

1. Introduction

This is the fourth in a series of semiannual reports based on the National Survey of Parents and Youth (NSPY), a continuing survey designed to evaluate the National Youth Anti-Drug Media Campaign. The National Youth Anti-Drug Media Campaign (the Media Campaign) is part of an effort by the Office of National Drug Control Policy (ONDCP) to educate and enable America's youth to reject illegal drug use by means of an advertising and social marketing program that attempts to increase their perceptions about the risks of drugs and increase their disapproval of drug use. Other important Media Campaign goals for youth are to convince those who are occasional users of drugs to stop using them to present positive alternatives to drug use and to teach youth drug resistance skills. Media Campaign goals for parents have evolved to focus on emphasizing to parents and influential adults that their monitoring activities can make a critical difference in preventing youth drug use, and to enhance adult perceptions of harm associated with the use of marijuana and inhalants.

This fourth report is both descriptive and evaluative. Chapter 2 describes the evaluation design and analytic logic. Chapter 3 provides descriptions of message exposure achieved by the Campaign from September 1999 through December 2001. Chapter 4 presents evidence about changes in behavior among youth. Chapters 5 and 6 present evidence about effects of the Campaign. Chapter 5 focuses on targeted youth attitudes and beliefs about drug use. Chapter 6 focuses on parent behavior and parental attitudes and beliefs about engagement with their children to prevent drug use. Both chapters 5 and 6 feature evidence about changes in the outcome indicators since late 1999, as well as evidence that exposure to the Campaign is related to these outcomes. New in this report, both chapters 5 and 6 include the presentation of evidence about the association of early Campaign exposure with subsequent changes on the target outcome indicators.

This introductory chapter reviews the nature of the Media 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 Media Campaign in Phase III

This report summarizes material from previous reports (Hornik et al., 2000; Hornik et al., October 2001, Hornik et al., April 2001) and updates that information with descriptions of activities undertaken between July and December 2001, the period covered by this report. It is worth noting that during this period (July to December 2001), the September 11 terrorist attacks occurred. The catastrophic nature of that day's events affected all media in the period that followed. Normal media programming and airing of advertisements did not resume for some weeks following the attacks. Further, most Americans were consumed with the enormity of the tragedy. This may have affected some of the outcomes monitored in this evaluation, including conversations about drugs between youth and parents or friends, with discussion of the tragedy at home, work, or school, crowding out discussions of other topics.

The Media Campaign is now in Phase III. Phase I involved pilot testing the intervention in 12 metropolitan areas, using existing Partnership for a Drug-Free America (PDFA) advertisements.

During Phase I of the Media 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 Media 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), on the Internet, in movie theaters, on schoolbook covers, and on basketball backboards. The mix of media used by the Campaign has evolved over time, with the latter three media types listed being phased out since 2000. Table 1-A shows the Media Campaign phases.

Table 1-A. Media Campaign phases

Phase I January 1998 - June 1998	Phase II July 1998 - July 1999	Phase III September 1999 - Continuing
<ul style="list-style-type: none"> ■ Pilot test in 12 metropolitan areas, with 12 sites selected for comparison ■ Previously produced ads ■ Paid and donated advertising (pro bono ad matching required) 	<ul style="list-style-type: none"> ■ National level intervention ■ Previously produced and new ads ■ Paid and donated advertising on a full range of media (pro bono ad matching required) 	<ul style="list-style-type: none"> ■ National level intervention ■ New ads ■ Paid and donated advertising on a full range of media (pro bono ad matching required) ■ Partnerships with media, entertainment, and sports industries, and civic, professional, and community groups ■ News media outreach through public relations activity

Phase III marks the full implementation of the Media Campaign. As in the past, an extensive range of media is used to disseminate Media Campaign messages to a national audience of youth and parents. In addition, Phase III features a significant interactive media component, involving content-based web sites and Internet advertising. Most of the ads used in Phase III are new, although some existing ads that were considered effective in the past also have been used. New ads are 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.

The development of the ads follows 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 comes from a 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 reviews strategies and advertising executions at bimonthly meetings to ensure behavioral relevance. ONDCP performs overall management of the Media Campaign. Under that overall leadership, responsibility for media buying, some supportive research, to assure a coherent advertising strategy, and the day-to-day management of the advertising component of the Media Campaign lie with Ogilvy, a national advertising agency.

Ogilvy has organized the participation (as subcontractors) of five agencies that specialize in communicating with minority audiences. Special attention has focused on sufficiently exposing Media Campaign messages to African Americans, Asian Americans, Pacific Islanders, Hispanic Americans, American Indians, Alaska Natives, and Aleuts. More than \$38 million in paid and negotiated pro bono advertising messages and outreach programs aimed at youth aged 11 to 17, parents, and other youth influencers are directed toward ethnic audiences each year. African Americans and Hispanics receive the dominant share of multicultural advertising exposure—more than 75 percent of the ethnic paid and pro bono investments (National Youth Anti-Drug Media Campaign Fact Sheet, “Multicultural Outreach,” July 2001). Ogilvy also has supervised a substantial research effort to provide ongoing support to the Media Campaign decisionmaking. These include monthly mall-based tracking surveys and focus groups, conducted across the country with both parents and youth, to review and generate feedback on developing ads and initiatives. Working with the specialized agencies, Ogilvy formulates, designs, and manages the implementation of multicultural research initiatives. Ogilvy and its subcontractors prepare recommendations on advertising content and buying strategies. ONDCP then reviews and provides final approval for all major Campaign decisions and for all advertising content.

Phase III of the Media Campaign is “an integrated social marketing and public health communications Campaign.” Thus, it attempts to reach the target audience indirectly and directly through advertising. Additional elements of the Media Campaign in Phase III involve (1) partnerships with civic, professional, and community groups, (2) outreach to the media, entertainment, and sports industries, as well as (3) the development of a pro bono advertising match program described below. Through the partner organizations, the Media Campaign strives to strengthen local anti-drug efforts. Through outreach, the Media Campaign encourages 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 are 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 Media Campaign provides 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 is to encourage popular culture to dispel myths about drug use and accurately portray consequences of drug use.

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

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

Youth exposure to Media Campaign messages may occur as a result of direct paid 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 Media Campaign outreach activities and the media match. 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 Media 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 Media Campaign may contribute to this environment.

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

1.2 Paid and Donated Advertising

The Media Campaign had budgets of \$195 million in FY 1998 and \$185 million in FY 1999 through FY 2001. Of that, during Phase III, \$144 million has been spent on the purchase of advertising time in year 1 (FY2000) and \$143 million in year 2 (FY2001). Congress mandated that media organizations accepting Media Campaign advertising must match Media 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. Some of the pro bono match has included messages encouraging participation in local anti-drug coalitions.

Chapter 3 presents the Phase III media-buying strategies for youth and parents in detail, including how much paid advertising was directed through each channel. The Campaign delivers specific anti-drug messages nationally through the television networks of ABC, CBS, NBC, FOX, UPN, and the WB; through cable networks; and through national radio networks. While in the past, the Campaign purchased additional advertising in more than 100 television and radio “spot” markets, these media purchases were eliminated for Wave 4. On-line advertising was placed on approximately 40 web sites and on America Online. Additionally, the Media Campaign has paid for advertising banners to appear on commercial web sites. Media 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.

The Media 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, targets 9- to 17-year-olds. As of 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). Despite this narrowing of the creative target, the media buy is still expected to reach the full 9- to 17-year-old youth audience. The paid advertising component of the Media Campaign was expected to reach 90 percent of America’s youth at least four times per week during the course of the Media Campaign (ONDCP Fact Sheet, “Summary of Campaign Accomplishments,” March 2000), although this includes both advertising directed toward youth as well as advertising targeted to parents, which may also be seen by youth.

The Media Campaign also designs advertising for high 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. Some results reinforcing this claim are presented in Chapter 4 of this report.

For both parent and youth audiences, the Media Campaign chose 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”) focuses on one theme or behavioral message platform. The plan includes four flights per year, each running 10 to 12 weeks. In each flight, two to three ads are run, but all of them address one of the themes or message platforms. Chapter 3 presents the details of this plan.

For youth, the strategic message platforms have also evolved since the beginning of the campaign. Some of the themes were merged together with the goal of increasing impact (National Youth Anti-Drug Media Campaign Communication Strategy Statement Supplement, August 2001). Flying themes were revised to increase impact and accommodate budget limitations and the effects of media inflation. The current themes are:

- **Resistance Skills and Self-Efficacy.** Ads in this platform attempt to enhance personal and social skills that promote positive lifestyle choices. Specifically, they try to help build confidence that youth can resist drug use.
- **Normative Education/Positive Alternatives.** 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 reinforces positive uses of time as behavioral alternatives to drug use. For both of these platforms, celebrities and peer-to-peer messages are used in the advertisements.
- **Negative Consequences.** This platform attempts 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 drug effects.

Based on ad time purchased from July to December 2001, as presented in Chapter 3, 60 percent of youth ads focused on the Negative Consequences platform with most of the rest conveying the Normative Education/Positive Alternatives platform. There were distinct strategies for each of the multicultural target audiences, and for African American youth, the resistance skills platform was emphasized toward the end of 2001.

For parents, the themes previously included the following:

- **Your Child at Risk.** This platform sends the message to parents, “Every child is at risk for drug use, even yours.”
- **Parenting Skills and Personal Efficacy.** This theme tells parents that they can learn simple skills to help their child avoid drugs, including communication and family management. There has been a particular emphasis on parental monitoring. Parents should know where their children are, what they are doing, whom they are with, and when they will be back.
- **Perceptions of Harm.** This platform stresses that parents need to be aware of the harmful effects of inhalants and marijuana on their child’s life and future.

For Wave 4, the parent message platforms were narrowed to one main message platform for mass media communication: Efficacy/Monitoring. The strategic flying plan reflects that the vast

majority of ads placed from July to December 2001 were of the Efficacy/Monitoring theme. The other platforms were conveyed via the parent website (www.TheAntiDrug.com) and fulfillment materials, as well as through non-advertising initiatives, although these channels reached many fewer parents.

Starting with Phase III, the Media Campaign has been incorporating 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. Youth were encouraged to submit ideas to ONDCP by postcard or by the Web.¹ These ideas, which were incorporated into advertising for early 2001, suggest activities that might serve as “anti-drugs” and allowed audience members to fill in their own (e.g., Soccer: My Anti-Drug). The “My Anti-Drug” Campaign’s overall goal is to create and reinforce anti-drug norms by identifying positive alternatives in young people’s own words.

In addition to running ads concerning marijuana and inhalants, the Campaign launched a \$5 million advertising and public communications effort to combat the use of the drug, MDMA, also commonly known as “Ecstasy.” The Campaign placed Ecstasy ads on national radio networks with targeted radio advertising in 14 high-usage Ecstasy markets and placed banner ads on web sites. The anti-Ecstasy ad purchases were around 8 percent of all adult radio and television ads in 2001 and 10 percent of all youth radio and television advertising during the second half of 2001 only (see Chapter 3) (National Youth Anti-Drug Media Campaign Communication Strategy Statement Supplement, August 2001).

During the second half of 2001, two new celebrity relationships were launched. New ads featured Taiwanese singer Jimmy Lin sponsored by the East West Bank Foundation and were specifically targeted for Asian and Asian American youth. Other new ads featured National Football League players Tiki Barber, and Derrick Brooks. The NFL also has been promoting the Campaign at initiatives such as the NFL experience, an interactive theme park at the Super Bowl, and youth activities including NFL Flag, a non-contact national flag football program involving more than 300,000 children nationwide. Additionally, drug prevention information and the new anti-drug ads are available on their website (www.NFL.com).

Among the other celebrities who appeared in anti-drug advertising during Phase III were singers Mary J. Blige, Lauryn Hill, the Dixie Chicks, and the late Scatman John, and athletes including tennis stars Venus and Serena Williams, professional skateboarder Andy MacDonald, track star Michael Johnson, Olympic figure skater Tara Lipinski, and members of the U.S. Women’s World Cup Soccer Team. Celebrities, however, were only one part of the advertising effort. There were more than 125 distinct paid ads played or scheduled to be played between September 1999 through December 2001, including radio and television, general market, African American- and Hispanic-specific ads, and ads for parents as well as youth. A complete set of ad descriptions appears in Appendix D of this report. Most of the ads can be viewed or played by visitors to ONDCP’s web site: <http://www.whitehousedrugpolicy.gov>.

¹ To facilitate on-line submissions, the on-line media unit allowed kids to submit their anti-drug as a vote and upload a creative expression articulating their anti-drug in the form of a story or picture file.

1.3 Public Communications Activities

Although advertising is the cornerstone of the Media Campaign, nonadvertising activities are also considered important to Media Campaign success. With an annual budget for nonadvertising of approximately \$9.6 million, public relations contractor Fleishman-Hillard develops and coordinates such nonadvertising activities related to the Media Campaign. The Media Campaign is a comprehensive social marketing campaign that seeks to reach the audience directly and indirectly, through both traditional and nontraditional channels. It is designed to strengthen existing anti-drug efforts in communities, to boost parental monitoring of youth by focusing on its efficacy in preventing drug use, to generate talk among youth and parents about drug use, to give youth and parents the tools they need to pursue drug-free strategies such as resistance skills and parenting strategies, and to increase the salience of drugs as an issue generally. In short, nonadvertising Media Campaign activities are 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. It is also true, however, that if these activities do not reach and affect a substantial portion of the national population, this nationally-focused evaluation may not be sensitive to their effects.

Youth

Internet outreach efforts have grown in the second half of 2001 according to the Campaign. Building on changes suggested by youth usability studies, the Campaign's youth web sites (www.WhatsYourAntidrug.com and www.Freevibe.com) hosted more than 2.5 million visitors in 2001, according to Fleishman-Hillard. The average site visit time increased from 7 minutes per session at the end of 2000 to between 11 and 13 minutes at the end of 2001. Strategic partnerships with high visibility portals including Yahoo, Lycos, and About.com allowed for content placement on many popular youth sites; and celebrity endorsement of youth brand messaging was featured on AOL's Kids Only site. Additionally, the Internet site, ePeervoices.com, launched in May 2001, served as a grassroots extension of the Campaign and a forum for peer-to-peer communication. The web site combines information about drugs, alcohol, and tobacco links to other authoritative web sites, and provides the opportunity for young people to talk with peers about related issues.

Popular institutions also supported the Media Campaign. Fleishman-Hillard reported that media outreach efforts resulted in placement of youth and drug-related topics in major national print media and large-market daily newspapers, television coverage in the largest media markets, hundreds of articles in smaller and mid-size market community papers, and features in multicultural publications and broadcast media. During the second half of 2001, youth outreach efforts continued to focus on extending the "What's Your Anti-Drug" brand. The airing of *NSYNC "What's Your Anti-Drug?" ad during the popular band's 36-city summer concert tour provided an opportunity to extend awareness of the brand to teens. Fleishman-Hillard reported that media placements in general and ethnic markets resulted in an estimated 34 million impressions in 36 daily publications including The Los Angeles Times, El Nuevo Dia, and California Journal for Filipino Americans (impressions are the sum of the number of people who are projected to be readers of the publications on the day a story is run.). The band's Media Campaign-inspired drug prevention message was featured on web sites such as AOL, Yahoo!, MTV.com, About.com, E!Online, TimeforKids.com, MSNBC.com, Vibe.com, Billboard.com and Associated Press online. Additionally, outreach to popular radio call-in shows resulted in 13 stations conducting special "What's Your Anti-Drug?" promotions.

The Campaign also used radio promotions to generate publicity for the 18-city Bolt.com/Freevibe.com “Sound Check” mall tour, featuring the ongoing “What’s Your Anti-Drug?” mural project. The tours were conducted in six major media markets including San Francisco, Boston, Dallas and Detroit, reaching an estimated 1.3 million listeners.

In addition to the “What’s Your Anti-Drug?” message, the Media Campaign also used non-advertising efforts to promote the normative education message. In the fall of 2001, a partnership with newspapers, educators, and community coalitions helped the Campaign gain access to many U.S. markets to deliver its youth messages. “Majority Rules: Most Kids Don’t Use Drugs” is a Campaign-generated template for local anti-drug newspaper supplements. The Campaign created and distributed the materials in collaboration with the Newspaper in Education (NIE) program of the Newspaper Association of America Foundation, Community Anti-Drug Coalitions of America (CADCA), the National Association of Student Assistance Professionals, and the National Middle School Association. According to Fleishman-Hillard, 440 NIE newspapers ordered the materials this summer, and an additional 150 newspapers that subscribe to the nationally syndicated “Kid Scoop” feature received a full-page English or Spanish adaptation for publication during Red Ribbon Week. As of December 2001, the materials have been published in 205 newspapers reaching 3.1 million readers in 29 states.

Previous semiannual reports have noted that the Media Campaign had formed partnerships with several national and local organizations already involved with drug prevention: Community Anti-Drug Coalitions of America, 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.), and National Association of Student Assistance Professionals and the YMCA. In the fall of 2001, the Campaign together with the YMCA, developed a substance abuse prevention tool: “Positively Drug Free: A Prevention Awareness Handbook,” which is intended to help program leaders of all experience levels motivate and empower tweens to choose healthy, drug-free lifestyles. The handbook is being printed and distributed in early 2002.

The Media Campaign also partnered with community and multicultural organizations (e.g., the Boys and Girls Clubs of America, the Girl Scouts of America, PowerUP, and 100 Black Men). In July 2001, the Media Campaign participated in the National Scout Jamboree, where more than 250,000 attendees and visitors were exposed to the Campaign and its “My Anti-Drug” youth brand. Each of 40,000 Boy Scouts added their own “anti-drug” to the jamboree’s scrolling signature board as part of the Campaign’s Mural Project. Partnerships with these types of organizations are 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. Some of these partners have PSA messages in the pro bono Match component, which serves to raise public awareness of these groups and the programs they make available at the community level.

In addition, the Campaign targets special audiences in its outreach efforts. Based on research indicating that children of substance abusers are at high risk of becoming substance abusers themselves, the Campaign developed the message, “You’re not alone: find someone you trust and talk about it.” This message was promoted in posters, brochures, web sites, and outreach activities in partnership with the National Association for Children of Alcoholics; the Child Welfare League of America; the National Institute on Alcohol Abuse and Alcoholism; the Center for Substance Abuse Treatment; the National Association of Student Assistant Professionals; and national associations

representing school nurses and counselors. According to Fleishman-Hillard, more than 140,000 posters have been distributed; a 6-day radio tour reached a national audience of more than 21 million, and interactive media outreach resulted in placements on such web sites as HealthNewsDigest.com, with 1.7 million subscribers.

The Campaign also recognizes the school as a key avenue in its non-advertising efforts through a partnership in ONDCP with “Cable in the Classroom.” The cable TV industry’s educational arm is highlighting and distributing substance abuse-focused programming and curriculum support materials to teachers and students in 80,000 schools nationwide. Additionally, in an effort to reach kids before, during, and after their school hours, the Campaign advertises on Searchopolis.com, an N2H2 education portal, and ChannelOne.com (National Youth Anti-Drug Media Campaign Fact Sheets, Partnerships for Action and Interactive Program, July 2001).

Parents and Other Adults

In addition to youth outreach, Fleishman-Hillard aimed activities at engaging parents as well. In the summer of 2001, the Campaign secured a partnership with the American Academy of Pediatrics (AAP) and the National PTA to develop a new parent brochure entitled, “Keeping Your Kids Drug-Free: A How-To Guide for Parents and Caregivers.” The AAP distributed the brochure 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 include the National Families in Action, the National Family Partnership, the National Fatherhood Initiative, Parenting Coalition International, and the National Asian Pacific American Families Against Substance Abuse.

The Campaign also launched a new program in August 2001 to take advantage of the workplace as an avenue for reaching parents and other adult influencers with youth drug prevention information. The Society for Human Resources Management mailed anti-drug program information to over 160,000 members promoting the new Campaign initiative and website www.theantidrug.com/workplace. The Campaign’s Workplace Program, which was fully implemented in February 2002, provides campaign resources and materials to employers for easy distribution to their employees.

During the second half of 2001, the Campaign continued its outreach to community newspapers, providing regional and local newspapers with 10 matte articles including two releases in Spanish. These efforts reached hundreds of thousands of newspaper readers, according to Fleishman-Hillard. The matte articles primarily targeted parents, delivering practical tips about parenting skills that help keep their kids drug free. The Campaign also disseminated anti-drug and drug prevention messages to parents and youth in African American, Hispanic, Asian, and American Indian and Alaska Native communities. Results included national feature stories in *People En Español* and *Today’s Child*, magazines reaching Hispanic and African American parents.

In addition to parents, the Campaign gave considerable attention to other influential adult audiences. In the fall of 2001, Fleishman-Hillard worked to improve the content and awareness of the web site www.TeachersGuide.org, a Web-based resource providing teachers with classroom activities, teaching tips, and other education resources to incorporate drug prevention into the classroom. In partnership with the National Education Association’s Health Information Network, the Campaign developed new classroom activities that directly tie to education standards. In addition to the classroom activities, new drug prevention resources were added to the web site, such as the New York Times’ “Guide to Anti-Drug Education and the Children of Substance Abusers” and the “Media Literacy Guide.” The Media Literacy Guide features techniques that students can learn to become

more media savvy regarding anti-drug messaging in the media, as well as lesson plans for teachers. The site continues to be promoted on a variety of web sites such as Cable in the Classroom and in The New York Times' Newspaper in Education Program.

Grandparents were also an audience for the Campaign's program to reach out to caregivers and other adult influencers. The Campaign began a partnership with AARP's Grandparent's Information Center (GIC), to educate grandparents about substance abuse among youth and provide resources and tools to help keep youth drug free. The new web site (www.theantidrug.com/Grandparents) features advice and tips for grandparents, pertinent news articles, guest columns, and a link to AARP's GIC. Outreach was also conducted for Grandparent's Day 2001 (September 9), to grandparent publications.

The web site www.theantidrug.com has been the primary online source of program information directed at parents and other influential adults. The Media Campaign has reported approximately 1.1 million user sessions for this site, defined as "entries onto a web site," on www.theantidrug.com in the year 2001 (Fleishman-Hillard, Inc., "National Youth Anti-Drug Media Campaign: Public Communication Activities," February 2002). Other Campaign online resources included a media tool kit for anti-drug action, print ads for community groups, new banner ads for web sites; TV, print, and radio ads; and a "Lawyers and Substance Abuse Prevention Brochure." In addition, the Campaign offered brochures such as "What Parents Need to Know about Marijuana" in four languages on their Asian language web site (www.druganswer.com). A new bilingual brochure titled "Inhalant Abuse: America's Hidden Drug Problem" was prepared for publication in summer 2001 in English with four Asian language texts included.

Community Outreach

The Campaign has collaborated with a variety of community groups such as the National Education Association (NEA), faith-based groups, and Girl Scouts of America. The Campaign worked with the NEA to develop tools and resources to communicate prevention messages to students, educators, and school employees and their families. NEA used print, satellite, and Internet communication channels to deliver Campaign messages to its members. Working with faith-based institutions, the Campaign developed materials to help youth leaders incorporate substance-abuse messages and up-to-date information on drug prevention into existing programs. The materials included a brochure that introduces ways for clergy and faith leaders to elevate youth substance-abuse prevention on faith agendas. The Campaign collaborated with the Girl Scouts of America to create a series of new programs. There is a new Girl Scout patch, which is earned by completing a set of drug-prevention activities. There were also satellite broadcasts and an "Issues for Girls" series aimed at discussing issues, including drug use, facing girls today.

In addition to community groups, the Campaign continues to involve the entertainment industry as an influencer on both youth and parents. In the second half of 2001, the Campaign collaborated with a variety of media industries to reach entertainment, TV, and magazine writers. Five roundtables were held for entertainment writers, producers, and feature journalists. Representatives from all the major networks, as well as major production companies and media outlets, participated in one or more of these events. Campaign messages were included in Oprah; *Teen People*; PBS's *In the Mix*; MTV's *Flipped*; *The New York Times*; and ABC's *All My Children*, and additional publications. Writers subsequently requested information on a variety of topics for their stories or programming.

One example was Oxygen Media's hosting of a roundtable at their New York headquarters that brought together magazine writers and television and documentary producers for a program

highlighting the dangers of “huffing” and “sniffing” products to get high. The program “Hidden Danger: Inhalant Abuse, Teens and Huffing” held a panel and featured representatives from the National Inhalants Prevention Coalition and several experts on inhalant abuse. MTV has since begun production on a documentary featuring the roundtable’s teen speakers and several writers have requested interviews with panelists. This inhalants program was one of a series of entertainment industry roundtables on drug-related topics including Ecstasy and steroids.

Through the conversations with Hollywood television writers in these roundtables and other meetings, the Campaign identified the need for an online, user-friendly and accurate source of data for entertainment writers and feature journalists. In December, the Campaign launched www.DrugStory.org, a web site for television and screenwriters to use as a research and information source to obtain information on drugs and their effects, as well as access to first-person accounts and feature stories. The site promotes accurate, informative depictions of substance abuse-related issues in the media. The Campaign collaborated with the National Institute on Drug Abuse, the Drug Enforcement Agency, the Writers Guild Foundation, medical consultants, treatment and legal experts, and journalists to develop this resource.

1.4 Administrative Structure for the Evaluation

ONDCP has 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 were part of the Media 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 Media Campaign and changes in behavior within 2 to 3 years.

The Phase III evaluation is being accomplished through a national household-based survey of youth and parents from the same household, including youth aged 9 to 18 years and their parents. The evaluation includes youth starting at ages 9 to 10 and their parents, so that initial interviews can be conducted with children before drug use is likely to begin and before they enter the “tween” ages, which is the primary target group for the campaign. They are then to be followed up to evaluate the impact of the campaign as they enter the “tween” years.

The evaluation includes a longitudinal component in which youth and parents in the same household will be interviewed three times over the evaluation period. These repeated interviews will allow measurement of aspects of adolescent development and will thereby allow a much better assessment of the causal influences associated with youth drug use than is possible with cross-sectional studies, such as Monitoring the Future and the National Household Survey on Drug Abuse. It will also assess awareness of the paid anti-drug ads that are central to the full implementation of the Media Campaign.

Westat and the Annenberg School for Communication are conducting the evaluation under contract to the National Institute on Drug Abuse (NIDA). The funding for the evaluation is provided by ONDCP from the appropriation for the Media 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 general responsibility for all aspects of the project and, in particular, for supervising all aspects of sample design, data collection, and data preparation. The Annenberg School for Communication at the University of Pennsylvania, the

subcontractor, has lead responsibility for study design and data analysis. 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

The report is organized in six chapters and five appendices, along with an extensive set of detail tables. Questionnaires for Wave 4 can be found on the NIDA web site at <http://www.nida.nih.gov/DESPR/Westat/index.html> and on the ONDCP web site at <http://www.whitehousedrugpolicy.gov>.

This chapter and the next provide background for the Media Campaign and the evaluation.

Chapter 3 gives estimates on general and specific exposure of youth and their parents to the Campaign. Chapter 4 discusses youth use of marijuana and inhalants. Chapter 5 covers norms, attitudes, beliefs, and intentions of youth toward the use of marijuana and inhalants. Chapter 5 also assesses the cross-sectional and the longitudinal association between youth exposure to the Campaign and drug beliefs, norms, attitudes, and intentions. Chapter 6 covers the effects of the Media Campaign on parental monitoring practices, on parental talking with their children about drugs, and on the frequency of their engaging with their children in fun activities. This chapter also assesses the cross-sectional and longitudinal association between campaign exposure and parental behaviors. The main body of the report provides what the evaluators viewed as the essential results of the survey.

The remainder of the report provides a large number of detail tables supporting and supplementing each of the text chapters. In some cases, these tables present results from some additional variables not presented in the text, and often provide detailed breakdowns of responses by age, gender, ethnicity, and 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. The five appendices provide detailed information about sample design, weighting, variance estimation, and geography (Appendix A), data collection procedures (Appendix B), methods used to control for the effects of confounding variables (Appendix C), the ads in the Media Campaign (Appendix D), and the preparation of the risk score index, the exposure indices, and the outcome indices (Appendix E).

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2. Summary of Evaluation Plan

The Media Campaign seeks to educate and enable America's youth to reject illegal drugs; prevent youth from initiating use of drugs, especially marijuana and inhalants; and convince occasional users of these and other drugs to stop using drugs. It is the task of the Media Campaign Evaluation to determine how successful the Media Campaign is in achieving these goals and to provide ongoing feedback useful to support decisionmaking for the Media Campaign. This chapter focuses on the evaluation study's approach to assessing the Campaign's progress and success. Accordingly, it summarizes the models for Media 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 a description of the study samples of parents and youth. The chapter concludes with a brief overview of three analysis issues.

2.1 Models for Media 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 and will answer, four overarching questions form the central focus of the evaluation: (1) Is the Media Campaign getting its messages to the target populations? (2) Are the desired outcomes going in the right direction? (3) Is the Media Campaign influencing changes in the outcomes? (4) What is learned from the overall evaluation that can support ongoing decisionmaking for the Media Campaign?

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

- 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 their association with 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 Media Campaign; and

- To compare groups of people with high exposure to other groups with low exposure. The circumstances of the Media Campaign present a serious challenge to evaluation. Because the Media 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 to evaluate the Media Campaign. Experimentation would require conducting the Media Campaign in a random sample of media markets. Instead, the Media Campaign will be evaluated by studying natural variation in exposure to the Media Campaign and how this variation appears to correlate with phenomena predicted by the theoretical model for the Media 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 new household survey, the National Survey of Parents and Youth (NSPY).

Groups have been found with different levels of exposure to the Media Campaign. It is possible that there are pre-existing differences between the groups that might explain both the variation in exposure and variation in outcomes. In anticipation of this finding of variable exposure, 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 Media Campaign Influence

In developing the overarching Media Campaign model, two foundations are relied on: basic theory about communication and health behavior change, and evidence about what influences drug use. The overarching model of Media Campaign influence can be largely presented in the form of four 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 outlines influences on parents' actions with regard to their children's drug use. However, these figures cannot portray some complex ideas about how the Media Campaign may produce its effects. For this reason, five routes by which the Media 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 Media Campaign influence in broad outline and names the categories of external variables likely to influence the process. All of the Media Campaign activities (advertising, work with partnership organizations, encouragement of parent and peer conversations about drug use) are intended to increase youth exposure to anti-drug messages. The process through which these activities will produce exposures is laid out in Figure 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. These influence paths are laid out in some detail in Figure 2-C. 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.

Figure 2-A. Overall model of Media Campaign influence

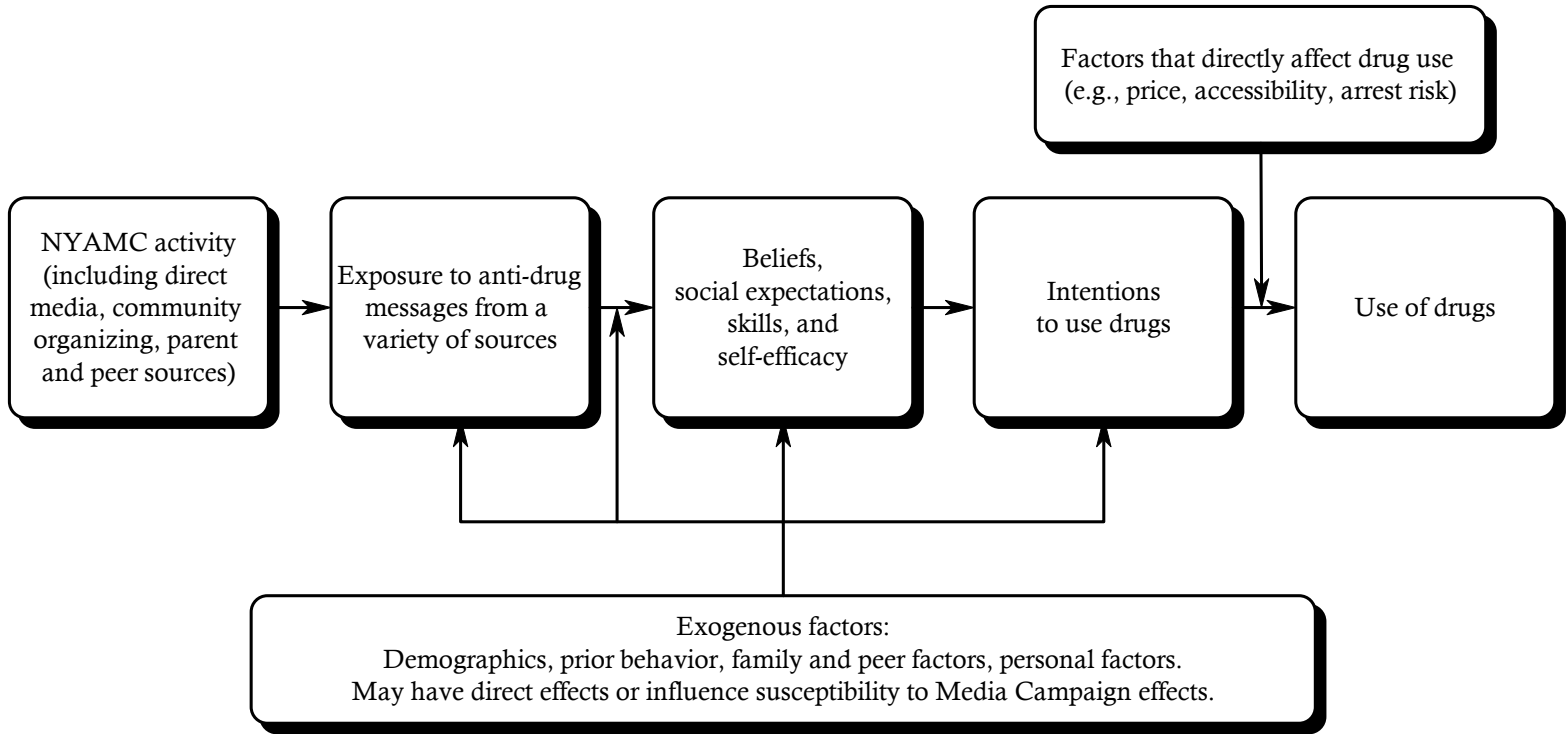
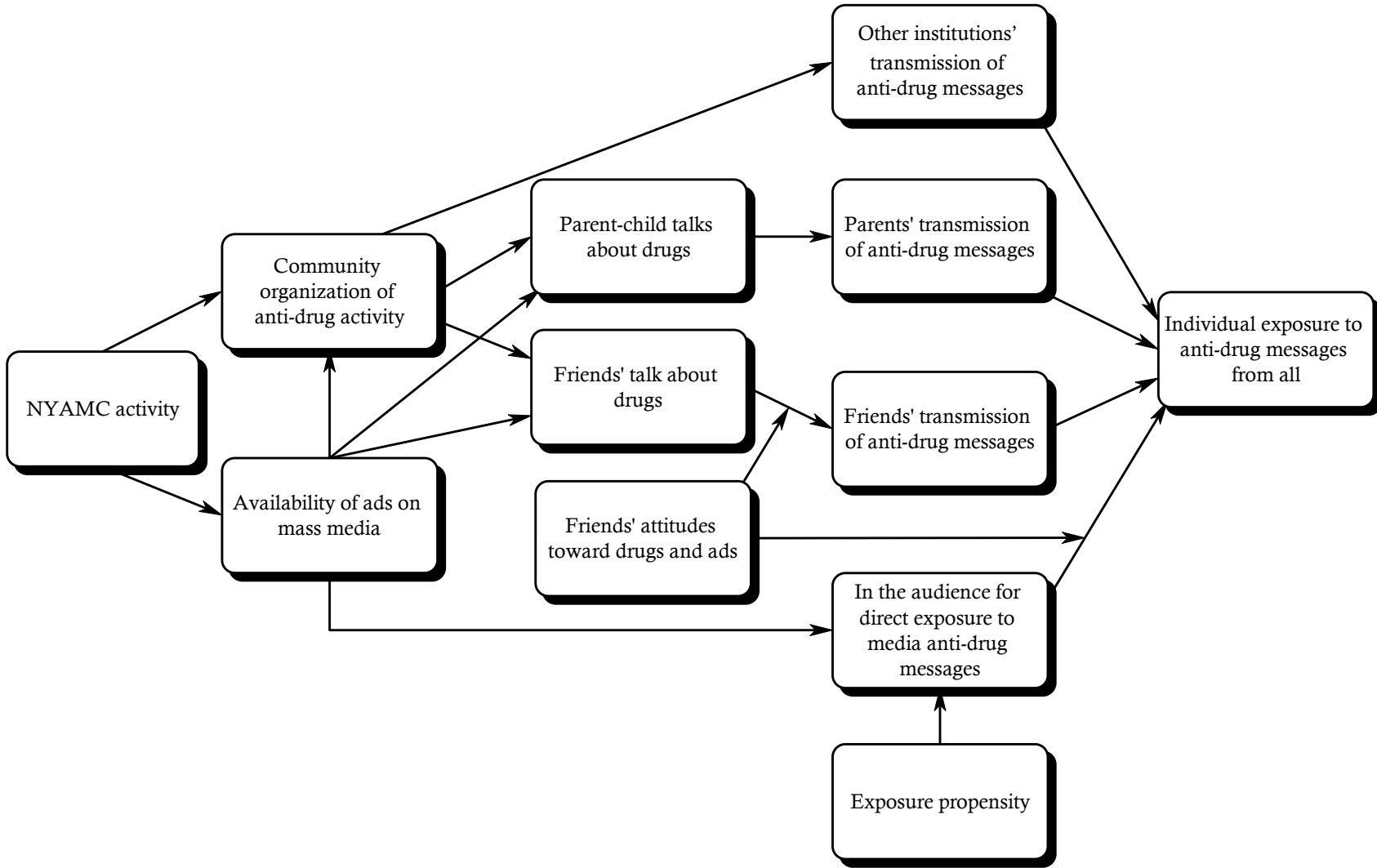
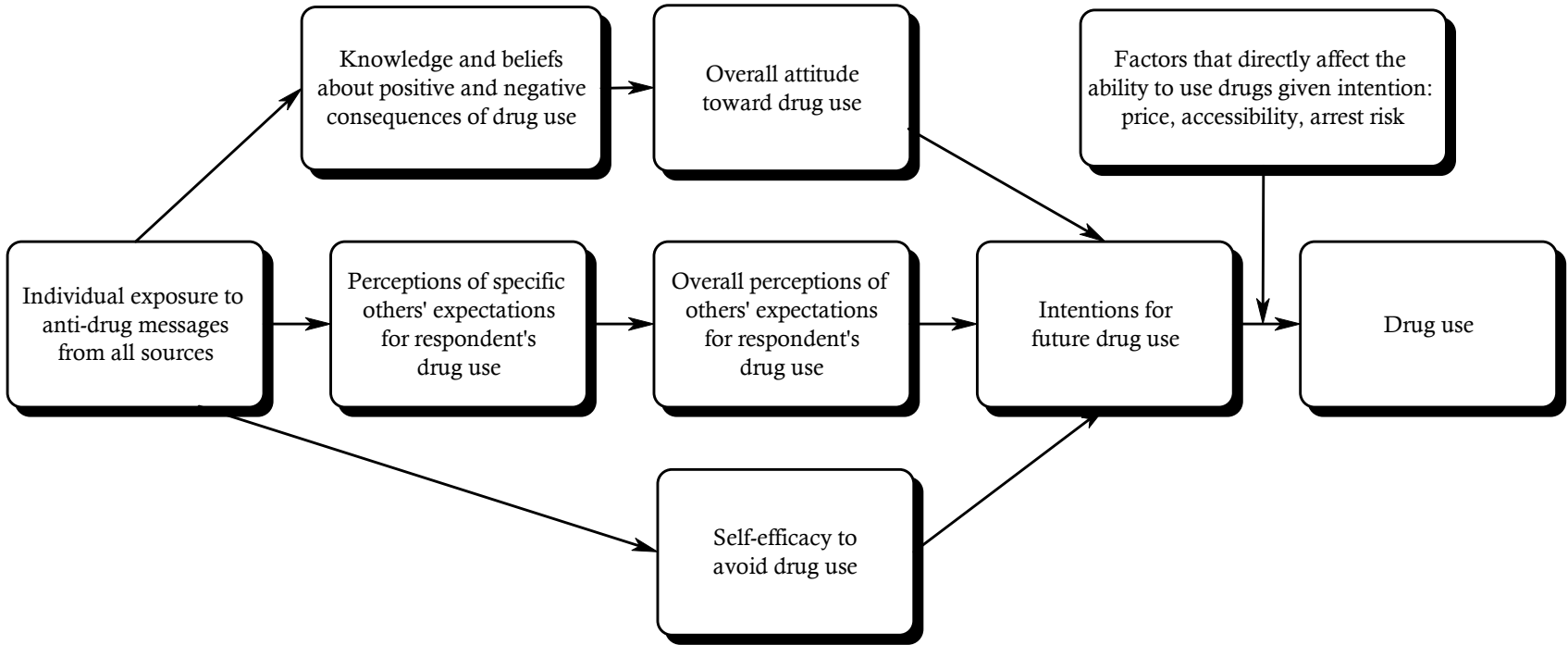


Figure 2-B. Model of influences on exposure to anti-drug messages



Other exogenous factors listed in Figures 2-A and 2-B are likely to directly influence some or all of these variables. Influence arrows not presented for clarity.

