12½ to 13 and 14 to 18. The Detailed Tables for this chapter do not include the results for child risk.

exposure measures only eight subgroup associations were statistically significant out of 84 tests, four in a positive direction and four in a negative direction. It seems likely that these can be explained just by chance.

**Table 6-T. Delayed-effects association of parent exposure per month and monitoring behavior for 12½- to 18-year-old youth (youth reports)**

| | Mean number of parent monitoring behaviors at later round (Round 2, 3, or 4), by parent exposure per month at earlier round (Round 1, 2, or 3), with an overall mean of 0.9 | | | | Gamma (CI) | | | |
|---|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases | Round 1 →Round 2 | Round 2 →Round 3 | Round 3 →Round 4 |
| General exposure | 0.93 | | 0.88 | 0.89 | -0.02 (-0.05, 0.01) | -0.02 (-0.06, 0.03) | 0.00 (-0.05, 0.05) | -0.05 (-0.09, 0.00) |
| Specific exposure | 0.85 | 0.92 | 0.89 | 0.95 | 0.03 (-0.00, 0.06) | 0.01 (-0.04, 0.06) | 0.05 (-0.01, 0.11) | 0.04 (-0.01, 0.10) |

Delayed-effects analyses of the association between general and specific exposures with parent monitoring cognitions did not find any overall significant effect either (Table 6-U). There were no statistically significant subgroup associations with general exposure and there were three significant subgroup associations with specific exposure (Detail Tables 6-66 and 6-67). Of these, one was positive and two were negative. As with parent reports, the most likely explanation is chance.

**Table 6-U. Delayed-effects association of exposure per month and monitoring cognitions by parents of 12½- to 18-year-old youth (parent reports)**

| | Mean score on parent Monitoring Cognitions Index at later round (Round 2, 3, or 4), by parent exposure per month at earlier round (Round 1, 2, or 3), with an overall mean of 98.35 | | | | Gamma (CI) | | | |
|---|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases | Round 1 →Round 2 | Round 2 →Round 3 | Round 3 →Round 4 |
| General exposure | 101.27 | | 95.81 | 98.76 | -0.01 (-0.03, 0.02) | -0.01 (-0.05, 0.02) | 0.01 (-0.03, 0.05) | -0.02 (-0.06, 0.02) |
| Specific exposure | 99.87 | 97.33 | 97.48 | 97.48 | -0.01 (-0.04, 0.02) | 0.00 (-0.04, 0.05) | -0.02 (-0.06, 0.01) | 0.02 (-0.04, 0.07) |

## 6.4.2 Delayed-effects Association of General and Specific Exposure with Talking Behavior and Cognitions Scales

The delayed-effects analysis of parent reports of household talk found that parents who reported more general exposure at an earlier round reported significantly more household talk at a subsequent round (Table 6-V). Evidence of a significant favorable delayed effects association was also found between Round 1 and Round 2 and between Round 2 and Round 3; the Round 3 to Round 4 association was somewhat smaller and did not reach statistical significance. Subgroup analyses showed that these effects were also widely shared across most subgroups (e.g., youth age, other youth characteristics, and parent characteristics) (Detail Table 6-72).

**Table 6-V. Delayed-effects association of exposure per month and talking behavior by parents of 12½- to 18-year-old youth (parent reports)**

| | Mean number of parent talking behaviors at later round (Round 2, 3, or 4), by parent exposure per month at earlier round (Round 1, 2, or 3), with an overall mean of 2.41 | | | | Gamma (CI) | | | |
|---|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases | Round 1 →Round 2 | Round 2 →Round 3 | Round 3 →Round 4 |
| General exposure | 2.35 | | 2.41 | 2.47 | **0.08* (0.04, 0.13)** | **0.09* (0.02, 0.16)** | **0.10* (0.03, 0.16)** | 0.06 (-0.01, 0.13) |
| Specific exposure | 2.40 | 2.36 | 2.44 | 2.50 | **0.05* (0.02, 0.09)** | **0.08* (0.02, 0.14)** | 0.04 (-0.03, 0.10) | 0.05 (-0.01, 0.12) |

* Significant at $p < 0.05$.

Unlike previous reports, there is now also a statistically significant favorable delayed-effects association of specific exposure and parent reports of talking behavior for the whole sample. The association is somewhat smaller than that for general exposure and, of the round-to-round associations, only that for Round 1 to Round 2 was statistically significant. The variation in the sizes of the associations for the various subgroups was within the bounds of sampling error (Detail Table 6-73).