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 Media Campaign exposure on all belief outcomes. (Relationships not pictured for clarity.)		
Demographics: gender, age, ethnicity	Family and peer factors: parental monitoring, family functioning, friends' attitudes and behaviors, involvement with youth engaged in risk behaviors	Personal factors: sensation seeking (Section 2.3.5), academic success, ambitions, religious involvement, drug experience

Audience Exposure

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

- **Exposure to media messages.** The audience may be directly exposed to Media 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 Media 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 Media Campaign, whether by advertisements or by activities undertaken by other organizations.

However, although the Media 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 Media Campaign. The Media 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 Media Campaign's early emphases has been to encourage parents' involvement in their children's lives and, in particular, to encourage conversations about drugs and drug use. If the mass media advertisements are successful, there should be more parent-child talk about drugs and thus a greater transmission of anti-drug messages.
- **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 (called 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 Media 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. In 2001, the Campaign focused almost exclusively on marijuana behaviors, however. 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 Media 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 Media Campaign effects, such potential confounding influences have been controlled. In addition, in some cases researchers will be able 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 will also be measured. Finally, for this 4th semi-annual report we have developed a risk of marijuana use scale for defining risk subgroups (Section 2.3.5). Risk is related to sensation seeking, but is more comprehensive, incorporating information such as the child's alcohol and tobacco use. It is expected that analyses of the higher-risk youth should be much more sensitive to exposure-based behavior change, thereby increasing the likelihood of detecting Campaign effects on youth.

Parent Component of the Media Campaign

The Media Campaign seeks to address three distinct parent behaviors, each of which is modeled separately in Figure 2-D. The original parent objectives related to three parent behaviors, are as follows: (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. Given their relative importance in the Media Campaign, the models for the first two behaviors are presented in greater detail. In all models, a box simply labeled "NYAMC activity" represents the Media 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

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

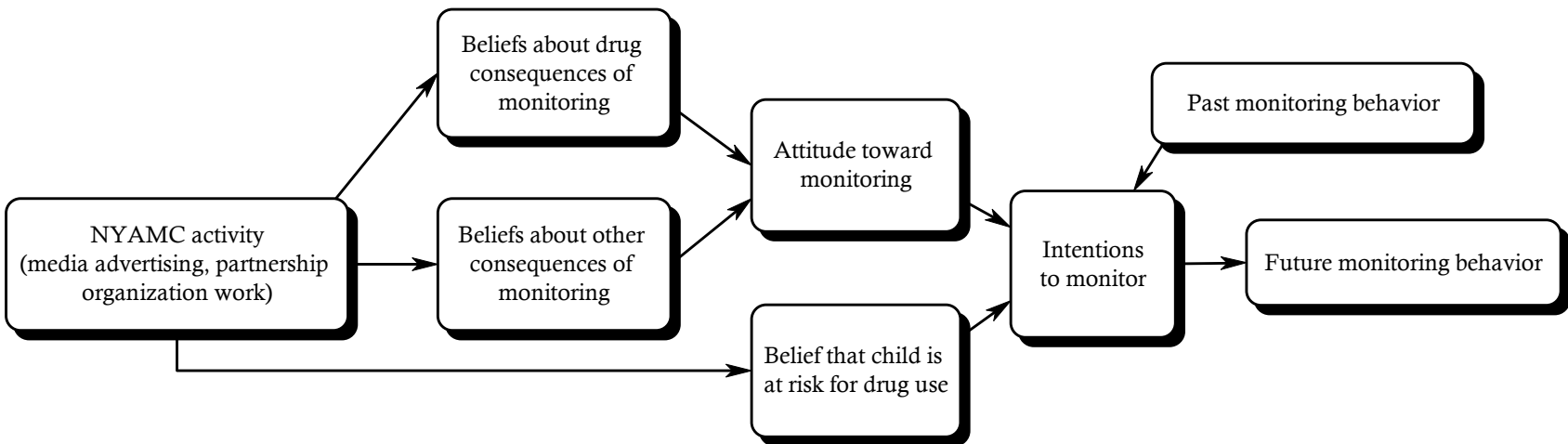


Figure 2-D. Model B - Effects on parent-child talk

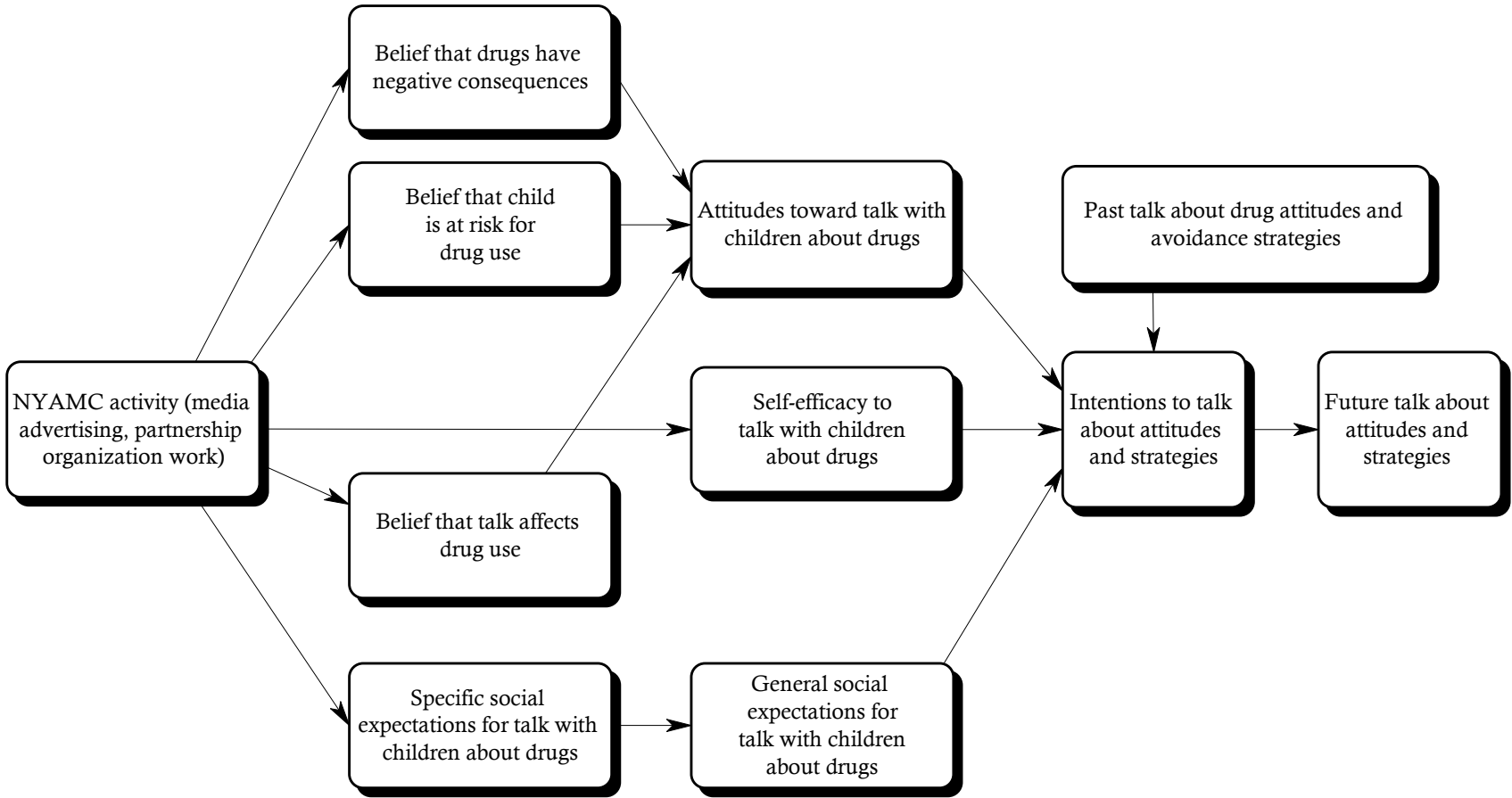
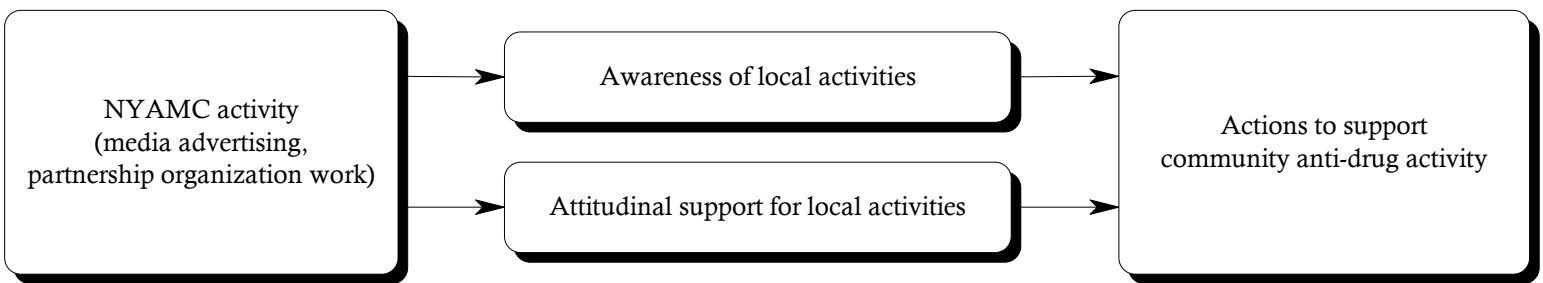


Figure 2-D. Model C - Effects on parental support for community anti-drug activity



intention 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). A decision to increase monitoring may be seen by a parent as having both positive and negative consequences. Media Campaign activities are presumed to affect both beliefs in the positive consequences of monitoring and the self-efficacy of parents to engage in monitoring behavior.

Model B in Figure 2-D describes a more complete process for the influence of the Media 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 Media 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 reference child, belief that the reference child is at risk for drug use, and belief that parent-child talk is likely to discourage drug use by the reference child. General social expectations are hypothesized to be a function of the specific social expectations of others that the parent talk with the child. Media Campaign activity is presumed to affect all of the beliefs, self-efficacy, and specific social expectations for conversation about drugs.

Model C in Figure 2-D focuses on parents' actions to support community anti-drug activities. Although this outcome behavior is included among Media Campaign outcomes, it has taken a secondary priority to other objectives. Interview time considerations have meant that none of the process variables that may lead from Media Campaign activity to this behavior will be specifically measured. Similarly, there are no measures of the process variables that might lead to increased levels of parents engaging in fun activities with their children. Only the behavior itself is assessed.

Routes of Influence

In this section, five overlapping routes through which the Media Campaign may have influenced behavior are presented. These routes include several factors that are difficult to portray in figures. First, it is possible that there will be time lags between Media 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 Media Campaign advertisements, youth immediately learn things about particular drugs that lead them to make different decisions about using those drugs. For example, they 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 Media 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.** Media 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.
4. **Social diffusion.** The advertisements stimulate discussion among peers and between youth and parents, and that discussion affects 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).
5. **Institutional diffusion.** The presence of advertisements (and the other elements of the Media Campaign) produces a broad response among other public institutions, affecting the nature of what they do with regard to drug use. In turn, institutional actions affect youth cognitions and social expectations about drug use and their own drug use behavior. Thus, Media Campaign activities may stimulate concern about drug use among school boards and lead them to allocate more time to drug education. Religious, athletic, and other private youth organizations may increase their anti-drug activities. News organizations may cover drug issues more actively, and the nature of their messages may change. Popular culture institutions (movie theaters, music, and entertainment television) may change the level of attention to and the content of drug-related messages. Like the social diffusion route, institutional diffusion does not require an individual-level association between exposure and beliefs or behavior. From the perspective of the evaluation, this path of influence is expected to be seen only at the community level of analysis, which is not addressed in this report. Also, institutional diffusion is a slow process, and there would be a relatively long lag between Media Campaign activities and institutional response and an even longer lag until the effects on youth beliefs or behavior become apparent.

2.2 Sample Design and Data Collection Methodology

The data in this report are based on the initial data collection (Waves 1, 2, and 3) of NSPY as well as a longitudinal data collection (Wave 4) of data from eligible sample members in Wave 1. Waves 1, 2, and 3 will be referred to collectively as the initial recruitment phase while Wave 4 is referred to as followup phase. The

data collection period for the waves were November 1999 through May 2000 for Wave 1; July 2000 through December 2000 for Wave 2; January 2001 through June 2001 for Wave 3; and July 2001 through December 2001 for Wave 4. The number of completed youth interviews for each wave include Wave 1 – 3,312 youth aged 9 to 18; Wave 2 – 2,362 youth aged 9 to 18; Wave 3 – 2,459 youth aged 9 to 18; and Wave 4 – 2,478 youth aged 9 to 18. The number of completed parent or caregiver interviews for each wave include Wave 1 – 2,293 parents; Wave 2 – 1,632 parents; Wave 3 – 1,681 parents; and Wave 4 – 1,752 parents. The numbers of interviewed youth who also had an interviewed parent were 3,118 in Wave 1; 2,210 in Wave 2; 2,307 in Wave 3; and 2,354 in Wave 4. (See Detail Tables 2-1, 2-2, and 2-3.)

2.2.1 Sampling

The youth and their parents were found by door-to-door screening of a scientifically selected sample of about 34,700 dwelling units for Wave 1, a sample of 23,000 dwelling units for Wave 2, and a sample of 23,300 dwelling units for Wave 3. These dwelling units were spread across about 1,300 neighborhoods in Wave 1 and approximately 800 neighborhoods in both Wave 2 and Wave 3. There were 90 primary sampling units (PSUs) in the three initial waves. In all subsequent followup waves, respondents recruited in Waves 1 through 3 are being followed up if they live within or just outside of the boundaries of the 90 PSUs. The sample was selected in such a manner as to provide an efficient and nearly unbiased cross-section of America's youth and their parents. All types of residential housing were included in the sample. Youth living in institutions, group homes, and dormitories were excluded.

The sampling was arranged to get adequate 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 Media Campaign. Within households with multiple eligible youth, up to two youth were selected.

Parents were defined to include natural parents, adoptive parents, and foster parents who lived in the same household as the sample youth. Stepparents were also usually treated the same as parents unless they had lived with the child for less than 6 months. When there were no parents present, an adult caregiver was usually identified and interviewed in the same manner as actual parents. No absentee parents were selected. When more than one parent or caregiver was present, one of the eligible parents was randomly selected. No preference was given to selecting mothers over fathers. Parents of both genders were selected at equal rates. This was done in order to measure the impact of the Media Campaign separately on mothers and fathers. When there were two sample youth who were not siblings living in the same household, a parent was selected for each.

The response rates were very consistent across the initial three data collection waves. The response rate in Waves 1 through 3 for screening dwelling units to find out whether any eligible youth were present was about 95 to 96 percent. Among dwelling units that were eligible for the survey, 74 to 75 percent in Waves 1 through 3 allowed the interviewer to enumerate the occupants and to select youth and parents for extended interviews. After selection of youth and parents, the interviewer sought signed consent from a parent to interview the sample youth. After that, the interviewer also sought signed assent from the sample youth. The interviewer then attempted to get extended interviews with the selected youth and parents. Among selected youth, the response rate was approximately 91 percent in Waves 1 through 3. This means that 91 percent of the youth received parental consent, signed to their own assent, and completed an extended interview. For Wave 4,

participants were located and eligibility was determined for approximately 87 percent of the parents and youth who completed an interview in Wave 1. Among those youth who were still eligible, the interview response rate was about 94 percent.

Among sample parents, approximately 88 percent completed the interview in Waves 1 through 3, whereas in Wave 4 the interview response rate for parents was about 92 percent. In all Waves, the percent of parents providing consent for the youth to complete an interview was higher than the percent of parents completing an interview themselves.

2.2.2 Extended Interview Methods and Content

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 cannot 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 he or she gives. 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 entered their own responses into the computer. The self-administered sections were arranged to promote a feeling of confidentiality for the respondent. In particular, it was 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; in Wave 1 just 0.4 percent of sample youth and parents were willing but unable to complete the questionnaire for reasons of physical or mental disability or because they could speak neither English nor Spanish, the two languages in which interviews could take place. In Wave 2, 0.7 percent of the parents and 0.4 percent of the youth were willing but unable to complete the questionnaire for the reasons above. In Wave 3, just 0.6 percent of the parents and 0.3 percent of the youth were unable to complete the questionnaire for these reasons and in Wave 4, the percentage was 0.6 for parents and 0.0 for youth.

The teen questionnaire included sections on basic demographics; school and religion; media consumption; extracurricular 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; antisocial 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 Media Campaign-sponsored anti-drug advertisements on TV and radio; Internet usage; and participation in drug education classes and programs. In Wave 3, questions were added to the teen questionnaire concerning Ecstasy trial and use, recollection of the "branding" statement in specific advertisements, and doing fun things with parents. In Wave 4, additional Ecstasy questions were added to the teen interview concerning intentions to use, perceived expectations of use by peers and attitudes of use, including approval/disapproval of use and perceived harm of use.

The parent interview 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 Media 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, only asked once. In Wave 3, questions were added to the parent questionnaire about recollection of the "branding" statement in specific advertisements, and the parent's perception of the efficacy of talking to children about drugs. In Wave 4, there were no changes to the parent questionnaire.

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 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, as many as six TV ads were shown to respondents in these groups. For radio ads, up to two 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.

In Wave 1, a total of 37 TV ads and 26 radio ads were aired during the wave and shown to respondents. The TV ads included 21 (16 in English and 5 in Spanish) aimed at parents and 16 (11 in English and 5 in Spanish) aimed at youth. The radio ads included 11 (8 in English and 3 in Spanish) aimed at parents and 21 (15 in English and 6 in Spanish) aimed at youth. There were additional radio ads that were audio versions of TV ads during Wave 1. These were not played for survey respondents for the reasons given in Chapter 3 of this report.

In Wave 2, a total of 31 TV ads and 19 radio ads were aired during this wave and shown to respondents. The TV ads included 16 (13 in English and 3 in Spanish) aimed at parents and 34 (32 in English and 2 in Spanish) aimed at youth. The radio ads included 9 (8 in English and 1 in Spanish) aimed at parents and 20 (15 in English and 5 in Spanish) aimed at youth. Wave 2 was not hampered by the issue of audio versions of TV ads, for only one of the Campaign Spanish radio ads was an audio duplicate of a television ad.

In Wave 3, a total of 22 TV ads and 27 radio ads were aired during this wave and shown to respondents. The TV ads included 10 (7 in English and 3 in Spanish) aimed at parents and 12 (9 in English and 3 in Spanish) aimed at youth. The radio ads included 16 (12 in English and 4 in Spanish) aimed at parents and 11 (8 in English and 3 in Spanish) aimed at youth. In Wave 3, six parent radio ads were played that were audio duplicates of a television ad. No youth radio ad was a duplicate of a television ad.

In Wave 4, a total of 16 TV ads and 19 radio ads were aired during the wave and shown to respondents. The TV ads included seven (3 in English and 4 in Spanish) aimed at parents and nine (6 in English and 3 in Spanish) aimed at youth. The radio ads included 9 (4 in English and 5 in Spanish) aimed at parents and 10 (8 in English and 2 in Spanish) aimed at youth. In Wave 4, seven parent radio ads and one youth radio ad were played that were audio duplicates of television ads.

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 were 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 were counted only when the ad aired during the 60 days immediately preceding the date of interview. The interview also contained a ringer TV ad—an ad that had not actually been shown, or a spill TV ad—an ad that had been shown but was targeted at the other (parent or youth) audience. Youth were shown parent TV ads to assess their spill effects and vice versa. This was done to allow study of the accuracy of ad recall. Some analyses of the ringer ad results were presented in Appendix C of the Second Semi-Annual Report, which presented strong evidence for the validity of the NSPY approach to measuring ad recall.

2.2.3 Weighting

Weights were developed for analysis to reflect differential probabilities of selection, differential response rates, and differential coverage. In Waves 2 and 3, youth in the age range of 12 to 13 and youth in the age range of 9 to 11 had the same probability of selection whereas youth in the age range 14 to 18 had a smaller probability of selection. In Wave 1, youth in the 12 to 13 age range had the largest probability of selection since they were oversampled. Youth in the 9 to 11 age range had somewhat smaller probabilities of selection, and youth in the 14 to 18 age range had the smallest probability of selection. Youth in the 14 to 18 and 9 to 11 age ranges with siblings in the 12 to 13 age range had higher probabilities of selection than those with no such siblings. (This was done to get more benefit out of each parent interview.) Youth with siblings in the same age range had smaller probabilities of selection since just one youth was selected per age range. Parents with spouses had smaller probabilities than single parents since generally only one parent was selected per household. For Wave 4, no new youth were selected. However, a new parent could be selected if the original sampled parent was no longer eligible for interview.

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 the 2-month reference period is working well (Hornik et al., 2001).

Response rates were found to vary geographically. Data from the 1990 Decennial Census were used to sort the sample into groups with different response rates. Within a group, the weights were adjusted upward by the inverse of the response rate. This has the effect of increasing the weights for difficult-to-reach households.

In this report, coverage is defined to be the NSPY sample-based estimate of the number of persons in the target population prior to poststratification to the corresponding estimate based on Census/CPS data. Coverage also varied geographically and by age. Table 2-A shows coverage rates by age for the initial recruitment waves. Overall, coverage 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. It would appear, based on census estimates, that screener respondents with children in the desired age range chose not to reveal the presence of their children. Perhaps this was an easy way to refuse participation in the survey without being impolite. To compensate for this as best as possible, the weights were adjusted so that estimates of sample youth were consistent with those from U.S. Census Bureau estimates by gender, age group, race and ethnicity, and region. The U.S. Census Bureau estimates were a synthesis of data from the Current Population Survey (CPS) and the Decennial Census. The January 2000 CPS data were used to adjust Wave 1 and October 2000 data was used to adjust Wave 2. However, for Wave 3, the average of March 2001 and April 2001 CPS data was used for adjustment. In Wave 4, a regression line was used to “smooth” 12 months of CPS estimates and the regression-based point estimate for October 2001 was used to adjust the Wave 4 weights.

The ordinary CPS totals could not be used in the adjustment because the CPS counts youth in dormitories as residing at their parents’ homes, but this is not done in NSPY. In the synthesis, CPS estimates were adjusted to remove estimated counts of youth living in dormitories. These were created by a special tabulation of the 1990 Decennial Census PUMS (Public Use Microdata Samples) that counted youth in dormitories in April 1990. It should also be noted that the CPS is itself adjusted for undercoverage and also for undercoverage in the Decennial Census; in October 1994, the CPS coverage rate for youth aged 15 was 89.5 percent (Montaquila, et al., 1996).

Table 2-A. Coverage rates by age

Age group	Wave 1 Coverage rate (%)	Wave 2 Coverage rate (%)	Wave 3 Coverage rate (%)
9 to 11	70	69	64
12 to 13	74	71	68
14 to 18	67	67	62

2.2.4 Confidence Intervals and Data Suppression

Confidence intervals have been provided for every statistic in the Detail Tables. These intervals indicate the margin for error due to the fact that a sample was used to derive the survey-based estimates rather than a 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 on each of those independent replications, the “true” value of the statistic would be contained within 95 percent of the calculated confidence intervals.

The confidence intervals reflect the effects of sampling and of the adjustments that were made to the weights. They do not generally reflect measurement variance in the questionnaires. The intervals are based on variance

estimation techniques that will be available in separate technical reports. In brief, subsamples of the full sample were identified and put through the same estimation techniques. The adjusted variation among the subsamples provides an estimate of the variance of the total sample. Details on how confidence intervals were calculated from variance estimates may be found in Appendix A.

Some estimates in the Detail Tables are suppressed. This was done when the reliability of a statistic was poor. This was measured in terms of the sample size and the width of the confidence interval. Estimated proportions near 0 percent and 100 percent are more likely to be suppressed than other estimates since it is difficult to estimate rare characteristics well. The exact criteria for this suppression are given in Appendix A.

2.2.5 Exposure Index and Imputation of Ad Recall

Because there were more ads being aired than could be reasonably shown to every survey respondent, a sample of ads was drawn as discussed above. Also as noted above, this was not a simple random sample of ads. Additional ads were selected 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 two different procedures depending on how many individuals had seen an ad. When fewer than 500 cases were available, the imputation was based on drawing respondents from similar pools and transferring values in what is known colloquially as a hot-deck imputation. The donor pools 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. If the ad had not been aired at all within the 60 days preceding the interview, it was not included in the calculations. When more than 500 cases were available for a particular ad, a procedure called MART (Multiple Additive Regression Trees) was used to develop an imputation model. These procedures are fully presented in Appendix E, Section E.3.3.

2.2.6 Future Waves of Data Collection

The NSPY is a two-phase design. During the first phase, the recruitment phase, eligible youth and parents are enrolled in the study and interviews are conducted. The recruitment phase (Waves 1 through 3) consisted of three national cross-sectional surveys lasting about 6 months each. During the second phase, the followup phase—Waves 4 through 7, parents and youth who participated in the recruitment phase are followed and, if determined eligible, are interviewed at two additional times during the followup period. Wave 1 participants are followed for the first time in Wave 4 and again in Wave 6. Wave 2 and Wave 3 participants are followed during Wave 5 and again in Wave 7. Followup intervals can range from 6 to 24 months, depending on the participant's situation. In total, participants can be interviewed up to three times over the study period. Combining the initial data collection and followup phases, there will be seven 6-month waves from which national semiannual estimates are prepared. This report contains data from Waves 1 through 4.

2.3 Sample Description

This section presents the youth and parent sample sizes for Waves 1 through 4 and defines the characteristics (i.e., race/ethnicity, sensation seeking, risk score, past marijuana usage, and dyads) of the samples.

2.3.1 Youth

Detail Table 2-1 shows the sample size in Waves 1 through 4 for youth by age and other characteristics. The total Wave 1 sample size of 3,312 youth is nearly evenly split among the three targeted age groups. The Wave 2 sample size of 2,362 is larger in both the 14 to 18 age group and the 9 to 11 age group. The sample size is deliberately slightly larger for the youth aged 14 to 18 because larger design effects were anticipated for this age domain. The Wave 3 sample size of 2,459 is larger in the 9 to 11 age group but about even for the other two age groups. For Wave 4, which is the first followup of Wave 1 respondents, the total number of youth is 2,478 but the age groups are distributed differently from the other waves because of the aging of the Wave 1 sample. In Waves 1 through 3, the 14- to 18-year-olds had been slightly over 50 percent of the sample whereas in Wave 4, 1,391 of the 2,478 youth were in the 14 to 18 age range, which represents 56 percent of the Wave 4 sample. Many of the tables also show estimates for youth aged 14 to 15 and for youth aged 16 to 18. These are much less reliable than the other age breaks since the sample sizes are only 552 and 611 for Wave 1, 394 and 387 for Wave 2, 378 and 380 for Wave 3, and 806 and 585 for Wave 4. Thus, when the sample is broken down by an additional demographic such as gender, separate detail for the finer age breaks is never shown.

The estimated number of eligible 12- to 18-year-old youth in the nation is 27.7 million during Wave 4. As mentioned above, this excludes youth in institutions, group homes, and dormitories, as well as other types of group housing. The confidence interval around this estimate is narrow because of the adjustments used to force the estimate to agree with census information. Table 2-1 also shows breakdowns of the sample and the population by gender, race/ethnicity, region, urbanicity, and sensation seeking. Further, for youth aged 12 to 13 and 14 to 18, there are breakdowns by past marijuana usage. Some of these breakdowns require some elaboration.

2.3.2 Race/Ethnicity

The categories used in all tables are White, African American, and Hispanic. These are short labels for more complex concepts. White means White but not Hispanic. African American also excludes Hispanics. Race and ethnicity were asked as two separate questions. For older youth, aged 12 to 18, self-reported race and ethnicity were typically used. For children aged 9 to 11, race and ethnicity reported by the screener respondent were typically used. In both cases, respondents were first allowed to choose multiple races from the standard list of five races:

- White
- African American
- Asian

- Native Hawaiian or other Pacific Islander
- American Indian or Alaska Native.

For those who chose more than one category, there was a followup question to pick just one. For those who could not pick just one, interviewer observation was used. Separate detail is not shown in any of the tables for the last three categories because of the low reliability associated with small sample sizes. The total number of interviewed youth who are Asian, Native Hawaiian, other Pacific Islander, American Indian, or Alaska Native was just 115 for Wave 1, with about 38 per age range. For Wave 2 the total was 93 youth and for Wave 3 the total was again 115. Within age ranges there were about 30 for each age range for Wave 2 and from 30 to 44 in the age ranges for Wave 3. In Wave 4, the total dropped to 89 out of the 115 present in Wave 1 because 26 of these aged out of the sample. However, there are some respondents in every age group, and their responses are used in the overall estimates.

2.3.3 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, 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 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 were 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 8-item scale from the original 20 items has levels of reliability and validity sufficient to replace the 20-item scale (Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, 2000). In a personal communication, Dr. Philip Donohew reports a comparison between the eight-item 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. Although the evidence of these two studies is unpublished, it 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.

This reduced series of four questions on sensation seeking were 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. Given a fixed cutoff that does not vary by age or sex, one would expect the prevalence of high sensation seekers to be greater among males than females and to increase with age. This is also the pattern observed. It was decided to use a single threshold to facilitate comparisons across groups and time.

2.3.4 Risk Score

In this report, a new scale of risk of marijuana use was developed. The risk score was an empirically-derived scale that predicts the risk of using marijuana derived from a number of youth and parent risk factors. It classifies youth into two risk categories—high and low risks. The rationale for creating the risk-based subgroups is similar to the subgroups developed using the sensation-seeking score. The risk score scale incorporates the sensation seeking measure along with a number of other youth and parent risk factors. It can be argued that exposure to these advertisements may affect the high risk groups differently from the low risk groups. The role of the risk categories in moderating the relationship between exposure and outcomes is examined in this report.

The measures used to develop the risk score include:

- **Youth covariates**
 - Age (12-18)
 - Sensation seeking (high versus low)
 - Started smoking 12+ months ago
 - Started drinking 12+ months ago
 - Urbanicity 1 (urban versus rural)
 - Urbanicity 2 (suburban versus rural)

- **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

Greater details of the methodology used to develop the risk score is discussed in Chapter 4.

2.3.5 Past Marijuana Use

Youth were divided into four categories of marijuana usage, only two of which are shown in most tables. The nonuser row is for youth who have never tried marijuana. The occasional user row is for youth who have used marijuana 1 to 9 times in the past 12 months. Youth who have used more frequently in the past year are classified as regular users and youth who have tried marijuana but not smoked it in the last 12 months are called former users. There were too few former users and regular users for these categories to be used as standard row variables in tables.

2.3.6 Parents

Detail Table 2-2 shows sample sizes for parents, weighted population estimates, and confidence intervals on the population estimates. Using NSPY definitions and procedures, there were about 33.3 million parents of youth aged 12 to 18 in this country during Wave 4. As mentioned above, the NSPY definition of parent excludes noncustodial parents but does include stepparents, foster parents, and even nonparental caregivers if no parent lived with sample youth. The NSPY definition also excludes parents whose children live in group facilities and dormitories.

In addition to the breakdown of race/ethnicity used in the youth tables, there are breakdowns by parental gender, parental education, and age of children. In the NSPY definition, about 38 percent of “interviewed parents” were male for Wave 1, about 44 percent of “interviewed parents” were male for Wave 2, and about 40 percent of “interviewed parents” were male for Wave 3. For Wave 4, which is a followup of Wave 1, 37 percent of the interviewed parents were male. The sample sizes by age of children add to more than the total sample size since a parent with multiple children will be counted in each applicable row.

2.3.7 Dyads

Detail Table 2-3 shows sample sizes for dyads, weighted population estimates, and confidence intervals on the population estimates. A dyad is defined to be the combination of a youth and a parent for that youth. The sample size is smaller for dyads than for all youth because for dyad analysis, it was required that both the youth and his or her parent respond to NSPY. For dyad statistics, the rows are defined in terms of the characteristics of the youth. For youth with two parents, the confidence intervals reflect the assumption that both parents would have given the identical response about the youth. The only parent variables that are used in dyad tabulations are those that are specifically about the sample youth.

2.4 Potential Analysis Modes

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

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

Section 2.4.1 explains some of the approaches we will use to answer each of those questions.

2.4.1 Measuring Exposure to the Media Campaign

The Media Campaign has and will continue to publish information about how much media time it has purchased. More specifically, for each audience of youth or parents, information is available on the proportion that would have been in the audience 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 on page 3-1 of Chapter 3. The evaluation team's task with regard to exposure is to measure the extent to which placement of the ads and other Media Campaign communication efforts broke through into the minds of the audience—that is, are audiences aware of the Media Campaign and is awareness increasing over time? Can target audiences recall the ONDCP-sponsored ads and other messages that were shown? Audience awareness is being 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.² 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.

² See, for example, question D10 in the teen questionnaire. All the NSPY questionnaires can be found on the NIDA web site.

- To improve the precision of the exposure measurement, a second major approach to exposure measurement, the recall of specific Campaign ads, is being made. Thus far, radio and television advertising represent the largest part of the advertising effort. Focus is on those channels for this next type of measure. Through the use of Westat’s Audio Computer-Assisted Self-Interview (ACASI) format, each respondent is shown Media Campaign television and radio ads at full length on a laptop computer brought to the respondent’s home by a member of Westat’s field interviewing workforce. (See Section 2.2 for a description of the NSPY.) The ads shown are all ads that have been broadcast nationally in the previous 2 months, according to the Media Campaign. For each respondent, a subsample of the Media 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 ads targeted toward these special populations. Each respondent is asked to tell whether they have ever seen the ad, how often they had seen the ad recently, and their assessment of the ad.³
- 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, each respondent is asked whether he or she has seen an ad that has, in fact, never been broadcast. This provides a benchmark to assess true exposure.
- In addition, the evaluation team recognizes that while the Media 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 Media 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 include 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 team will examine whether the intensity of Media Campaign efforts are translating into changes in the perceived public communication environment about drugs. The evaluation design will likely not permit separate attribution of effects on parent and youth outcomes to the operation of these components of the Campaign. However, it will be possible to examine whether these efforts are associated with increases in the “buzz” about drug-related issues.

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 Media Campaign might work, if it was successful. They have determined what measures were incorporated into the survey questionnaires. The outcomes being measured capture quite a range of objectives for this Campaign:

³ See, for example, question D17 of the teen questionnaire.

- **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.
- **Attitudes and beliefs:** Beliefs and attitudes 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.

In the first semiannual report (Hornik, et al., 2000), the evaluation team provided estimates of the simultaneous association of cognitions and behavior, while controlling statistically for the effects of confounding variables. In the second semiannual report, the team presented estimates of change in cognitions and behaviors between the first and second halves of 2000 and provided 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 present report is the first that permits examination of longitudinal effects using the Wave 1 sample followed up at 18 months. Future reports will have followup data on all parents and youth interviewed in waves 1, 2, and 3, and will report in more detail on persistent and lagged effects of Campaign exposure on cognitive and behavioral outcomes.

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

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

In this report, as in the third semiannual 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” is 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.

The present report includes several new features intended to increase the capacity of the analysis to detect campaign effects:

- For the first time, data was examined to determine whether the evidence for effects differs depending on the child's risk of taking up marijuana. Also examined was the dependence of effects on the characteristics of the youth or his/her parents, gender, 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.
- This is the first report in which the cross-sectional causal analyses are supplemented with longitudinal causal analyses. The same national sample of youth and their parents is being followed for 2 or 3 years. This permits the examination of whether a young person 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 will permit response to concerns about ambiguity of causal direction (i.e., that the cross-sectional association between exposure and beliefs is the result of beliefs affecting recall of exposure rather than exposure affecting beliefs). Among nonusers at Wave 1 (about 80% of the population), Campaign effects on marijuana use as well as on cognitions will be examined. For this report, 18-month reinterview data was available for analysis on approximately 40 percent of parents and youth interviewed initially. Analyses incorporating the remaining 60 percent will appear in the fifth semiannual report scheduled for fall 2002.
- Previously, 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 2D, alternate pathways are also feasible. In this report one of these is examined, specifically, the effects of parent exposure on youth behavior. As with direct effects, both cross-sectional and longitudinal relationships are analyzed. These analyses show the association of parent exposure with youth behavior, regardless of the path through which the effects have occurred (monitoring, talking, fun activities, or some unmeasured parent behavior that affects youth behavior).

2.4.4 Types of Longitudinal Analyses Reported

The addition of a longitudinal analysis capability is probably the most significant innovation of the fourth semiannual report. The approach taken was to use the longitudinal data to address the Campaign effects question in several ways, each of which provides a somewhat different form of strengthening the ability to make inferences. The first analysis (lagged effects) strengthens the ability to sort out causal order between exposure and outcome. It involves looking at the association of Exposure measured at Wave 1 with Outcome measured at Wave 4, controlling for a propensity score based on prediction of E1 from the confounders measured at Wave 1. This lagged association will capture both the delayed effects of Exposure at Wave 1 on outcome if that effect did not emerge until after Wave 1, as well as the effects of exposure at Wave 1 that flow through exposure at Wave 4 to outcome at Wave 4. In addition, and for an analogous purpose, the association of Exposure at Wave 1 with change in the Outcomes between Wave 1 and Wave 4 for the subsample of youth who have Outcome measures at both waves was reviewed. In Wave 4, this is presented only in a limited way, because of sample size considerations. It will be presented more systematically in the subsequent report.

The second analysis approach (stable exposure effects) makes use of an averaged measure of exposure that should show a more stable measure of exposure and thus more ability to detect associations with outcomes. It is based on the argument that previous cross-sectional analyses may have failed to find association (for youth) or underestimated the association (for parents) because the exposure variable was not an ideal measure of the effective exposure. This analysis is logically similar to the cross-sectional analysis done for the Wave 3 report with one possible advantage: by averaging two waves of exposure, it may provide a better estimate of exposure, compared to using only the single exposure measure. This would also involve a propensity score based analysis, with the propensity score based on predicting the average of exposure at Waves 1 and 4 from confounders at Wave 1.

Both the lagged and stable types of analysis 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.

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3. Exposure to Anti-Drug Messages

This chapter focuses on exposure to both Media Campaign efforts and exposure to non-Campaign anti-drug efforts during the period from September 1999 to December 2001. First, the chapter discusses advertising placement activities of the Media Campaign. Next, it presents statistics regarding the level of ad recall among youth and parents, with some focus on people's recognition of specific television and radio ads from the Campaign. The third section provides assessments of the television advertisements recognized by youth and parents, as they provide one way of gauging the population's judgment of prominent Media Campaign content. The fourth section discusses youth and parent exposure to other drug information, including encounters with drug information on the Internet, drug education classes, discussions about drugs, discussions about anti-drug ads, and perception of media and community attention to drug use. The last section presents a summary and conclusions.

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, the ad earns one GRP. It is also quite typical to report GRPs on a weekly basis. So, 100 GRPs is equivalent to one weekly exposure to one ad for each person in the target population. In more common language, an ad that earns 100 GRPs in a week is projected to have been seen by the average person 1.0 times, and an ad that earned 250 GRPs would have been seen by the average person 2.5 times in that week. Exposure to multiple ads, or to ads available through multiple channels, is calculated by summing the GRPs for each of the individual ads for each medium. GRP estimates are averages across the relevant population.

If 100 GRPs have been purchased for a week, that means that the average number of times that a random person saw or heard programs, billboards, newspapers, or magazines carrying the ad was 1.0. This does not mean that everyone saw or heard the ad exactly once. It is quite possible that some saw or heard it many times while others saw or heard it rarely, but the average number of times for a random person is 1.0.

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 audience 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 only capture the availability of an audience. They do not guarantee that an audience member was actually paying attention to the ad.

3.1 Media Buying Reports

- Based on Media Campaign reports of purchased time and space, it is estimated that the average youth has been exposed to 2.5 youth-targeted ads per week and that the average parent has been exposed to 2.2 parent-targeted ads per week, during the period from September 1999 through December 2001. (These estimates include Media Campaign advertisements intended for the general market youth or general market adults, respectively; 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.)

Estimates of expected Campaign exposure for this report are derived from reports of media time purchased by Ogilvy on behalf of the Media Campaign for the 28-month period from September 1999 through December 2001. These estimates show that Ogilvy obtained a total of approximately 30,740 gross rating points (GRPs) for advertisements intended for general market youth and approximately 26,471 GRPs for advertisements intended for general market parents.¹ These totals translate into an average of 252 targeted GRPs for general market youth per week and 217 targeted GRPs for general market parents per week. In turn, such estimates are equivalent to 2.5 targeted ad exposures per week for general market youth and 2.2 targeted ad exposures per week for general market parents.

Table 3-A provides more detail about these estimates. The distribution of GRPs across various media and channels reveals the predominance of particular media as sources of GRPs for each of the two audiences. Television and radio account for over 80 percent of GRPs for youth and 57 percent of GRPs for parents.