When youth reports of parent talking behavior were substituted for parent reports of talking with their youth, the overall delayed-effects associations did not reach statistical significance for general exposure but were significant for specific exposure, primarily driven by the Round 3 to Round 4 effect (Table 6-W and Detail Tables 6-104 and 6-105). There were two significant subgroup associations with general exposure (one positive, one negative), but no clear indication of a differential subgroup effect for either exposure type.

**Table 6-W. Delayed-effects association of parent exposure and talking behavior by parents of 12½- to 18-year-old youth (youth reports)**

| | Mean number of parent talking behaviors at later round (Round 2, 3, or 4), by parent exposure per month at earlier round (Round 1, 2, or 3), with an overal mean of 1.35 | | | | Gamma (CI) | | | |
|---|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases | Round 1 →Round 2 | Round 2 →Round 3 | Round 3 →Round 4 |
| General exposure | 1.33 | | 1.33 | 1.35 | 0.01 (-0.03, 0.04) | 0.04 (-0.01, 0.09) | -0.03 (-0.09, 0.03) | 0.00 (-0.06, 0.05) |
| Specific exposure | 1.27 | 1.33 | 1.34 | 1.39 | **0.03* (0.00, 0.06)** | 0.03 (-0.02, 0.08) | -0.02 (-0.07, 0.03) | **0.08* (0.02, 0.14)** |

The delayed-effects analyses showed a statistically significant but small overall favorable association of general exposure with parent talking cognitions (Table 6-X). There was no marked variation in the size of the association by subgroup (Detail Table 6-68). In addition, there was no significant overall association between parent reports of specific exposure and reported cognitions about talking to one's child (Table 6-X).

**Table 6-X. Delayed-effects association of exposure per month and talking cognitions by parents of 12½- to 18-year-old youth (parent reports)**

| | Mean score on Talking Cognitions Index at later round (Round 2, 3, or 4), by parent exposure per month at earlier round (Round 1, 2, or 3), with an overal mean of 99.68 | | | | Gamma (CI) | | | |
|---|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases | Round 1 →Round 2 | Round 2 →Round 3 | Round 3 →Round 4 |
| General exposure | 98.16 | | 95.18 | 105.08 | **0.03* (0.01, 0.05)** | **0.05* (0.01, 0.09)** | 0.03 (-0.02, 0.07) | 0.01 (-0.03, 0.05) |
| Specific exposure | 99.45 | 97.00 | 101.07 | 105.55 | 0.02 (-0.01, 0.05) | 0.04 (-0.01, 0.08) | 0.00 (-0.05, 0.04) | 0.04 (-0.01, 0.09) |

* Significant at $p < 0.05$.

## 6.4.3 Delayed-effects Association of General and Specific Exposure with Fun Activities

Significant overall favorable associations were found for both general and specific exposure to anti-drug advertising and parent reports of doing three or more fun activities with their child per week (Table 6-Y). In both cases, the associations were statistically significant between Round 1 and Round 2; for specific exposure it also was significant between Round 2 and Round 3. For both general exposure and specific exposure, the subgroup associations were all in the same favorable direction and the variation between the sizes of the subgroup associations was within the bounds of sampling error (Detail Tables 6-74 and 6-75).

**Table 6-Y. Delayed-effects association of exposure per month and parents doing three or more fun activities with their child per week for 12½- to 18-year-old youth (parent reports)**

| | Percentage of parents doing three or more activities per week at later round (Round 2, 3, or 4), by parent exposure per month at earlier round (Round 1, 2, or 3), with an overall average of 61 percent | | | | Gamma (CI) | | | |
|---|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases | Round 1 →Round 2 | Round 2 →Round 3 | Round 3 →Round 4 |
| General exposure | 58 | | 61 | 62 | **0.07* (0.02, 0.11)** | **0.09* (0.02, 0.16)** | 0.07 (-0.02, 0.15) | 0.03 (-0.04, 0.10) |
| Specific exposure | 58 | 60 | 61 | 66 | **0.07* (0.02, 0.12)** | **0.10* (0.02, 0.18)** | **0.10* (0.03, 0.18)** | -0.02 (-0.10, 0.06) |

* Significant at $p < 0.05$.

Table 6-Z and Detail Tables 6-106 and 6-107 present the summary data for the associations of both measures of parent exposure and youth reports of fun activities. It should be noted that youth were not asked about fun activities in 2000, so that the periods covered by the parent reports and youth reports of these associations are different. For general exposure, the only statistically significant associations were positive and occurred for the Round 1 to Round 2 sample and two of its subgroups (mother reports, and some college). There were no significant subgroup associations for specific exposure.

**Table 6-Z. Delayed-effects association of parent exposure per month and parents doing three or more fun activities per week for 12½- to 18-year-old youth (youth reports)**

| | Percentage of youth reports of parents doing three or more activities per week at later round (Round 2, 3, or 4), by parent exposure per month at earlier round (Round 1, 2, or 3), with an overall average of 60 percent | | | | Gamma (CI) | | | |
|---|---|---|---|---|---|---|---|---|
| | <1 exposure | 1 to 3 exposures | 4 to 11 exposures | 12+ exposures | All cases | Round 1 →Round 2 | Round 2 →Round 3 | Round 3 →Round 4 |
| General exposure | 53 | | 55 | 55 | 0.02 (-0.02, 0.06) | **0.07* (0.00, 0.15)** | -0.01 (-0.07, 0.06) | -0.03 (-0.09, 0.02) |
| Specific exposure | 52 | 54 | 55 | 56 | 0.04 (-0.01, 0.08) | 0.03 (-0.05, 0.10) | 0.01 (-0.06, 0.09) | 0.07 (-0.02, 0.15) |

* Significant at $p < 0.05$.

## 6.5 Evidence of Association of Parent Exposure with Youth Outcomes

Parent cognitions and behaviors are conceived as intermediate variables; they may be affected by the Campaign and in turn they may influence youth. It is worthwhile to ask whether there is a direct association of parent exposure and the youth behavioral and cognitive outcomes of main interest: marijuana use, intentions to use, attitudes/beliefs about marijuana, perception of social norms regarding marijuana, and self-efficacy to refuse marijuana offers. Examining this direct association is particularly advisable, given the number of statistically significant favorable associations of parent exposure with parent-reported outcomes in cross-sectional and delayed-effects analyses and the delayed-effects associations of parent behaviors and cognitions with youth outcomes discussed in Section 6-1. The following sections describe these cross-sectional and delayed-effects overall associations between parent exposure and youth outcomes.

### 6.5.1 Cross-sectional Association of Parent Exposure with Youth Outcomes

Table 6-AA presents the results for the overall analyses of the cross-sectional associations of parent exposures with the several youth outcomes, with more extensive information provided in Detail Tables 6-78 through 6-85. For all youth aged 12½ to 18, there was no cross-sectional overall association for either general or specific parental exposure with youth past year marijuana use. For nonuser youth[11], there were no significant overall associations between either measure of exposure and intentions to not use marijuana, anti-marijuana attitudes and beliefs, perceived anti-marijuana social norms, and self-efficacy to refuse marijuana. These results replicate the findings of the previous report.

[11]This is consistent with the logic presented in Chapters 2 and 5, i.e., precursors to use such as "intentions not to use" are not meaningful when applied to youth who are already using marijuana.

**Table 6-AA. Cross-sectional association between parental exposure per month and youth outcomes among 12½ to 18 nonusers**

| Youth outcome | | Parental exposure level | | | | Gamma (CI) |
|---|---|---|---|---|---|---|
| | | <1 exposure | 1 – 3 exposures | 4 – 11 exposures | 12 + exposures | |
| Percent definitely not intending to use | General exposure | 85.5% | | 84.9% | 86.4% | 0.03 (-0.02, 0.09) |
| | Specific exposure | 87.1% | 85.4% | 85.2% | 87.4% | 0.00 (-0.05, 0.06) |
| Mean score on Attitudes/Beliefs Index | General exposure | 104.48 | | 104.60 | 109.68 | 0.02 (-0.01, 0.04) |
| | Specific exposure | 108.72 | 106.40 | 105.26 | 111.30 | 0.00 (-0.02, 0.03) |
| Mean score on Social Norms Index | General exposure | 101.32 | | 100.68 | 102.59 | 0.00 (-0.02, 0.03) |
| | Specific exposure | 99.44 | 101.01 | 100.82 | 104.97 | 0.01 (-0.01, 0.04) |
| Mean score on Self-efficacy Index | General exposure | 104.78 | | 105.07 | 102.31 | -0.02 (-0.05, 0.01) |
| | Specific exposure | 103.18 | 105.37 | 104.35 | 108.47 | 0.01 (-0.03, 0.05) |

There were a total of 180 tests of significance undertaken for cross-sectional subgroup analyses[12], of which only 7 were statistically significant. All seven significant associations were on the border of significance and are likely chance results.