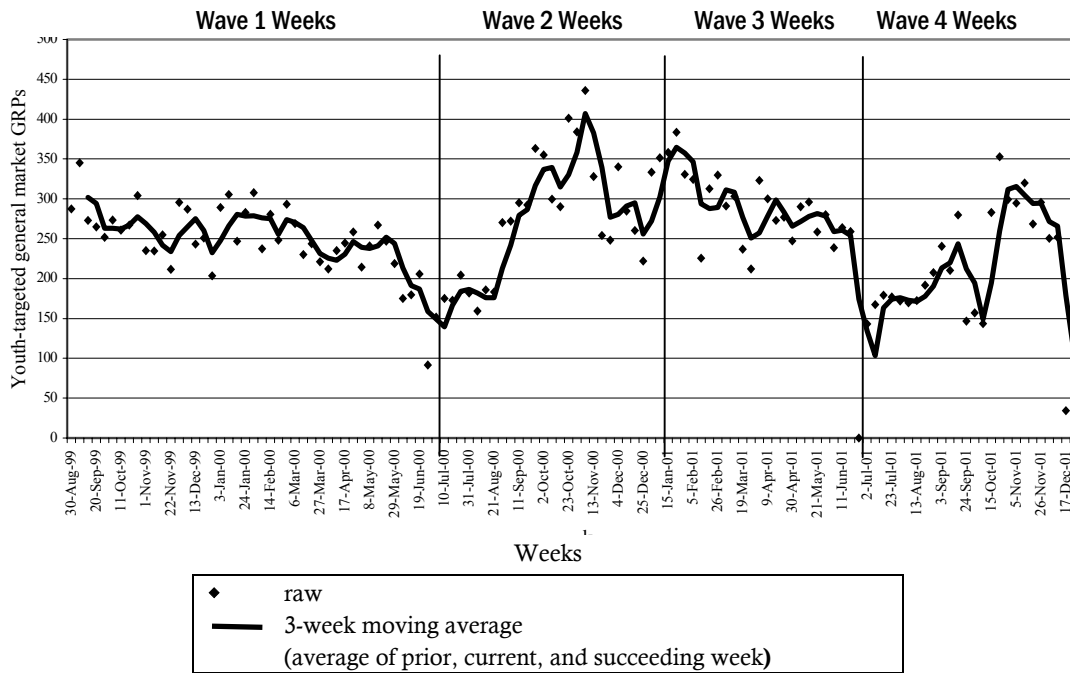
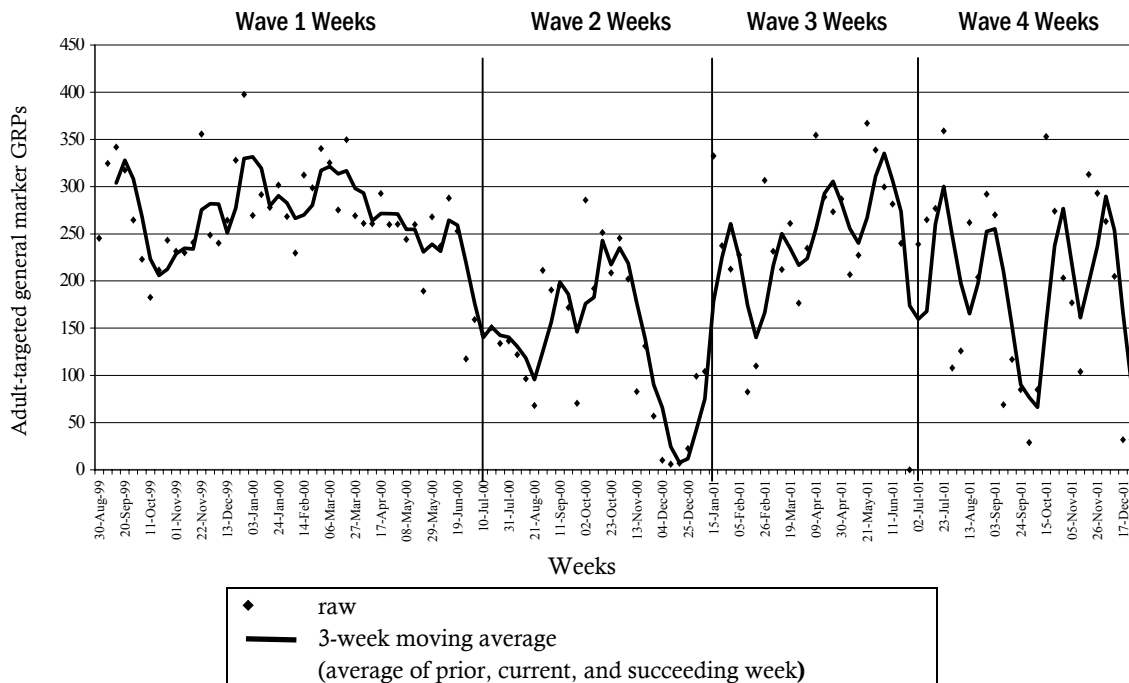
Table 3-A. Targeted gross rating points (average per week and per medium)

	Youth GRPs	Percent of Youth	Parent GRPs	Percent of Parents
All media for 121 weeks (9/99 – 12/01)	30,740		26,471	
Television per week	135	54	60	27
Radio per week	69	27	65	30
Print per week	24	10	32	15
Outdoor per week	--	--	56	26
Other per week	24	10	4	<1
All media per week	252	100	217	100

NOTE: The “other” category for youth includes advertising on basketball backboards, in movie theaters, on the Internet, and other activities such as postings of flyers; the “other” category for adults includes movie theaters and Internet.

- The GRPs for both youth and parents were sharply down during Wave 4, from July through December 2001. The number of GRPs to which youth and parents were exposed varied over the 121 weeks of Phase III of the Campaign. As depicted in Figure 3-A and Table 3-B, youth GRP exposure had shown upward and downward trends during the first three waves of measurement

¹ Ogilvy has provided the Evaluation team with detailed information about the media purchases made, organized by channel, by week, and for many channels by the name of ad. The GRP data presented in this report are derived from that information, supplied as of January 2002. It should be recognized that these are not definitive buying information. Some of the information is based on postbroadcast confirmed buys, some of it on prebroadcast scheduled buys, and some on estimated buys. Also, there are survey errors of unreported magnitudes in the audience surveys.

Figure 3-A. Weekly youth-targeted general market GRPs (September 1999 through December 2001)**Figure 3-B. Weekly adult-targeted general market GRPs (September 1999 through December 2001)**

(from September 1999 through June 2001), but the overall average in each wave was always more than 250 (259, 254, and 281 GRPs per week for Waves 1, 2, and 3 respectively). Wave 4 was down 20 percent from the average of the previous levels, with an average of 209 GRPs per week from July through December 2001. This represents approximately 2.1 exposures on average per week in that wave. The youth Wave 4 GRPs appeared to have a low period between July and mid-October (due, in part, to the coverage of September 11 events as well as the summer disruption in normal media programming), a somewhat higher period between mid-October and

December, and then minimal purchases of ad time at the end of December. The Campaign has reported that declines in youth GRPs in Wave 4 are due, in part, to a concentration of media buys on more “high visibility” and high cost prime time and event TV programming, which yields less GRPs per dollar spent but which it believes creates greater impact. Some of the youth decline in Wave 4 also reflected the lack of any spot radio or television buys during that period, without a commensurate increase in other media time purchases.

Parent GRPs were also down during Wave 4 (Figure 3-B and Table 3-B). Parent GRPs per week had been high in Wave 1 (275), sharply down in Wave 2 (152), up in Wave 3 (230), but were back down in Wave 4 (194). Declines in parent GRPs are due, in part, to the same reasons as the youth declines cited above (concentration on high visibility prime time and event TV programming, media cost inflation, and elimination of local out-of-home activity in Wave 4). However, as will be shown below, the overall decline in total parent GRPs during Wave 4 might have been mitigated by a concentration in channels that reached a wide audience.

In addition to the broad up and down patterns across waves, there is a good deal of variation across weeks within waves, particularly for parents. This variation in GRP exposure is due partly to ad flighting. Flighting involves running advertising only for specific periods of time, such as four 10- to 12-week periods, rather than running it continuously. GRPs are grouped into flights and run within behavioral messaging platforms to achieve Campaign communication goals. GRPs vary within flights depending on the goals for a particular platform, the total GRPs purchased for the time period, and the media mix used for each platform. Section 3.1.1 provides some additional information about the adult pattern, which makes this rise and fall appear to be less extreme. As noted previously, the drop in early September through mid-October GRPs can be attributed directly to the aftermath of September 11th.

- **The Campaign also reported additional Campaign-related exposure beyond the main general market efforts intended for youth and adults.** In addition to the estimated general market exposure reported above, youth and parents also might have been exposed to advertising intended for people other than themselves, or to unpaid advertising devoted as a pro bono match to the paid advertising.

Table 3-B. Distribution of youth and adult average weekly GRPs across waves

	Wave 1 2000	Wave 2 2000	Wave 3 2001	Wave 4 2001
Youth	259	254	281	209
Adults	275	152	231	194

Insofar as youth saw or heard an anti-drug advertisement intended for parents or vice versa, one could argue that the advertisement 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 July 2001 to December 2001 (which overlaps with the period covered by this report), for example, youth GRP estimates would increase by approximately 33 percent² if spill exposure to parent advertisements were added to the youth total. This is worth noting from the standpoint of general awareness of the Media 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, they have 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 audience group.

² According to a January 2002 Ogilvy estimate, youth GRPs for July 2001 through December 2001 were approximately 7,681 with spill exposure accounting for 2,569 GRPs.

3.1.1 Distribution of Exposure

Reported GRP numbers are average estimates of exposure across the entire population of a specified group. It is possible that the same level of GRP performance can be achieved by producing many exposures for relatively few people or a few exposures for many people. For example, a media buying plan that bought four exposures per week for half of a target population would achieve the same GRP level ($200=4 \times 0.50 \times 100$) as a media-buying plan that purchased two exposures per week for all of the population ($200=2 \times 1.00 \times 100$). This is why media buying strategies customarily are expressed in terms of both reach and frequency, or more broadly, in terms of the distribution of exposure, rather than just the average exposure.

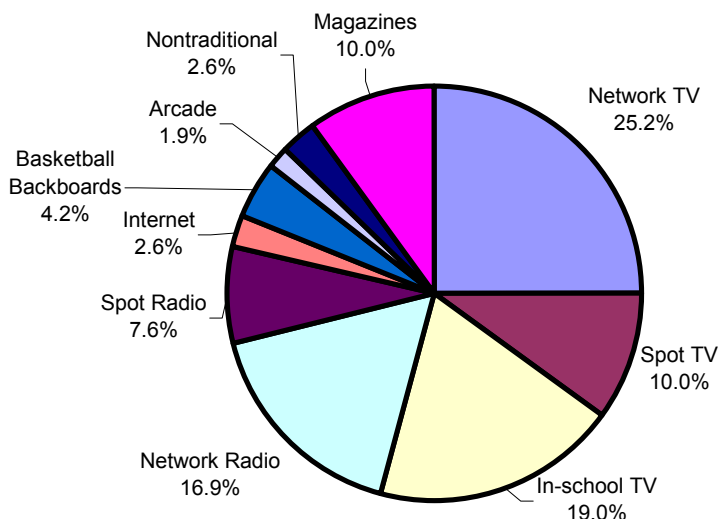
NSPY provides direct estimates of the reach and frequency of ad viewing and hearing.³ Before presenting those estimates, it is useful to look at the general viewership levels of each of the channels in which advertising was bought. By doing so, GRPs can be classified as having been bought either on media with wide reach or on media with more narrow reach. One pattern that stands out across both groups is the predominance of television and radio GRPs, particularly for youth.

- **Television and radio GRPs composed the vast majority (over 80%) of total youth-targeted GRPs.**
 - While advertisements intended for youth were placed in a variety of media, most GRPs for youth-targeted ads were generated through television and radio. Twenty-five percent of youth GRPs resulted from combined network and cable television placement, nearly 20 percent resulted from in-school television (largely through the Channel One program), and another 10 percent came from “spot” TV in more than 100 metropolitan areas around the country. Approximately 25 percent of youth GRPs came from network and spot radio. (See Figure 3-C.)
 - Almost two-thirds of targeted youth GRPs were obtained in media with the potential for wide reach, and about one-third in media with less wide reach. For instance, network radio (17% of the GRPs) and network and cable television⁴ combined (25% of GRPs) have the potential to reach most of the population. With all TV and radio buys, nonetheless, the specific reach and frequency will depend strongly on the particular buys in terms of programs and times. Media channels with narrower reach among youth include in-school television (19% of youth GRPs mostly on Channel One), basketball backboards (4%), arcades (2%), and so-called nontraditional media, such as movie theaters and flyer postings (3%). In addition, the Campaign reports roughly 3 percent of youth-targeted GRPs arose from Internet efforts. Another media outlet used by the Media Campaign to a limited extent, magazines (10% of youth GRPs), also has considerably lower reach than television or radio.

³ The Media Campaign provided data in a variety of formats. Most of the information used in this report exploits the information about weekly purchases of media time for specific ads and/or on specific media. In addition, the Campaign has supplied estimates for overall reach and frequency for an advertising platform across all media cumulatively for the weeks the platform was on the air. These estimates depend on complex assumptions about the probability of an individual who is exposed to a message on one medium being exposed to the message on a second medium. They are not presented in this report. The survey-based estimates reported in the remainder of this chapter present parallel information and describe the distribution of recalled exposure. Evidence for the validity of these measures was provided in previous reports (Appendix C, Second Semiannual Report.)

⁴ The combination of network and cable television is referred to as network TV in presented graphs.

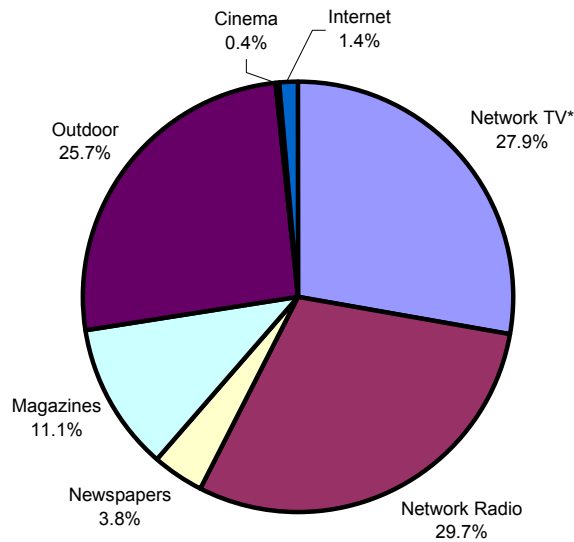
Figure 3-C. Targeted youth media placements by medium (September 1999 through December 2001)



- While television and radio represented the great majority of GRPs for youth, this was less the case for GRPs purchased for parents.
 - While the Media Campaign purchased 135 targeted GRPs per week for youth on television, for example, it purchased only 60 such GRPs per week for parents on television. As can be seen in Figure 3-D, many of the general market adult GRPs came from media other than television, radio, or even print. In fact, just over a quarter of all of the adult GRPs came from outdoor media (billboards, bus shelter placards, etc.). The Campaign purchased outdoor advertising intended for general market adults in only 10 major media markets,⁵ which collectively contain roughly a third of the U.S. population.
 - For parents, the overall balance across waves between wide-reach media and other media is somewhat similar to that of youth (Table 3-D). Approximately half of the GRPs came from wide-reaching network TV (28% of GRPs) and network radio (30% of GRPs); with the other half coming from media with less reach, including newspapers (4% of GRPs), magazines (11% of GRPs), and outdoor media (26% of GRPs).
- The proportion of wide-reach and narrow-reach media used by the Campaign was stable for youth across waves. In contrast, for adults, that ratio varied sharply. Table 3-C presents the proportion of GRPs purchased across waves according to whether they were purchased on wide- or narrow-reach media. For youth, wide-reach media make up 60 percent of the purchased GRPs across all four waves. In contrast, the cross-wave pattern for parents is quite different. Just less than 50 percent of all GRPs were on wider reach media for Waves 1 and 3, but for Waves 2 and 4, although overall GRPs were down, a larger proportion (63% and 85%) were bought on wider reach media. Thus, even though the total adult GRPs declined in Waves 2 and 4, the GRPs on the wider reach media were actually the highest during Wave 4. Thus, the proportion of the population likely to have been reached at some level would have been more stable than what was suggested by the overall GRP figures.

⁵ According to Ogilvy, those markets were New York, Chicago, Los Angeles, Philadelphia, San Francisco, Dallas/Ft. Worth, Atlanta, Boston, Detroit, and Washington, DC.

Figure 3-D. Targeted adult media placements by medium (September 1999 through December 2001)



* The combination of network and cable television is referred to as network TV in presented graphs.

Table 3-C. GRPs per week purchased for youth and parents across waves, by reach of the media

Youth	Reach	Expected weekly exposures (% of all exposures)				
		Wave 1 2000	Wave 2 2000	Wave 3 2001	Wave 4 2001	All Waves
	Wider reach channels (Network, Cable, and Spot TV; Network and Spot Radio)	1.54 (59%)	1.59 (63%)	1.70 (61%)	1.30 (60%)	1.53 (60%)
	Narrower reach channels (Magazines, Movie Theaters, Internet, In-school TV, etc.)	1.05 (41%)	0.95 (37%)	1.11 (39%)	0.79 (40%)	0.97 (40%)
	Total per week	2.59	2.54	2.81	2.09	2.52
Adults	Wider reach channels (Network and Cable TV, Network Radio)	1.33 (48%)	0.95 (63%)	1.06 (46%)	1.66 (85%)	1.25 (58%)
	Narrower reach channels (Newspapers, Magazines, Outdoor Media, Internet, Movie Theaters)	1.42 (52%)	0.57 (37%)	1.24 (54%)	0.28 (15%)	0.87 (42%)
	Total per week	2.75	1.52	2.30	1.94	2.12

3.1.2 Distribution of General Market Ad Platforms

The Media 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.

Tables 3-D and 3-E outline the major platforms for both general market target audiences. Each ad that was broadcast was associated with a particular platform (or platforms) on the basis of the concepts it addressed. Tables 3-D and 3-E also list the names of television and radio Campaign ads airing during

the period from late 1999 through 2001, according to their respective platforms. Descriptions of the ads are provided in Appendix D.

Table 3-D. Distribution of youth message platforms on general market TV and radio

Advertising platform	Percentage of television GRPs ¹	Ads in this platform during NSPY Waves 1,2,3 and 4 ²	Percentage of radio GRPs ¹	Ads in this platform during NSPY Waves 1, 2, 3 and 4 ²
Negative consequences	27.6	Two Brothers ³ , No Thanks, Hockey, Mother/Daughter, No Skill, Vision Warrior, Brain	19.1	Two Brothers, Make You Think, Stressed, Brother Jeff, If Pot Were a Person, Money, The First Time, The Rant
Normative education/ positive alternatives	51.6	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, Derrick Brooks	44.3	Mary J. Blige, Drugs Kill Dreams, Scatman, What's Yours, What's Yours- Urban, Margot, Alberto, Basketball, Cross-Country, Limericks, What's Yours, What's Yours-Urban
Resistance skills	26.3	Drugs Kill Dreams ³ , How to Say No, No Thanks, Michael Johnson, It's OK to Pass, What I Need	25.6	Drugs Kill Dreams, Excuses, Orientation, What to Say- Boy, What to Say- Girl, Moment of Truth
Other	1.1	Ads not associated with the major platforms include Lauryn Hill, Layla, I'm Free, Miss America, and others	11.0	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. TV ads exclusively intended for Hispanics included Fast Food, Second Trip, You Know How to Say It, Natural High, and Test. Such radio ads included Laugh, Weekend, Boy Meets Girl, Typical Story, She Did It, and The First Time.

³ On both television and radio.

Table 3-E. Distribution of adult message platforms on general market TV and radio

Advertising platform	Proportion of television GRPs	Ads that were in this platform during NSPY Waves 1, 2, 3 and 4 ¹	Proportion of radio GRPs	Ads that were in this platform during NSPY Waves 1, 2, 3 and 4 ¹
Parenting skills/ personal efficacy	72.2	Clinic, Phone, Office, Email, TV, Instructions ads (Stay Involved and Praise and Reward), Smoke, Keep Trying, Smoke, My Hero ² , My Hero-African American, Thanks ² O'Connor, Anyway You Can, Kitchen, Ananda, Gene	71.0	Tree Fort, Cooking Dinner, Basketball, Keep Trying, Desperate, My Hero, Thanks, I Know My Kid
Your child at risk	10.9	Pipe ² , Roach, Weed, Drugs, Clip ² , Pot, Bag ²	11.2	Pipe, Clip, Grass, Bag
Perceptions of harm	15.5	Symptoms, Under Your Nose, Funeral, Deal, Clinic, Needle/Spray Can ² .	17.0	Happy Birthday Steven, Kathy Abel, Symptoms Sooner/Later-David, Sooner/Later-Megan
Other	<1	Ads not associated with the major platforms: Car, Eddie George, Derrick Brooks	<1	Ads unidentified in GRP reports.

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. TV ads exclusively included for Hispanics included Mirrors, Heroes: Dancing, Heroes: Swimming, Game Show, and Natural High. Such radio ads included Sharing (Pepperoni) and Game Show.

² On both television and radio.

For youth, for example, over 50 percent of the general market television exposures (GRPs) emphasized Normative Education/Positive Alternatives, which involve 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?” ads that stressed the number and variety of youth who do not use drugs (along with their favorite alternative behaviors). The Media Campaign categorizes these ads as in the Normative Education/Positive Alternatives platform. Discussion of Resistance Skills (e.g., how to refuse drug offers) and Negative Consequences (e.g., physical or mental health or schooling outcomes of drug use) received approximately 27 percent of the GRPs each. (It is worth noting that ads could represent more than one platform and a small number did so.) The pattern is similar, although with slightly less of an emphasis on Normative Education/Positive Alternatives, for radio ads.

For parents, the major emphases were on parenting skills and on boosting personal efficacy to intervene (72%), with secondary emphases on the idea that one’s child is at risk of drug use (11%) and on the perceptions of harm resulting from drug use (16%). As with youth, a similar pattern was seen regarding radio platforms.

- The Campaign emphasis on different platforms varied sharply across waves for both youth and parents as planned in the Campaign’s flighting schedule. Tables 3-F and 3-G present the proportion of television and radio GRPs that were dedicated to each of the major platforms across the four waves for youth and adults, respectively. For youth, the Wave 1 distribution of GRPs across three platforms gave way to a focus on Normative Education/Positive Alternatives for Wave 2. 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 Wave 4, Negative Consequences were the focus of the majority of the ads. Normative Education/Positive Alternatives were also highlighted during this wave, but there was little attention to Resistance Skills (Table 3-F).

Table 3-F. GRPs per week purchased for specific youth platforms across waves (TV and radio)

Platform	Wave 1 2000	Wave 2 2000	Wave 3 2001	Wave 4 2001
Negative Consequences	24.7%	16.6%	0.0%	61.3%
Normative Education/Positive Alternatives	40.1%	71.1%	41.6%	34.6%
Resistance Skills	33.0%	3.0%	46.5%	3.0%
Other	2.2%	9.2%	11.8%	0.01%

For parents, there was also substantial variation in platform emphasis across waves. Perceptions of Harm, which received nearly one-third of GRPs in Wave 1, did not air in subsequent waves. Your Child at Risk (which includes the anti-inhalant advertising) took a substantial portion of the GRPs only in Wave 3. Parenting Skills/Personal Efficacy was strongly present across all four waves, and accounted for almost all of the GRPs during Waves 2 and 4 (Table 3-G).

Table 3-G. GRPs per week purchased for specific parent platforms across waves (TV and radio)

Platform	Wave 1 2000	Wave 2 2000	Wave 3 2001	Wave 4 2001
Parenting Skills/Personal Efficacy	54.2%	98.8%	48.6%	91.3%
Your Child at Risk	13.6%	0.0%	51.4%	7.9%
Perceptions of Harm	31.0%	1.0%	0.0%	0.0%
Other	1.2%	0.0%	0.0%	0.0%

3.1.3 GRPs Purchased for Minority Audiences

The Media Campaign also reported additional efforts to reach specific minority populations with advertisements developed and intended specifically for those groups, such as Spanish-language ads for Hispanics attending to Spanish media programming. The media use behavior on which GRP estimates are based are available from commercial sources for African-American and Hispanic targets. Parallel data are not available for other targeted minority audiences such as Asian, Pacific Islander, or Native American. Table 3-H describes each of these efforts. There are two ways these advertising efforts can affect exposure. They can add to the overall exposure for the general population and they can add to the specific exposure among the target populations. These are considered separately. These extra GRPs do not add a great deal to the overall level of GRP exposure. Table 3-H illustrates the relatively small contribution to overall general market GRPs that these efforts would contribute if they were combined. The first row reflects the average weekly GRPs reported exclusively for each group. One hundred GRPs for Hispanics, for example, could reflect a one-time reach of all U.S. Hispanics. Those totals then can be viewed in terms of their potential contribution to the general population’s Campaign experience.

The numbers presented in Table 3-H reflect the approximate number of additional age-group-specific GRPs to which the general population could have been exposed as a result of the special targeting efforts during Wave 4. For African American youth, for example, roughly 40 GRPs were obtained for 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, these targeted efforts would contribute an additional estimated 7 GRPs (i.e., 40 x 0.16) to the average U.S. youth’s communication experience. This addition reflects only a 3 percent increase over and above the general market GRPs obtained for U.S. youth, which, while noteworthy, does not alter the larger picture of GRP distribution substantially.

Table 3-H. Estimated additional Wave 4 GRPs generated exclusively to reach specific groups

	African American youth	African American adults	Hispanic youth	Hispanic adults	Residents of Puerto Rico (youth)	Residents of Puerto Rico (adults)
Weekly within-group GRPs for targeted efforts	40.4	25.4	13.6	91.2	160.8	43.0
Percentage of U.S. population for age group	16% ¹	13% ¹	15% ¹	14% ¹	1% ²	1% ²
Additional general population GRPs per week for Wave 4	6.5	3.3	2.0	12.6	1.6	0.43
Percentage additional weekly general population Wave 4 GRPs	3%	2%	1%	6%	<1%	<1%

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

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

Data to assess the add-on effect of these extra GRPs for the specific 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 an unlikely result 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 Hispanic audience represents a large portion of the Campaign GRPs for primary Spanish speakers, including many Puerto Rican residents, rather than being an add-on.

For African American audiences and Hispanic bilinguals, the issue is less clear. However, these two groups and general market audiences have different media use patterns. Presumably, the general market media buys reflect media use across the entire population. Then it might be expected that African American and Hispanic bilingual audiences would be either less or more exposed, on average, to the general market materials than would the general market audience. Thus, the buys reflected in Table 3-H, even for the African American audience, are in unknown portions an add-on to and a makeup for reduced access under the general market media buy. However, as will be shown below, there is consistent evidence that Hispanic and African American audiences do report higher total exposure to most Campaign media; this may reflect either an advantage with regard to general market exposures or add-on effects of targeted exposures.

3.1.4 Inhalant and Ecstasy GRPs

The Media Campaign reported some efforts to reach parents and youth with ads that focused on the risks of inhalants and of Ecstasy. While these anti-inhalant and anti-Ecstasy ads are included as part of the major youth and parent platforms discussed in Section 3.1.2, the Campaign also classifies them as separate platforms. The following discussion refers only to media time purchased for the general market audience, and does not include time purchased to reach Hispanic or African American audiences.

During Wave 1, no anti-inhalant GRPs were purchased for youth, but a combined total of 524 TV and radio anti-inhalant GRPs were purchased for parents. These 524 GRPs represent approximately 13.4 GRPs a week, which means parents could be expected to have seen one anti-inhalant ad every 10 weeks. In Wave 2, neither youth nor parent anti-inhalant GRPs were purchased. During Wave 3, the average parent would have seen or heard one anti-inhalant ad every 2 weeks, but no youth anti-inhalant GRPs were purchased. In Wave 4, however, anti-inhalant GRPs were purchased for the youth audience (youth could be expected to have seen less than one anti-inhalant ad every 10 weeks) but not for parents (Table 3-I).

Table 3-I. Estimated Inhalant GRPs purchased by wave

		GRPs purchased per wave (per week)				Total GRPs All Waves
		Wave 1 2000	Wave 2 2000	Wave 3 2001	Wave 4 200	
Youth	Inhalants					
	TV (Brain)	0	0	0	10	261
	Radio	0	0	0	0	0
	Total TV and Radio	0	0	0	10	261
	As a percentage of all TV & Radio GRPs	0%	0%	0%	4%	0.08%
Adults	Inhalants					
	TV (Needle/Spray Can, Funeral, Under Your Nose)	5	0	26	0	859
	Radio (Happy Birthday Steven, Kathy Abel, Needle/Spray Can)	8	0	19	0	788
	Total TV and Radio	13	0	45	0	1,647
	As a percentage of all TV & Radio GRPs	10%	0%	43%	0%	11%

The Campaign did not begin running anti-Ecstasy ads until Wave 3. During Waves 3 and 4, approximately a tenth of an exposure a week was purchased for parents, and during Wave 4 around a fifth of an exposure a week was purchased for youth (Table 3-J).

Table 3-J. Estimated Ecstasy GRPs purchased by wave

Ecstasy		GRPs purchased per wave (per week)				Total GRPs All Waves
		Wave 1 2000	Wave 2 2000	Wave 3 2001	Wave 4 2001	
Youth	Radio (The Rant)	0	0	0	16	424
	As a percentage of all TV & Radio GRPs	0%	0%	0%	10%	1.7%
Adults	Radio (Sooner or Later-Megan, Sooner or Later-David)	0	0	9	13	560
	As a percentage of all TV & Radio GRPs	0%	0%	8%	8%	3.7%

3.2 Recall of Exposure from NSPY Questionnaires

To assess exposure to the Campaign, NSPY included two complementary measurement approaches. First, all respondents were asked for an estimate of how often they had seen or heard anti-drug advertisements in each of the major media in which the Media Campaign had purchased time (including television and radio, newspapers and magazines, outdoor venues, or movies). These questions were modeled after a measure used in the Monitoring the Future (MTF) study so as to maximize comparability across surveys.⁶ These measures are intended to provide a general impression of the intensity of recent exposure and will be particularly helpful in comparisons over time and across media.⁷ They 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 the aforementioned “spill” exposure to advertising directed toward the other audience, as well as some pro bono advertising.⁸

In addition, to improve the precision of the measurement of exposure, questions also were included regarding the recognition of specific ads. Television and radio advertising represented a large part of the advertising effort, particularly for youth, and was the focus for this measure.

⁶ Previous reports (Hornik et al., December 1999) discuss the differences between MTF and NSPY findings, and plausible reasons for the differences.

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 1-3 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 channels, half of the sample was given either two questions, addressing each channel 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.

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 (Table 3-K).⁹ The four general recall questions were transformed into quantitative measures of exposure and summed to provide rough estimates of total recalled

**Table 3-K. Overall recalled exposure to anti-drug ads across all media
(November 1999 through December 2001)**

Exposures per month	Percentage of parents					Percentage of youth				
	Wave 1 2000	Wave 2 2000	Wave 3 2001	Wave 4 2001	Average All Waves	Wave 1 2000	Wave 2 2000	Wave 3 2001	Wave 4 2001	Average All Waves
Less than 1	7.0	6.6	7.9	7.3	7.2	6.9	5.7	5.9	8.3	6.2
1 to less than 4	20.1	23.4	21.4	25.0	22.4	17.1	15.1	17.5	17.8	16.9
4 or more	72.9	70.0	70.7	67.7	70.4	74.0	79.2	76.6	73.9	75.9
Median exposures	10.5	9.0	9.5	8.3	9.5	12.0	16.0	12.5	11.8	13.1

exposure.¹⁰ Using these measures, over 90 percent of youth and parents recalled seeing or hearing some form of anti-drug advertising at least once per month. Moreover, this degree of reported general high exposure was relatively constant across all waves. There were no significant overall changes from 2000 to 2001 among youth or parents. Youth reported a significant decrease between of 3 percent in having seen newspaper or magazine ads at least weekly (i.e., at least 4 times per month) and parents reported a significant 1 percent increase in having seen movie theater ads at least weekly between 2000 and 2001 (Detail Tables 3-23 through 3-32).

- **More than 75 percent of youth reported weekly exposure (4 or more times per month) from the combination of the sources (Table 3-K).** Thus, the purchase of approximately 2.5 targeted general market exposures per week among youth, according to the GRP data, produced recall of at least one ad per week among 76 percent of the youth population, but less than that among 24 percent of the population. The median number of recalled ad exposures by youth was 13.1 per month, across all sources. (The median number of ads recalled is the number of exposures such that half the audience saw the ads as many or more times and half the audience saw 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 aforementioned GRP data. The median recall of 13.1 ads per month for youth translated into 3.1 exposures per week; GRP estimates would suggest a similar 2.5 for targeted youth GRPs alone.

⁹ In all tables throughout this section of Chapter 3, only youth aged 12 to 18 at any wave are included. In previous reports, youth aged 9 to 11 were also included in overall charts. Therefore the Waves 1, 2, and 3 estimates are not identical to those in previous reports.

¹⁰ Each general recall question had answer categories shown below. Each category was recoded as indicated. The recoded answers were then summed to get the rough estimate of total recalled exposure.

Answer Category	Recoded times per month
Not at all	0.0
Less than one time a month	0.5
1 to 3 times a month	2.0
1 to 3 times a week	8.0
Daily or almost daily	30.0
More than 1 time a day	45.0

- **A slightly lower percentage of parents, (70 percent) than youth reported weekly exposure from the combination of the sources (Table 3-K).** The Media Campaign purchased roughly 2.2 targeted general market exposures per week for parents, somewhat less than the level achieved for youth. As with the youth estimate, this number can be roughly compared with the estimates of potential exposure generated from the GRP data. For parents, the median recall of 9.5 ads per month translated into around 2.3 exposures per week, quite similar to the targeted parent GRP level of 2.2.
- **Recalled exposure varied across different media channels.** Table 3-L displays reports of weekly exposure to each of the various channels employed by the Campaign. While approximately half of youth and parents recalled seeing or hearing radio or television ads weekly, only about one-quarter recalled such frequent exposure to print or outdoor advertising, and fewer than one-tenth recalled weekly exposure to movie or video messages.

Table 3-L. Weekly recall of general anti-drug advertising by medium across all waves (November 1999 through December 2001)

Group	Percent who recall seeing or hearing ads at least weekly			
	TV and radio ads	Newspaper and magazine ads	Movie theaters and video rental ads	Billboard and other public postings
Parents	49.2	20.7	3.4	23.4
Youth 12 to 13	53.5	25.9	8.5	27.2
Youth 14 to 15	60.1	28.0	6.8	28.2
Youth 16 to 18	60.0	24.6	6.4	25.4
Youth 12 to 18	56.6	26.0	7.1	26.8

- Estimates of general recall were largely consistent with the focus of GRP purchases, with 60 percent of youth-targeted GRPs (including in-school TV) and 58 percent of parent-targeted GRPs estimated for radio and television (see Figures 3-C and 3-D).
- Youth and parents reported similar general exposure within various media, even though not all media carried equal amounts of content officially targeted to both groups. The Media Campaign mostly purchased outdoor advertising to reach parents, for example, and yet comparable percentages of youth and parents reported at least weekly exposure to billboard ads or other public postings.

Changes in General Exposure from 2000 to 2001

- **The data suggests minimal fluctuations in youth or parent overall recall of Campaign ads.** This is somewhat surprising when one considers that the average weekly GRPs did show some change across waves. For youth, Wave 1 average weekly GRPs were 2.6; Wave 2 averaged 2.5 youth GRPs per week; Wave 3 average youth GRPs were 2.8 per week; and in Wave 4 average weekly youth GRPs were 2.1. Parent GRPs also exhibited an up-and-down pattern: Wave 1 average adult weekly GRPs were 2.8; Wave 2 averaged 1.5 adult GRPs per week; Wave 3 averaged 2.3 adult GRPs per week; and Wave 4 average weekly adult GRPs were 1.9 (Table 3-C). As can be seen in Table 3-K, expected GRP exposures did track the general exposure measure, but not very closely. Why might it have not tracked GRP exposure more precisely? The general exposure measure may include recall of advertising for the other target audience and advertising perceived as anti-drug, but not sponsored by the Campaign. Also, while respondents were asked to recall ads seen or heard in recent months, they may have included longer periods, stretching back to previous waves, in their recall estimates. The general exposure measure may not be very sensitive to the magnitude of changes in GRP purchases that occurred across the four waves.

- **There were few statistically significant changes between 2000 and 2001 in recall of exposure to any of the specific media, either overall or for subgroups (Detail Tables 3-28 through 3-31).**
 - Among youth, there were no significant changes either overall or for subgroups for recall of general TV and radio advertising from 2000 to 2001. As discussed in preceding reports, in Wave 2, 14- to 18-year-olds reported more exposure to television and radio anti-drug advertising than their counterparts in Wave 1, but Wave 3 and Wave 4 levels were equivalent to the Wave 1 level. No other age group demonstrated any change. The increase in reported exposure among Hispanic youth between Waves 1 and 2 remained in both Waves 3 and 4, thus keeping Hispanic, White, and African American teens relatively equivalent in their recall of anti-drug television and radio advertising. Wave 2 witnessed an increase in high sensation-seeking youth and high-risk youth's recall of anti-drug TV and radio advertising. However, reported recall among these groups declined in both Wave 3 and Wave 4 to levels similar to those seen at Wave 1 (Detail Table 3-28).
 - All youth aged 12 to 18 showed decreased recall (-3%) of print advertising between 2000 and 2001. Recall of print advertising seen at least once a week reached a high of 31 percent in Wave 2, but declined to 27 percent in Wave 3 and 22 percent in Wave 4 (Detail Table 3-29).
 - There were no overall significant changes in recall of billboard or other publically posted anti-drug ads or movie/video sources from 2000 to 2001. The only subgroup change was a 3 percent decrease in 16- to-18-year-olds recall of movie or video rental ads at least weekly (Detail Tables 3-30 and 3-31).
 - Among parents, there were few changes of any size from 2000 to 2001. There was a 1 percent significant increase in parents reporting having seen movie theater or video rental ads at least weekly (Detail Table 3-35). The only other significant change from 2000 to 2001 was a 4 percent decrease in college educated parents recalling having seen newspaper or magazine ads at least weekly (Detail Table 3-34).

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

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 at full length on their laptop computers. 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, each respondent was asked whether he or she had seen one of three ads (otherwise known as “ringer ads”) that had never been broadcast.

Previous Campaign evaluation reports (Hornik et al., 2000; Hornik et al., 2001) provided strong evidence for the validity of the measures. Broadcast television ads were much more often recalled than ringers. Also, the specific television ad recall measures tracked the GRP data closely, ad by ad, for youth and, to a lesser extent, for parents.

Evidence also suggests that parent TV recall measures also are valid, although this evidence is less impressive than for youth.

Television Recall

Across the first four waves, approximately 56 percent of the total youth-targeted GRPs were obtained through television (including Network TV, Cable TV, Spot TV, In-school TV, and televisions in arcades). Each week, the Media Campaign purchased about 135 general market youth-targeted television GRPs, on average, indicating that the average youth respondent should have been exposed to 1.4 television ads per week. For parents, general market television efforts were less substantial, enough to produce an average of 60 GRPs per week, or about 0.6 weekly TV exposures for the average adult. How do those numbers compare with evidence about youth and parental 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 analyses for parents and vice versa. This means that youth-parent “spill” is not reflected in these specific ad recognition results. Spill is the phenomenon of ads targeted to one group being watched by members of another group. Similarly, a person who speaks only English or only Spanish was never shown an ad in the other language. Bilingual English-Spanish speakers were shown both sets of ads, and special efforts were taken to be sure that African American respondents had targeted ads played for them.

Each respondent was shown a sample of the ads that had been broadcast during the previous two months that were targeted to their audience (parent/youth and in their language (Spanish/English)) and 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 shown to each respondent. The results were then recoded and summed across ads.¹¹

About 84 percent of youth and about 69 percent of parents recalled seeing at least one of the ads that had been playing in the previous 60 days. The median number of recalled viewings of youth-targeted TV ads by youth was 6.0 times over recent months or about 0.7 times per week. The mean was considerably higher at 9.6 times or about 1.1 exposure per week. Such a difference between the mean

¹¹

Recoding of NSPY ad recall data

Question: Here is another TV ad. Have you ever seen or heard this ad?	[If yes,] In recent months, how many times have you seen or heard this ad?	Recoded Response
No		0.0
Don't know		0.5
Yes	Not at all	0.0
Yes	Once	1.0
Yes	2 to 4 times	3.0
Yes	5 to 10 times	7.5
Yes	More than 10 times	12.5

and the median is consistent with a pattern of uneven distribution of exposure where some youth saw the ads many times, while others saw the ads much less frequently or not at all. The median number of viewings of parent-targeted TV ads in recent months by parents was 3 times or about 0.35 per week. As with youth, the mean was considerably higher at about 6.3 times or about 0.7 of an exposure a week, indicating an uneven distribution where some parents recalled seeing the ads many times, while others recalled seeing them much less frequently or never saw the ads.

Changes from 2000 to 2001 and Diversity in Patterns of Change

There were different patterns of change over time among youth and parents. All youth reported a continually increasing recall of specific television ads across the four waves, with 35 percent of all youth claiming weekly exposure at Wave 1, but 53 percent claiming such exposure at Wave 4. Parent recall was declining across the first three waves, but then showed a sharp increase in Wave 4. (See Table 3-M.)

Table 3-M. Percent recalling having seen TV ads at least once per week across waves (November 1999 through December 2001)

Group	Wave 1 2000	Wave 2 2000	Wave 3 2001	Wave 4 2001	Average 2000	Average 2001	2000 to 2001 Change	95% Confidence Interval on change
Parents	25.5	22.6	19.8	39.2	24.1	29.7	5.6*	+2.5 to +8.8
Youth 12 to 13	39.5	42.9	50.6	59.7	41.2	55.2	13.9*	+10.2 to +17.7
Youth 14 to 15	39.4	37.9	48.0	59.7	38.7	53.6	15.0*	+9.6 to +20.3
Youth 16 to 18	29.3	35.6	46.9	47.8	32.4	47.3	14.9*	+9.8 to +20.0
Youth 12 to 18	35.4	38.5	48.3	53.0	37.0	51.6	14.71*	+11.7 to +17.6

* Between year change significant at $p < 0.05$.