## 6.5.2 Delayed-effects Association of Parent Exposure with Youth Outcomes

The following delayed-effects analyses examine the associations of parent exposure at an earlier round with youth cognitive and behavioral outcomes at the next round. The analyses included only those youth who reported that they did not use marijuana (i.e., nonusers) at the earlier round and who were also 12½ to 18 years old at followup.

For all nonuser youth 12½ to 18 years old, there were no significant delayed-effects associations between either measure of parent exposure and youth outcomes (Table 6-AB and Detailed Tables 6-86 to 6-95). Moreover, the gamma coefficients were nearly all close to zero. Ignoring the individual round-to-round analyses, only a small fraction of the 160 subgroup gammas[13] were statistically

[12]Subgroup comparisons for the cross-sectional relationship between parent Campaign exposure and youth outcomes were conducted by youth age (2 groups), gender (2 groups), risk (2 groups), and race/ethnicity (3 groups); parent's gender (2 groups) and education (2 groups); and year (5 groups) totaling 18 subgroups by 5 outcomes and 2 measures of exposure and by (18 x 5 x 2 = 180). Since the age categories presented in the Detail Tables overlap, comparisons were made only between two, mutually exclusive age groups: 12½ to 13 and 14 to 18.

[13]Subgroup comparisons for the delayed-effects relationship between parent Campaign exposure and youth outcomes were conducted by youth age (2 groups), gender (2 groups), risk (2 groups), and race/ethnicity (3 groups); parent's gender (2 groups) and education (2 groups); and round (3 groups) totaling 16 subgroups by 5 outcomes and 2 measures of exposure and by (16 x 5 x 2 = 160). Since the age categories presented in the Detail Tables overlap, comparisons were made only between two, mutually exclusive age groups: 12½ to 13 and 14 to 18.

significant and most of these were just on the border of significance. As there is no discernible pattern to the significant results, they may simply be chance results.

**Table 6-AB. Parental exposure at earlier round and youth outcomes at the next round among 12½- to 18-year-olds who were nonusers of marijuana at the earlier round**

| Youth outcome at later round | | Parental exposure at earlier round | | | | Gamma (CI) |
|---|---|---|---|---|---|---|
| | | <1 exposure | 1 – 3 exposure | 4 – 11 exposures | 12 + exposures | |
| Percent reporting marijuana initiation | General exposure | 11.8% | | 11.9% | 11.7% | 0.00 (-0.09, 0.08) |
| | Specific exposure | 10.7% | 12.0% | 12.3% | 10.8% | 0.01 (-0.06, 0.07) |
| Percent definitely not intending to use | General exposure | 79.8% | | 78.6% | 78.9% | -0.02 (-0.07, 0.04) |
| | Specific exposure | 77.4% | 79.2% | 79.6% | 80.2% | 0.04 (-0.03, 0.10) |
| Mean score on Attitudes/Beliefs Index | General exposure | 94.35 | | 94.11 | 95.3 | 0.00 (-0.02, 0.03) |
| | Specific exposure | 90.34 | 94.61 | 94.45 | 103.68 | 0.03 (-0.00, 0.05) |
| Mean score on Social Norms Index | General exposure | 90.57 | | 88.72 | 88.27 | -0.01 (-0.04, 0.02) |
| | Specific exposure | 88.52 | 87.16 | 86.98 | 94.18 | 0.01 (-0.02, 0.03) |
| Mean score on Self-efficacy Index | General exposure | 100.55 | | 98.04 | 95.29 | -0.02 (-0.06, 0.02) |
| | Specific exposure | 94.80 | 99.12 | 94.15 | 93.75 | -0.01 (-0.05, 0.03) |

## 6.6 Summary and Discussion

The inferential logic laid out at the start of this chapter implies that three favorable results would support Campaign effects: a favorable trend on a target outcome; a favorable cross-sectional association between exposure to the Campaign and the outcome; and finally, a favorable delayed-effects association between exposure and the subsequent outcome measure. Tables 6-AC and 6-AD summarize the results for parent outcomes and youth outcomes, respectively, on each of these criteria. Each row in the tables indicates whether there was a full sample trend, whether there was a full sample cross-sectional association with the general or specific exposure measures, and whether there was a full sample delayed effects association with each of the two exposure measures. The association criterion is whether or not the gamma estimate was significant at the $p< 0.05$ level. In addition, each row in the tables indicates whether a subgroup of the population showed one of those effects when the full sample did not. With four rounds of data, the present report capitalizes on a larger sample than previous reports, which increases confidence in the presence of effects over and above the idiosyncrasies of individual pairs of rounds. Similar to the 2003 Report of Findings, youth reports were again fully incorporated into the analysis, which enables a systematic comparison with parent reports.

**Table 6-AC. Summary of outcomes for parents of 12½- to 18-year-old youth**

| Parent outcomes | All parents of youth aged 12½ to 18 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Trend | | Cross-sectional association | | | | Delayed-effects association | | | |
| | | | General | | Specific | | General | | Specific | |
| | Parent reports | Youth reports | Parent reports | Youth reports | Parent reports | Youth reports | Parent reports | Youth reports | Parent reports | Youth reports |
| Talking behavior | Favorable | Unfavorable | Favorable | None | Favorable | Favorable | Favorable | None | Favorable | Favorable |
| Talking cognitions | None | NA | Favorable | NA | Favorable | NA | Favorable | NA | No Overall, Whites (F) College (F), | NA |
| Monitoring behavior | No Overall, 12½ to 13 (F), 14 to 16 (F), Lower Risk (F) | Favorable | No Overall, 12½ to 13 (U), 14 to 18 (F), No College (F) | No Overall, African-Americans (F) | Favorable | None | None | No Overall, Lower Risk (U) | No Overall, Lower Risk (F) | No Overall, 14 to 18 (F), Mothers (F) |
| Monitoring cognitions | Favorable | NA | Favorable | NA | Favorable | NA | No Overall, Higher Risk (U) | NA | None | NA |
| Doing fun activities[1] | Unfavorable | Unfavorable | Favorable | Favorable | Favorable | No Overall, African-Americans (F), Boys (F), Higher Risk (F) | Favorable | No Overall, R1→ R2 (F) | Favorable | None |

[1] Youth reports for trends in fun activities report changes between 2001 and 2004; parent reports for trends in fun activities report changes between 2000 and 2004.

Favorable or (F): Significant result at $p < 0.05$ favorable to Campaign goals.

Unfavorable or (U): Significant result at $p < 0.05$ unfavorable to Campaign goals.

None: No overall significant effect and no significant subgroup effects at $p < 0.05$.

No Overall: No overall significant effect, but significant subgroup effect(s) at $p < 0.05$.

NA: No analysis undertaken.

**Table 6-AD. Summary of the effects of parent exposure on youth outcomes for 12½- to 18-year-old nonusers**

| Youth outcomes (marijuana) | All parents of nonusing youth aged 12½ to 18 | | | |
|---|---|---|---|---|
| | Cross-sectional association | | Delayed-effects association | |
| | General | Specific | General | Specific |
| Marijuana initiation | NA | NA | No Overall, African Americans (U) | None |
| Definitely not intending to use | No Overall, Higher Risk (F) | None | None | No Overall, Boys (F) |
| Attitudes/Beliefs Index | No Overall, Fathers (F), Higher Risk (F) | None | None | No Overall, Hispanics (F) |
| Social Norms Index | No Overall, Boys (F), Fathers (F) | No Overall, Boys (F), College (F) | No Overall, 14 to 16 (U), Girls (U) | No Overall, Hispanics (F) |
| Self-efficacy Index | No Overall, Mothers (U) | None | No Overall, R1→R2 (U) | None |

Favorable or (F): Significant result at $p < 0.05$ favorable to Campaign goals.

Unfavorable or (U): Significant result at $p < 0.05$ unfavorable to Campaign goals.

None: No overall significant effect and no significant subgroup effects at $p < 0.05$.

No Overall: No overall significant effect, but significant subgroup effect(s) at $p < 0.05$.

NA: As with the youth exposure analyses, the cross-sectional and delayed effects analyses of parent exposure on youth outcomes is restricted to youth who were nonusers at the point of exposure. Therefore, there was no cross-sectional test of exposure on marijuana initiation.