For parents, the pattern of variation in recall levels was consistent with the variation over time in ad time purchased (Figure 3-E). The sharp increase in parent TV GRPs during Wave 4 is reflected in the recall data. For youth, in contrast, these changes were less consistent. Figure 3-F shows that the up-and-down pattern in youth TV GRPs does not match the straight upward pattern of youth TV ad recall. The inconsistency could be partially explained by the fact that respondents were questioned about their recall of ads on the air in recent months (60 days), so interviews in Wave 2 actually covered the period from the final 2 months of Wave 1 and the first 5 months of Wave 2, and for Wave 4 covered the final 2 months of Wave 3 and the first 5 months of Wave 4.

Additionally, many of the youth ads that were used in later waves also aired in earlier waves. So, it is possible that although youth were asked how frequently they had seen the ad in recent months, their answers may have reflected longer term recall. Finally, as will be discussed below, the Campaign TV ads were also sometimes used in soundtrack versions on radio. This was particularly true for the parent ads. It is possible that respondents' high levels of recall of Wave 4 TV ads reflected confusion about the media on which an ad was heard or seen.

Overall, parents and youth are clearly increasing their recall of Campaign television advertising, substantially reflecting both the increases in television GRPs and perhaps the effectiveness of the ads and their placement in reinforcing recall of the ads.

Figure 3-E. Parent TV GRPs and Ad Recall

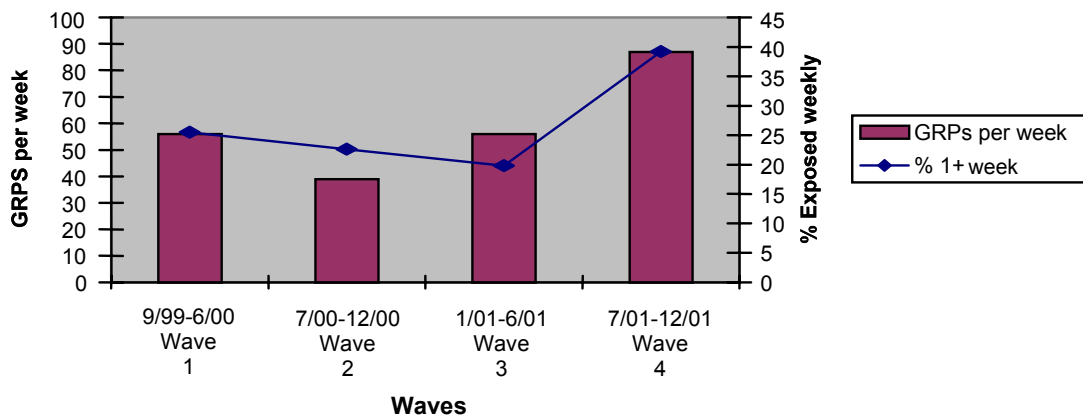
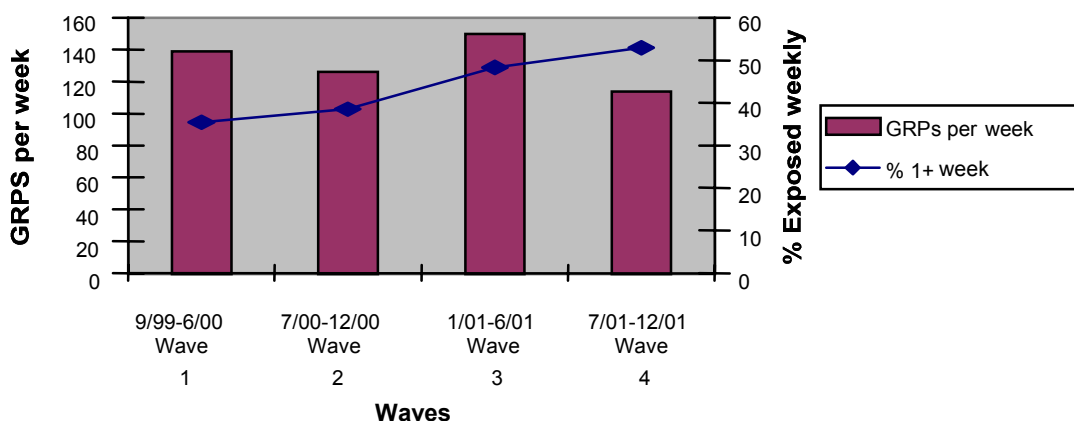


Figure 3-F. Youth TV GRPs and Ad Recall



Overall recall of anti-inhalant ads was low, reflecting the relatively small amount of media time purchased for them. During Waves 1 and 3, the Campaign broadcast anti-inhalant ads for parents. Parents were asked about recall if an anti-inhalant ad had been on the air in recent months (60 days) prior to their interview. During Wave 1, about 7 percent of parents recalled seeing such ads and about 33 percent of parents recalled seeing one of these ads during Wave 3. Only 1.2 percent and 3.5 percent of all parents in those waves claimed to have seen the inhalant ads once a week or more (Detail Table 3-11). The GRPs for inhalant-focused ads in Wave 3 were purchased at more than three times the rate as those purchased in Wave 1, so this discrepancy is not surprising. No general market anti-inhalant ads targeted at parents were run during Waves 2 and 4.

Radio Recall

The Media Campaign complemented its purchases of television time with purchases of radio time. For youth, that included an average of 69 weekly targeted GRPs and approximately 65 weekly targeted GRPs for parents. As previously noted, a sample of radio ads was played for each parent and all youth between 12 and 18 years of age. Children aged 9 to 11 were not played any Campaign radio ads. 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 used in this report because many of the radio ads broadcast during that period were essentially soundtracks from the television ads, and any Wave 1 radio ad that was an audio duplicate of a television ad was not played for Wave 1 respondents. There was a

concern that respondents 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. Their responses to the questions about television ads, which were asked about first, likely would have reflected their total exposure through both TV and radio, rather than uniquely indicating radio exposure.

Beginning in Wave 2, however, all radio ads were played for both youth and parent respondents, regardless of whether they were audio duplicates of TV ads. Such media source issues did not hamper Wave 2 or Wave 3 data, however, as no network radio ads for youth were audio duplicates of a television ad. But in Wave 4, “Two Brothers” appeared both as a network TV youth ad and a network radio youth ad, accounting for 46 percent of the television GRPs and for 36 percent of the radio GRPs. The parent data has a similar problem. In Wave 3, two adult ads, “Needle/Spray Can” and “My Hero” received a considerable number of parent GRPs on both network TV (38%) and network radio (63%). In Wave 4, “My Hero” and “Thanks” both received a considerable number of parent GRPs on both network TV (51%) and network radio (79%). Parent radio recall estimates for Waves 3 and 4 and, to a lesser degree, youth radio recall estimates for Wave 4, may be biased upward compared to previous wave estimates, given the heavy overlap in ads on both media.

Overall, Campaign radio ads were recognized by 41 percent of 12- to-18- year olds during Waves 2, 3, and 4. This left 59 percent who reported no recognition of the Campaign radio ads presented. The mean number of targeted radio ad encounters among this age group in recent months was 1.78, whereas the median was 0 over Waves 2 through 4 (Table 3-N). This pattern suggests that the majority of youth heard no ads or only one radio ad from the Campaign during these waves. Instead, a minority of adolescents heard some ads repeatedly.

- **Youth recall of radio ads varies across waves.** As shown in Table 3-N, in Wave 2 less than 35 percent of youth claimed to have heard any Campaign radio ads in recent months. However, in Wave 3 this number increased to 57 percent, a 22-point increase. But by Wave 4, this trend had reversed. Approximately 31 percent of Wave 4 youth claimed to have heard any Campaign ads in recent months. This pattern can be seen in all subgroups (Detail Tables 3-16 and 3-17). These patterns also coincide with changes in radio GRP purchases: in Wave 2, 69 GRPs per week were purchased; in Wave 3, 80 GRPs per week were purchased; and in Wave 4, 54 GRPs per week were purchased.

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

Number of ads heard in recent months	Wave 2 ¹ (%)	Wave 3 (%)	Wave 4 (%)	Average for Waves 2-4
0 times	65.2	42.7	69.5	59.3
0.01 to 0.99	10.9	17.2	10.5	12.9
1-3.99	20.3	27.8	16.9	22.1
4 - 11.99	3.4	10.9	2.7	5.2
12 or more	0.2	1.3	0.4	0.5
Mean	1.35	3.05	1.16	1.78
Median	0	1	0	0

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

While less than 50 percent of parents had heard at least one of the radio ads in 2000, more than 50 percent had heard at least one radio ad by 2001 (Table 3-O). The mean number of encounters with radio ads by parents in recent months was 3.4 (Detail Table 3-22), with roughly 13 percent of parents having heard a Campaign radio ad at least once a week (Detail Table 3-21).

Table 3-O. Change in parent recall of radio ads heard per month across waves

Number of ads heard in recent months	Wave 1 2000 (%)	Wave 2 2000 (%)	Wave 3 2001 (%)	Wave 4 2001 (%)	Average 2000 (%)	Average 2001 (%)
0 times	51.5	53.8	41.6	48.9	52.6	45.4
0.01 to 0.99	9.2	5.7	11.8	4.4	7.4	8.0
1 to 3.99	29.4	29.6	29.4	31.8	29.5	30.7
4 to 11.99	8.2	10.5	15.2	12.7	9.4	14.0
12 or more times	1.7	0.4	1.9	2.1	1.1	2.0
Mean	3.05	2.95	3.94	3.77	3.00	3.85
95% Confidence Interval for Means					(2.75, 3.25)	(3.54, 4.16)

Parent recall of Campaign ads increased significantly from 2000 to 2001. Table 3-O shows that while approximately 47 percent of parents recalled hearing radio ads in 2000, this increased to 55 percent in 2001. Much of this change seems to be the result of a large increase in recall during Wave 3. A similar pattern is suggested by Table 3-P, which shows the percent of parents who recalled having heard a radio ad at least once a week.

Table 3-P. Change in parent recall of having heard radio ads at least once per week

Having heard radio ads at least weekly	Wave 1 2000 (%)	Wave 2 2000 (%)	Wave 3 2001 (%)	Wave 4 2001 (%)	Average 2000 (%)	Average 2001 (%)	2000-2001 change (95% Confidence Interval)
Overall	10.0	11.0	17.1	14.9	10.5	16.0	5.5 (3.0, 7.9)*

* Between year change significant at p<0.05.

Only Wave 3 parents report much exposure to inhalant radio ads. During Wave 1, only 9 percent of parents recalled radio inhalant ads. During this period, enough inhalant radio GRPs were purchased for the average parent to be exposed to one inhalant ad every 10 weeks. In Wave 3, about 40 percent of parents recalled hearing inhalant radio ads. During this period, enough radio GRPs were purchased for the average parent to be exposed to approximately one inhalant ad every 5 weeks. No general market inhalant radio ads for parents were aired during Waves 2 or 4 (Detail Table 3-26).

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 nonadvertising 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 and that may influence acceptance of the Campaign’s messages. It is clear that the Campaign’s brand has diffused into the populations of both

parents and youth with Wave 4 showing evidence for that even more strongly than at Wave 3. The Campaign introduced the parent brand first, which involved a series of phrases that included a set-up word, such as “Communication,” and ended with a colon and the phrase: “the Anti-Drug,” for example, “Communication: The Anti-Drug.” The youth brand, introduced during Wave 2 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 was that kept them from using drugs. In a typical ad, a series of blanks would precede the phrase: |_| |_| |_| |_| |_|: My Anti-Drug. In some ads, the blanks would have a possible response filled in, e.g.: “Music: My Anti-Drug,” as if it were written in by the respondent.

To evaluate the extent to which youth and parents recognize the brand, Waves 3 and 4 of NSPY included a section focusing on brand recall. This section 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 phrases that were not the Campaign brand, discussed below.

- In Wave 3, about 60 percent of the 12- to 18-year-old respondents who were asked this question reported recall of the Campaign brand. In Wave 4, Campaign brand recall increased to 74 percent.

Parents 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”?

Approximately 46 percent of the parents responded positively to these phrases in Wave 3. In Wave 4 Campaign brand recall among parents increased to 63 percent.

These increases in reported brand recall are possibly the result of the brand having been on the air for a longer period of time, thus more youth and parents were exposed to it. These were substantial recognition rates, but there is a concern. It is possible that some of the youth and parents may have said “yes” because they wanted to appear knowledgeable, or because the phrase sounded familiar enough that they thought they might have heard it, even if they had not. Therefore, it is important to try to measure the recall as if the brand had not been used by the Campaign.

It was not possible to obtain an estimate of recall before the brand was introduced, which would have been the strongest way to estimate a baseline level. Therefore, two other approaches were used in the evaluation instead.

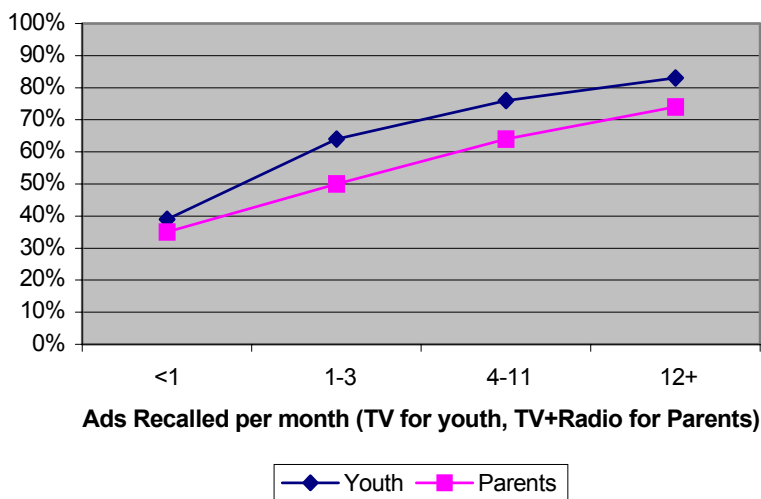
In one approach, used for both youth and parents, the brand recall rates were compared across levels of the specific ad exposure measure used above. If the brand recall claims were reliable, they should be substantially related to the specific Campaign ad recall claims since the ads often included the brand. Those with more exposure to such ads would have had many more opportunities to see or hear the

brand. (Evidence for the validity of the specific recall measures was strong,¹² so if the brand recall was associated with it, there would be reason to accept the brand recall as credible as well.)

The second approach, used with the youth only, was to ask about recall of phrases that sounded like they might have been used but had not been. The two false brands that were played to youth respondents are “I’m drug free and I’m doing just fine” and “Drugs—I don’t need them.” In Wave 3 we reported that the recall rates for the false brands (“ringers”) was about equal to the recall rates for the true brands (all at around 60%.) This was a surprising result, but we claimed that there was evidence of brand learning on the basis of the association of ad recall and true brand recognition as shown again below. We explained the high recall rates on the basis of an argument that the ringers sounded like reasonable brands and were easily thought of as legitimate, while the true brand was less conventional appearing. In Wave 4, the evidence for brand learning is much stronger. During Wave 4 for youth, the average recall of the true brand was 74 percent, while the recall of the ringers had fallen to about 51 percent. The false recall remains surprisingly high, but now is much lower than the true brand recall rates.

The results of the analysis of brand recall and specific exposure is captured in Figure 3-G. For youth, only 39 percent of the lowest exposure group said they recognized the brand, while 83 percent of the highest exposure group—those who had seen television ads more than 12 times per month—did so. For parents, where recall of both television and radio ads are included in the exposure measure, 35 percent of the lowest exposure group and 74 percent of the highest exposure group recalled the brand phrase. These are large and statistically significant differences. The more people were exposed to the Campaign, the more they recalled the brand, just as would be expected.

Figure 3-G. Recall of brand phrase by specific ad recall (%)



As additional support for the claim of true brand learning, there is no evidence of a similar association for youth between television ad recall and recall of the ringers. About the same proportions of youth claim to recall the ringer ads, regardless of their levels of television ad recall.

There is an important caveat here. Because we cannot directly assess what the false brand recall would have been without the Campaign, we cannot precisely estimate true brand recall rates. We assume that the 50 percent levels for the ringer brands are a higher level of false recall than would have been

¹² Hornik et al. (2001). Appendix C, pages C-1-C-5.

shown had we been able to use the true brands before their launch, because they have a less conventional appearance. Also, the lowest exposure groups do *not* represent the level that would be expected without the Campaign because they include parents and youth who might have been exposed to the brand through other channels—not only through the television ads captured by the specific recall measure. On the other hand, true brand recall rates may not have been as high as the observed average youth and parent recall—68 percent and 55 percent respectively, since some of the claimed recall could have been due to false recall. However, both these rates were significantly higher than their counterpart rates for those with minimal TV and radio exposure, suggesting that substantial brand learning occurred.

Thus, while the magnitude cannot be precisely estimated, there is good evidence for brand learning, particularly among youth.

3.2.4 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 Media Campaign when they see or hear them. In addition, these data will be used in future reports to see whether the evaluative response to the ads affects respondents' susceptibility to Media Campaign effects. Researchers will be able to examine whether individuals who were less convinced by or more skeptical of the ads were less likely to avoid initiation or continuation of drug use.

The 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 for each respondent. Additionally, a single skeptical item (whether the ad exaggerated the problem) was analyzed separately. It was recoded so a higher score indicated less belief that the ad exaggerated. Both positive and negative responses were placed on a scale from -2 to $+2$, with 0 representing a neutral response. From 2000 to 2001, youth evaluations of the TV ads became more negative, while parent evaluations of the TV ads became more positive.

- **Overall, youth tended to favorably rate the television Campaign ads that they were shown across all waves** (Table 3-Q and Detail Tables 3-12 and 3-13).
 - On a five-point scale ranging from -2 to $+2$, mean responses from the three age groups of youth interviewed (12- to 13-year-olds, 14- to 15-year-olds, and 16- to 18-year-olds) ranged from 0.57 to 1.00. The responses to the “exaggerated the problem” evaluative question told a similar story, with a tendency for youth respondents to somewhat disagree with the notion that an ad “exaggerated the problem.” The responses ranged from 0.67 to 0.80 (Detail Tables 3-12 and 3-13).
 - There are several subgroup differences in evaluations of the ads worth noting. Older youth, White youth, and males tended to be more skeptical in their ad evaluations. High sensation seekers, high risk youth, and occasional marijuana users were also more skeptical (Detail Table 3-12).
 - Similar subgroup differences were seen regarding the belief that the TV ads “exaggerated the problem.” Older youth, males, high sensation seekers, high risk youth, and occasional marijuana users were more likely to agree that the ads “exaggerated the problem” (Detail Table 3-13).

**Table 3-Q. Television ad evaluation scores among youth and parents
(November 1999 through December 2001)**

Age	Mean evaluation score			Disagree that the ad exaggerated the problem		
	2000 (W1&2)	2001 (W3&4)	2000-2001 (95% Confidence Interval)	2000 (W1&2)	2001 (W3&4)	2000-2001 (95% Confidence Interval)
Parents	1.07	1.27	0.20 (0.15, 0.26)*	0.99	1.22	0.23 (0.15, 0.31*)
12 to 13	1.00	1.00	0.00 (-0.07, 0.07)	0.84	0.76	-0.07 (-0.17, 0.03)
14 to 15	0.79	0.73	-0.07 (-0.15, 0.02)	0.74	0.73	-0.01 (-0.09, 0.08)
16 to 18	0.54	0.59	0.04 (-0.05, 0.13)	0.65	0.69	0.04 (-0.06, 0.14)
12 to 18	0.76	0.75	-0.01 (-0.06, 0.04)	0.73	0.72	-0.01 (-0.06*, 0.05)

Note: Evaluation scale runs from -2 to +2 being most positive.

* Between year change significant at p<0.05.

■ **Among youth, overall, there were no significant changes in ad evaluation scores from 2000 to 2001. (Table 3-Q).**

- There was essentially no change in ad evaluation from 2000 to 2001 among all youth aged 12 to 18 on either measure (Detail Tables 3-12 and 3-13).

There was a significant difference in the evaluation score trends for White versus African American youth. Whites started out more skeptical of the ads than African Americans (0.74 versus 0.87 in 2000) and the two groups separated further over time. Whites became more skeptical (0.68 in 2001) while African Americans rated ads even more favorably (0.98 in 2001) (Detail Table 3-12).

■ **While youth were not changing, their parents were moving in a positive direction. Parents' already positive evaluation scores increased markedly across waves (Table 3-Q and Detail Tables 3-14 and 3-15).**

- The mean evaluation score over the 2 years from parents was 1.17, suggesting that parents, like youth, tended to rate the ads more favorably than negatively. Parents also tended to disagree that an ad exaggerated the problem.
- Most demographic subgroups of parents offered largely similar average assessments of the Campaign TV ads, although some differences did appear. Mothers rated the ads more favorably than did fathers. African American and Hispanic parents were somewhat more favorable in their response to the TV ads than were White parents (Detail Table 3-14).
- Parents became much more positive about the ads with a statistically significant gain of 0.20 points. They also became less likely to agree that TV ads exaggerated the drug problem from 2000 to 2001. There was an overall statistically significant increase of 0.23 (Table 3-Q and Detail Tables 3-14 and 3-15).

3.2.5 Internet Use and Encounters with Drug Information On Line

Youth Internet Use

Results from the first four waves suggest that the vast majority of adolescents now have at least minimal contact with the Internet, as can be seen in Table 3-R (and Detail Table 3-37).

Approximately 87 percent of adolescents report using the Internet in the past 6 months. Internet use

among 12- to 18-year-olds significantly increased from 2000 to 2001, up 3.5 percent. However visits to pro-drug and anti-drug sites did not significantly change from 2000 to 2001.

Table 3-R. Youth Internet use and encounters with drug information on line in past 6 months (November 1999 through December 2001)

	Wave 1 2000 (%)	Wave 2 2000 (%)	Wave 3 2001 (%)	Wave 4 2001 (%)	2000-2001 Change (%)	95% Confidence Interval on Change (%)
Percent using the Internet at least a few times	83.1	86.6	89.6	87.2	3.5 ¹	+1.6 to +5.4
Percent visiting anti-drug Internet site among all youth	10.0	9.1	10.7	9.3	0.5	-1.2 to +2.2
Percent visiting pro-drug Internet site among all youth	6.3	3.9	6.6	4.4	0.5	-0.8 to +1.7

¹ Between year change significant at $p < 0.05$.

Race and sensation seeking were associated with Internet use. White adolescents reported higher rates of Internet use than either African American or Hispanic youth. Compared with their low sensation-seeking peers, a slightly higher percentage of high sensation-seeking youth reported having had at least minimal contact with the Internet in the past 6 months (Detail Table 3-37).

Despite wide diffusion of access to the Internet, most youth currently do not encounter information related to drugs on line. However, twice as many youth report visiting an anti-drug web site as those visiting pro-drug sites. Approximately 10 percent of adolescents across the four waves reported visiting a web site with anti-drug information in the previous 6 months. A smaller percentage of adolescents, 5.3 percent, reported visiting a pro-drug Internet site (Detail Tables 3-38 and 3-39).

- High sensation-seeking adolescents and high risk adolescents are more likely to visit pro-drug Internet sites. Approximately 10 percent of high sensation-seeking youth reportedly visited pro-drug sites in the past 6 months, whereas only roughly 3 percent of their low sensation-seeking counterparts did so. Likewise, high sensation-seeking and high risk youth reported visiting anti-drug sites more than other youth; the difference was significant in 2001 (Detail Tables 3-38 and 3-39).
- **The rate of Internet use for accessing drug-related information has not changed over time.** There were no significant overall or subgroup changes in the percentage of youth visiting anti-drug or pro-drug Internet sites from Wave 1 to Wave 4 (Detail Tables 3-38 and 3-39).

Parent Internet Use

Parents are less engaged with the Internet than are youth. Only 67 percent of parents report any Internet use in the previous 6 months across the four waves, compared with approximately 87 percent of youth. However from 2000 to 2001, there was a significant increase in the number of parents reporting Internet use, and in parents reporting visiting anti-drug and parenting skill Internet sites.

- Among parents, wide disparities in Internet use by education and race-ethnicity persist. Across all waves, 90 percent of parents who are college graduates reported use of the Internet in the past 6 months, whereas only 28 percent of those parents with less than a high school education and 53 percent with a high school diploma claimed such recent use. In addition,

African American and Hispanic parents reported a substantially lower likelihood of some contact with the Internet than did White parents. (Detail Table 3-40).

- **Parental Internet use increased between 2000 and 2001 (Table 3-S).** There was an overall statistically significant increase in Internet use among parents of 5.5 percentage points, from 2000 to 2001, and a 10 percentage point increase from Wave 1 to Wave 4 (Detail Table 3-40).

Table 3-S. Parent Internet use and encounters with drug information on line (November 1999 through December 2001)

	Wave 1 2000 (%)	Wave 2 2000 (%)	Wave 3 2001 (%)	Wave 4 2001 (%)	2000-2001 Change (%)	95% Confidence Interval on Change (%)
Percent using the Internet at least a few times	60.8	67.8	69.4	70.2	5.51*	+1.9 to+9.1
Percent visiting anti-drug Internet site among all youth	5.8	7.7	9.3	8.0	1.91*	+0.3 to+3.5
Percent visiting parenting skill Internet sites	6.7	8.7	9.8	9.0	1.71*	0.0 to+3.4

* Between year change significant at p<0.05.

Patterns among parents are similar to patterns among youth in terms of accessing information about drugs on-line. About 8 percent of Wave 4 parents reported visiting an Internet site with anti-drug information in the past 6 months and 9 percent reported visiting an Internet site that included information about parenting skills during the previous 6 months (Detail Tables 3-41 and 3-42).

- Parental education is a telling variable with regard to visiting anti-drug sites and parenting skill Internet sites. A higher percentage of parents with at least some college education visited anti-drug Internet sites than did parents with less education, and more of them visited parenting skill Internet sites (Detail Table 3-41). This is in proportion to their overall heavier use of the Internet.
- **Visits to anti-drug sites and parenting skill sites increased among parents from 2000 to 2001.** There was a 2 percentage point increase in reports of visiting anti-drug sites and parenting skill sites (Detail Tables 3-41 and 3-42) (Table 3-S).

The material in this chapter has thus far focused on exposure to Campaign-generated messages, through mass media or through the Internet. The next 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. However, one cannot 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.

3.3 Anti-Drug Related Education

The Media Campaign is not the only source of drug information reaching the population. 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 conversations 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 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

Most youth reported receiving anti-drug education in school during the past year and in previous years. Across the four waves, approximately 77 percent of 12- to 18-year-olds responded that they had ever attended a drug education class or program in school and more than 65 percent reported attending such an event within the past year. Out-of-school drug education class or program attendance was much lower; 11 percent reported attending in past years and only 7 percent reported attending in the previous 12 months (Table 3-T and Detail Tables 3-43 through 3-46).

- Ethnicity, age, and a youth's risk propensity have some effect on anti-drug class and program exposure. African American youth reported greater exposure than other youth to in-school drug education and more exposure to out-of-school education. Among age groups, 12- to 13-year-olds reported significantly more attendance at both lifetime and past year in-school drug education classes or programs than did 16- to 18-year-olds. High-risk youth reported significantly less exposure than low-risk youth to in-school drug education classes or programs in the past 12 months and less lifetime exposure to drug education programs outside of school (Detail Tables 3-43 through 3-46).

Table 3-T. In-school and out-of-school drug education across waves (12- to 18-year-olds)

	Wave 1 2000 (%)	Wave 2 2000 (%)	Wave 3 2001 (%)	Wave 4 2001 (%)	2000-2001 Change (%)	95% Confidence Interval on Change (%)
In-school drug education ever	78.6	80.0	75.7	75.1	-4.0*	-6.1 to -1.8
Past year in-school drug education	66.6	65.6	64.6	65.3	-1.2	-4.4 to +2.1
Out-of-school drug education ever	12.5	10.9	10.0	10.7	-1.4	-3.1 to +0.4
Past year out-of-school drug education	7.9	6.8	5.6	6.0	-1.5*	-2.8 to -0.02

* Between year change significant at $p < 0.05$.

3.3.2 Changes in Youth Anti-Drug Education

There is evidence of a decrease in reported drug education from 2000 to 2001 among youth. All types of education show decreases; significant decreases are seen in youth ever attending drug education classes or programs in school, and youth attending out-of-school drug education classes in the past year (Detail Tables 3-43 through 3-46). Given that there is no reported decline in past year in-school

drug education, the small decline in “ever” attending in-school programs is hard to interpret. The Campaign has not dedicated much of its resources to in-school drug education efforts except through the advertising buy on the Channel One network included in the paid advertising already presented. An on-line initiative to provide teachers with additional anti-drug classroom activities was introduced in late 2001, and thus the current results would not be sensitive to that effort, even were it to have wide reach.

- **Overall, there was a statistically significant 4 percentage point decrease in youth reporting ever having attended an in-school drug education class. However reports of past year attendance did not show a significant decline (Table 3-T).**

Most subgroups showed declines in ever having attended that were not significantly different from the overall pattern. The only exception was for Hispanic youth. Their decline of 12.4 percentage points (from 79.7% in 2000 to 67.3% in 2001) was significantly more than the 4 percentage point decline for White youth. While in 2000, lifetime drug education among the racial-ethnic groups was similar, in 2001, Hispanic adolescents’ attendance was 8 percentage points behind White adolescents’ attendance and 16 percentage points behind African American adolescents’ attendance. Hispanic youth reports of past year in-school drug education were also lower than reports from Whites in 2001, although they had not been significantly lower in 2000 (Detail Table 3-43).

- **From 2000 to 2001, 12-to 18-year-old youth reported a statistically significant decrease of 1.5 percentage points for attendance at out-of-school drug education classes or programs in the past year.** Since the starting (2000) level of 7.3 percent was already quite low, this represented a substantial attendance decline (Table 3-T). Complementary local activities in support of the anti-drug message do not seem to be penetrating into out-of-school programs, at least as perceived by the youth.

3.3.3 Parenting Skills and Anti-Drug Education

About a third of parents report having attended drug prevention or parent effectiveness programs. On average across the waves, 30 percent reported attendance at a drug abuse prevention activity and 29 percent said they attended a parent effectiveness program in the previous year (Detail Tables 3-76 and 3-77).

Ethnicity is associated with attendance at both drug abuse prevention programs and parent effectiveness programs. African American parents reported significantly higher attendance at both types of programs than either White or Hispanic parents. White parents reported the second highest levels of attendance (Detail Tables 3-76 and 3-77).

- **There was little change in parents’ reported attendance at drug prevention or parenting skills programs.** There were no overall change and only one subgroup reported significant attendance increases or decreases among parents for either of these programs from 2000 to 2001 (Detail Tables 3-76 and 3-77).

Hispanic parents reported an 8 percentage point decrease in attending drug abuse prevention programs over the 2 years. In 2000, Hispanic parent reported attendance was around 30 percent, but this declined to 22 percent in 2001 (Detail Table 3-76).

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 some discussion about the contents of talk about drugs and some focus on changes in conversations across time. Differences between youth and parent reports of their conversations are striking.

3.4.1 Youth Discussions with Friends and Parents about Drugs

Most youth have conversations about drugs, and many of them have such conversations frequently. About 73 percent of youth aged 12 to 18 reported having had at least one conversation about drugs with friends in the previous 6 months. Approximately 72 percent reported having had at least one conversation with parents about drugs in the previous 6 months, and 48 percent reported having had four or more conversations with parents or friends about drugs in the past 6 months (Detail Tables 3-47 and 3-48, 3-52 through 3-54). The analyses that follow present evidence about the association of respondent characteristics and year of interview with youth and parent reports of discussions about drugs. They use the percentage of youth or parents who report two or more conversations in the previous 6 months as the criterion measure. Overall, 60 percent of youth report this number of conversations with friends and 50 percent with parents. Over 80 percent of parents reported two or more conversations with their children (Detail Table 6-10). It is worth noting, however, that the Wave 4 data collection included the period surrounding the tragic events of September 11, 2001. Many youth-parent conversations in the days and months following September 11 may have been focused on topics related to the terrorist acts.

- **Age, gender, and ethnicity played a role in conversations about drugs.** Older adolescents aged 16 to 18 were more likely than younger adolescents to report having had two or more such conversations with friends than younger adolescents, while younger adolescents were more likely than 16- to 18-year-olds to report having had these conversations with their parents. Females were more likely than males and White adolescents were more likely than African American adolescents to have had two or more conversations about drugs with friends (Detail Tables 3-48 and 3-53).
- **Sensation seeking and risk score were associated with conversations with friends about drug use.** High sensation-seeking youth and high-risk youth reported higher levels of drug conversations than their low sensation-seeking and lower risk counterparts. For instance, 77 percent of high-risk youth reported having had two or more conversations with friends about drugs in the past 6 months, compared to only 49 percent of low-risk youth. Similarly, 71 percent of high sensation-seeking youth reported having had two or more conversations with friends about drugs in the past 6 months, while only 46 percent of low sensation-seeking youth reported having had two or more such conversations (Detail Table 3-48).
- **In contrast, youth reports of two or more conversations with parents varied only a little by age and in the opposite direction as their reports of conversations with friends.** Only about 6 percent more 12- to 13-year-olds than 16- to 18-year-olds reported drug conversations with their parents (Detail Table 3-53). As for conversations with friends, 31 percentage points fewer of the 12- to 13-year-olds reported two or more conversations than did 16- to 18-year-olds (Detail Table 3-48). There was no statistically significant variation in frequency of conversations with parents, either by gender or race-ethnicity of the child.

- **Parents reported much higher levels of conversation with their children at all ages, and the level remained consistent across waves.** In contrast to the moderately lower youth reports of conversations with parents among older children, parent reports showed essentially no variation across ages of children, or any other characteristics of children (Detail Table 6-10). This inconsistency with the child reports is addressed further in Chapter 6, where effects of the Campaign on parent-child talking are discussed.

3.4.2 Changes in Drug Conversations Across Years

Youth reports of drug conversations with friends were relatively stable from 2000 to 2001, except among 12- to 13-year-olds, where a significant decrease was seen. Youth reports of drug conversations with parents, however, decreased significantly from 2000 to 2001, both overall and among several subgroups.

- **All youth reported a decline in drug conversations with parents between 2000 and 2001.** In 2000, 54 percent of youth reported two or more such conversations. That declined by four percentage points in 2001. This decline was shared by all subgroups of youth. Even so, the decline among males (-6.8%) was more negative than for females (-1.4%) (Detail Table 3-53 and Table 3-U).
- **Only younger adolescents’ (12- to 13-year-olds) drug conversations with friends decreased from 2000 to 2001** (Table 3-U and Detail Table 3-48). Approximately 5 percent fewer 12- to 13-year olds reported having had two or more conversations with friends in the past 6 months. All other age subgroups and other subgroups showed no statistically significant change (Detail Tables 3-48 through 3-51).

Table 3-U. Change in drug-related conversations across waves

Percent with two or more conversations in the past 6 months	Age Groups	Wave 1	Wave 2	Wave 3	Wave 4	2000-2001 Change (%)	95% Confidence Interval on Change (%)
		2000 (%)	2000 (%)	2001 (%)	2001 (%)		
With friends, reported by youth of ages:	12 to 13	44.4	43.8	39.1	39.5	-4.8*	-8.6 to -1.0
	14 to 15	69.4	51.9	65.1	65.1	4.7	-0.7 to +10.1
	16 to 18	67.6	71.1	70.1	71.3	1.4	-2.5 to +5.2
With parents, reported by youth of ages:	12 to 13	59.2	56.2	53.0	51.1	-5.7*	-9.8 to -1.7
	14 to 15	58.4	52.1	53.1	50.2	-3.5	-8.6 to +1.7
	16 to 18	48.4	51.7	44.7	47.8	-3.7	-8.6 to +1.2
By parents with children of ages:	12 to 13	80.3	78.2	81.3	81.3	2.0	-0.9 to +5.0
	14 to 15	81.7	79.3	82.1	86.3	3.6	-1.7 to +8.9
	16 to 18	78.2	79.9	83.3	81.9	3.5	-0.6 to +7.6

* Between year change significant at p<0.05.

Content of Drug Conversations

In the course of conversations about drug use, young people of all ages discussed the negative consequences that happen because of drugs, but some also spoke positively about drugs. Around 51 percent of young people aged 12 to 18 reported talking with their friends about “bad things that happen if you use drugs” within the past 6 months. Approximately 30 percent said they talked about “specific things I could do to stay away from drugs,” and around 22 percent had conversations about how “marijuana use isn’t so bad” (Detail Tables 3-49 to 3-51). From 2000 to 2001, there were no overall statistically significant changes in the proportion of youth having specific types of drug conversations.

Saying positive things about drugs appears to be partly a function of age, and age also somewhat affected conversations about the consequences of drug use. While few 12- to 13-year-olds reported engaging in conversation about how “marijuana use isn’t so bad,” 21 percent of 14- to 15-year-olds and 34 percent of 16- to 18-year-olds have been involved in such conversations. Older youth, those 16- to 18 years old, also have significantly more conversations about the “bad things that happen if you use drugs” than do 12- to 13-year-olds (Table 3-V).

Table 3-V. Topics of conversation with friends by age group across all waves

Age group	Specific things I could do to stay away from drugs (%)	Bad things that happen if you use drugs (%)	Marijuana use isn’t so bad (%)
12 to 13	30.9	44.0	8.7
14 to 15	30.4	51.4	20.5
16 to 18	27.5	55.4	33.9

Sensation seeking and risk score are strongly associated with a youth’s likelihood of having conversations about how “marijuana use isn’t so bad.” While 33 percent of high sensation-seeking youth had such conversations in the past 6 months, only 10 percent of low sensation-seeking youth had them. And compared to the relatively small 9 percent of low-risk youth who had conversations about how “marijuana use isn’t so bad,” 43 percent of high-risk youth had similar talks with friends. Sensation seeking and risk also appear to be associated with other types of drug conversations. Fewer high sensation-seeking youth and high-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 low-risk counterparts. But they had more conversations in the past 6 months about “bad things that happen if you use drugs” (Detail Tables 3-49 through 3-51).

Ethnicity and gender were also associated with the types of conversations that adolescents had about drugs. White adolescents were significantly less likely than youth of other ethnicities to have had conversations with friends about “specific things they could do to stay away from drugs” (Detail Tables 3-49 through 3-51).

- **Overall from 2000 to 2001, there were no significant changes in the proportion of all youth who reported conversations about either positive or negative consequences of drug use** (Detail Tables 3-49 to 3-51).
- **The only subgroup to show significant changes were 12- to 13-year-olds.** Among this age group there was a statistically significant 3 percentage point decrease in conversations about how “marijuana use isn’t so bad,” a significant 44 percentage point decrease about the “bad things that happen if you use drugs,” and a decrease of 3 percentage points in discussions about “specific things that I could do to stay away from drugs.” These changes are possibly due to this age group’s overall decrease in the number of drug conversations as reported in Section 3.5.2 (Detail Tables 3-49 through 3-51).

3.4.3 Discussions about Anti-Drug Ads

Youth reported having conversations about the Campaign anti-drug ads (Table 3-W). Twenty-eight percent of 12- to 18-year-olds reported having a conversation about the anti-drug ads with their parents and 39 percent recalled having such a conversation with friends or others in the previous 6 months (Detail Table 3-55 and 3-56). There were no overall statistically significant changes in

discussions about anti-drug ads from 2000 to 2001; however, several subgroups did show significant changes.

Table 3-W. Changes in conversations about anti-drug ads from Wave 1 to Wave 4

Age group and discussion partner	Percent with at least one conversation about anti-drug ads in past 6 months				2000-2001 Change (%)	95% Confidence Interval on Change (%)
	Wave 1 2000 (%)	Wave 2 2000 (%)	Wave 3 2001 (%)	Wave 4 2001 (%)		
Discussions with parents:						
Youth aged 12 to 13	40.1	37.4	36.8	35.1	-2.8	-6.6 to +1.0
Youth aged 14 to 15	30.8	30.0	28.5	27.4	-2.4	-7.4 to +2.5
Youth aged 16 to 18	21.2	16.3	20.0	22.4	2.5	-2.0 to +7.0
Discussions with others (friends, other adults):						
Youth aged 12 to 13	39.7	44.5	39.4	37.5	-3.7	-8.0 to +0.6
Youth aged 14 to 15	45.0	39.9	41.7	41.9	-0.7	-6.0 to +4.7
Youth aged 16 to 18	45.6	34.5	39.1	36.6	-2.3	-7.4 to +2.8

- **Age, sensation seeking, and risk score were related to conversations with parents about the anti-drug ads.** Younger adolescents aged 12 to 13 reported more conversations with their parents about anti-drug ads than did older adolescents. Similarly, low sensation-seeking and low-risk adolescents reported more anti-drug ad conversations with their parents than did high sensation-seeking adolescents and high-risk youth (Detail Table 3-55).
- **Gender was strongly associated with anti-drug ad conversations with people other than the youth’s parents.** Females were significantly more likely than males to have talked with friends or other adults about the ads (Detail Table 3-56).
- **Overall, conversations with parents remained stable across 2000 to 2001.** The only exception was a decline in such conversations reported by Hispanic youth, from 35 percent to 26 percent. In 2001, Hispanic youth were no different than White youth, although they had reported 9 percent more conversations in 2000.