Table 6-AC suggests that there is some evidence of a Campaign effect on some parent outcomes. Although the strongest support for Campaign effectiveness comes from using parent reports of behaviors, youth reports of the same behaviors provide some additional support for the parent findings. There is increased evidence that the Campaign has influenced the extent of cognitive support among parents and, more importantly, the level of conversation between parents and youth about drugs. While scattered, there is growing evidence that the two variables that best predict initiation of marijuana use—monitoring behaviors and cognitions—may have been affected by the Campaign, particularly during the last wave of data collection (first half of 2004). Finally, as indicated in Table 6-AD, there is no support that the Campaign effect on parents led to a change in youth marijuana use, intentions to use, social norms, self-efficacy, or cognitions. Each of the outcomes is reviewed in turn.

As shown in Figure 6-B, monitoring behavior (whether reported by parents or youth) is an important predictor of the initiation of marijuana use. There was a statistically significant upward trend in monitoring behavior between 2000 and 2004 as reported by youth, and a corresponding upward trend as reported by parents of all but the oldest youth (16- to 18-year-olds). There were no overall cross-sectional or delayed-effects associations of either exposure measure with youth- reported monitoring behavior, and no delayed-effects associations with parent- reported monitoring behavior. However, there was a significant favorable cross-sectional association between specific exposure and parent-reported monitoring behavior in the full sample. This effect was not detected in prior reports, and in fact was entirely driven by a strong association that first appeared in 2004 (Wave 9). While still tentative (e.g., it would be more persuasive if corroborated by an analogous effect on youth reports), this result represents the strongest evidence to date for a Campaign effect on the monitoring behavior of parents.

Monitoring cognition (only available from parent reports) has a substantial association with monitoring behavior, and like monitoring behavior, is associated with youth marijuana use and intentions. There is good reason to think that affecting parental monitoring cognitions would affect youth behavior. The 2000 to 2004 trend for this outcome was favorable and statistically significant, at least based on parent reports. The 2004 estimate is the highest recorded for this index. In addition, there was evidence for cross-sectional associations for both general and specific exposure and monitoring cognitions for the full sample. Therefore, on these two criteria, there are grounds for claiming a favorable Campaign effect. However, there was no evidence of a delayed-effects association overall and only three subgroup associations, which were likely due to chance. Without evidence for a delayed effect that would establish the causal order, it remains unclear whether parent ad exposure affects their beliefs about the value of monitoring, or parents' commitment to engaging with their children influences their monitoring beliefs and their attention and recall of the advertising.

Consistent with previous reports, this report's fun activities association analyses once again offers solid support for Campaign effects. While not a theme of the Campaign, the pattern for both cross-sectional and delayed-effects associations were supportive of a favorable effect of the Campaign. All of the associations of both specific and general exposure and the parent reports of fun activities were significant and favorable. Results for youth reports were more modest, but also favorable. Thus, the associational data were quite supportive of a favorable effect. However, the trend data for fun activities showed a decline between 2000 and 2004, as well as between 2002 and 2004 in both parent and youth reports. One interpretation of those results is that the Campaign was having a favorable effect on parent involvement with youth fun activities, but the positive trend that might be expected from that effect was obscured by other external forces that were causing a decline.

The talking behavior results were similarly quite supportive of favorable Campaign effects. For the 2000 to 2004 time period, the parent reports showed positive trends as well as statistically significant and favorable overall associations for both measures of association and for both cross-sectional and delayed effects. In addition, the overall cross-sectional associations were favorable for the period covered by the Marijuana Initiative. The youth reports provided more modest support for a Campaign effect. While there were small statistically significant favorable overall cross-sectional and delayed-effect associations between specific exposure and youth reports of parent talking behavior, no other overall association was found and the trend data based on youth reports were unfavorable. While parents reported more talk about drugs with their children in 2004 than in 2000, youth reported a decrease in such conversations over the same time period. There is no easy explanation for this discrepancy.

The talking cognitions analysis was based on parent reports only, and it generally supports a favorable interpretation. There were statistically significant and favorable cross-sectional associations for the 2000 through 2004 period for both exposure types; however, the delayed-effect association was significant for general exposure only. In addition, the trend data showed no statistically significant changes between 2000 and the first half of 2004 and there was a significant decrease between 2002 and 2004, most notable for parents of 14- to 18-year-old youth. While the claims for a Campaign effect would be stronger if the trend results were to match the associational results, and the delayed-effect association for specific exposure was significant, the support for a favorable Campaign effect on talking cognitions, as with talking behavior, is still substantial.