There was also no detectable overall change in drug-related conversations with friends and other adults between 2000 and 2001. Still, two subgroups showed statistically significant declines over time. There was a significant decline of 4 percentage points among males in 2001. Also, high-risk youth reported a decrease in conversations with others, down from 44 percent to 37 percent (Detail Table 3-56).

3.5 Perceptions of Media and Community Attention to Drug Use

This section focuses attention on youth and parent perceptions of the amount of public attention in their environments on youth and drugs. It bears on two issues: whether the onset of the Campaign was associated with an increase in public attention to drugs, and the extent to which there was already a great deal of background noise about drugs and youth which created a context for the Campaign’s efforts.

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. More than 95 percent of all youth reported at least monthly exposure to media stories about young people and drug use.¹³ The media channels that respondents were asked about included television and radio news; television movies, sitcoms, and dramas; television talk shows; rental and theater movies; and magazines. There was a statistically significant decrease in the reported overall exposure to drug-related coverage from 2000 to 2001, as well as significant decreases in exposure to certain media and among certain subgroups. The huge shift in media coverage in the latter part of 2001 toward stories related to the September 11th events and terrorism in general probably eclipsed many drug-related media reports.

- **More than 40 percent of youth noticed media coverage about drug use among young people at least once a week on at least one of these media channels.** About 30 percent noticed such stories weekly on television or radio news, and more than 15 percent recalled such stories appearing weekly in television movies, sitcoms, or dramas, and on television talk shows. Fewer young people noticed such stories appearing weekly in movies or in magazines (Detail Tables 3-57 through 3-61).

Recall of drug stories on various media is related to gender, age, and ethnicity. Younger adolescents, aged 12 to 13, reported less exposure to stories about drugs and youth than did older youth across all types of media, and significantly less on three types: TV movies, sitcoms, and dramas; TV talk shows; and movies (theater/rental). African American youth were more likely than White and Hispanic youth to recall stories about youth and drugs in all media and were significantly more likely than White youth to recall such stories in movies. Females reported more exposure than males to stories about drugs among youth on all media types except movies, and significantly more on four of the five media (Detail Tables 3-57 through 3-61).

- **From 2000 to 2001, there was an overall statistically significant decrease of 3 percentage points in youth recalling stories about drug use in at least one medium in recent months.** Declines were also significant for TV or radio news and for magazines (Detail Table 3-62). The decline was particularly sharp between Wave 3 and Wave 4 for television and radio news as a source (from 33% to 25% recalling weekly stories in recent months) very likely reflecting the turn toward September 11th news.

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

Across waves, parents reported often seeing drug themes presented in the media. Nearly 65 percent of parents reported weekly exposure to at least one media source dealing with the issues of youth and drugs (Table 3-X). Slightly less than half of all parents reported having seen or heard stories about drug use on television or radio news programs at least weekly in recent months. Approximately 30 percent of parents noticed such stories appearing weekly in newspapers and in television entertainment programs; and more than 20 percent saw 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 (Detail Tables 3-63 through 3-69). Statistically significant changes in recall of exposure to stories about youth and drugs that were heard or seen in particular media sources are discussed below.

¹³ See question D9 in the Teen questionnaire.

- Ethnicity and education were associated with recall of exposure to stories about youth and drugs in the media.** White parents were less likely than both African American and Hispanic parents to report having noticed stories dealing with drug use among young people in all media except newspapers. Hispanic parents reported the greatest recall in all media, except on TV talk shows or TV news magazine programs and stories in magazine and newspaper articles, where African American parents recalled slightly higher exposure. College graduates were less likely to report having noticed stories on all media except magazine and newspaper articles (Detail Tables 3-63 through 3-69).
- There was little overall change from 2000 to 2001 in parents' recall of having seen media stories about young people and drug use at least weekly.** However, statistically significant changes were seen in two media sources. Parents' reports of having noticed such stories in TV movies, sitcoms, or dramas increased by 4 percentage points. In contrast, there was a significant overall decrease of 3 percentage points in parents reporting having noticed such stories on TV or radio news programs at least weekly (Table 3-X and Detail Table 3-64). This latter change again might be explained by the major shift in news coverage to the events of September 11.

Table 3-X. Parents exposure to weekly media stories about drugs across waves

	Wave 1 2000 (%)	Wave 2 2000 (%)	Wave 3 2001 (%)	Wave 4 2001 (%)	2000-2001 Change (%)	95% Confidence Interval on Change (%)
TV or radio news	52.5	48.3	49.8	45.4	-2.9*	-5.7 to -0.1
Newspapers	34.8	30.7	33.8	28.9	-1.5	-4.7 to +1.7
TV dramas, sitcoms, movies	30.9	26.2	33.7	31.4	3.9*	1.2 to +6.6
TV talk, magazine shows	24.6	20.8	23.0	19.9	-1.3	-3.8 to +1.1
Radio (not news)	14.3	12.0	14.5	14.7	1.5	-0.7 to +3.6
Movies	10.1	8.6	10.4	8.8	0.2	-1.7 to +2.0
Magazines	8.1	8.3	8.1	7.2	-0.6	-2.4 to +1.2
At least one source	65.6	62.4	64.8	61.5	-0.9	-3.6 to +1.8

* Between year change significant at p<0.05.

- Significant subgroup differences were also reported in several types of media from 2000 to 2001.** Female parents' recall of having seen stories on TV talk shows or TV news magazine programs decreased by 4 percentage points. A 2 percentage point increase was found among parents of youth aged 12 to 13 having noticed such stories in movies. And college graduates reported a 4 percentage point decrease in having noticed such stories in magazine articles and an 8 percentage decrease in having noticed such stories in the newspaper (Detail Table 3-65, 3-67 through 3-69).

Parent Reports of Local Anti-Drug Activity

Most parents reported some awareness of anti-drug activity in their localities. About 44 percent of all parents reported having heard a lot about police crackdowns on drug use or drug sales in their community within the past year and over 30 percent had “heard a lot” about anti-drug programs in schools or community centers. Reports of a political focus on drugs was less prominent than legal enforcement or prevention programs. Only 16 percent of all parents had heard a lot about drug-related laws proposed by state or local governments within the past year. Thirteen percent reported hearing public officials speak about drugs, and 8 percent had heard a lot about drug-related propositions or referenda on the ballot for public voting (Detail Tables 3-71 through 3-75).

There was only one statistically significant change from 2000 to 2001 in parents' awareness of drug activities, a 4 percentage point decrease in parents saying they had heard a lot about anti-drug programs in schools or community centers (Table 3-Y).

Table 3-Y. Change in parent exposure to drug-related communication across waves¹

Measure	Wave 1 2000 (%)	Wave 2 2000 (%)	Wave 3 2001 (%)	Wave 4 2001 (%)	2000-2001 Change (%)	95% Confidence Interval on Change (%)
Percentage hearing a lot about anti-drug programs in community in past year	31.1	37.7	31.0	29.4	-4.2*	-7.3 to -1.2
Percentage hearing a lot about speeches about drugs by public officials in past year	14.8	15.5	13.2	13.7	-1.7	-4.5 to +1.1
Percentage hearing a lot about anti-drug laws in past year	15.7	19.9	16.2	16.6	-1.4	-3.5 to +0.8
Percentage hearing a lot about drug-related referenda in past year	5.8	10.0	8.9	7.1	0.1	-1.8 to +2.0
Percentage hearing a lot about police crackdowns on drug use or sales in past year	45.6	45.7	41.7	45.8	-1.8	-5.0 to +1.3

¹ For parents with children 12 to 18.

* Between year change significant at $p < 0.05$.

- Ethnicity and education are associated with knowledge of various types of drug related activities. White parents were less likely to have heard a lot about political and legal activities compared to Hispanic and African American parents; African American parents were the most likely to have heard a lot about these activities (Detail Tables 3-71 through 3-75).
- Parents with some college or with college degrees were much more aware of anti-drug programs in schools and community centers than were parents with less education (Detail Table 3-71). But parents with less than a high school education were more likely to have heard a lot about drug related propositions/referenda (Detail Table 3-75).

3.6 Summary and Conclusions

The data provided to the evaluators by the Media Campaign describes what media time and space have been purchased over the 28-month period from September 1999 to December 2001. On average, the Campaign purchased 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. For both parents and youth, there was some instability in the amount of GRPs bought over each measurement wave (roughly 6 months). For youth, exposures in Waves 1 and 2 per week were quite similar at 2.6 and 2.5, respectively. They increased to 2.8 exposures per week in Wave 3, and then decreased to 2.1 per week in Wave 4. For parents, there was more exposure instability across waves. During Wave 1, media time purchased for parents was enough to expect 2.8 exposures per week. During Wave 2 it fell to 1.5 exposures per week, then climbed back to 2.3 exposures per week in Wave 3. In Wave 4, parent exposures fell again to 1.9 per week.

The Campaign also varied the emphasis on the behavioral ad platforms in each wave. The available data allowed classification of the Campaign TV and radio ads, which made up approximately 80 percent of all GRPs for youth and about 60 percent for all GRPs for parents. For youth, an early focus on Negative Consequences of drug use had almost disappeared by Wave 3, but was revitalized

in Wave 4. A focus on Normative Education/Positive Alternatives was strong across all four waves, while Resistance Skills were emphasized in Waves 1 and 3, but not included in Waves 2 or 4. For parents, the Parenting Skills/Personal Efficacy platform was maintained through all four waves, and was especially strong in Wave 4. But “Your Child at Risk” received heavy weight only in Wave 3, while “Perceptions of Harm” was included only at Wave 1. Some of the “Your Child at Risk” platform advertising in Waves 3 and 4 focused on the risks of inhalants and Ecstasy.

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 (TV and radio, print, outdoor media, and movies/videotapes). Both parents and youth reported high exposure on those measures. The median response was 10 exposures per month for parents and 13 exposures per month for youth. This was probably equivalent to between 2 to 3 exposures per week. There was no overall detectable exposure change from 2000 to 2001, suggesting this general exposure measure was insensitive to the changes in media purchases.

The second exposure measure asked for recalled frequency of viewing specific ads on television and radio that were on the air in the 60 days prior to the interview. These produced lower estimates of exposure to the Campaign, with parents reporting a median of 3 exposures and youth reporting a median of 6.0 exposures to the TV ads “in recent months.” This was probably equivalent to 0.35 to 0.7 exposures per week respectively.

On these specific exposure measures, parents and youth diverged sharply over time. Consistent with the sharp drop in television GRPs during Wave 2, parent recall of TV ads declined from Wave 1 through Wave 3, presumably reflecting the carryover effects of very low TV GRPs at the end of Wave 2. Using the percent of parents recalling weekly exposure as an estimator, there was a small decline in parent recall of TV ads from 26 percent to 20 percent between Waves 1 and 3. In Wave 4, the percentage climbed to 39 percent, although TV GRP purchases had dropped. This high recall level probably reflected the large number of TV GRPs purchased for parents during Wave 3. In contrast, youth reported a substantially higher level of recall of specific TV ads over time, with the percent of youth claiming at least weekly exposure climbing from 35 percent at Wave 1 to 53 percent at Wave 4, even though youth TV GRPs in Wave 4 were lower than in previous waves.

Recall of specific radio ads was assessed for youth during Waves 2, 3, and 4, and for parents across all four waves. The absolute level of recall of radio ads remained much lower than for television ads in both groups. Among youth at Wave 2, 4 percent of youth said they had heard radio ads weekly; this had increased to 12 percent at Wave 3, but then decreased to 3 percent in Wave 4. For parents, weekly recall increased from 10 percent at Wave 1 to 17 percent at Wave 3 and then decreased to 15 percent at Wave 4. The pattern of youth recall of radio ads tracks GRP radio purchases reasonably well. For parents the match is less clear.

All youth and parents were asked to provide their assessments of the ads they had been shown. Both groups remained generally positive. Youth evaluations of the ads were unchanged from 2000 to 2001, while parent evaluations became markedly more positive.

Overall use of the Internet continued to grow for youth and for parents. However, the level of visits to anti- (or pro-) drug sites was below 10 percent and unchanging for youth. Parent claims that they had visited either anti-drug sites or parenting skills sites both grew from 2000 to 2001, although their absolute levels remained less than 10 percent.

In addition to distributing messages directly, the Campaign hopes also to reach its audiences indirectly, through other institutions and routes. While for many of these channels there was a substantial level of exposure to anti-drug messages, there was little evidence that this was increasing over the course of the Campaign. Thus it is difficult to attribute these complementary exposures as indirect exposures produced by 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. Most youth reported recent in-school drug education and that was unchanged between 2000 and 2001. Potential Campaign influence through out-of-school activities was also examined. Youth reported that these activities were rare and even reported a significant decrease in attendance at out-of-school anti-drug activities in the past year.

Parents reported lots of drug-related discussions with their children, but no more during 2001 than in 2000. Youth reported a substantial level of such conversations, even if less than their parents claimed. From 2000 to 2001, youth reported significantly fewer conversations with their parents, and 12- to 13-year-olds also reported fewer drug conversations with nonparents as well. No changes were reported in the content of drug-related conversations.

Both youth and parents were asked about exposure to drug and youth stories across a variety of mass media. Parents were asked about their awareness of any local anti-drug activity. While there were reasonably high levels of recall of mass media stories, and sometimes of local anti-drug activities, there was no change for most of them across waves. Around 30 percent of parents reported attending drug abuse prevention programs and parenting effectiveness programs in the past year, but this did not change significantly over time.

Overall, the Campaign has provided a heavy dose of media messages, and youth and parents do recall seeing and hearing them. Notable changes from 2000 to 2001 include increases in recall of specific TV ads for youth and parents, and in radio ads for parents. Youth are still not reporting much contact with anti-drug information on the Internet; parents also report low levels of such contact, with some small but significant increase over time. There was little evidence that anti-drug messages from other institutions were increasing over the course of the Campaign, and in some cases there were slight declines (children's reports of talking with parents and attendance at anti-drug programs).

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4. Trends in Youth Marijuana and Inhalant Use

This chapter focuses on trends in youth marijuana and inhalant use as reported by three sources: the Monitoring the Future (MTF), the Media Campaign’s Evaluation Survey—National Survey of Parents and Youth (NSPY), and the National Household Survey of Drug Abuse (NHSDA). Data are also presented regarding trends in youth reports of marijuana offers. As mentioned in Chapter 2, youth were stratified by their risk probability of marijuana use in order to reduce the number of subgroup analyses performed in previous reports. Section 4.6 explains the development of this risk score model. Along with cross-sectional analyses based on the four waves of NSPY data collection, this chapter also presents results from longitudinal analyses of reported marijuana use among Wave 1 respondents who were reinterviewed at Wave 4.

Before turning to the analysis presented in this chapter on youth behavior with respect to marijuana and inhalant use, as well as the analyses regarding the Campaign influence to date on behavior and attitudes in the two following chapters, it should be remembered that the NSPY Wave 4 data collection time period included the tragic events of Sept. 11 and its aftermath. The nature and magnitude of these events was unprecedented in the Nation's history. While the impact on potential Campaign exposure is known (i.e., GRPs were reduced), the impact on the behaviors and attitudes of the NSPY respondents is impossible to gauge. Clearly, the period was not representative of a typical semiannual interviewing cycle, and the possibility that this affected respondent answers in unknown ways, which in turn may have affected findings, cannot be ruled out.

4.1 MTF Trends in Marijuana Use

The MTF study is sponsored by the National Institute on Drug Abuse (NIDA). It 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 about 420 in recent years, and the number of responding students approximately 50,000. From 1991 to 2000, the MTF has maintained an overall student response rate between 88 and 91 percent in participating schools. The main reason for student nonresponse is student absence from class at the time of data collection. The study uses a standard set of three questions to determine usage levels for the various drugs. For instance, the questions about marijuana use are as follows: “On how many occasions (if any), have you used marijuana... (a) in your lifetime? (b) during the past 12 months? (c) during the last 30 days?” Each of the three questions is answered on the same scale: 0 occasions, 1-2 occasions, 3-5, 6-9, 10-19, 20-39, and 40 or more occasions. Because of its longevity, the MTF study serves as an important benchmark for comparing results and judging the nation’s success in combating drug use by youth.

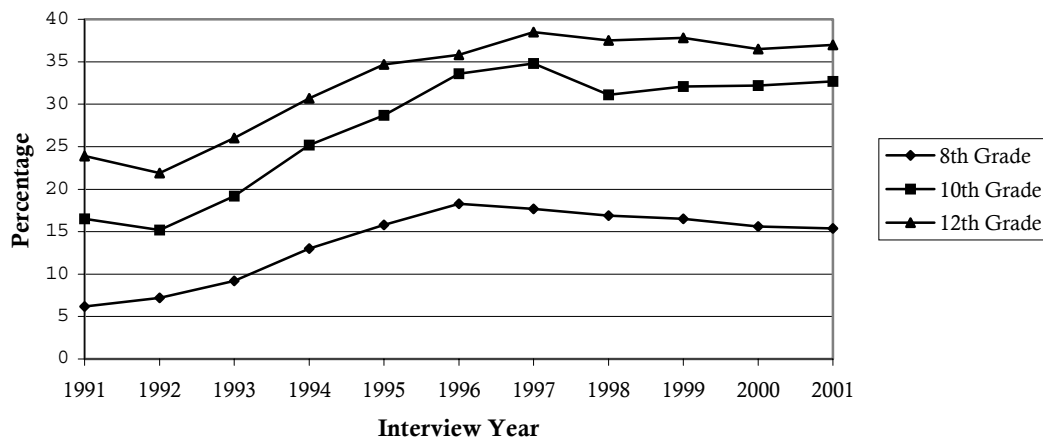
According to the 2001 MTF study, there are no significant changes in lifetime, annual, or past month marijuana use. For eighth, tenth, and twelfth graders, 2001 levels are essentially the same as they were in 2000, which had not changed significantly from 1999 levels (Table 4-A).

Table 4-A. MTF lifetime, annual, and past-month marijuana use in 1999, 2000, and 2001

Grade	Marijuana use								
	Ever (%)			Past year (%)			Past month (%)		
	1999	2000	2001	1999	2000	2001	1999	2000	2001
8 th	22.0	20.3	20.4	16.5	15.6	15.4	9.7	9.1	9.2
10 th	40.9	40.3	40.1	32.1	32.2	32.7	19.4	19.7	19.8
12 th	49.7	48.8	49.0	37.8	36.5	37.0	23.1	21.6	22.4

MTF researchers conclude that after reaching a peak in 1996 among eighth graders and in 1997 among tenth and twelfth graders, annual marijuana use has declined only very modestly, with no significant changes in more recent years (Johnston, O’Malley, and Bachman, 2002). This long-term trend is evident in Figure 4-A.

Figure 4-A. Percentage of 8th, 10th, and 12th graders reporting annual marijuana use: MTF 1991-2001



The 11-year trends for lifetime and past month use were similar, with sharp increases in the early 1990s followed by stabilization and some declines starting in 1996. MTF researchers note that the two directional changes registered in the past decade for many illicit drugs, among them marijuana, were first evident among eighth graders. They interpret this as a suggestion that “eighth graders may be the most immediately responsive to changing influences in the larger social environment” (Johnston, O’Malley, and Bachman, 2001).

4.2 NSPY Trends in Marijuana Use

This section focuses on marijuana use as reported by youth during the four NSPY waves of data collection completed to date. Rates for 9- to 11- year olds, presented in the first three semiannual reports, will not be available for this or subsequent reports because many of the youth in this age group have aged into the next group (12- and 13-year-olds) by the time of this first followup wave of data collection. However, those rates were quite low in the previous reports, less than 0.5 percent in the Wave 3 report. This analysis concentrates on youth between the ages of 12 and 18.

The previous report found that overall for the Wave 3 data collected in the first half of 2001, most marijuana use was not significantly different from use estimates during Wave 1 or Wave 2. At the

time, two exceptions were noted: a pattern of decline among 12- to 13-year-olds, and a pattern of increased use among 14- to 15-year-olds. These patterns in Wave 3 data were consistent, though for each age group only one of the four use measures registered a significant change. Among the younger group, there was a significant decline in “past month” use; among 14- to 15-year-olds, there was a significant increase in regular use (defined as use every month or almost every month).

For trends analyses, this report focuses on yearly changes based on average estimates from Waves 1 and 2 for 2000 and Waves 3 and 4 for 2001. Overall, as in the previous report, there are no significant changes in lifetime, past year, past month, or regular use. Detail Tables 4-1 through 4-4 present this information for a variety of subgroups. Table 4-B also presents overall estimates (for all youth aged 12 to 18), along with estimates of the proportion of youth within each age group that reported marijuana use across the four measures.

There is no longer a significant decline in marijuana use among 12- to 13-year-olds. No changes for 2000-2001 are significant. However, the pattern of increased use among 14- to 15-year-olds receives stronger confirmation, with significant changes in past month and regular use of marijuana. While the absolute levels of past month and regular use among this group were low, both doubled over the year: from 3.6 to 7.2 for past month use, and from 2.2 to 5.4 for regular marijuana use. Levels of past year and lifetime marijuana use for this group also rose by similar magnitudes, but these changes were not statistically significant.

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

Use measure	Age group	Percent reporting use			
		Year 2000 Average Waves 1 and 2 (%)	Year 2001 Average Waves 3 and 4 (%)	Year 2000 to 2001 % Change	95% CI on 2000- 2001 Change
Lifetime					
	12 to 13	4.9	4.1	-0.8	-2.4 to 0.8
	14 to 15	15.1	18.9	3.8	-0.3 to 7.8
	16 to 18	40.3	39.9	-0.4	-5.4 to 4.6
	12 to 18	21.9	22.6	0.8	-1.7 to 3.2
Past year					
	12 to 13	3.3	2.6	-0.6	-2.1 to 0.8
	14 to 15	11.3	13.8	2.5	-1.0 to 5.9
	16 to 18	29.1	26.8	-2.3	-6.9 to 2.3
	12 to 18	15.8	15.5	-0.3	-2.5 to 1.9
Past month					
	12 to 13	1.4	1.1	-0.3	-1.2 to 0.7
	14 to 15	3.6	7.2	3.6*	0.9 to 6.3
	16 to 18	14.6	14.0	-0.6	-4.3 to 3.0
	12 to 18	7.2	8.0	0.8	-0.9 to 2.5
Regular					
	12 to 13	0.5	0.3	-0.3	-0.7 to 0.2
	14 to 15	2.2	5.4	3.3*	1.1 to 5.4
	16 to 18	12.4	11.7	-0.7	-4.1 to 2.7
	12 to 18	5.6	6.3	0.7	-0.8 to 2.1

*Between-year change significant at $p < .05$.

The absolute size of the changes among 14- to 15-year olds is small, but the relative change is more meaningful. Reports of regular use of marijuana among 14- to 15-year-olds have increased. These data are inconsistent with the results reported for the MTF 2000 versus 2001 comparisons, which showed no increase in past 30-day use for any of the three groups: 8th, 10th, or 12th graders. There are three credible explanations for this inconsistency: first, the MTF 2001 data are collected only during the early spring of the year, while the NSPY data covers the entire year. Second, the 14- to 15-year-olds in the NSPY sample fall between the eighth grade and tenth grade groups of MTF; because there were no effects for 12- to 13-year-olds or 16- to 18-year-olds in the NSPY sample, the inconsistency may reflect this age mismatch. Finally, in general, while the trends for MTF overall have been quite similar to those for NSPY for almost all groups and measures, the absolute levels have not been identical. Of immediate relevance to this apparent result, MTF reports higher past 30-day use of marijuana than does NSPY overall (see Table 4-D, below). It is possible that the two surveys are differentially sensitive to changes in regular use of marijuana. The next section deals with the comparisons across surveys.

4.3 NSPY Comparison with MTF and NHSDA Data

Hornik et al., (2000) reported marked differences in estimates of marijuana use throughout the 1990s among the MTF, NHSDA,¹ and the Partnership Attitude Tracking Study (PATS),² which is sponsored by the Partnership for a Drug-Free America (PDFA). In general, the estimates provided by PATS were the highest, followed by MTF, and those provided by NHSDA were the lowest. Given the variation in these estimates across surveys, the estimates from the NSPY were expected to vary somewhat from those presented in these three surveys. However, because both PATS and MTF are school-based surveys, and NHSDA and NSPY are home-based surveys, one would expect that the estimates from NSPY would be closer to those from NHSDA. In fact, that was the case.

NSPY 2000 estimates of use of marijuana are within sampling error limits of NHSDA estimates from the 2000 data (Table 4-C). The NHSDA also reported no statistically significant change in marijuana use among 12- to 17-year-old youth between 1999 and 2000 with regard to lifetime use, past year use, or use in the past month. NSPY data does not cover 1999.

Table 4-C. Comparison of published NHSDA 2000 data with NSPY 2000 (Waves 1 and 2) data on use of marijuana among youth aged 12 to 17 (percentages and confidence intervals)

All 12- to 17-year-olds	Marijuana use		
	Lifetime (%)	Past year (%)	Past month (%)
NHSDA 2000	18.3 (17.7 to 18.9)	13.4 (12.86 to 13.94)	7.2 (6.78 to 7.62)
NSPY 2000 (Waves 1 and 2)	19.2 (17.4 to 21.1)	14.0 (12.5 to 15.7)	6.0 (5.0 to 7.3)

* NHSDA results from <http://www.samhsa.gov/hhsurvey/hhsurvey.html> accessed on 02/14/02

¹ The National Household Survey of Drug Abuse (NHSDA) is sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA). This survey system can be used to measure change from the 70s and 80s until 1998 and from 1999 forward but cannot be easily used to measure change from 1998 and earlier, to 1999 and later, because of a major redesign in 1999 that substantially disrupted the time series.

² The Partnership Attitude Tracking Study (PATS) is sponsored by the Partnership for a Drug-Free America (PDFA).

MTF 2000 and 2001 estimates of marijuana use are higher than the NSPY 2000 and 2001 estimates (Table 4-D). As noted earlier, the MTF estimates were also higher than the NHSDA estimates throughout the 1990s. The reasons for these differences are not entirely clear. They may stem from the wording of the questionnaire, the setting for the interviews (school versus home), response rates, coverage rates, some combination thereof, or other factors such as edit/imputation rules. It is also possible that the discrepancy may be accounted for in part by the fact that MTF is conducted during the spring of each year, while NSPY data is collected throughout the year. On average, respondents to NSPY in a given grade may be 4 months younger, based on date of interview, than are respondents to the MTF survey.³ To the extent that changes in behavior took place during this period, they are likely to be reflected in differential estimates of marijuana use.

Table 4-D. Comparison of MTF and NSPY 2000 and 2001 data on marijuana use

Survey and grade	Marijuana use					
	Lifetime (%)		Past year (%)		Past month (%)	
	2000	2001	2000	2001	2000	2001
MTF 8 th	20.3	20.4	15.6	15.4	9.1	9.2
NSPY 8 th	9.5	10.3	6.4	7.1	2.4	3.5
MTF 10 th	40.3	40.1	32.2	32.7	19.7	19.8
NSPY 10 th	27.2	23.13	19.3	17.0	9.1	9.7
MTF 12 th	48.8	49.0	36.5	37.0	21.6	22.4
NSPY12 th	40.0	47.2	30.8	32.1	16.5	19.0

4.4 Marijuana Offers

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

No age group shows a statistically significant change in receiving offers at all or in the past 30 days. Detail Tables 4-6 and 4-7 present this information. Table 4-E focuses on the proportion of youth within each age group that reported receiving offers in the previous 30 days. The table shows the strong age gradient of offers and the lack of any significant yearly changes across four waves. In addition, as shown in Detail Tables 4-6 and 4-7, there are no subpopulations that show consistent significant changes in offers between years 2000 and 2001.

Table 4-E. NSPY trends in youth reports of marijuana offers received in prior month

Age group	Percent reporting having received marijuana offers one or more times in past 30 days			
	Year 2000 Average Waves 1 and 2 (%)	Year 2001 Average Waves 3 and 4 (%)	Year 2000 to 2001 % Change	95% Confidence Interval on 2000- 2001 Change
12 to 13	9.8	9.0	-0.8	-2.9 to 1.3
14 to 15	26.6	27.8	1.2	-4.2 to 6.7
16 to 18	46.7	46.6	-0.1	-5.2 to 4.9

³ This difference reflects two factors: NSPY respondents are interviewed throughout the year, and all respondents interviewed after the end of an academic year are assigned to the grade they are entering.

While previous reports described the association between offers and marijuana use but made no claims as to causality, longitudinal data allow one to clarify whether receiving offers precedes use or is only a correlate of it. Wave 4 interviewees were the same youth who had been interviewed at Wave 1, which permitted a new set of analyses that had not been possible previously. Table 4-F presents this information. It includes only youth who indicated that they had not used marijuana at Wave 1. Then for each age group, initiation of marijuana use by Wave 4 is compared for those who had indicated at Wave 1 that they had received an offer with those who said they had not received an offer.

Table 4-F. Lifetime marijuana use at Wave 4 by marijuana offers received at Wave 1 among nonusers by age group

Used marijuana by Wave 4	Age group at Wave 4					
	12 to 13		14 to 15		16 to 18	
	Ever received offer (% ¹ , CI)		Ever received offer (% ¹ , CI)		Ever received offer (% ¹ , CI)	
	No	Yes	No	Yes	No	Yes
No	96.7	s ¹	90.1	71.2	83.9	66.1
	94.6 to 98.0		86.4 to 92.9	62.3 to 78.8	77.9 to 88.5	57.8 to 73.5
Yes	3.3	s ¹	9.9	28.8	16.1	33.9
	2.0 to 5.4		7.1 to 13.6	21.2 to 37.7	11.5 to 22.1	26.5 to 42.2

¹ Estimate is suppressed due to the small number of cases in cell.

Nonusers who reported receiving marijuana offers were much more likely to have initiated marijuana use by Wave 4 than were nonusers who reported never having received an offer. As can be seen in Table 4-F, among 14- to 15-year-olds who had never used marijuana at Wave 1, 29 percent of those who reported having received offer(s) had used marijuana by Wave 4, while only 10 percent of those who reported never receiving an offer had used marijuana by Wave 4. For 16- to 18- year-olds, the comparable percentages were 34 percent and 16 percent. (There were not enough Wave 4 12- to 13-year-olds who had received an offer at Wave 1 to calculate a comparison.) It is important to note, however, that while receiving offers is closely related to use, most of those who received offers did not report use. Sixty-eight percent of nonusers who reported ever receiving marijuana offers at Wave 1 had still not used marijuana by Wave 4.

4.5 NSPY, MTF, and NHSDA Trends in Inhalant Use

As reported in Chapter 3, there has been very little inhalant-focused advertising for youth through Phase III. Only in Wave 4 were any youth inhalant ads broadcast, and they were only 4 percent of the broadcast media GRPs even in that wave. This was estimated to be enough to reach only 7 in 100 youths in the average week. It would seem unlikely that this would be enough exposure to produce a detectable inhalant-specific effect on youth. If there were Campaign effects on inhalant use, it would reflect the effects of the generalized anti-drug message of the Campaign, which the youth had then applied to inhalants.

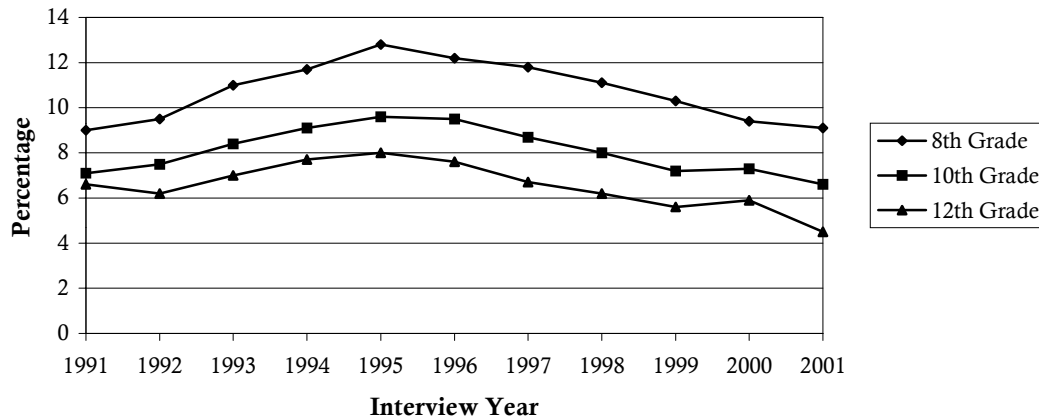
The MTF results for inhalants are presented in Table 4-G. MTF provides significance tests only for changes between adjacent years. Only two results are significant against that criterion: lifetime use for 8th graders between 1999 and 2000, and past year use for 12th graders. However, if tests were provided for the 1999 to 2001 period, it is likely that additional declines would have been significant.

Table 4-G. MTF lifetime, annual and past month inhalant use 1999, 2000, and 2001

	Inhalant use								
	Lifetime (%)			Past year (%)			Past month (%)		
	1999	2000	2001	1999	2000	2001	1999	2000	2001
8 th	19.7	17.9*	17.1	10.3	9.4	9.1	5.0	4.5	4.0
10 th	17.0	16.6	15.2	7.2	7.3	6.6	2.6	2.6	2.4
12 th	15.4	14.2	13.0	5.6	5.9	4.5*	2.0	2.2	1.7

*Difference with regard to previous year is significant at $p < .05$.

Indeed (Figure 4-B), MTF researchers note that inhalant use among youth increased in the early 1990s through 1995, with all grades exhibiting a steady decline since then (Johnston, O'Malley, and Bachman, 2002). Given those long-term trends initiated in 1995, the observed recent declines, which seem mostly to continue the secular trend, cannot be easily attributed to the Campaign. NHSDA reported no statistically significant change on these three measures of inhalant use among 12- to 17-year-olds between 1999 and 2000.

Figure 4-B. Percentage of 8th, 10th, and 12th graders reporting annual inhalant use: MTF 1991-2001

According to NSPY, levels of lifetime use decreased significantly by 1.3 percentage points among all youth aged 12 to 18 from 2000 to 2001 (Table 4-H). Though this decrease might seem small, absolute levels of lifetime inhalant use, as measured by NSPY, are fairly low already (5.2 percent in 2000 and 3.9 percent in 2001). Other measures of use do not show any significant changes, nor are there any for specific age groups. As can be seen in Detail Table 4-8, there are also some differences in trends for lifetime inhalant use by subgroups, but these are not consistent across other measures of inhalant use.

The levels of use reported in the MTF and NSPY are quite different, with MTF providing much higher estimates of use. The NHSDA 2000 reported levels of use for 12- to 17-year-olds suggest that its estimates lie between the MTF and NSPY estimates (lifetime: 8.9%; past year: 3.5%; and last month: 1.0%). The reasons for these differences are not known. They may be caused by question wording, the school versus home setting for the interviews, response or coverage rates, the data collection methods implemented, or some combination of these possible causes. The issue of question wording deserves particular attention. The questionnaire wording used by NSPY and MTF are presented in Figure 4-C. NSPY used more abstract language than did MTF. MTF asked specifically about having “sniffed glue” instead of the more abstract wording of having “used inhalants.” The NHSDA asked a still more detailed series of questions

Table 4-H. NSPY trends in inhalant use

Use measure	Age group	Percent reporting use			
		Year 2000 Average Waves 1 and 2 (%)	Year 2001 Average Waves 3 and 4 (%)	2000 to 2001 % Change	95% CI on 2000- 2001 Change
Lifetime					
	12 to 13	1.3	1.7	0.4	-0.4 to 1.2
	14 to 15	5.7	3.6	-2.1	-4.7 to 0.4
	16 to 18	7.8	5.8	-1.9	-4.3 to 0.4
	12 to 18	5.2	3.9	-1.3	-2.5 to -0.2
Past year					
	12 to 13	0.8	1.1	0.3	-0.4 to 1.0
	14 to 15	2.6	1.9	-0.7	-2.4 to 0.9
	16 to 18	3.1	2.3	-0.8	-2.7 to 1.1
	12 to 18	2.3	1.8	-0.5	-1.4 to 0.4
Past month					
	12 to 13	0.2	0.4	0.2	-0.2 to 0.6
	14 to 15	0.3	0.8	0.5	-0.2 to 1.2
	16 to 18	0.9	0.4	-0.4	-1.2 to 0.3
	12 to 18	0.5	0.5	0.1	-0.3 to 0.4
Regular					
	12 to 13	0.1	0.0	-0.1	-0.3 to 0.1
	14 to 15	0.2	0.2	0.0	-0.5 to 0.5
	16 to 18	0.4	0.4	-0.1	-0.4 to 0.2
	12 to 18	0.3	0.2	-0.1	-0.2 to 0.1

Figure 4-C. NSPY and MTF inhalant question sequences

The NSPY sequence asks:
 “The next questions are about inhalants. Inhalants are liquids, sprays, and gases that people sniff, huff, or inhale to get high or make them feel good. Have you ever, even once, used an inhalant for kicks or to get high? [if yes] During the *last 12 months*, on how many occasions have you used an inhalant for kicks or to get high?”

The MTF question asks:
 “On how many occasions (if any) have you sniffed glue, or breathed the contents of aerosol spray cans, or inhaled any other gases or sprays in order to get high during the last 12 months?”

covering specific types of inhalants, in order to determine whether a respondent ever used inhalants (the NHSDA questionnaire can be found at <http://www.samhsa.gov/hhsurvey/hhsurvey.html>). The choice to use the more abstract language in NSPY was a response to a concern that more direct language might teach youth how to inhale, particularly since the questions were to be asked of children as young as nine, while MTF questions were asked of youth who were already in 8th grade. However, the use of

abstraction may have had a cost if respondents did not always know what was to be considered inhalants. Also, the NSPY begins with a “gate” question that asks whether inhalants have ever been used. Only respondents who report ever having used inhalants are asked about use in the past year. In contrast, the MTF questionnaire has no “gate” question on ever having used a substance. Rather, it asks of everyone the frequency of usage over different time intervals.

A particular anomaly in the two tables is the different age gradient for the two studies. The MTF shows a negative age gradient: older youth report less use across measures than do younger respondents. In contrast, the NSPY results show the opposite pattern with older respondents reporting more rather than less recent inhalant use. There is no ready explanation for this difference in pattern. However, it may be worth noting that the third major study of drug use among adolescents, the NHSDA, reports estimates between MTF and NSPY overall and does not find any age gradient at all in inhalant use.

4.6 Predictors of Marijuana Use and the Development of a Risk Model

This report incorporates a new subgroup category defined by a youth’s risk of marijuana use. Youth were stratified into lower and higher risk subgroups. This reflects the expectations of the Campaign implementers who have argued from the start of the Campaign that their target audience were those youth who were at risk of marijuana use. In the past, the risk has been represented by sensation-seeking; however, for this report the idea of risk has been extended to include other characteristics that put a child at risk.

Stratification into risk subgroups was made on the basis of cross-predicted risk probabilities for marijuana use in the past year. This section briefly presents its underlying logic and the measures used. The sample for the development of the “risk score” (the predicted probability of the undesired event) was aggregated across the first three NSPY waves of data collection. Only youth who were 12 to 18 years old were included, a total of 4,804 cases.

The outcome variable was defined as marijuana use that began or continued in the last 12 months. Youth who had used in previous years but not in the past year were excluded from the analysis. The list of youth and parental covariates was gleaned from existing literature on risk factors for adolescent problem behavior in general and for substance use in particular. However, the consideration of what variables were to be included was subject to an additional limitation. No variable that might have been affected by the Campaign directly or indirectly or that could be a consequence as well as a cause of marijuana use was eligible for inclusion. For example, a well known predictor of risk is the number of friends an individual has who use marijuana. However, there is some risk that the friend’s use may be an effect of the individual’s use as well as a cause. Including such variables in the risk model would have created ambiguity in the interpretation of the risk variable, in its relationship to possible Campaign effects. Where it was possible, some variables that could have held such ambiguous relationships were constructed so that they would not. Thus, child cigarette and alcohol use as antecedent covariates are well established in the literature; the measures used here were constructed so as to avoid capturing reciprocal effects between them and marijuana use. Only cigarette or alcohol use that had occurred more than 1 year prior to the interview was included. That was temporally precedent to current use. Given the cross-sectional nature of the data, other promising risk covariates

were excluded in order to avoid such causal ambiguity, for example, marijuana offers, association with deviant peers, child-parent conflict, among others.

Table 4-I presents the results for the final model⁴. The strongest predictors are: having started smoking prior to the past 12 months, sensation seeking, age, and having started drinking prior to the past 12 months, all of which are youth characteristics and behaviors. To ease interpretation, the last column presents the adjusted odds ratio estimates. Children who had started using cigarettes prior to the past year were nearly four and a half times more likely (i.e., the odds ratio) to use marijuana in the past year than were children who had not started smoking prior to the last 12 months. Each 1-point increase in the child’s sensation-seeking tendencies was associated with an increase of 116 percent in the odds of marijuana use in the past 12 months. Each 1-year increase in age was associated with a 42 percent increase in the odds of marijuana use in the past 12 months. Children who had started drinking prior to the past year had twice the odds of using marijuana in the past year, than did children who had not started alcohol use before that period. Children living in large urban areas had 31 percent greater odds of having used marijuana in the past year than children living in towns and rural areas.

Table 4-I. Youth and parent covariates for youth past year marijuana use

	Estimate	Standard error	Wald χ^2	Significance level	Odds ratio ¹
Intercept	-9.9651	.5842	290.9522	<.0001	
Youth covariates					
Age (12-18)	.3530	.0323	119.2926	<.0001	1.4233
Sensation seeking (high versus low)	.7730	.0692	124.8318	<.0001	2.1663
Started smoking 12+ months ago	1.4890	.1250	141.9463	<.0001	4.4327
Started drinking 12+ months ago	.7655	.1216	39.6234	<.0001	2.1501
Urbanicity 1 (urban vs. rural)	.2704	.0815	11.0169	.0009	1.3105
Urbanicity 2 (suburban versus rural)	-.0036	.0852	.0018	.9661	.9964
Parent covariates					
Marijuana use in past 5 years	.3361	.1678	4.0142	.0451	1.3995
Cigarette use in past month	.4127	.1233	11.1949	.0008	1.5109
Had no drink in past month	-.1727	.1180	2.1418	.1433	.8414
Attendance at religious services	-.0943	.0656	2.0703	.1502	.9100
Rating of importance of religion	-.0768	.0713	1.1595	.2816	.9261
Shares parenting with other adult in household	-.4396	.1186	13.7378	.0002	.6443

¹ Likelihood of a youth using marijuana in the past year.

The strength of parental factors included in the model was, overall, of lower magnitude and some variables did not achieve statistical significance at the conventional level ($p < .05$) in the final model. Children from households in which parenting is shared have only 0.64 times the odds of using

⁴ With regard to the analytical procedure, the data set was split into 10 random groups; one of these was randomly dropped, and a logistic regression model was fitted to the remaining 9 groups. The fitted model was then used to assign the risk scores of persons in the omitted group. The logistic regression model was run so that each of the 10 groups was dropped in turn, resulting in a cross-predicted risk score for every person in the sample. In a second step, all 10 models were rerun using only variables that had been found to be significant in any of the previous analyses. Coefficients were averaged across these latter 10 models, and they were the basis for the cross-predicted probability.

marijuana in the past year as children living in single parent households. Children whose parent reported tobacco use in the past month had 1.5 times greater odds of using marijuana in the past year than children whose parent had not smoked cigarettes in the preceding month. Likewise, parental marijuana use was associated with a 39 percent increase in the odds of child past-year marijuana use.⁵

Across the first three NSPY waves of data collection, the sample used to develop the risk model, only about 11.5 percent of youth reported marijuana use during the preceding year. Given such a low base rate, the risk probabilities for nonusers tend to be fairly low. The average 12- to 18-year-old had about a 12 percent predicted probability of annual marijuana use, with half of the youth having less than a 4 percent risk of use.

About a third of the sample across four waves were classified as at higher risk (set at having a risk of use equal to or greater than 8 percent). While an 8 percent cutoff seems low, this measure represents a relative risk and not an absolute risk, hence the use of the terms “higher” and “lower.” There are, nevertheless, considerable differences in youth reports of marijuana and inhalant use by risk group. Because child’s age is an important covariate in the risk model, it is important to determine whether the differences by risk group do not disappear when controlling for age. Table 4-J presents the results for different measures of marijuana use by age and risk subgroups.

Table 4-J. Percent of youth reporting marijuana use by age and risk subgroup

Use measure	Youth characteristics		Percent of youth reporting use			
			Year 2000 Average Waves 1 & 2	Year 2001 Average Waves 3 & 4	Year 2000 to 2001 % change	95% CI on 2000-2001 change
Lifetime	12 to 13	Higher	34.1	22.4	-11.7	-24.7 to 1.3
		Lower	2.1	2.1	-0.1	-1.3 to 1.2
	14 to 18	Higher	49.3	52.0	2.7	-2.3 to 7.7
		Lower	5.3	6.9	1.6	-0.9 to 4.1
Past year	12 to 13	Higher	23.0	18.4	-4.6	-16.0 to 6.7
		Lower	1.5	1.3	-0.2	-1.3 to 0.8
	14 to 18	Higher	37.2	36.0	-1.2	-6.2 to 3.8
		Lower	3.4	4.9	1.5	-0.6 to 3.6
Past month	12 to 13	Higher	11.3	6.2	-5.1	-13.8 to 3.6
		Lower	0.4	0.6	0.2	-0.3 to 0.8
	14 to 18	Higher	17.8	18.9	1.1	-3.7 to 5.9
		Lower	1.0	2.4	1.4	-0.1 to 2.9
Regular	12 to 13 ¹	Higher	5.2	2.3	-2.9	S¹
		Lower	0.0	0.1	0.1	S¹
	14 to 18	Higher	14.7	14.9	0.2	-3.6 to 4.0
		Lower	0.4	1.8	1.5*	0.2 to 2.8

¹ Confidence interval suppressed because of small sample sizes.

* Between year difference is significant at $p < .05$.

⁵ Covariates that did not make it into the risk measure are wave, youth gender, youth race/ethnicity, parent binge drinking in past 30 days, age of parent, parental education, and annual household income.

4.7 The Effects of Risk Group on Change in Marijuana Use

With only one significant change for regular marijuana use among older youth at lower risk, there do not seem to be important differences in trends by risk group. There are, however, important differences in levels of use. Marijuana use reported by children at higher risk tends to be about 10-fold that reported by children at lower risk. This is true for lifetime, past year, and past month marijuana use, and across age groups. For example, among 12- to 13-year-olds, 0.6 percent of children at lower risk and 6 percent of children at higher risk reported past month marijuana use in 2001. Among the older group, a little more than 2 percent of children at lower risk and nearly 19 percent of children at higher risk reported past month use in the same period.

In addition to examining cross-sectional trends, subgroup analyses by risk probabilities can be useful for studying changes in marijuana use over time. Excluding those who reported use at the first time point, children at higher risk do progress into use at greater rates than children at lower risk, as can be seen in Table 4-K. While 34 percent of nonusing children at higher risk had initiated marijuana use by Wave 4, only 7.5 percent of lower risk children had done so.

Table 4-K. Marijuana use at Wave 4 among nonusers at Wave 1 by risk

Had used marijuana at Wave 4	Risk Group	
	Lower % (CI)	Higher % (CI)
No	92.5 90.6 to 94.0	65.9 58.7 to 72.4
Yes	7.5 6.0 to 9.4	34.1 27.6 to 41.3

Due to the small number of cases in some cells, further breaking up the analysis by age groups was not possible. Thus, a logistic regression model was run to test whether the difference in initiation rates between higher and lower risk children holds up even when controlling for age. The predictive power of risk is only slightly diminished when age is included in the model.

Summary

Through the first 2 years of NSPY data collection, there are no significant reductions in marijuana use for any of the target age groups. There were, instead, small but significant increases in past month and regular marijuana use among 14- to 15-year-olds. With regard to inhalant use, there was a small but significant decrease in lifetime use for all youth aged 12 to 18 years.

The NSPY data collection covers the period from November 1999 through December 2001, substantially parallel to Phase III of the National Youth Anti-Drug Media Campaign. This analysis could not detect changes if they had already occurred before the initiation of Phase III, for example, with the initiation of the national broadcasts in Phase II at the beginning of 1998. However, MTF data do cover that earlier period. MTF reports indicate that marijuana use had been stable from 1998 through April 2001, the end point for currently available data. The NSPY results for lifetime inhalant use were consistent with the pattern of declines in MTF inhalant use reports. However, the MTF results make it clear that a downward trend began several years before the initiation of the Campaign.

Youth reports of receiving offers of marijuana were stable. There was no statistically reliable evidence that the rate of offer refusal was changing during Phase III. Also, temporal order of the association between offers of marijuana and use was further clarified in analyses of the differences in marijuana use by Wave 4 among nonusing children who reported receiving offers at Wave 1.

Previous reports in this series have noted the strong association of marijuana use with age and with sensation seeking. In the current report, these factors are incorporated into a measure of risk that is even more strongly associated with marijuana use across measures and age groups. There are substantial differences in levels of use of both marijuana and inhalants by youth stratification into higher and lower risk subgroups. Moreover, longitudinal analyses show a strong association between predicted risk among nonusers at Wave 1 and progression into marijuana use by Wave 4.

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5. Campaign Effects on Youth

The primary audience for the Campaign is young people, with some focus on youth in the early teen years who are 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. Although the Campaign has at times focused on a variety of drugs (methamphetamines, 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. Marijuana is thus the focus of the analyses presented here, and some attention is also paid to inhalants.

In part, the Campaign has aimed to affect youth drug use through influencing the behavior of parents and other adults important in youths' lives. Increased adult engagement in youths' lives is accepted as an important intervention in preventing drug use. The success of the Campaign in reaching and affecting adults is discussed in Chapter 6. However, the Campaign also 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 evidence for changes in drug use over Phase III of the Campaign. There was inadequate evidence to support a claim of overall change in marijuana use thus far. However, there was a statistically significant increase in regular and in past 30-day use among 14- to 15-year-olds. 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. 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?

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, that is, a trend favorable to the campaign, 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 trend alone won't 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 than to have to explain why the lack of such a 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.

For a favorable trend to be more firmly 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 (i.e., that youth who reported seeing Campaign ads two or three times a week are more likely to believe, for instance, that there were negative outcomes of marijuana use than those who reported ad exposure less than once a week). However, even were such associations 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 detectable through individual level comparisons.

The third concern in making inferences from cross-sectional associations 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 idea 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. Therefore, in the face of significant associational results, it will be necessary to have data that will give evidence of causal order.

With the Wave 4 data collection, the Campaign now has access to over-time, cohort data, with youth interviewed at Wave 1 having been re-interviewed at Wave 4. As previously described in Chapter 2, the primary longitudinal analysis is lagged analysis. This examined the association between exposure at Wave 1 and outcomes measured at Wave 4. A causal inference from the lagged association is at risk of possible effects of confounders, as are the cross-sectional analyses. The same statistical procedure, propensity scoring, was used to address those concerns. It is described in Appendix C.¹ With these lagged associations, we are able to establish that any observed association between exposure and the later outcome cannot be the result of the outcome affecting exposure. Any lagged association would either reflect delayed effects of exposure at Wave 1 directly on outcomes after Wave 1, or that the effects of exposure at Wave 1 would reflect continuing levels of subsequent exposure through Wave 4 which, in turn, affects outcome at Wave 4. Both of these routes are consistent with a claim of influence of exposure on outcome.

The additional explanatory power gained by the longitudinal associations is critical. This followup data can serve to sort out with some confidence the causal order between variables. Thus, the

¹ The lagged association would ordinarily be controlled for the Wave 1 value of the outcome measures. This could not be done for the whole sample, in this case, because the youth who were aged 9 to 11 at Wave 1 but older than 12 at Wave 4 did not receive the full battery of outcome questions at Wave 1. Insofar as we know this should not bias the results, since as we have shown previously and show again in this report, there is no association between simultaneously measured exposure and outcome. Thus the Wave 1 outcome could not account for the Wave 1 exposure–Wave 4 outcome association. However, since we do not have most such measures for the 9- to 11-year-olds, we cannot be absolutely sure that the lack of simultaneous association would hold for them as well. However, for the Intention to Use Marijuana measure we do have data from the 9- to 11-year-olds in Waves 2 and 3, and there is no simultaneous association between exposure and intention for those youth. In addition, analyses were run including only those who were 12 to 18 at Wave 1 and thus who had all of the outcome measures at baseline. Those results are presented as well, although they cannot be informative for the younger children.

longitudinal analyses for the first time included in this chapter address one major concern raised above about making causal claims from cross-sectional associations. The remaining challenge to a claim of causal influence of exposure on outcome is that there was some additional confounder, not measured at Wave 1, which influenced exposure at Wave 1 and outcome at Wave 4, but not outcome at Wave 1.

The best cross-sectional evidence consistent with a Campaign effect is an association of reported exposure to the Campaign with the target outcomes statistically controlled for likely confounders. If this is accompanied by evidence of a favorable trend in the outcome, the argument that there was a Campaign effect is strengthened. This report adds longitudinal analyses to these methods. Evidence for a lagged effect would allow a clearer understanding of the causal order between exposure and outcomes.

The overall analysis focuses on effects among current nonusers of marijuana who are 12- to 18-year-olds. Also, baseline current users do not receive a great deal of attention in the presentation. The Campaign would like to increase the resistance of these youth to use of marijuana. However, there are not enough of them in the samples, particularly at younger ages, to provide very much statistical sensitivity to their changes. Although 40 percent of 16- to 18-year-olds report prior use, fewer 12- to 13-year-olds and 14- to 15-year-olds report use. Therefore, analyses with those samples will only be able to detect very large changes in outcomes.

In addition to the overall analysis, this chapter presents trend and cross-sectional associational results for subgroups of youth. The subgroup analyses are used for two purposes. If there is an overall effect for all 12- to 18-year-olds, there is a search for evidence that the trends or the association is significantly larger or smaller for particular groups. If there is no overall effect, the subgroups are examined to see if there is evidence of effect for only a subpopulation. By contrast with previous reports, this chapter will include 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 Chapter 4. Subgroups' differences are noted when they show a consistent pattern. All trend and cross-sectional associational analyses are fully presented in the Detail Tables and summarized in the text. The longitudinal analyses are restricted to overall analysis and analyses for some subgroups.

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 we tend to downplay individual significant effects, and rather look for consistent patterns of effects.

At this writing, only data from the Wave 1 to 4 longitudinal sample are available, approximately 40 percent of the eventual full sample. The sample is not large enough for overly detailed subgroup analysis, although analyses by gender, age, and risk subgroups are presented, when appropriate. In addition, the longitudinal results are presented only in the text and in text tables. For the next semi-

annual report, when longitudinal data will be available for the entire youth and parent sample, the full range of subgroup analyses, including those for race–ethnicity will be presented.

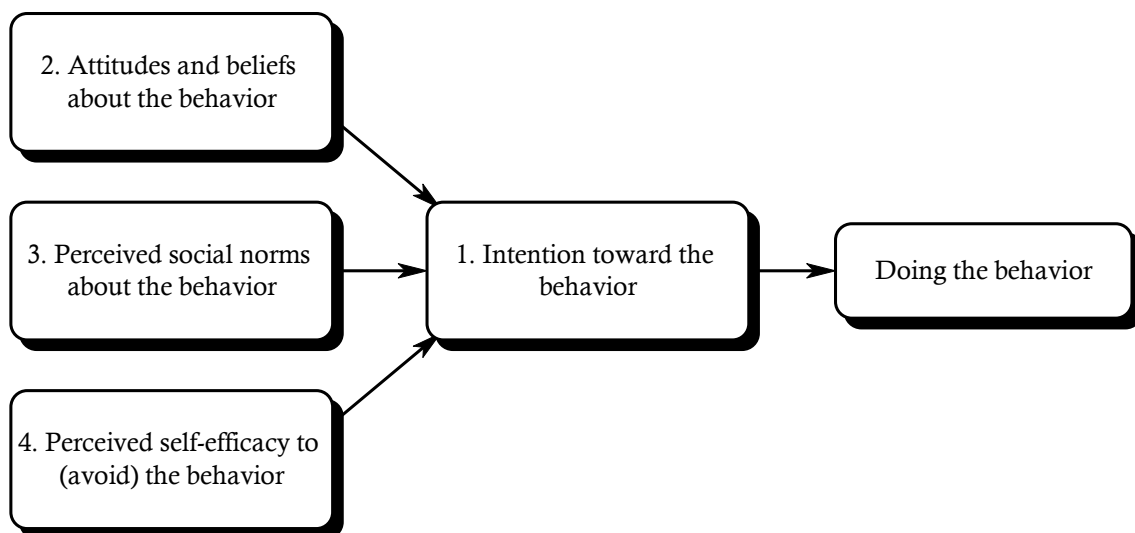
5.2 Development of Overall Scales, Combining Trial and Regular Use, and Summarizing Multiple Related Items

The Detailed Tables provide information about trends in a total of 34 cognitive outcomes related to use of marijuana and 6 outcomes related to use of inhalants. 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. The indices 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



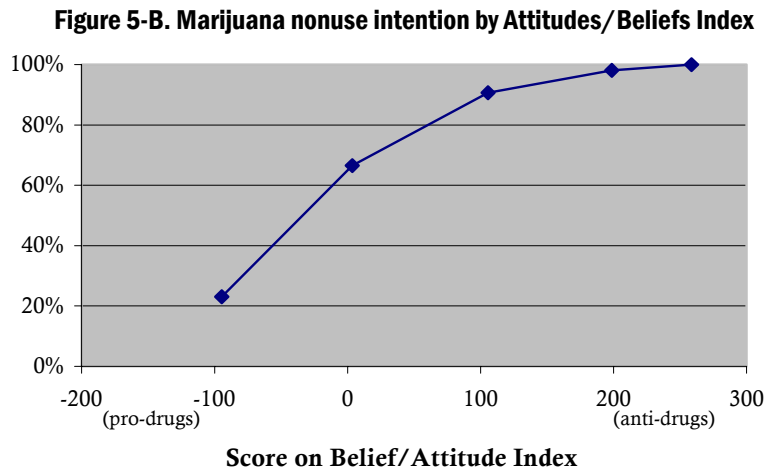
The analysis of marijuana cognitive outcomes focuses on four measures that correspond to the expected four predictors of behavior:

- **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, 82 percent, of current nonusers 12 to 18, said, “definitely not.” In the analyses below, this group is compared to the 18 percent of nonusers who were not definite in their intended rejection of use. It is worth noting that this measure is highly predictive of future use. Nonusers at Wave 1 were divided into two groups; those who said they definitely would not use and the rest. Of those who said definitely not, about 14 percent said they had used by Wave 4; of those who gave any other answer (most often probably not) 46 percent said they had initiated use by Wave 4. (Only youth 12 and over at Wave 1 were included in this analysis.)
- **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 nonusing respondent was randomly asked one of the eight belief sequences. They were also each asked two questions that assessed overall attitude toward either “once or twice” use or regular use. All of the youth with prior use experience were asked about the consequences of and attitudes toward regular use.

It is useful to look at the attitudes and beliefs about the two behaviors—using once or twice, and using regularly—as distinct. In the previous reports, analysis focused on distinguishing between the two sets of outcomes. However, beginning with the Third Semi-Annual Report, it was decided to sacrifice the distinctions to allow the creation of a single index to capture beliefs and attitudes about marijuana. Since youth who have never used marijuana, referred to in this report as “nonusers,” were randomly assigned to answer questions about “once or twice” or regular use, it was possible to equilibrate the two sets of responses on a single scale. This permitted the maximization of the number of youth who could be studied in a particular analysis and thus the power to detect an effect if any were present.

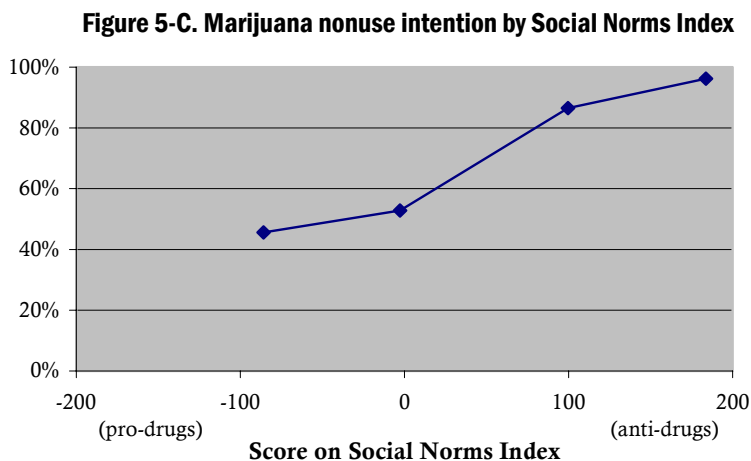
The following steps were used to create the index. All nonusers were divided into two groups: those who had been randomly assigned to answer the questions about “once or twice” use, and the rest who were assigned to answer the questions about regular use. Each subgroup was then used in separate analyses in which intention to use was predicted from the eight consequence beliefs and two attitudes in a logistic regression equation. The regression coefficients from the prediction equation were then used to weight each of the items for a summed index. The weights derived from the nonusers’ equations were also used to construct index scores for the population of prior users to ease interpretation. Each of the summed indices was then calibrated so that its mean and standard deviation were equal to 100 for the 12- to 18-year-old nonusers at Wave 1. Then the two indices were treated as equivalent to a single index with higher scores corresponding to more anti-drug attitudes and beliefs. This index could be used for all respondents, regardless of which sequence of questions they answered. The development of this and each of the following indices is described in more detail in Appendix E.

The summed Attitudes/Beliefs Index, as expected, was substantially associated with the intention to use marijuana in the next year. Figure 5-B presents that relationship graphically. Only 23 percent of those with the lowest scores on that index said “definitely not” to marijuana use in the next year, while almost 100 percent of those who were at the highest levels rejected such use.



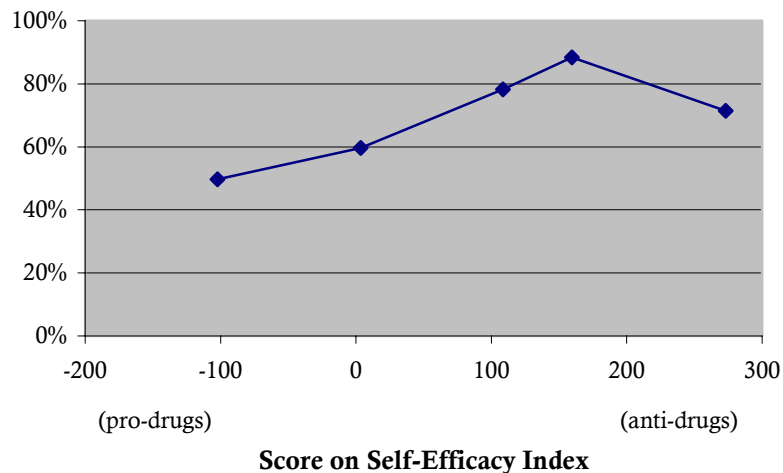
- Perceived social norms.** The perceived Social Norms Index was formed in a parallel way to the Attitudes/Beliefs Index. There were five parallel questions that assessed social normative pressure with regard to each of “once or twice” and regular use of marijuana. They asked about the perception of 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 so strong as that between the Attitudes/Beliefs Index and intention (Figure 5-C).



- 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. Once again, 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 similarly, but less powerfully, than the other two indices (Figure 5-D).

Figure 5-D. Marijuana nonuse intention by Self-Efficacy Index



5.3 Trends in Drug Attitudes and Beliefs and Intentions about Use of Marijuana among Nonusing 12- to 18-Year-Olds

This section covers trends in intentions about trial use, attitudes, and beliefs, perceived social norms and self-efficacy about use across NSPY waves. The trends are broken out by age. It also discusses the evidence for diversity in trends across various subgroups.

All indices are scaled so that a higher score indicates stronger anti-drug attitudes, beliefs, and intentions.

5.3.1 Intentions About Marijuana Trial Use by Age and by Wave

There are no statistically significant changes in intentions to use marijuana once or twice over the four waves of measurement among prior nonusers. Table 5-A presents these data. (See also Detail Table 5-1.) All of the Wave 1 to Wave 4 changes are small and their confidence intervals include zero. Interestingly, there had been statistically significant change between Waves 1 and 2 in intentions for the 12- to 18-year-olds (the change from 85.9% to 89.1% that appears in the table), but that favorable change was completely counterbalanced by a reversal between Waves 2 and 3. This pattern of reversal in change is repeated in the tables presented below. While percentages rose again slightly in Wave 4, the overall trend is statistically flat in the percent of youth reporting they definitely will not use

marijuana in the next year. The possible explanations for this pattern are considered in the discussion section of this chapter.

Table 5-A. Trends in intentions to use marijuana once or twice for nonusers, by child age

Age group	Percent of nonusers saying “definitely not”							
	Wave 1 11/99 – 6/00 (%)	Wave 2 7/00 – 12/00 (%)	Wave 3 1/01 – 6/01 (%)	Wave 4 7/01 – 12/01 (%)	Year 2000 Average Waves 1 and 2 (%)	Year 2001 Average Waves 3 and 4 (%)	Year 2000 to 2001 % Change	95% CI on 2000-2001 Change
12 to 13	91.7	92.9	90.1	91.6	92.3	90.9	-1.4	-3.8, 0.9
14 to 15	83.3	86.8	85.4	82.2	85.1	83.8	-1.3	-5.2, 2.7
16 to 18	82.1	87.3	80.8	86.0	84.7	83.5	-1.2	-5.7, 3.4
12 to 18	85.9	89.1	85.8	86.8	87.5	86.3	-1.2	-3.3, 0.8

“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. 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; ever use rates start at 2 percent among 12-year-olds and rise to 48 percent among 18-year-olds.

Also, there is some age association in these responses with 16- to 18-year-olds less likely to say definitely not than 14- to 15-year-olds who, in turn, are less likely to reject use than 12- to 13-year-olds. However, the age effects are understated in this table, particularly with regard to the responses of 16- to 18-year-olds because the table presents only the responses of nonusers. Since 40 percent of 16- to 18-year-olds were prior users, the numbers presented here are not reflective of the intentions of all youth in the age group. Overall, among nonusers, 92 percent of all 12- to 13-year-olds, 85 percent of all 14- to 15-year-olds, and 84 percent of all 16- to 18-year-olds say “definitely not” to this question. Overall, among both prior and nonusers, 89 percent of all 12- to 13-year-olds, 75 percent of all 14- to 15-year-olds, and 61 percent of all 16- to 18-year-olds say “definitely not” to this question.

5.3.2 Attitudes/Beliefs by Age and by Wave

The results for the Attitudes/Beliefs Index show no overall effects, but they do show an effect for one age subgroup, and that is toward a less anti-drug view. Table 5-B presents the results for each age subgroup and the entire sample of 12- to 18-year-olds. (See also Detail Table 5-2.) Statistically significant findings are presented in bold typeface.

Table 5-B. Trends in Attitudes/Beliefs Index about marijuana use among nonusers by child age

Age group	Score on Index							
	Wave 1 11/99 – 6/00	Wave 2 7/00 – 12/00	Wave 3 1/01 – 6/01	Wave 4 7/01 – 12/01	Year 2000 Average Waves 1 and 2	Year 2001 Average Waves 3 and 4	Year 2000 to 2001 Change	95% CI on 2000-2001 Change
12 to 13	122.0	136.3	117.4	125.6	129.2	121.5	-7.8*	-14.8, -0.8
14 to 15	89.9	113.8	105.5	96.1	102.3	100.9	-1.5	-11.7, 8.7
16 to 18	85.9	97.4	78.3	91.5	91.5	85.1	-6.4	-20.2, 7.4
12 to 18	100.0	117.1	101.9	105.1	108.7	103.5	-5.1	-11.4, 1.1

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

* Between-year difference significant at p<0.05.

Table 5-B shows no statistically significant trend for the full sample comparing 2000 with 2001. However, the 12- to 13-year-old subgroup shows a decline in anti-drug beliefs (i.e., an unfavorable trend). This should be understood in the context of changes over each of the Waves. The change from Wave 1 to Wave 2 was favorable and statistically significant, as had been reported in the Wave 2 semiannual report. Indeed the Wave 1 to Wave 2 shift was favorable for every age group. However, every age group went in the opposite direction between Wave 2 and Wave 3. The shifts from Wave 3 to Wave 4 were not significant. Overall this complex pattern produced the summary year-to-year decline for the 12- to 13-year-olds.

Table 5-B shows a clear age gradient, despite the omission of marijuana users from the analysis, with older nonusers expressing weaker anti-drug sentiments than younger nonusers. On average across Waves 3 and 4, 12- to 13-year-olds had an index score of 121, while 16- to 18-year-olds had an index score of 85 (Detail Table 5-2).

5.3.3 Perceived Social Norms about Marijuana Use by Age and by Wave

With statistically significant overall effects as well as significant effects for two out of three age groups, the trends in perceived social norms follows the general pattern observed for both previous indices, only more strongly. Table 5-C presents the essential results with additional detail presented in Detail Table 5-3. The early, statistically significant positive change between Waves 1 and 2 was largely reversed by Wave 3, with only a nonsignificant and negligible positive trend for 14- to 15-year-olds remaining.

Table 5-C. Trends in Social Norms Index about marijuana use among nonusers by child age

Age group	Score on Index							
	Wave 1 11/99 - 6/00	Wave 2 7/00 - 12/00	Wave 3 1/01 - 6/01	Wave 4 7/01 - 12/01	Year 2000 Average Waves 1 and 2	Year 2001 Average Waves 3 and 4	Year 2000 to 2001 Change	95% CI on 2000-2001 Change
12 to 13	131.5	142.3	131.5	127.5	137.0	129.5	-7.5*	-14.6, -0.4
14 to 15	87.9	106.4	106.0	90.3	97.5	98.2	0.7	-10.6, 12.0
16 to 18	76.9	91.6	68.0	73.1	84.1	70.7	-13.5*	-25.8, -1.2
12 to 18	100.0	114.9	104.2	98.1	107.5	101.1	-6.4*	-12.2, -0.5

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

* Between-year difference significant at $p < 0.05$.

There is a significant overall trend of declining anti-marijuana social norms from Year 2000 to 2001 for all 12- to 18-year-olds. There is also a significant downward trend for 12- to 13-year-olds and 16- to 18-year-olds.

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 77 across the four waves; the 12- to 13-year-olds scored 56 points higher. This difference is even larger if both users and nonusers are considered together. All 12- to 13-year-olds had a social norm score of 127. All 16- to 18-year-olds had a social norm score of only 29.

5.3.4 Perceived Self-efficacy about Marijuana Use by Age and by Wave

The final 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. The overall results for the 12- to 18-year-olds as a group do not show significant change between Years 2000 and 2001. However, the age groups show different trends. The 14- to 15-year-olds display a significant improvement over the time of the Campaign while the 16- to 18-year-olds and 12- to 13-year-olds do not show any significant change. (Table 5-D and Detail Table 5-4).

Table 5-D. Trends in Self-Efficacy Index about marijuana use among nonusers by child age

Age group	Score on Index							
	Wave 1 11/99 - 6/00	Wave 2 7/00 - 12/00	Wave 3 1/01 - 6/01	Wave 4 7/01 - 12/01	Year 2000 Average Waves 1 and 2	Year 2001 Average Waves 3 and 4	Year 2000 to 2001 Change	95% CI on 2000-2001 Change
12 to 13	99.8	102.6	94.9	107.1	101.3	100.9	-0.3	-7.1, 6.45
14 to 15	89.2	103.3	113.8	110.0	96.6	112.0	15.4*	3.1, 27.7
16 to 18	112.2	109.6	92.1	124.3	110.9	108.7	-2.2	-15.5, 11.2
12 to 18	100.0	104.9	100.6	113.4	102.5	107.0	4.6	-1.7, 10.8

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

* Between-year difference significant at p<0.05.

It is interesting to note the differences between self-efficacy and the other outcome measures. Nonuser anti-marijuana attitudes and beliefs significantly declined for the 12- to 13-year-old youth from 2000 to 2001. Similarly, social norms decreased significantly for all youth ages 12 to 18 years and for 12- to 13-year-olds and 16- to 18-year-olds. By contrast, self-efficacy trends appear to go in the opposite, more desirable direction for 14- to 15-year-olds.

5.3.5 Evidence for Diversity in Trends in Cognitions about Marijuana Use

Table 5-E summarizes the results separately for 12- to 18-year-old females and males across the four outcome measures. Clearly, the trends are most notable among females for whom three of four are statistically significant. Except for the Self-Efficacy Index, each shows a significant negative change from 2000 to 2001.

Table 5-E. Cognitions about marijuana use among 12- to 18-year-old nonusers by gender

Measure	Score on Index							
	Wave 1 11/99 - 6/00	Wave 2 7/00 - 12/00	Wave 3 1/01 - 6/01	Wave 4 7/01 - 12/01	Year 2000 Average Waves 1 and 2	Year 2001 Average Waves 3 and 4	Year 2000 to 2001 Change	95% CI on 2000-2001 Change
Female								
No intentions (%)	87.0	89.7	84.4	86.5	88.4	85.5	-2.9*	-5.5,-0.3
Attitudes and Beliefs	104.5	123.8	99.8	109.5	114.3	104.6	-9.8*	-18.5, -1.0
Social norms	108.4	124.0	111.2	103.2	116.3	107.3	-9.0*	-16.9, -1.2
Self-efficacy	108.5	106.6	96.3	117.7	107.5	106.9	-0.7	-9.1, 7.7
Males								
No intentions (%)	84.8	88.6	87.2	87.1	86.7	87.1	0.4	-2.6, 3.5
Attitudes and Beliefs	95.5	110.3	104.0	101.0	103.0	102.5	-0.5	-7.98, 6.94
Social norms	91.6	105.7	97.0	93.3	98.7	95.1	-3.6	-12.87, 5.60
Self-efficacy	91.5	103.2	104.9	109.4	97.4	107.2	9.8*	1.95,17.57

* Between-year difference significant at p<0.05.

The findings for boys are quite different. Over the 2 years, they showed no statistically significant change for intentions, for attitudes and beliefs, or for social norms. However, male youth did show statistically significant improvement on self-efficacy. While the gap between girls and boys appears to have narrowed between 2000 and 2001, girls still perceive themselves as better able to reject the use of marijuana.

Altogether, there are seven subgroups of three grouping variables (two sexes; three race/ethnicity groups; two risk groups²). These groups are examined across four measures, making a total of 28 trend comparisons. Six of them were significant (probably more than would be expected by chance), two in a favorable direction and four in an unfavorable direction.

5.4 Cross-Sectional (Concurrent) Associations of Anti-Drug Advertising Exposure with Attitudes, Beliefs, and Intentions about Marijuana Use among 12- to 18-Year-Old Nonusers

The data show no trends overall, and within subgroups show only scattered evidence of favorable trends matched by more frequent evidence of unfavorable trends. The next step in the analysis turns to the examination of associations of recalled exposure and the four major outcomes. In contrast to the trend data, the associational evidence speaks directly to the influence of individual exposure to the Campaign. The analyses below show only rare evidence of association, and the observed associations are more often unfavorable than favorable.

Chapter 3 describes the two types of exposure measures available for analysis. One, called general exposure, represents the sum of recalled exposure in recent months to anti-drug 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 2 months before the interview.

Table 5-F presents the exposure levels for the 12- to 18-year-old population overall (i.e., across Waves 1 through 4). The distribution of exposures among nonusers, who are the focus of the analyses reported below, are very close to these overall estimates.

Table 5-F. Exposure per month reported by 12- to 18-year-olds

	<1 exposure (%)	1 - 3 exposures (%)	4 - 11 exposures (%)	12+ exposures (%)
General exposure		26.3	23.7	50.0
Specific exposure	23.3	34.8	33.1	8.8

The general exposure measures display substantially higher levels than do the specific exposure levels. For example, 50 percent of youth reported general exposure 12 or more times per month, but less than 9 percent reported specific exposure at that level. There are three factors that may contribute to that difference: the general exposure measure included more sources than the specific exposure measure;

² The Detail Tables present trend information for high and low 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 substantial redundancy of reporting, the text includes analysis of only the risk subgroups.

the general exposure measure allows recall of advertising that was directed to other audiences, while the specific exposure measure focuses only on television³ ads directed to the youth; and finally, the general exposure measure may be less demanding since it does not require the respondent to claim that he or she has 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 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. However, the highest exposure group for the specific exposure measure is quite small, so in many of the tables the estimates for outcomes for this group have very wide confidence intervals. Usually the specific exposure claims must rely on the differences among the other three exposure groups.

In the exposure analyses that follow, the effects are corrected for the influence of confounder variables using the propensity scoring procedures described in Appendix C. They are the 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 cross-sectional analyses of exposure include data from all four waves, but are restricted to 12- to 18-year-olds who reported never using marijuana. Each of the detail tables that present these associational results (Detailed Tables 5-33 through 5-40) 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 four different measures of Campaign effect. The first, called the direct campaign effect, compares the score on the outcome variable (e.g., intention to use marijuana even once or twice in the next year) for the entire sample with the score achieved by the lowest exposure group. It asks whether the average person was different from those who had minimal exposure. It is the best estimate of the average effect of the Campaign across the population. The second measure is a significance test that indicates whether there is an overall pattern for those who have higher exposure to be higher on the outcome variable. Each table provides the probability statistic in this column where the test for monotonic association (Jonckheere-Terpstra) is significant at the $p < 0.05$ level. This is the test used to determine whether there is an overall association between exposure and the outcome. The decision to focus on this test reflects an assumption that if the Campaign is having an effect, it would reflect a dose

³ 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, 3, and 4, 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).

response relationship, that is, at every higher level of exposure the effect should be as large or larger.⁴ In addition, in order to have an estimate of the magnitude of association, the Spearman rank correlation coefficient (ρ) is presented. Like the Pearson correlation coefficient, ρ varies from -1 to $+1$, with 0 being no relationship.⁵ The final measure, called the maximum campaign effect, compares youth with the highest and lowest levels of exposure. De facto it answers the question: If the Campaign had been able to give everyone 12 or more exposures per month, how much of an effect would there have been?

5.4.1 Overall Analyses of Four Cognitive Measures by Exposure

After controlling for confounders by propensity scores, there is no detectable cross-sectional association between either exposure measure and intentions to use marijuana for the entire Wave 1 through Wave 4 population of 12- to 18-year-old youth on any of the indicators of Campaign effect. (See Table 5-G and Detail Tables 5-33 and 5-34.)

Table 5-G. Exposure per month and intentions to use marijuana reported by nonuser 12- to 18-year-olds

Percent saying “definitely not” to likelihood of using marijuana even once or twice- overall average=86.8%								
	<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures	Direct effect (CI)	Monotonic trend	ρ	Maximum effect
General exposure	88.8		85.6	86.5	-1.9 -4.3 to 0.4	NO	-.03	-2.2 -5.4 to 0.9
Specific exposure	86.8	87.2	86.1	86.5	0.0 -2.6 to 2.7	NO	-.01	-0.3 -7.3 to 6.7

Similarly, there is no statistically detectable cross-sectional association of exposure and the Attitudes/Beliefs Index. This is shown in Table 5-H as well as in Detail Tables 5-35 and 5-36.

Table 5-H. Exposure per month and Attitudes/Beliefs Index among nonuser 12- to 18-year-olds

Score on Attitudes/Beliefs Index: average for the sample=106.1								
	<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures	Direct effect (CI)	Monotonic trend	ρ	Maximum effect
General exposure	107.7		104.9	106.7	-1.6 -9.6 to 6.4	NO	.00	-1.2 -11.5 to 9.1
Specific exposure	109.1	107.5	101.3	105.3	-3.0 -10.2 to 4.3	NO	-.02	-3.8 -18.9 to 11.3

The results for the cross-sectional association of Campaign ad exposure and the Social Norms Index are presented in Table 5-I. The overall results are consistent with the findings for the Attitudes/Beliefs Index: no detectable overall effect for youth aged 12 to 18 years. (See also Detail Tables 5-37 and 5-38.)

⁴ It is possible that the effect of the Campaign could be curvilinear, that is, that a moderate level of exposure produces an effect but with much higher doses of exposure the effect is reversed, in a boomerang phenomenon. The detail tables do provide estimates for outcomes at each level of exposure, and an informal search for curvilinear effects is possible. However, the authors made the a priori judgment that the expectation of the Campaign was that at each higher level of exposure the outcome would be at least as high as at the previous level, so the use of the overall test for monotonicity was the appropriate criterion for success.

⁵ Unlike the Pearson correlation, ρ does not assume that both exposure and the outcome are measured on interval level variables.

Table 5-I. Exposure per month and Social Norms Index among 12- to 18-year-olds

Score on Social Norms Index: average for the sample=104.1								
	<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures	Direct effect (CI)	Monotonic trend	rho	Maximum effect
General exposure	104.1		101.4	104.8	-0.3 -6.2 to 6.2	NO	.00	0.7 -7.1 to 8.5
Specific exposure	105.9	106.4	101.8	101.1	-1.8 -10.0 to 6.4	NO	-.03	-4.8 -17.9 to 8.3

The cross-sectional results for the self-efficacy scale are essentially consistent with the other three outcome measures. There is no monotonic trend, rho is close to zero, and there is no maximum effect. The only exception is for the direct effect estimate for the specific exposure analysis. Although this apparently favorable effect is marginally significant, it does not appear readily interpretable. The lowest and highest exposure groups are similar and the rho is zero. Table 5-J summarizes the self-efficacy results. (See also Detail Tables 5-39 and 5-40.)

Table 5-J Exposure per month and Self-Efficacy to Refuse Marijuana Index among 12- to 18-year-olds

Score on Self-Efficacy Index: average for the sample=105.4								
	<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures	Direct effect (CI)	Monotonic trend	rho	Maximum effect
General exposure	104.4		100.1	108.4	1.1 -5.5 to 7.6	NO	.00	4.1 -4.3 to 12.4
Specific exposure	111.8	102.4	105.0	112.5	-6.4* -12.7 to 0.0	NO	.00	0.8 -11.7 to 13.2

* Significant at p<0.05.

In conclusion then, there is no supportive evidence that cross-sectional or concurrent campaign exposure is associated either favorably or unfavorably with any of the four cognitive outcomes for the full sample of 12- to 18-year-olds. The next sections ask whether, in the absence of 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

The Campaign has been particularly focused on younger teens as its primary audience. Thus, there is a particular interest in showing that there are effects among that group, represented here by the youth aged 12 to 13. They are, in general, not at high immediate risk of drug use; 96 percent of them report having never used marijuana, and more than 90 percent of the current nonusers say they definitely won't use marijuana in the next year. However, they are maturing into the age when more of them will try marijuana and other drugs. Thus they are of primary importance as an audience for the Campaign, and separating the results of younger (12 to 13) and older (14 to 18) teens is, therefore, appropriate.