In summary, Table 6-AC provides substantial evidence for a favorable Campaign effect on three of the five parent outcomes: talking cognitions, talking behavior, and fun activities. There was also some

evidence for a favorable Campaign effect on the monitoring behavior and monitoring cognitions outcomes; however, the causal ordering is uncertain in these cases due to the absence of delayed effects. The evidence is strong, based on the positive associations between exposure and outcomes, but mixed if trend data are the focus.

In prior reports, the lack of evidence of favorable Campaign effects on monitoring behavior was described as a challenging result from the Campaign's perspective because parenting skills have been the prime focus of the parent advertising, almost since the beginning of the Campaign. There is good evidence that in focusing on monitoring behavior, the Campaign chose correctly. Monitoring behavior has been shown here and in other studies to be substantially related to noninitiation of drug use. Talking about drugs has not been an explicit platform of the Campaign in Phase III, although it can be seen as an implicit message of some of the parenting skills ads. The relatively recent Marijuana and Early Intervention Initiatives can be perceived as efforts to influence both parental monitoring and parental talking cognitions and behaviors. Doing fun activities with children was only an explicit message of the Campaign in the first year. So the areas of apparent favorable effects of the Campaign have been sharpest on talking (both cognition and behavior) and fun activities, areas where the Campaign has placed comparatively little focus. By contrast, effects have been generally weakest in the area of most focus, monitoring behavior. This appears to have begun changing during the last wave of data collection (first half of 2004), where the cross-sectional association between specific exposure and parent–reported monitoring was favorable and significant for the first time, and strong enough to make the overall association for 2000-2004 significant. At the same time, the effect did not appear for youth reports, and the cross-sectional effect on parent reports has not yet carried over into a delayed effect.

In discussing the findings on parents, the critical question remains whether Campaign effects on parent outcomes translate into effects on youth behavior. Table 6-AD provides a summary of the evidence for such effects. The analysis of youth outcomes in Chapter 5 noted a positive trend in youth anti-marijuana attitudes and beliefs over the full Campaign, and a positive trend in intensions to not use marijuana for the 2002 to 2004 time period. However, trend results by themselves provide insufficient evidence for an indirect Campaign effect on youth through their parents. Statistically significant associational findings, particularly delayed-effect associations between parent exposure and youth outcomes, are required. An examination of the associational results in Table 6-AD show that the favorable trend findings were not supported by either cross-sectional or delayed-effects associations between either general or specific parent exposure and youth attitudes/beliefs or intension not to use marijuana. Further, there was no other reported full sample favorable youth outcome effect associated with parent exposure. Statistically significant subgroup effects were infrequent for the 2000 to 2004 time period but when they appeared, they were more likely to be in a direction favorable to the Campaign. Similarly, the pattern for 2002 through the first half of 2004 provided no evidence for an indirect Campaign effect of parent exposure on youth outcomes during the period of the Marijuana Initiative.

How can one explain this pattern of supportive evidence for Campaign effects of parent exposure on parent behavior, but no positive effects of parent exposure on youth outcomes? Three explanations fit these data. The claim of Campaign effects on parent outcomes might be mistaken. None of the outcomes had evidence that satisfied all of the a priori criteria for strong claims of effect, and if there were no effect, in fact, then one would not expect an indirect effect on youth. Second, talking behavior and talking cognitions, the outcomes with the clearest evidence for effects for parents, were not related to youth marijuana use. Thus, even if there had been a Campaign effect on parent talking cognitions

and behavior it would not have been expected to affect youth outcomes. Third, indirect effects are hard to detect. For instance, if there were a small favorable effect of the Campaign on a parent behavior accompanied by a small favorable effect of that behavior on the youth outcome, the resulting indirect effect would be the product of those two effects. For example, if the effect of Campaign exposure on monitoring behavior were .10, and the effect of monitoring behavior on youth marijuana use were .20, the expected effect of the Campaign exposure on marijuana use would be the product of those two effects, or .02 (.10 x .20). An effect of .02 could not be detected by the National Survey of Parents and Youth. The Campaign's indirect effects through parents could be detected only if there had been effects on several of the parent behaviors and each of those were related to the youth outcomes, and the sum of all the individual indirect paths had been large enough as a set to produce a detectable cumulative effect. All of these three explanations remain possible. Each of them may explain the current conclusion about the parent component of the Campaign: there is some evidence consistent with an effect of the National Youth Anti-Drug Media Campaign on parent outcomes, but little evidence for indirect effects of parent exposure to the Campaign on youth outcomes.