Detail Tables 5-33 through 5-40 present data for two age subgroups: youth aged 12 to 13 and youth aged 14 to 18. There are a total of 16 analyses presented: two age groups by two exposure measures by four cognitive measures. In that entire set there are two significant effects. One result, for 14- to 18-year-olds, illustrates the specific exposure effect seen in Table 5-K for 12- to 18-year-olds, where self-efficacy is highest for the lowest and highest exposure groups, suggesting that whatever that effect may have meant, it was primarily driven by the older youth. This nonmonotonic result does not permit

easy interpretation. The second result is an apparent unfavorable effect for general exposure on intentions to use marijuana for 12- to 13-year-olds. The results for both the general and specific exposure variables are presented in Table 5-K.

Table 5-K Exposure per month and intentions to use marijuana reported by 12- to 13-year-olds

Percent saying “definitely not” to likelihood of using marijuana even once or twice- overall average=91.6%								
	<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures	Direct effect (CI)	Monotonic trend	rho	Maximum effect
General exposure	94.4		90.5	91.0	-2.8* -4.7 to -0.9	YES*	-.05	-3.4* -5.9 to -1.0
Specific exposure	90.5	91.6	91.2	91.6	1.1 -2.3 to 4.4	NO	.01	1.0 -3.8 to 5.8

*Association significant at $p < 0.05$.

- All three of the effect estimators and the rho for general exposure are consistent with a small unfavorable Campaign effect for this subpopulation for this measure. However, the specific exposure measure shows no evidence of any effect whatsoever. There were no other significant exposure outcome associations for any of the other outcomes for either age group.
- The Campaign has also had a particular interest in reaching higher risk individuals. Accordingly, the Campaign has been designed with a recognition that youth vary in their risk of drug use and has identified a subgroup category of youth defined by their level of risk for marijuana use, as described in detail in Chapter 4. There was only one overall significant association for either of the risk subgroups. There were also significant “direct effects” for specific exposure with social norms and with self-efficacy, but absent any monotonic association, these are not easily interpreted (Detail tables 5-33 to 5-40).

In addition to the subgroup analyses by age and risk, for which the Campaign had clear expectations of subgroup effects, separate analyses were also performed for subgroups defined by gender and race/ethnicity. There were a total of 40 such subgroup analyses examined: five groups (defined by two genders and three race/ethnicities) by four outcomes by two exposure measures. Since there were no a priori hypotheses about which of these groups were more or less likely to show effects, the possibility of chance effects needs particular attention. With 40 tests, it might be expected that a few tests would be significant at the conventional level by chance. In fact, only one result was significant on one test. White youth showed an unfavorable direct effect for specific exposure and self-efficacy, but in the context of an overall nonmonotonic association, essentially repeating the odd result already shown above in Table 5-K (Detail Table 5-40). In sum, the analyses of subgroups, in tandem with the overall analyses, provide little support for cross-sectional or current effects of Campaign exposure, either favorable or unfavorable.

5.5 Summary and Discussion of Trend and Cross-sectional Results for Marijuana Cognitions

This section summarizes the trend and cross-sectional associational results presented thus far for marijuana cognitions. As noted above, the most desirable result for a claim of Campaign effects from these data would be a favorable trend on a target outcome, and a favorable association between exposure to the Campaign and the outcome. Table 5-L summarizes the results from the earlier parts of the chapter, which describe overall effects for the two age subgroups. The trends are significant for two of the outcomes for the 12- to 13-year-olds and for one outcome for the entire sample of nonusing

12- to 18-year-olds. Attitudes/beliefs and social norm trends are statistically significant for the youngest age subgroup and norms are also significant for all youth. Each of these trends is negative, that is, represent change in a pro-drug direction, across the 2 years.

Table 5-L. Summary of trend and association results for youth

Index	12-13			14-18			12-18		
	Trend	Association		Trend	Association		Trend	Association	
		General	Specific		General	Specific		General	Specific
Intention	NO	YES (neg.)	NO	NO	NO	NO	NO	NO	NO
Attitudes/Beliefs	YES (neg.)	NO	NO	NO	NO	NO	NO	NO	NO
Social Norms	YES (neg.)	NO	NO	NO	NO	NO	YES (neg.)	NO	NO
Self-Efficacy	NO	NO	NO	NO	NO	NO	NO	NO	NO

There was no evidence for monotonic associations overall, and only one for an age subgroup: the unfavorable association for 12- to 13-year-olds between general exposure and intentions. There was no accompanying significant decline in 12- to 13-year-old intentions to use marijuana.

The overall pattern of “NOs” in the table, along with the fact that the only statistically significant association is not accompanied by a corresponding significant trend over time, is not consistent with an inference of direct Campaign effects on youth. Additionally, the three significant trends evident in the table are not coupled with significant monotonic associations. Thus, the evidence does not support attributing these trends to the impact of the Campaign. Standing alone, these results do not support an inference of Campaign effects.

The trend and cross-sectional results alone do not support an inference of Campaign effects for the entire population or for the specific age subgroups presented in this table. Is it possible that there are effects that have been missed here? Throughout this chapter, there have been a few significant effects detected for subgroups of the population. Do the subgroup results suggest effects not seen for the overall population? The results are summarized in Table 5-M.

There are a total of 11 significant results out of 108 examined results. The trend data are perhaps most notable for the difference between girls and boys. Girls trend unfavorably on three outcome indicators excluding self-efficacy. At the same time, boys trend favorably on self-efficacy **only**. Low risk and sensation-seeking youth also trend favorably on self-efficacy only. However, none of these trends can be tied to exposure. Only one monotonic association was found, an unfavorable association of general exposure with intent to use among low risk youth. Since this was an isolated finding, we do not make too much of this. In general, the cross-sectional data do not support an inference of Campaign effects among subgroups, consistent with the findings on youth overall.

Table 5-M. Summary of trends and associations for marijuana cognitions by subgroups

		Intentions			Attitudes/Beliefs			Social Norms			Efficacy		
		Trend	Association		Trend	Association		Trend	Association		Trend	Association	
			General	Specific		General	Specific		General	Specific		General	Specific
Gender	Male	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES (pos.)	NO	NO
	Female	YES (neg.)	NO	NO	YES (neg.)	NO	NO	YES (neg.)	NO	NO	NO	NO	NO
Race/ Ethnicity	White	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	African American	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	Hisp.	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Risk score	High	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	Low	NO	YES (neg.)	NO	NO	NO	NO	NO	NO	NO	YES (pos.)	NO	NO
Sensation seeking	High	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	Low	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES (pos.)	NO	NO

5.6 Campaign Effects on Inhalant Intentions and Attitudes Among Prior Nonusers

During the Wave 3 data collection, the Campaign raised the profile of its anti-inhalant advertising, particularly those ads directed at parents, which might have been accessible to youth as well. About 43 percent of all radio and television GRPs for parents in Wave 3 related to inhalants. However, no parent anti-inhalant ad time was purchased in Wave 4. For youth, no anti-inhalant ads were run during Wave 3, and only a small amount of inhalant-specific advertising was directed toward youth in Wave 4 (about 4% of all youth-directed GRPs—see Table 3-I). This pattern of buys may not be consistent with expecting changes among youth in behavior or cognitions. Nonetheless, this section of the report examines change in inhalant cognitions across time.

The analysis of trends focuses on two summary measures. The first is parallel to the marijuana intentions index used in the previous sections. The analysis is limited to 12- to 18-year-old prior nonusers of inhalants. The second index sums four questions that addressed the youths' attitudes about inhalant use: disapproval of "once or twice" and regular inhalant use by others, and perception of risk of harm from once or twice and regular inhalant use. These questions were modeled on questions asked in the Monitoring The Future survey for many years. They contrast with the more personal and specific questions that were asked about the consequences of marijuana use and which made up the indices presented above. As with the marijuana Attitudes/Beliefs Index, the responses to the four questions were summed according to weights derived from the prediction of the intentions question in a logistic regression equation, and standardized to have a mean and standard deviation of 100 for 12- to 18-year-olds at Wave 1.

5.6.1 Intentions and Attitudes about Inhalant Use by Age and by Wave

There is no statistically significant change between years for any of the age subgroups in their intention to use inhalants in the next year. Almost all youth said they would not use in Year 2000 and

almost all youth said they would not use in 2001 (Table 5-N and Detail Table 5-27). This may be the result of a “ceiling effect”; the Campaign cannot show favorable effects because the criterion outcome is already so high.

Table 5-N. Trends in intentions to use inhalants once or twice by youth age

Age group	Percent of nonusers saying “definitely not”							
	Wave 1 11/99 - 6/00 (%)	Wave 2 7/00 - 12/00 (%)	Wave 3 1/01 - 6/01 (%)	Wave 4 7/01 - 12/01 (%)	Year 2000 Average Waves 1 and 2 (%)	Year 2001 Average Waves 3 and 4 (%)	Year 2000 to 2001 % Change	95% CI on 2000-2001 Change
12 to 13	95.4	95.5	94.1	94.7	95.4	94.4	-1.0	-2.8, 0.8
14 to 15	93.5	93.2	96.3	95.0	93.3	95.7	2.4	-0.1, 4.8
16 to 18	96.5	95.9	94.8	94.7	96.2	94.8	-1.4	-3.8, 0.9
12 to 18	95.2	94.9	95.1	94.8	95.1	95.0	-0.1	-1.3, 1.1

“How likely is it that you will use inhalants to get high, even once or twice over the next 12 months?”

Table 5-O shows only one statistically significant trend, that being a favorable change in the Attitudes/ Beliefs Index between 2000 and 2001 for 16- to 18-year-old youth (see also Detail Table 5-28). The index’s pattern also shows a little more variation by age: older youth tend to be slightly more accepting of inhalant use than younger ones though, in general, the age gradient is less clear cut than for marijuana. (On average, 12- to 13-year-olds had a score of 118, while 16- to 18-year-olds had a score of 97.) In fact, the age gradient “flips” in 2001, with 16- to 18-year-olds scoring nominally higher on the Attitudes/Beliefs Index than 14- to 15-year-olds.

Table 5-O. Trends in Attitudes/Beliefs Index about inhalant use by youth age

Age group	Score on Index among nonusers							
	Wave 1 11/99 - 6/00	Wave 2 7/00 - 12/00	Wave 3 1/01 - 6/01	Wave 4 7/01 - 12/01	Year 2000 Average Waves 1 and 2	Year 2001 Average Waves 3 and 4	Year 2000 to 2001 Change	95% CI on 2000-2001 Change
12 to 13	116.2	118.8	117.2	118.5	117.5	117.9	0.4	-6.0, 6.7
14 to 15	96.7	103.4	85.2	98.5	100.1	91.6	-8.5	-20.4, 3.4
16 to 18	90.3	91.1	105.6	100.3	90.7	102.9	12.2*	1.6, 22.8
12 to 18	100.1	103.5	102.2	105.1	101.8	103.7	1.9	-3.62, 7.4

Note: The index was standardized so 12- to 18-year-old nonusers had mean and standard deviation of 100 at Wave 1.

* Significant at p < .05

The overall trend for all nonusing 12- to 18-year-olds shows no statistically significant change across the four waves. However, the 16- to 18-year-olds show a significant favorable trend over the years of the Campaign, 2000 and 2001.

5.6.2 Evidence of Diversity in Trends

Aside from the age subgroup effects just described, there are no other detectable trend effects for any of the subgroups of interest (males vs. females, Whites versus African American vs. Hispanics, or among risk subgroups).

Although there are no differences in trends, there are sharp differences between high and low sensation seekers in both their intentions to use inhalants and their attitudes about inhalants. Among sensation seekers, 98 percent say they definitely won’t use in the next year; among high sensation seekers 92 percent, significantly less, reject such future use. Similarly low sensation seekers score 132 on the

Attitudes/Beliefs Index, in contrast to the high sensation seekers' score of 79. The identification of high sensation seekers as at greater risk of drug use is clearly reinforced by these results.

5.7 Longitudinal Associations of Anti-Drug Advertising Exposure with Attitudes, Beliefs, and Intentions about Marijuana Use among 12- to 18-Year-Old Nonusers

This section presents an analysis of cohort data: the youth who were interviewed at Wave 1 and again at Wave 4. With these youth, who were followed for an average of 1½ years, it is possible to examine whether level of exposure to advertising at Wave 1 predicts subsequent changes on the important outcomes. Given the lack of evidence of Campaign effects shown in the previous sections, finding evidence for a lagged effect on the cognitive outcomes and on reported marijuana use was unexpected. Initial analysis appears to indicate that the observed effect goes in an unfavorable direction: those who were more exposed to the Campaign at Wave 1 tended to move more markedly in a “pro-drug” direction as they aged than those who were less exposed.. Because these results are inconsistent with hypothesized Campaign influences and are hard to explain, they have been analyzed through a variety of procedures.⁶

The lagged exposure analysis commences with a display of the fully adjusted results for the 12- to 18-year-olds and then for two age subgroups, 12- to 13-year-olds and 14- to 18-year-olds. These analyses are adjusted for the complex sample design and the full set of potential confounders. The confounder adjustments follow the same procedures used for the cross-sectional association analyses, above, although the propensity scores used for adjusting were based on the specific Wave 1 exposure scores for this sample (see Appendix C). Only youth who were nonusers at Wave 1 and were reinterviewed at Wave 4 were available for this analysis. The number of youth from that wave who were in the highest exposure category on the specific exposure measure was small, particularly when analyses were done within age groups. As a result, in order to provide more stable estimates of outcomes within categories, the tables in this section use a three-category rather than the four-category specific exposure measure used elsewhere in this chapter. The basic pattern of results reported here was largely matched when the analyses were done with the four category measure.

Table 5-P presents the results of the lagged analysis for the sample of 12- to 18-year-old youth who have never used marijuana. The table shows one significant result, for the association of Wave 1 specific exposure with Wave 4 social norms. The youth who were higher on exposure at Wave 1 have less favorable social norms at Wave 4. The association has a negative rho of -.10, and it is roughly the same as the rhos for the 12- to 13-year-olds (-.08) and the 14- to 18-year-olds (-.09), presented in the subsequent tables. Because of smaller sample sizes those associations are not statistically significant.

⁶ An additional set of longitudinal analyses, not further reported, were also undertaken. In the previous reports it was found, as is also the case in the previous section of this report, that there was no cross-sectional association between exposure and outcomes. One possible explanation for that result was that the measures of exposure were not sufficiently strong to show such effects. It was then proposed that the measurement quality of the exposure measure be strengthened by taking an average exposure level across two Waves (in this case across Wave 1 and Wave 4.). The goal of this “stable exposure” analysis (in contrast to the “lagged exposure” analysis discussed in this section) was to make sure that the lack of association between exposure and outcome was not an artifact of inadequate measurement. However this concern largely disappears with the evidence from the lagged analysis presented in this section, where associations using the single Wave 1 measure of exposure are found. In that context it was no longer thought necessary to report fully the results of the association of the averaged measure of exposure with the Wave 4 outcome as had been planned. In fact, those analyses showed results essentially consistent with the cross-sectional results presented in the previous sections. There was no pattern of significant associations between the average of Wave 1 and Wave 4 exposure and the Wave 4 outcomes.

The results for respondents who were 12 to 13 years old and had never used marijuana at Wave 4 are displayed in Table 5-Q. The rhos are all negative, again, varying from -.01 to -.11. In every case, youth with each higher level of specific exposure report less positive cognitions. The tests for association of intention to use marijuana with both general exposure and specific exposure are statistically significant and negative as well.

Table 5-P. Exposure per month at Wave 1 and outcomes at Wave 4 among 12- to 18-year-olds who were nonusers of marijuana at Wave 1

Wave 4 Outcome (average)		Wave 1 Exposure				Spearman rho	Signif.
		<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures		
% (Not) intending to use	General exposure	78.8		81.2	76.2	-.03	NS
	Specific exposure	82.4	78.6	74.1		-.08	NS
Attitudes/Beliefs Index	General exposure	86.3		88.6	86.2	-.01	NS
	Specific exposure	89.1	90.0	77.3		-.03	NS
Social Norms Index	General exposure	81.6		88.3	76.7	-.03	NS
	Specific exposure	98.3	80.0	69.8		-.10	P=.01
Self-Efficacy Index	General exposure	96.8		112.9	105.1	.00	NS
	Specific exposure	114.5	104.4	99.2		-.04	NS

Table 5-Q. Exposure per month at Wave 1 and outcomes at Wave 4 among 12- to 13-year-olds who were nonusers of marijuana at Wave 1

Wave 4 Outcome (average)		Exposure at Wave 1				Spearman rho*	Signif.**
		<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures		
% Not intending to use	General exposure	92.7		91.8	85.4	-.10	P=.02
	Specific exposure	94.2	90.1	85.7		-.11	P=.02
Belief/Attitude Index	General exposure	126.1		129.8	111.1	-.07	NS
	Specific exposure	126.1	120.3	106.1		-.05	NS
Social Norms Index	General exposure	122.8		143.1	115.9	-.01	NS
	Specific exposure	137.1	120.2	112.4		-.08	NS
Self-Efficacy Index	General exposure	101.8		118.9	98.2	-.05	NS
	Specific exposure	112.6	104.2	96.2		-.05	NS

¹ Estimate is suppressed due to the small number of cases in cell.

* Spearman rho is an estimate of the association of two ordered variables and varies between -1 and +1.

** The significance is based on the Jonkheere-Terpstra test for monotonic association. NS denotes not significant at the 5 percent significance level.

The results for the 14- to 18-year-olds are displayed in Table 5-R. None of those results are statistically significant. The general exposure measures are not related to any of the outcomes. As noted above the social norms outcome, with a rho of $-.09$, is consistent with the effects for the entire sample, and thus is appropriately seen as a reliable effect.

Table 5-R. Exposure per month at Wave 1 and outcomes at Wave 4 among 14- to 18-year-olds who were nonusers of marijuana at Wave 1

Wave 4 Outcome (average)		Exposure at Wave 1				Spearman rho	Signif.
		<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures		
% Not intending to use	General exposure	71.3		76.9	71.5	.00	NS
	Specific exposure	75.4	74.4	68.3		-.06	NS
Belief/Attitude Index	General exposure	65.6		72.3	74.0	.02	NS
	Specific exposure	68.3	76.8	63.6		.00	NS
Social Norms Index	General exposure	60.2		66.7	57.4	-.02	NS
	Specific exposure	76.4	62.5	49.5		-.09	NS
Self-Efficacy Index	General exposure	94.2		110.6	108.5	.01	NS
	Specific exposure	115.7	104.4	100.6		-.03	NS

The negative results for the social norm measure across all of the youth, and for the intentions measure for the 12-13 year olds , after controlling for a wide variety of possibly confounding variables, are surprising and clearly undesirable from the perspective of the Campaign.. These results merited further careful examination. Therefore, three additional analysis paths were undertaken:

1. To make sure that the observed results did not appear only with the complex adjustment procedures that were implemented, the data were weighted to adjust for NSPY's sample design but not for confounder control (i.e., the CFP weights) and then re-analyzed. While the adjustments for confounders were based in statistical theory, it would provide additional strength if the apparent results did not only appear at the end of that process.
2. The association of Wave 1 exposure with the change in outcomes between Wave 1 and Wave 4 was also examined. The analyses presented in the previous tables were structured to examine the association of Wave 1 exposure with Wave 4 outcomes, controlling for Wave 1 confounders. However, the confounders did not include the Wave 1 measures of the outcomes. This was because the youngest children in the sample, those who were 9 to 11 at Wave 1, had been given a different questionnaire at Wave 1, which did not include all of the outcome measures. Nonetheless, to provide an additional perspective on the effects, an analysis was added of the association of Wave 1 exposure and the change scores on the outcomes for the older children.
3. The analysis then turned to the evidence about use of marijuana. Were the youth who were more exposed to the Campaign not only more likely to report pro-drug cognitions but also more likely to have initiated marijuana use?

The results for the first analysis path outlined above, undertaken to further examine the unfavorable lagged association of Wave 1 exposure with Wave 4 outcome, are presented in Table 5-S. This table presents the NSPY data unadjusted for confounder control.⁷

Table 5-S. Exposure per month at Wave 1 and outcomes at Wave 4 among 12- to 18-year-olds who were nonusers of marijuana at Wave 1- (data not corrected for confounders)

Outcome (average)		<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures	Spearman rho	Signif.
% (Not) intending to use	General exposure	81.2		81.8	74.7	-.07	NS
	Specific exposure	84.3	79.0	74.1		-.09	P < .01
Attitudes/Beliefs Index	General exposure	94.2		90.9	81.2	-.06	NS
	Specific exposure	96.3	91.5	78.1		-.06	NS
Social Norms Index	General exposure	91.6		91.4	71.3	-.10	P=.019
	Specific exposure	101.5	81.7	66.0		-.13	P < .01
Self-Efficacy Index	General exposure	102.7		114.8	103.4	-.05	NS
	Specific exposure	117.0	105.1	98.3		-.05	NS
N	General exposure	441-443		397-399	922-932	1760-1774	
N	Specific exposure	456-461	695-697	547-556		1798-1814	

For both measures of exposure, and for each of the four cognitive outcomes, the relationship is unfavorable. This consistency is not surprising since three of the cognitive variables are highly correlated: intentions is correlated .55 with attitudes, .47 with norms, and norms and attitudes are correlated at .58. All three are correlated with efficacy but at somewhat lower levels (.36 for intentions, .36 for attitudes, and .27 for norms). Three of the relationships are statistically significant at the p<.05 level: specific exposure with intentions, and both specific and general exposure with social norms. The pattern in Table 5-S is consistent with that found for the fully adjusted data. The negative associations are not merely a byproduct of the procedures used to adjust for confounders. The next table examines whether the trajectories of change in the outcomes are actually predicted by the exposure levels at Wave 1. Table 5-T, presents the same analyses as in the previous table but instead of using Wave 4 outcomes, the change between Wave 1 and Wave 4 on the outcomes is used. Once again these are corrected for sampling weights but not for the possible influence of confounders. For this analysis, youth who were not yet 12 at Wave 1 were excluded, since they were given a different questionnaire. Hence, most youth aged 12- to 13 at Wave 4 are not included in Table 5-T. No youth who were over 17 at Wave 1 were eligible for interview at Wave 4.

⁷ The data presented in all tables in this report were adjusted for NSPY's complex sample design.

Table 5-T. Exposure per month at Wave 1 and change in outcomes between Wave 1 and Wave 4 among 12- to 17-year-olds who were nonusers of marijuana at Wave 1- (data not corrected for confounders)

Outcome (average)		<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures	Spearman rho	Signif.
% (Not) intending to use	General exposure	-12.3%		-9.9%	-14.5%	-.03	NS
	Specific exposure	-10.8%	-9.8%	-16.8%		-.06	NS
Attitudes/Beliefs Index	General exposure	-28.8		-32.4	-31.1	.03	NS
	Specific exposure	-27.9	-23.8	-39.0		-.03	NS
Social Norms Index	General exposure	-28.4		-35.3	-51.5	-.09	P<=.01
	Specific exposure	-20.0	-42.2	-55.3		-.12	P<.001
Self-Efficacy Index	General exposure	7.5		13.5	7.4	.00	NS
	Specific exposure	18.2	9.5	6.7		-.03	NS

With the exception of the self-efficacy measure, each of the other outcomes shows a downward trend for all groups. This was to be expected, since these youth are, on average, 1.5 years older, and age is highly associated with holding less anti-drug views.

This analysis shows a pattern of results very similar to that presented in Table 5-S for the simple association. There continue to be unfavorable associations of both the specific and general exposure measures with social norms. This table is different from the previous one both because it leaves out the youngest sample members who did not have the baseline measures on the outcomes, and it looks at change scores as the outcome. Those differences matter. It was previously shown that the strongest negative effects were on the youngest respondents, a group underrepresented in the youth who had change scores. However, even with those limitations, the basic result from the fully elaborated analysis is largely maintained.

Finally, these same procedures were used to examine whether there were parallel lagged effects on actual initiation of marijuana. These analyses, which were adjusted for confounder effects, were restricted to youth who reported no use of marijuana at Wave 1. The outcome criterion was whether they reported that they had used marijuana ever at Wave 4, indicating that they had initiated use between the two waves. Table 5-U presents these analyses for the entire sample of 12- to 18-year-olds at Wave 4, for 12- to 13-year-olds, and for 14- to 18-year-olds. Table 5-V continues this analysis for three major subgroups of 12- to 18-year-olds, Whites, males and females and low and high risk youth.

Table 5-U. Exposure per month at Wave 1 and Initiation of marijuana use by Wave 4 among nonusers of marijuana at Wave 1

Outcome (average)		<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures	Spearman rho	Signif.
All 12- to 18-year-olds	General exposure	y17.1%		12.4%	13.7%	-.04	NS
	Specific exposure	10.4%	14.4%	16.3%		.07	NS
12- to 13-year-olds	General exposure	4.4%		2.7%	4.6%	.00	NS
	Specific exposure	1.2%	5.8%	5.2%		.09	P=.04
14- to 18-year-olds	General exposure	23.7%		16.3%	18.4%	-.05	NS
	Specific exposure	15.7%	18.2%	21.9%		.07	NS

Similar to most of the earlier tables, for all 12- to 18-year-old youth there are no statistically significant associations of behavior with the general measure of exposure controlling for Wave 1 confounders. The effects seen in the previous tables do extend to effects of specific exposure on behavior. The 12- to 13-year-olds show a significant association between exposure and initiation, although the absolute levels of use are quite low. Only about 4 percent of all of these children had begun using by that age. The effects for the 14- to 18-year-old subset and the entire 12- to 18-year-old sample are not statistically significant, though the nominal monotonic trend remains. However, for two major subgroups of the full population of 12- to 18-year-olds the unfavorable association becomes significant: for females and for low risk youth (Table 5-V).

Table 5-V. Exposure per month at Wave 1 and initiation of marijuana use by Wave 4 among nonusers of marijuana at Wave 1

Outcome (average)		<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures	Spearman rho	Signif.
12- to 18-year-old males	General exposure	18.4%		12.9%	12.3%	-.07	NS
	Specific exposure	15.9%	16.0%	11.4%		-.05	NS
12- to 18-year-old females	General exposure	15.5%		11.9%	15.2%	.00	NS
	Specific exposure	3.7%	12.9%	21.6%		.22	P < .01
12- to 18-year-old Whites	General exposure	19.3%		12.9%	15.4%	-.04	NS
	Specific exposure	11.0%	16.4%	18.8%		.09	NS
12-18 year old Higher risk youth	General exposure	29.5		33.6	32.9	.03	NS
	Specific exposure	35.8	39.4	37.0		-.00	NS
12-18 year old Lower risk youth	General exposure	10.1		5.8	8.3	-.03	NS
	Specific exposure	5.4	9.6	11.8		.09	P=.02

Most subgroups of the population were too small for further analysis. However, Whites, males, and females and low risk youth had sufficient sample sizes for further examination. Males showed no evidence of effects, and none of the three groups showed an association with general exposure, but both females and low risk youth showed significant associations for specific exposure and initiation of marijuana use. While the high risk youth are displayed in the table, and they make up a small proportion of the sample, so their results are unstable. However, while their overall level of initiation is much higher than for low risk youth there is no hint of an association with either exposure measure.

5.8 Summary and Discussion

In this chapter, a number of results were presented pertinent to direct Campaign effects on youth.⁸ For each of the four cognitive indices plus reported use of marijuana, we examined: 1) trends/changes from 2000 to 2001, 2) cross-sectional associations with both general and specific exposure, and 3) longitudinal associations for the Wave 1 cohort only focused on lagged analysis. Table 5-W summarizes all of the major results, by age group. Following the convention adopted for these semi-annual reports, the statistically significant findings are presented in bold typeface.

Table 5-W. Summary of trend, cross-sectional associations, and longitudinal associations

Age	Outcome	Trend (year 2000 to 2001)	Cross-sectional association (rhos)		Longitudinal association (rhos)	
			General	Specific	General	Specific
12-13	(Non-)Intentions	-1.4%	-.05	.01	-.10	-.11
	Attitudes and Beliefs	-7.8	.02	.02	-.07	-.05
	Social Norms	-7.5	.02	-.03	-.01	-.08
	Self-Efficacy	-0.3	-.03	.05	-.05	-.05
	Initiation of use*	-0.6%	NA	NA	.00	.09
14-18	(Non-)Intentions	-1.2%	-.02	-.02	.00	-.06
	Attitudes and Beliefs	-4.0	-.01	-.05	+.02	-.02
	Social Norms	-6.2	-.01	-.04	-.02	-.09
	Self-Efficacy	+7.3	.02	-.03	+.01	-.03
	Initiation of use*	0.0%	NA	NA	-.05	+.07
12-18	(Non-)Intentions	-1.2%	-.03	-.01	-.03	-.08
	Attitudes and Beliefs	-5.1	.00	-.02	-.01	-.03
	Social Norms	-6.4	.00	-.03	-.03	-.10
	Self-Efficacy	+4.6	.00	.00	-.00	-.04
	Initiation of use*	-.3%	NA	NA	-.04	+.07

The non-intentions measure and the three indexes are coded so that a higher score is an anti-drug position. This means that a negative rho represents an unfavorable result. The final variable is initiation of use. In that case a positive rho is unfavorable to the Campaign – those with more exposure were more likely to initiate use. NA: Not examined, since only nonusers included in cross-sectional analyses.

⁸ Indirect effects mediated through parent exposure are presented in Chapter 6.

5.8.1 Trends

In chapter 4, we presented the trends for marijuana use. There was no overall trend in use, nor for any marijuana use behavior for the 12- to 13- or 16- to 18-year-olds, although there was some evidence for increasing regular use among the 14- to 15-year-olds. From this chapter, there were no statistically significant trends in intentions to use marijuana over the 2 years of measurement among prior nonusers. This is true for the overall sample and for each age group. Similarly, there is no overall trend on attitudes and beliefs. The 12- to 13-year-old subgroup did show a 2000-2001 decline in anti-drug beliefs, although in a complex cross wave pattern. There is an unfavorable trend in perceived social norms, with significant overall effects as well as significant effects for the 12- to 13-year-old group. Finally, there is no overall trend on self-efficacy; however, 14- to 15-year-olds display a significant improvement over the time of the Campaign.

5.8.2 Cross-Sectional Associations

Regarding exposure-outcome associational effects, Wave 4 continues a pattern that was observed in the earlier reports from Waves 2-3: very few cross-sectional concurrent effects. There was no evidence for monotonic associations overall, and for only one subgroup out of 72 examined: the unfavorable association for 12- to 13-year-olds between general exposure and intentions. This pattern was not changed when the exposure measure was replaced by an average of the exposure responses across Wave 1 and Wave 4 and the association of that “stable” exposure measure and Wave 4 outcomes was assessed. There continued to be no pattern of favorable or unfavorable association between amount of either general or specific exposure and outcomes.

5.8.3 Lagged Associations

.For some outcomes, and for some subgroups of respondents, analysis raises the possibility that those with more exposure to the specific Campaign ads at the start of Phase III of the Campaign had less favorable outcomes over the following 18 months. This was true for the youth respondents who were nonusers and aged 10 to 12 at the start of this phase, with regard to their intentions to use marijuana in the future and for all youth 12 to 18 for their perceived social norms about marijuana use. Girls with the highest exposure to Campaign ads at the start were more likely than less exposed girls to initiate marijuana use. This effect on initiation was not seen for boys. This unfavorable association with initiation was also significant for the youngest respondents and for the low risk respondents.. If this association is real and if it reflects Campaign influences, it is clearly a disturbing and unwelcome one for the Campaign. Consequently, the findings were subjected to further scrutiny before drawing any conclusions. There were two basic lines of inquiry: 1) Can the results be due to a statistical artifact? and 2) Could the Campaign have indeed produced a true negative effect?

Can the results from the lagged analysis be due to a statistical artifact? There are two logical threats to a casual claim that the Campaign produced an unfavorable effect. The first is that in the sheer complexity of the statistical analysis, with its adjustment for confounder effects, some error crept in and that the observed results are merely an artifact of that process. Several points argue against this theory. First, the fully weighted and controlled model provides very similar results to a simple analysis of the uncontrolled data. The basic effects are all in the same direction, particularly for the specific exposure effects. Second, an examination of association between Wave 1 exposure with changes in

Wave 1 to Wave 4 outcome scores also yields similar results. Third, the complex analysis has been undertaken with extended checks and quality control oversight.

There are two specific risks to causal inference associated with the analysis approach undertaken. First, is it possible that the potential covariates that were included in the analysis were not adequately controlled in the process? Second, is it possible that some unmeasured covariates could account for the observed negative association?

Propensity scoring is designed to remove the effects of confounding variables from the association between outcomes and exposures. It is possible to detect the success of that process by showing that the potential covariates 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 counterfactual projection across all exposure levels. If confounders are not balanced, results can still be biased. The ability to assess balance is an important advance of propensity scoring over traditional analysis of covariance (Rosenbaum and Rubin, 1984). A number of tests of balance were conducted for the overall data as well as for subgroups divided by age. Overall the number of covariates out of balance for the full sample and for the age subgroups were probably no more than would have been expected by chance. However there was some evidence of lack of balance for some covariates including a few that were associated with the outcome measures. Additional post hoc analyses were performed controlling statistically for the variables that were out of balance as well as the full set of confounders and accounting for the complex sample design. Preliminary models that included out-of-balance covariates revealed the effect on perceived social norms and probably intentions to be quite robust, and in all cases the nominal direction of the effect was unchanged. The pattern of relationships in which some of the covariates are both out of balance in the propensity models, as well as significantly related to outcomes at Wave 4 does call for more elaborated examination of the inference of a negative association between Wave 1 exposure and Wave 4 outcomes. More rigorous models to control for unbalanced covariates will be examined and, if appropriate, implemented prior to the next semi-annual report.

The second threat is more substantive in character. Is it possible that there is some unmeasured covariate? Is there some variable not included in the propensity model, which could have influenced recall of exposure to the television advertising at Wave 1 and the Outcomes at Wave 4? An unmeasured covariate can bias the effect estimates even if all the measured covariates are perfectly balanced. 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 characteristic accounts for an observed result.

However, such an unmeasured variable would have to have a particular character. The obvious possibility would be that youth with more interest in marijuana, with more positive beliefs and perceived social norms, pay more attention to the advertising. However, insofar as this can be examined, that does not appear to be a viable explanation. Baseline data are lacking on many of the cognitive measures for the youth who were 9 to 11 at Wave 1, and these make up a substantial portion of the 12- to 13-year-olds at Wave 4. Therefore, control could be implemented for these baseline cognitions only for the older youth. However, when this is done, these Wave 1 cognitions do not account for the observed negative effect. Also, there is no cross-sectional association between exposure and the outcomes. Furthermore, when the effects of exposure at Wave 1 are examined, statistically controlling for Wave 1 beliefs and social norms for the youth who were 12 or older at Wave 1, the basic relationships are still present.

Thus the unmeasured variable would have to be one that suggests that youth who reported high exposure at Wave 1 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 Wave 1, 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.

This unmeasured covariate 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 Wave 1 and Wave 4. Practically speaking, this is likely to occur if the measured variables do not fully capture the “selection” process producing the various exposure levels. Thus far there is no specific evidence that this is true, although it may be. Given the above findings, the evaluation team must proceed with caution, but with the recognition that the relationship has not been rejected by the challenges to it undertaken thus far.

How can it be that there is no detectable trend in marijuana use, and there is no detectable cross-sectional association of specific exposure and outcomes, but there is a robust unfavorable lagged association? Here are some speculations:

- Trend effects are in fact partly consistent with an unfavorable Campaign effect. There was evidence for a year-to-year downward trend among 12- to 13-year-olds on social norms and for the Attitudes/ Beliefs Index. The intentions measure trended downward as well, although not significantly. The real inconsistency focuses on the usage trend. Youth who were 12 to 13 in 2001 were not different from the same aged youth in 2000 in their rates of use. How could this be if the effect of the Campaign has been to increase use? Perhaps the effects are simply too small to be detected. Very few 12- to 13-year-olds become users. Among those who became 12 to 13 by Wave 4, fewer than 4.2 percent of Wave 1 nonusers became users over the 18-month interval and only 3 percent of all 12- to 13-year-olds report using marijuana in the past year. The higher exposed group may not be large enough to produce effects when their usage behavior is averaged with the rest of the population. It must also be remembered that all observed trends are subject to influence by non-Campaign factors that have not been measured or controlled for in this study. While unfavorable trends are consistent with an unfavorable Campaign effect, alternative explanations are plausible, and cannot be ruled out.
- A more difficult inconsistency has to do with the failure to find any cross-sectional association between exposure and outcome. How can it be that there is an unfavorable lagged effect but no cross-sectional association? Certainly, this is an odd result. One speculative explanation is consistent with some empirical results, but still not easy to sort through: there are two causal relationships operating, exposure has an unfavorable effect on outcomes, but outcomes have a favorable effect on recalled exposure. The sum of these effects produces a zero cross-sectional relationship.

There is then some difficulty, certainly, in reconciling the full set of results. The inference logic set at the outset asked for three mutually supportive results to make a claim for positive Campaign effects: a favorable trend, a favorable association, and evidence for a favorable lagged effect. Obviously these have not been found, and thus there are no grounds to make a claim that the Campaign has had a favorable effect on youth thus far. Still, if those were the criteria for claiming a positive influence for the Campaign, then perhaps it is appropriate to use the same criteria for addressing a claim for

unfavorable Campaign effects. It cannot be claimed the criteria have been met, even if some post hoc speculation can be offered as to why they might be inconsistent.

Despite the above uncertainties there is one more problem to address. How could it be that the Campaign could have produced an unfavorable effect? If, for the sake of argument, it is stipulated that the observed relationship is real, through what mechanism could the Campaign have produced such an effect on perceived norms, intention and behavior? The theory underlying the Campaign and the evaluation were all about the process of producing anti-drug beliefs and behavior. At this point in the evaluation, any explanation for the observed, surprising, result is based on speculation.

The strongest results relate to social norms. There are unfavorable trend and lagged association effects present for that outcome for the entire population. Is it possible that the Campaign, while its explicit message is anti-drug, provides a second implicit message—that drugs are a big problem and their use 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 Wave 1 (or subsequently) that put this idea forward. Contrarily, the messages which were broadcast—negative consequences (25%), normative positive consequences (40%), and resistance skills (33%)—all have as an implicit assumption that drugs are a problem. Is it possible that youth took from these messages that drug use is expected behavior?

A second speculation is that youth do not like being told what to do. The more they are told what to do the more resistant they are to the messages. A body of psychological theory refers to this phenomenon as “reactance.” The more heavily exposed to the ads youth were, the more resistant to their ideas they became. As far as we know, there has not been prior evidence of reactance in published evaluation of campaigns. Snyder (2002) published a meta-analysis of 48 behavior change programs that made use of mass media. None of them showed an unfavorable effect. All of the evidence supporting this hypothesis has come from experimental studies. It may be possible that youth have gotten so much anti-drug information from school and elsewhere that their response to this extra exposure has been to go in the opposite direction.

There is some empirical evidence consistent with this speculation. In a straightforward analysis, Jacobsohn (2002) has found that the cross-sectional association of exposure and outcome was contingent on the youth’s assessment of the ads they had seen. Based on NSPY data collected to date, there was essentially no association between exposure and any outcome among youth who were positive toward the ads (the great majority of youth). Youth who were negative in their ad evaluation showed a clear association for the attitude index and 12- to 13-year-old youth demonstrated this association for both the norms and attitude indices. Since the causal order between ad evaluation and the cognitive outcomes is uncertain, the evaluation team is reluctant to put too much emphasis on this result. Nonetheless, it provides some support for the reactance speculation: most youth may be unaffected by the ads, but those who are negatively predisposed may be reinforced in their negative response by increasing exposure. The Wave 1 and 4 samples are not large enough to test this hypothesis in order to determine whether it might explain the lagged results. However, it will be possible to do such a test when the full sample is available after Wave 5.

5.8.4 Conclusion

Overall, most of these results are consistent with no Campaign effects on youth, while one set is consistent with an unfavorable effect. The unfavorable effect has not been rejected by the additional

analyses performed to date. If valid, it is a surprising result, both because it was unexpected for the Campaign, and because it has no real precedent in the published communication campaign literature. Explanations presented for a possible unfavorable Campaign effect are speculation with only a small amount of empirical support. To be sure, the results raise concern, but they cannot be viewed as definitive. The next report will permit longitudinal analysis with the entire sample, not just those who were originally interviewed during Wave 1. The sample for that wave will include more than twice as many respondents, and will permit additional subgroup analyses. More time with the results will also permit additional statistical investigations, as well as extended exploration of possible mechanisms of effect. It is also important to remember that the unfavorable effects apply only to Campaign exposure in early 2000. It is still possible that subsequent waves of data will show a favorable Campaign effect, if later advertising was more effective than the Wave 1 exposures. Finally, some would argue that true behavior change can be a slow process, and may well take 2 or 3 years to occur. This may explain, at least in part, why favorable changes in youth have not been observed.

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6. 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 slogan, 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. A second component has been to encourage talking between parents and children about drugs. Also, 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 those three classes of outcomes: talking with children about drugs, monitoring children's behavior, and engaging in fun activities with children. In the previous report, based on both favorable trends over time and cross-sectional associations, there was evidence supportive of Campaign effects on objectives related to talking with children, and for beliefs and attitudes regarding monitoring of children, and in the case of the cross-sectional associations for doing fun activities with them. These results are largely replicated here. However, there was some concern about whether the observed cross-sectional association reflected the influence of the Campaign on the outcomes or the influence of parents' engagement with youth on their tendency to recall the Campaign's messages. With this report it is possible to examine followup data with the parents interviewed at Wave 1. This would permit examination of the possibility that Wave 1 exposure to messages predicted change by Wave 4 in the outcomes, thus helping to address the concern about causal direction. However, as will be seen, there is no evidence yet for such lagged associations. Longitudinal analyses, at this point, do not resolve the issue of causal order in the association between exposure and parent outcomes.

This chapter first discusses the logic supporting claims of Campaign effects and presents the primary outcome variables. In Section 6.2 it turns to evidence for change in those outcome variables over the four waves of data collection. Section 6.3 and 6.4 presents the evidence for the association of exposure to Campaign advertising with the major outcome variables. The following section reviews results from the longitudinal analyses of parent outcomes. Finally, Section 6.6 brings together the trend, associational, and longitudinal analyses and discusses conclusions about Campaign effects.

6.1 The Logic of Inference and the Development of Parent Outcome Scales

As discussed in the previous chapter, it would be desirable to show that target outcomes are trending in a direction favorable¹ to Campaign objectives: more monitoring, more talking, and more fun activities. This would be desirable even though trend data, by itself, is 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.

¹ 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."

Second, it would be desirable to show that parents who were more exposed to the Campaign displayed more of the desired 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 report ad exposure less than once a week? These observed associations are controlled for other confounder variables that might have influenced both of them and been the true cause of the observed association. (See Appendix C for the propensity score methodology that was used.)

Given the cross-sectional nature of the data heretofore, previous reports presented a favorable association of reported exposure to the Campaign with the target outcomes statistically controlled for likely confounders as the best evidence consistent with a Campaign effect. If this was accompanied by evidence of a favorable trend in the outcome, the argument that there was a Campaign effect was strengthened. This report adds longitudinal analyses to preceding approaches, allowing a clearer understanding of the causal order between exposure and outcomes.

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 benefits from cohort data available over time; parents interviewed at Wave 1 were re-interviewed at Wave 4.² As explained in Chapter 2, the longitudinal analysis involves examining the association between exposure measured at Wave 1 and outcome measured at Wave 4, statistically controlling both for the Wave 1 levels of the outcomes and for confounders. This lagged association captures both the delayed effects of exposure at Wave 1 if that effect did not emerge until after Wave 1, as well as the effects of exposure at Wave 1 that flow through exposure at Wave 4 to outcome at Wave 4. Overall, as mentioned above, the difference between cross-sectional and longitudinal results for the association between parent exposure and outcomes does not allow a straightforward inference about campaign effects.

The overall analysis focuses on effects among all parents of 12- to 18-year-olds. The age range is restricted to match the age range of the youth at risk of drug use and the primary focus of the previous chapter. In addition to the overall analysis, the chapter presents both trend, associational, and longitudinal data for subgroups of parents. The subgroup analyses are used for two purposes. If there is an overall effect for all parents, there is a search for evidence that the trends or the association is significantly larger or smaller for particular groups. If there is no overall effect, the subgroups are examined to see if there is evidence of effect for only a subpopulation. By contrast with previous reports, this chapter will focus on subgroup analyses by youth's risk for marijuana use. (See Chapter 4 and Appendix C for further details.) However, other subgroups' differences are noted when they show a consistent pattern.

The primary analyses presented focus on five summed outcome measures: talking behavior, talking cognitions, monitoring behavior, monitoring cognitions, and fun activities undertaken. These measures summarize 21 individual measures. Trends in all the individual measures are presented in the Detail Tables, but the Campaign effects analyses focus on these five measures. The use of only five measures reflects three purposes. The combination of multiple measures into single indices may increase the sensitivity of the measure in detecting effects. Multi-item indices are ordinarily less error prone than single item measures. Also, the more results that are presented, the more likely it is that a

² This is only a part of the followup sample, with the rest coming in Wave 5, when Waves 2 and 3 respondents will be reinterviewed.

result will be significant at the conventional ($p=.05$) level by chance. 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 significant results is reduced. Finally, the presentation of five distinct outcomes is more focused, allowing writers and readers to make sense of the results more easily.

The choice of indices and the procedures for weighting the individual items in the summed indices is described next. The three behavioral indices follow the procedures that have been used in the previous semiannual reports. The talking behavior index, with a range of 0 to 3, gives a point to parents for each of the following: for talking with their son or daughter about drugs at least twice in the previous 6 months, for having discussed family rules about drug use, and for having discussed specific things that the child could do to stay away from drugs. The monitoring behavior index, which also varied from 0 to 3, gave points to parents for saying they “always or almost always” knew what their child was doing when he or she was away from home, had a pretty good idea about the child’s plans for the coming day, and for saying their child never spent free time in the afternoon hanging out with friends without adult supervision. These questions were also asked of youth, so that youth and parent responses could be directly compared. The fun activities variable combined the responses of parents to questions about the frequency of in-home joint projects and activities, and going together to out-of-home activities. Parents who reported doing the sum of both activities three or more times each week were assigned one, with everyone else assigned zero.

The two cognitive indices were constructed on a different basis, and parallel to the way the indices in Chapter 5 were created. These belief and attitude variables, presented in Figure 6-A, were summed with weights reflecting their independent prediction of 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 behavioral scale. Similarly, the seven items that addressed self-efficacy about and general attitudes toward talking with children were used to predict the parent-child talk behavior scale. Appendix E describes the procedures for developing these indices in detail.

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. These weighted summed scores had no natural metric. To ease their interpretation, the two scales were standardized so that the entire population of parents had a mean of 100 and a standard deviation of 100 at Wave 1. This provides a natural metric for comparing the magnitude of change over time and between groups.

Figures 6-B and 6-C present the association between each of the cognition indices with their respective behavioral outcome. In both cases there is a substantial pattern of association. The monitoring association is almost a perfect linear relation, with the parents at the low end of the monitoring cognition scale doing 0.50 of the three monitoring behaviors while those at the high end undertake 2.2 of the three behaviors.

Figure 6-C shows a relationship between talking cognitions and behavior, but perhaps one that is less clear cut than for the monitoring variables. Also, it is clear that the talking behaviors are more

Figure 6-A. Beliefs and attitudes about monitoring

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 <i>nearly every month</i>	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

Figure 6-B. Monitoring behavior by monitoring cognitions index

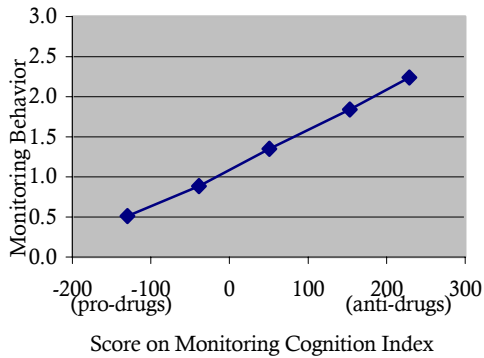
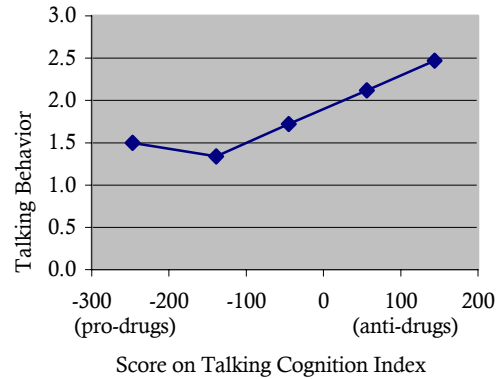


Figure 6-C. Talking behavior by talking cognitions index



common than the monitoring behaviors (with a mean of 2.3 for talking versus 1.6 for monitoring on the 0 to 3 scale) and even the parents with the least supportive cognitions are doing half of the three talking behaviors.

The next section begins with evidence for trends on the five indices.

6.2 Trends in Outcomes

This section covers monitoring behaviors and cognitions, talking behaviors and cognitions, engagement in fun activities, and evidence for diversity in observed trends.

6.2.1 Monitoring Behaviors

Table 6-A presents evidence of yearly changes in monitoring behavior over the four waves of data collection, and the test for statistical significance of the difference in yearly averages for 2000 (Waves 1 and 2) and 2001 (Waves 3 and 4). Three conclusions can be drawn from this table. (See also Detail Table 6-3.)

First, focusing on the entire population of parents of 12- to 18-year-olds, there is a just statistically significant trend toward a favorable change, with 0 as the exact lower limit of the confidence interval around change. There is also a statistically significant favorable trend for one of the age subgroups, parents of 12- to 13-year-olds. Since the recommendation for increased monitoring as an approach to prevention of drug use has often focused on middle school aged youth, the finding of a significant trend among these parents is particularly encouraging. Thus the overall conclusion is that in 2001 parents are reporting they monitor their children, particularly their younger children, more than in 2000.

Table 6-A. Parental monitoring behavior by child age (Parent reports)

Age group	Number of Monitoring Behaviors			
	Year 2000 Average Waves 1 and 2 (%)	Year 2001 Average Waves 3 and 4 (%)	2000 to 2001 % Change	95% CI on 2000- 2001 Change
12 to 13	1.65	1.80	0.15*	0.07 to 0.23
14 to 15	1.47	1.46	-0.01	-0.12 to 0.09
16 to 18	1.18	1.21	0.03	-0.08 to 0.14
12 to 18	1.41	1.46	0.05*	0.00 to 0.11

* Between year difference significant at $p < 0.05$.

Second, parents monitor children of different ages to different degrees. Older children are much less monitored than younger children. Detail Tables 6-11 through 6-13 present the data for each of the three behaviors that make up the scale. On average, 70 percent of 12- to 13-year-olds' parents, but only 52 percent of 16- to 18-year-olds' parents, say they always or almost always know where their children are when they are away from home. Likewise, 67 percent of 12- to 13-year-olds' parents versus 51 percent of 16- to 18-year-olds' parents always or almost always know their child's plans for the coming day. Finally, 36 percent of 12- to 13-year-olds' parents versus 16 percent of 16- to 18-year-olds' parents claim that their child never spends time with other children without adult supervision.

Youth report that their parents engage in these behaviors less frequently than do parents, at every age. As examples, while 61 percent of parents of 12- to 18-year-olds claimed they always or almost always

knew where children were when they were away from home, only 47 percent of youth agreed; 58 percent of parents but only 31 percent of youth claimed that parents always or almost always knew the child’s plans for the coming day. Finally, 25 percent of parents, but only 9 percent of youth said they never spent time alone with other children without adult supervision. Also, as can be seen in Table 6-B, there is no parallel pattern of change in youth reports that would reinforce parents’ claims. For 12- to 18-year-olds, parents claim to be monitoring more, but youth do not report a similar change. (See also Detail Table 6-3.)

Table 6-B. Parental monitoring behavior by child age (Youth reports)

Age group	Number of Monitoring Behaviors			
	Year 2000	Year 2001	2000 to 2001 % Change	95% CI on 2000- 2001 Change
	Average Waves 1 and 2 (%)	Average Waves 3 and 4 (%)		
12 to 13	1.03	1.08	0.06	-0.01 to 0.13
14 to 15	0.87	0.88	0.02	-0.07 to 0.10
16 to 18	0.75	0.70	-0.05	-0.12 to 0.03
12 to 18	0.87	0.87	0.00	-0.04 to 0.05

6.2.2 Monitoring Cognitions

The yearly change in parents’ monitoring cognitions over the four waves is parallel to the claims of behavior change. Table 6-C presents the data for each of the youth age subgroups. (See also Detail Table 6-1.) The cognitive results show an overall statistically significant favorable trend for parents of all youth 12 to 18, and for the 12- to 13-year-old subgroup.

Table 6-C. Parental monitoring cognitions by youth age

Age group	Score on the index with 100 as the average ¹			
	Year 2000	Year 2001	2000 to 2001 % Change	95% CI on 2000- 2001 Change
	Average Waves 1 and 2 (%)	Average Waves 3 and 4 (%)		
12 to 13	114.85	123.00	8.15*	1.57 to 14.73
14 to 15	91.55	94.47	2.93	-7.86 to 13.71
16 to 18	61.94	67.43	5.49	-4.44 to 15.42
12 to 18	87.12	92.68	5.56*	0.00 to 11.03

¹ The scale has a mean of 100 and a standard deviation of 100 for all parents at Wave 1.

* Between year difference 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 6-51. In general, parents of 12- to 13-year-olds show consistent favorable changes in responses to the individual questions, though less than half of them are significant. It is only when the set of measures are weighted and summed that the pattern of significant effects, at least for parents of the younger children, appears.

6.2.3 Talking Behaviors

Table 6-D summarizes the information about the extent of parent – child conversations about drugs. Parents could earn up to three points if they reported talking about drugs at least twice in the past 6

Table 6-D. Parent – child talk about drugs by youth age (Parent reports)

Age group	Number of Talking Behaviors (0 to 3)			
	Year 2000	Year 2001	2000 to 2001 % Change	95% CI on 2000- 2001 Change
	Average Waves 1 and 2 (%)	Average Waves 3 and 4 (%)		
12 to 13	2.29	2.38	0.09*	0.01 to 0.17
14 to 15	2.28	2.39	0.11	-0.05 to 0.27
16 to 18	2.21	2.33	0.11*	0.01 to 0.21
12 to 18	2.26	2.36	0.11*	0.03 to 0.18

* Between year difference significant at $p < 0.05$.

months, as well as talking about family rules about drugs, and about specific things a child could do to avoid drugs.

Parents are widely claiming to do a good deal of talking about drugs with their children. The average parent claims to engage in 2.3 out of the 3 measured talking behaviors. In contrast with the monitoring results above, parents do not differentiate by age of child in their frequency of talk.

This table also shows an overall pattern of increasing talk, only the parents of 14- to 15-year-olds show a nonsignificant favorable trend. The size of the absolute change is small, from 2.26 to 2.36. Each of the individual questions showed a change of only around 3.5 percent. (See Detail Tables 6-6, 6-7, and 6-10.) Despite the small magnitude of change, the data are consistent with a claim that the Campaign is associated with a favorable trend in parent reports of talk for all parents of 12- to 18-year-olds.

The parallel data from youth about the same talk questions provide a very different picture from the parent reports (Table 6-E and Detail Table 6-4), with much lower absolute levels of reported talk. While parents report undertaking 2.3 out of 3 behaviors, their children report less than 1.5 of those behaviors. Finally, while parents showed a small but favorable change, the youth reports show an unfavorable change of the same magnitude, which is also statistically significant. Every age group of children, except for the 16- to 18-year-olds, shows a statistically significant unfavorable trend. As will be shown below, there is evidence that these good parent-reported trends among parents of all youth 12 to 18 complement a strong association between exposure and talking behavior. However, the lack of support in child reports of talking brings into question an otherwise strong inference about Campaign effects on parent and youth talk about drugs.

Table 6-E. Parent – child talk about drugs by youth age (Youth reports)

Age group	Number of Talking Behaviors (0 to 3)			
	Year 2000	Year 2001	2000 to 2001 % Change	95% CI on 2000- 2001 Change
	Average Waves 1 and 2 (%)	Average Waves 3 and 4 (%)		
12 to 13	1.74	1.58	-0.15*	-0.26 to -0.04
14 to 15	1.56	1.42	-0.14*	-0.27 to -0.02
16 to 18	1.32	1.27	-0.05	-0.15 to 0.06
12 to 18	1.52	1.41	-0.11*	-0.17 to -0.04

* Between year difference significant at $p < 0.05$.

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. About half of the parents of 12- to

18-year-olds and a little less than one-third of youth of those ages reported such conversations. There was no evidence that the rate of conversations was increasing or decreasing across the four waves. The only exception to this was for Hispanic parents and Hispanic youth; both groups showed declines in conversation across the four waves. For Hispanic parents, 55 percent who reported conversations in 2000 declined to 50 percent by 2001, although this change was not statistically significant; Hispanic youth started at 35 percent in 2000 and declined significantly to 26 percent by 2001 (Detail Table 6-24).

6.2.4 Talking Cognitions

Table 6-F presents the data about the summed scale for parent attitudes and beliefs about talking with their children about drugs. (See also Detail Table 6-2.) There is an overall statistically significant pattern of improvement for parents of all youth 12 to 18 years old.

Table 6-F. Parent cognitions about talk about drugs by youth age

Age group	Score on summed scale with average = 100 at Wave 1			
	Year 2000 Average Waves 1 and 2 (%)	Year 2001 Average Waves 3 and 4 (%)	2000 to 2001 % Change	95% CI on 2000- 2001 Change
12 to 13	109.37	112.07	2.70	-5.67 to 11.07
14 to 15	103.15	108.63	5.48	-6.30 to 17.27
16 to 18	81.77	90.74	8.97	-1.26 to 19.19
12 to 18	96.83	102.88	6.05*	0.28 to 11.82

* Between year difference significant at p<0.05.

The trends for the individual items that make up these scales are presented in Detail Tables 6-26 through 6-31. Only one of the self-efficacy items shows any trend, an unfavorable one. However, the attitude scales do show a favorable trend for all parents of 12- to 18-year-olds. The Year 2000 mean of 6.16 on the 7-point scale increased to 6.22 by 2001. The increase was particularly strong for parents of the oldest teens, 16- to 18-year-olds, who increased from 6.11 to 6.19 between years (Detail Table 6-31). In this case, the attitude measure alone corresponds to the talk behavior measure.

6.2.5 Fun Activities

During the first period of Phase III, corresponding to the Wave 1 data collection period, the Campaign encouraged parents to engage in fun activities with their children. The variable presented in Table 6-G indicates the proportion of parents who claimed to do at least three or more activities with their child each week, either at home or out-of-home. (See also Detail Table 6-5.)

Table 6-G. Parents doing fun activities with their child by youth age

Age group	Percent saying they did three or more activities per week			
	Year 2000 Average Waves 1 and 2 (%)	Year 2001 Average Waves 3 and 4 (%)	2000 to 2001 % Change	95% CI on 2000- 2001 Change
12 to 13	74.8	74.7	0.1	-3.7 to 3.5
14 to 15	67.8	64.3	-3.5	-8.5 to 1.5
16 to 18	51.1	51.9	0.8	-5.0 to 6.5
12 to 18	63.5	62.7	-0.8	-4.0 to 2.3

Table 6-G offers three striking results. First, parents report doing a lot of fun activities with their children. More than three-fifths claim to be doing three or more activities from the start. Less than 10 percent of all parents said they had not done any activities. This creates something of a ceiling for the Campaign: if most parents already see themselves as doing fun activities with their children, then a message to do fun activities may not suggest a deficit in current behavior that needs improvement. Second, the level of activity is sharply associated with the age of the child. Across both years, nearly three-fourths of parents of 12- to 13-year-olds reported such activities, while only about half the parents of 16- to 18-year-olds did so. Finally, the evidence does not support a claim of increasing levels of activity. This theme was emphasized only during Wave 1 of the Campaign; if there had been any effects, they were likely to have already been present for the de facto baseline wave.

6.2.6 Evidence for Diversity in Trends

Is it possible that the overall patterns presented above might vary for subgroups of parents? There are two circumstances of interest: when there is no overall significant trend but a particular subgroup does show a significant trend, and when two subgroups show different trends. The overall presentation outlined the diversity of trends among parents with children of different ages. This section focuses on diversity among parents based on their children's gender, sensation-seeking level, and risk for marijuana use, as well as the parent's gender and educational level. Also, if a parent had two children in the 12- to 18-year-old sample (one 12 to 13 and one 14 to 18), the parent was asked separate questions about each child's behavior and cognitions referring to each one. Both sets of answers are included in the overall results.

Diversity of Trends for Monitoring Behavior and Cognitions

Tables 6-A and 6-C presented the overall subgroup results for parents' monitoring behavior and cognitions by age of child. There was a just statistically significant overall effect for parents of 12- to 18-year-olds on monitoring behavior, so the question is whether effects were different for different subgroups. The observed absolute change was larger for some groups than others (see Detail Table 6-3), and five of the subgroups showed statistical significance. However, all of the confidence intervals for yearly change overlap with the confidence interval for the overall change estimate. The appropriate conclusion is that the evidence does not permit a claim for differential effects.

While the trends are not statistically significant, it is worth noting that the actual behaviors, averaged across the four waves, are different by subgroups. Parents are more likely to monitor girls (1.68 on the 0 to 3 scale) than they are boys (1.49). Most notably, parents of children at differing levels of risk for marijuana use show consistent differences with regard to monitoring behavior and various measures of monitoring beliefs and attitudes.

Nevertheless, when examining differences by risk subgroup, it is possible the estimates could be confounded by age, with parents of older children (who are also at higher risk) reporting fewer monitoring behaviors and less favorable monitoring cognitions. Table 6-H examines these differences in parent reports by risk within age groups for different measures to do with monitoring. Only parents of youth 12 to 18 who had never used marijuana are used for these analyses of differences by risk so as to avoid making inferences where reverse causation might be a greater concern.

Table 6-H. Differences* in parent monitoring behaviors and cognitions by child age and risk

Youth characteristics		Parent reports averaged across four waves of:		
Age	Risk	Monitoring behavior mean (CI)	Monitoring cognitions mean (CI)	Intention to monitor mean (CI)
12 to 13	Higher	1.30 (1.04 to 1.56)	90.7 (71.3 to 110.1)	1.38 (1.26 to 1.49)
	Lower	1.79 (1.73 to 1.86)	123.3 (118.9 to 127.8)	1.56 (1.53 to 1.59)
14 to 15	Higher	1.36 (1.18 to 1.55)	70.8 (54.2 to 87.3)	1.4 (1.35 to 1.48)
	Lower	1.64 (1.56 to 1.72)	110.3 (102.6 to 118.1)	1.50 (1.45 to 1.55)
16 to 18	Higher	1.21 (1.05 to 1.38)	70.3 (57.3 to 83.3)	1.10 (1.04 to 1.17)
	Lower	1.52 (1.39 to 1.65)	92.9 (81.5 to 104.4)	1.29 (1.22 to 1.35)

* Significant differences between parents of higher and lower risk children within age groups are in bold type.

While not all the differences hold up when controlling for child age, seven of the nine comparisons yield statistically significant differences. Parents of children at higher risk across all age groups report fewer monitoring behaviors. Parents of the youngest and oldest youth at higher risk also report fewer intentions to monitor. The beliefs and attitudes index (“monitoring cognitions”) also yields significant differences between risk subgroups. Parents of the children 12 to 15 at higher risk report less favorable beliefs and attitudes about monitoring than do parents of children at lower risk within the same age groups.

Diversity of Trends for Talking Behavior and Cognitions

Table 6-D presented the evidence about trends in talking behavior, establishing a statistically significant trend for all parents of 12- to 18-year-olds. In addition, a number of subgroups showed significant change, but the confidence intervals around their rates of change overlapped with the overall change estimate (Detail Table 6-4). The appropriate conclusion is that the observed change in talking behavior between years was widely shared.

Likewise, talking cognitions, as presented in Table 6-F, also showed a significant change from 2000 to 2001 for all parents of youth 12 to 18. As was the case for change in talking behavior, though a few subgroups showed significant change, their rates of change in talking cognitions did not differ significantly from the overall estimate. No differential effects can be inferred from this evidence.

With regard to differences in absolute levels, talking behavior and cognitions averaged across the four waves showed only one significant difference by subgroup. Mothers were more likely to report household talk than were fathers (2.38 vs. 2.17; Detail Table 6-4); mothers also reported significantly more favorable talking cognitions than did fathers (106.6 vs. 87.0; Detail Table 6-2). Otherwise, parents were equally likely to report talking to their male and female children and their high and low sensation-seeking children, and regardless of their own level of education. In sharp contrast with the consistent differences in monitoring behavior and cognitions by risk subgroup, parents of children at higher and lower risk report similar levels of talking behavior and cognitions (Table 6-I).

Table 6-I. Differences in parent talking behaviors and cognitions by child risk subgroup

Youth characteristics		Parent reports averaged across four waves of:		
Age	Risk	Talking behavior mean (CI)	Talking cognitions mean (CI)	Intention to talk mean (CI)
12 to 13	Higher	2.32 (2.13 to 2.51)	106.7 (89.9 to 123.5)	1.16 (1.0 to 1.32)
	Lower	2.32 (2.25 to 2.40)	110.9 (104.3 to 117.5)	1.15 (1.09 to 1.22)
14 to 15	Higher	2.33 (2.13 to 2.53)	106.0 (91.1 to 121)	1.20 (1.10 to 1.31)
	Lower	2.30 (2.18 to 2.41)	100.6 (88.8 to 112.4)	1.13 (1.04 to 1.21)
16 to 18	Higher	2.19 (2.06 to 2.31)	85.8 (71.8 to 99.8)	0.92 (0.83 to 1.02)
	Lower	2.18 (2.04 to 2.33)	100.6 (88.8 to 112.4)	0.99 (0.88 to 1.10)

Given that the predicted risk probability for marijuana use did not incorporate parental monitoring or talking behaviors, finding consistent differences between parents of higher and lower risk children for the one and not the other is striking. Parents of youth at higher risk for marijuana use consistently report fewer monitoring behaviors and less favorable monitoring cognitions than parents of youth at lower risk, whereas household talking behavior and cognitions do not vary by child risk, among parents of children who were nonusers of marijuana.

Looking at the risk model more closely (see chapter 4, section 4.6), the strongest predictors of marijuana use are child 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 of children who use cigarettes, have higher sensation-seeking tendencies, are older, and use alcohol find it harder to monitor them, and that is also reflected in their beliefs and attitudes about monitoring.

Interestingly, child reports of parental monitoring and talking behaviors parallel these results (Table 6-J). That is, across all age groups, children at higher risk for marijuana use report their parents are performing significantly fewer monitoring behaviors than do children at lower risk. There are no differences in child reports of parental talking behaviors by risk subgroup.

In summary, the trend data provides evidence of favorable change for both monitoring and talking behavior and cognitions, although not for fun activities. There are no patterns of consistent trend differences for particular subgroups, though child risk for marijuana use yields interesting differences in absolute levels of parental and child reports of monitoring. This chapter next turns to the complementary evidence about the association of exposure and these outcomes.

Table 6-J. Differences¹ in child reports of household monitoring and talking behaviors by age and risk among nonusers 12 to 18

Youth characteristics		Child reports averaged across four waves of:	
Age	Risk	Parental monitoring behavior mean (CI)	Parental talking behavior mean (CI)
12 to 13	Higher	0.52 (0.40 to 0.63)	1.46 (1.26 to 1.67)
	Lower	1.14 (1.09 to 1.20)	1.71 (1.65 to 1.76)
14 to 15	Higher	0.67 (0.58 to 0.76)	1.32 (1.18 to 1.45)
	Lower	1.06 (0.98 to 1.14)	1.52 (1.42 to 1.61)
16 to 18	Higher	0.73 (0.62 to 0.85)	1.31 (1.20 to 1.42)
	Lower	1.09 (0.99 to 1.19)	1.28 (1.15 to 1.41)

¹ Significant differences between higher and lower risk children within age groups are in bold type.

6.3 Cross-sectional Association of Advertising Exposure with Parent Outcomes

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 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 2 months before the interview. The general exposure measures display substantially higher levels than do the specific exposure levels. For example, around 43 percent of parents reported general exposure 12 or more times per month, but only 11 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 allows recall of advertising that was directed to other audiences, while the specific exposure measure focuses only on ads directed to the parent; finally, the general exposure measure may be less demanding since it does not require the respondent to claim that he or she has seen a specific ad. One might speculate, therefore, that general exposure is at greater risk of inflated reporting. Because 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 parents who reported exposure fewer than 4 times per month, 4 to 11 times per month, and 12 or more times per month. There were very few parents 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. However, the highest exposure group for the specific exposure measure is quite small, so in many of the tables the estimates for outcomes for this group have a very wide confidence interval. Usually the

specific exposure claims must rely on the differences among the other three exposure groups. Table 6-K presents the distributions for both general and specific exposure for all parents of 12- to 18-year-olds.

Table 6-K. Exposures per month reported by parents of 12- to 18-year-olds across four waves

	<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures
General exposure	30.1%		26.7%	42.5%
Specific exposure	26.8%	33.1%	29.2%	10.9%

In all exposure analyses, the effects are corrected for the influence of confounder variables using the propensity scoring procedures described in Appendix C. They are the 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 12- to 18-year-olds. Each table presents four different estimators of Campaign effect. The first (called the direct campaign effect) compares the score on the outcome variable (e.g., parental monitoring behavior) for the entire sample with the score achieved by the lowest exposure group. It asks whether the average person was different from those who had minimal exposure. It is the best estimate of the average effects of the Campaign across the population. The second estimator is a significance test that indicates whether there is an overall pattern for those who have higher exposure to be higher on the outcome variable. Where the test for monotonic association (Jonckheere-Terpstra) is significant at $p < 0.05$, each table includes the exact p-value in this column. This test is best at estimating whether exposure to the Campaign affected parents at all, and it is the one used in the final summary to capture effects.

The Jonckheere-Terpstra test, however, does require a monotonic association and it gives no sense as to the magnitude of the association. To that end, as was mentioned in Chapter 5, this report includes a new measure of association, Spearman's rho. This is a rank-order correlation that assumes order only in the pairs. It varies from -1 to $+1$, with estimates closer to either end showing stronger associations. It is important to note, though, that Spearman's rho estimates here included have not been tested for significance. The final measure, called the maximum campaign effect, compares parents with the highest and lowest levels of exposure. De facto, it answers the question: If the Campaign had been able to give everyone 12 or more exposures per month, how much of an effect would there have been? The detail tables also provide estimates for subgroups of that population defined by youth characteristics (age, gender, race/ethnicity) and parent characteristics (gender, education).

6.3.1 Cross-sectional Association of Monitoring Behavior and Cognitions Scales with General and Specific Exposure

Neither the general nor the specific exposure measure is associated with parent reports of monitoring behavior. This is true for all the parents of 12- to 18-year-olds, and for all of the subgroups, with one exception to be discussed below. It is true for all of the measures of effects. Table 6-L presents the summary data for both exposure measures, with the full version in Detail Tables 6-61 and 6-62.

Table 6-L. Cross-sectional association of exposure per month and monitoring behavior reported by parents of 12- to 18-year-olds

Score on the monitoring behavior index, with 1.44 the overall mean across four waves								
	<1 exposure	1 – 3 exposures	4 – 11 exposures	12+ exposures	Direct effect (CI)	Monotonic trend	Spearman's rho	Maximum effect
General exposure	1.43		1.43	1.47	0.00 -0.06 to 0.07	-	.013	0.03 -0.06 to 0.12
Specific exposure	1.45	1.41	1.47	1.47	-0.01 -0.06 to 0.07	-	.009	0.02 -0.14 to 0.19

In contrast to their reports of behavior, parent reports of cognitions around monitoring do show association with exposure. It is highly significant for general exposure, and in a consistent direction for the specific exposure measure. These data are presented in Table 6-M, which summarizes the information that is fully presented in Detail Tables 6-57 and 6-58.

Table 6-M. Cross-sectional association of exposure per month and monitoring cognitions reported by parents of 12- to 18-year-olds

Score on monitoring cognition index with 90.1 the overall mean across four waves								
	<1 exposure	1 – 3 exposures	4 – 11 exposures	12+ exposures	Direct effect (CI)	Monotonic trend	Spearman's rho	Maximum effect
General exposure	81.6		88.9	95.1	8.5* 2.8 to 14.2	.002	.056	13.5* 4.8 to 22.1
Specific exposure	87.6	88.8	90.4	97.7	4.5 -2.5 to 11.5	-	.038	10.1 -5.2 to 25.5

* Significant at p<0.05.

Both exposure measures are correctly ordered with regard to the monitoring index, with the mean score larger at each succeeding level. For the general exposure measure, this is a significant monotonic tendency, and the difference between the lowest and highest exposure levels is 13.5 points. Though larger than for the association between the two measures of exposure and monitoring behavior, Spearman's rho estimates for association with monitoring cognitions are fairly small (.056 and .038 for general and specific exposure, respectively).

6.3.2 Cross-sectional Association of Talking Behavior and Cognitions Scales with General and Specific Exposure

If the monitoring behavior and cognitions show some inconsistency, the talking behavior and cognitions tables consistently support an inference of a Campaign effect. Table 6-N presents the evidence for the overall effect on talking behaviors. Both the general and specific exposure measures are associated with talking for all three tests: direct effects, monotonic trend, and maximum potential effect. Those who report more exposure to the Campaign's messages are clearly more likely to report talking to their children as well.

Table 6-N. Cross-sectional association of exposure per month and talking behaviors reported by parents of 12- to 18-year-olds

Score on the 0 to 3 point scale, with overall average at 2.31 across four waves								
	<1 exposure	1 - 3 exposures	4 - 11 exposures	12+ exposures	Direct effect (CI)	Monotonic trend	Spearman's rho	Maximum effect
General exposure	2.19		2.31	2.43	0.12* (0.07 to .19)	<.001	.092	0.24* (0.15 to 0.34)
Specific exposure	2.24	2.26	2.40	2.43	0.07* (0.01 to 0.14)	<.001	.087	0.19* (0.05 to 0.33)

* Significant at $p < 0.05$.

Table 6-O provides closely parallel information for cognitions about talking. Against both measures of exposure, those who report seeing many ads are substantially more likely to report that they value talking with their children about drugs. Both analyses put the difference between the highest and lowest exposure groups at over 20 points, after major potential confounding variables are controlled, a very large difference. Likewise, rank order correlations (Spearman's ρ) for the association between both talking behavior and cognitions with general and specific exposure are larger than for their association with monitoring behavior and cognition.

Table 6-O. Cross-sectional association of exposure per month and talking cognitions reported by parents of 12- to 18-year-olds

Score on the index with 99.9 the overall average across four waves								
	<1 exposure	1 - 3 exposures	4 - 11 exposures	12+ exposures	Direct effect (CI)	Monotonic trend	Spearman's rho	Maximum effect
General exposure	85.3		93.2	114.7	14.6* 9.3 to 19.9	<.001	.107	29.4* 20.5 to 38.3
Specific exposure	93.0	94.5	107.5	114.6	7.0* 0.7 to 13.3	.002	.076	21.7* 7.9 to 35.4

* Significant at $p < 0.05$.

6.3.3 Cross-sectional Association of Fun Activities with General and Specific Exposure

Table 6-P presents a strong picture of association between reported exposure to both general and specific advertising and the proportion of parents doing three or more activities per week with their children. For both the general exposure measure and for the specific exposure measure, every test of association is statistically significant. This is a somewhat surprising result, given the lack of any upward trend whatsoever in the previously reported data (see Table 6-H, above) and the reduced emphasis on the fun activities objective after the first few months of data collection. This result is not merely the result of effects appearing during the first wave. The same pattern of association is present among respondents at each wave. The possible explanations for this result are discussed in the final section of the chapter.

Table 6-P. Cross-sectional association of exposure per month and fun activities reported by parents of 12- to 18-year-olds

Percent of parents doing three or more activities per week, with overall average at 63 percent across four waves								
Exposure measure	<1 exposure	1-3 exposures	4-11 exposures	12+ exposures	Direct Effect (CI)	Monotonic trend	Spearman's rho	Maximum effect
General	57		64	67	6* 4 to 9	<.001	.083	10* 6 to 13
Specific	58	63	63	71	5* 2 to 8	<.001	.091	13* 6 to 20

* Significant at p<0.05.

6.3.4 Evidence for Diversity in Cross-sectional Associations

There are two ways to examine questions of diverse effects among subgroups. First, in situations where there was no overall evidence of an association, is there evidence that there were effects on some important subgroups? This is the focus for this section. Second, is there evidence that the associations are significantly different among subgroups? In fact, there is no evidence of differential associations in Detail Tables 6-57 through 6-66 across subgroups.

The focus question for this subsection is: Are there effects for some subgroups where there were no effects for all parents of 12- to 18-year-olds? Each of the five outcome variables was subject to two tests for associations, using the general exposure and the specific exposure measure. Seven of the 10 overall association analyses were significant for all parents of 12- to 18-year-olds. These include the tests for association for both talking outcomes, doing fun activities, and the analysis of monitoring cognitions that used the general exposure measure. Generally, most of the subgroup analyses in each of those analyses were also significant, and none could be shown to be different in association from the overall pattern. There were 11 comparisons made for each set of associations (two child genders, three race-ethnicities, two parent genders, two parent education levels, and two child age groupings). There were 77 analyses examined for the seven sets of associations where there was an overall association. Out of a total of 77, 59 were statistically significant on the monotone dose-response test. Thus for these measures, the conclusion is that the effects were widely shared. (African-American and Hispanic parents were least likely to show statistically significant effects across the set of comparisons; however, this likely reflects the fact that they were small subgroups of the entire population.)

There were three analyses where the overall associations were not statistically significant: both general and specific exposure measures with the monitoring behavior index, and the specific exposure measure with the monitoring cognitions index. Overall, in these three cases, the lack of an overall association was matched by a lack of subgroup associations. The subgroup analysis involved a total of 33 comparisons. Only 4 of the 33 showed a statistically significant association. In two of the cases, however, the subgroup to show a significant effect was fathers. The two others were parents of male youth and parents with a college education or more. In the case of the fathers, this meant that either the overall association was significant (and the fathers' association was not different from the overall significant association) or the fathers' association was significant in all but one case. Thus in 9 out of 10 tests, the reasonable inference was that there was an association for fathers. The only exception was for the general exposure association with monitoring behavior.

In summary, where there were overall associations, most subgroups showed associations. Where there was no overall association, few subgroups showed associations. The associations were particularly consistent for fathers.

6.4 Evidence of Association of Parent Exposure with Youth Behavior

While the Campaign anticipated that it may require 2 to 3 years to change youth marijuana use behavior, given the number of significant favorable associations of parent exposure with parent outcomes in cross-sectional analyses, it is worthwhile to ask whether there is an association of parent exposure and youth behavior. That is, parent behaviors and cognitions are conceived as intermediate variables meant to influence the outcome of main interest, youth marijuana use. Therefore, is there yet evidence indicating that youth are less likely to have used marijuana in the past year if their parent were more highly exposed to the Campaign's TV and radio messages? Table 6-Q presents the results, with more extensive information provided in Detail Tables 6-67 and 6-68.

Table 6-Q. Association between youth marijuana use and parental exposure per month

Percent of youth reporting past year marijuana use by parental exposure, with overall average at 15.6 percent across four waves								
Exposure measure	<1 exposure	1-3 exposures	4-11 exposures	12+ exposures	Direct Effect (CI)	Monotonic trend	Spearman's rho	Maximum effect
General	15.5		15.2	16.1	0 -1.9 to 1.9	-	.006	0.6 -2.6 to 3.7
Specific	14.8	15.9	15.3	20.0	0.8 -1.2 to 2.7	-	.046	5.2 -1.2 to 11.6

Overall, there were no significant cross-sectional associations for either measure of parental exposure and youth past year marijuana use. There were three significant associations by subgroups: for the specific exposure measure there were significant associations for White youth and for the youth defined as at higher risk of marijuana use. For the general exposure measure there was a significant association for parents of Hispanic youth, also in an unfavorable direction. There were a total of 32 tests of significance performed on such subgroup associations. Thus three significant results must be interpreted with caution. In addition, as can be seen in Table 6-R (and Detail Table 6-67 and 6-68), the effects reflect a sharp difference in use comparing one category of exposure to all of the others rather than a consistent upward trend across exposure categories. These results do not appear to be easily interpretable.

The relationship is marginally significant. There were 32 monotonic trend tests undertaken, and only one was significant; and that one was marginal. It would be inappropriate to make an inference of an unfavorable Campaign effect from these isolated results, although it will be important to monitor this effect in future waves. However, it is also clear that these analyses do not support a hypothesis that parent exposure to the Campaign has, thus far, reduced youth marijuana use.

Table 6-R. Association between youth marijuana use and parental exposure per month for youth subgroups

Subgroup and Exposure measure (Average use %)	Percent of youth reporting past year marijuana use by parental exposure							
	<1 exposure	1-3 exposures	4-11 exposures	12+ exposures	Direct Effect (CI)	Monotonic trend	Spearman's rho	Maximum effect
Hispanic youth General (14.3%)	9.7		16.9	14.6	4.6 0.3 to 8.9	.034	.06	4.9 -1.6, 11.5
High Risk youth Specific (35.7%)	33.7	37.0	34.0	46.8	1.8 -2.5 to 6.1	.045	.09	13.1* 1.3 to 24.9
White youth specific (16.4%)	15.1	17.0	15.1	25.7	1.4 -1.0 to 3.7	.038	.08	10.7 1.5 to 19.8

* Significant at p<0.05.

6.5 Longitudinal analyses of parent outcomes

Longitudinal analyses involve examining the association between exposure measured at Wave 1 and outcome measured at Wave 4, statistically controlling for Wave 1 values of the outcomes as well as confounders. This lagged association captures both the delayed effects of exposure at Wave 1 if that effect did not emerge until after Wave 1, as well as the effects of exposure at Wave 1 that flow through exposure at Wave 4 to outcome at Wave 4. These analyses examine the association of Wave 1 exposure and Wave 4 outcomes, over and above the association of Wave 1 exposure with Wave 1 outcomes. They will not detect any effects of exposure on outcomes that have already affected the Wave 1 measures. The focus of lagged analyses presented here is parents of youth who were 12 to 18 at Wave 4, when they were re-interviewed. Though subgroup differences are noted, longitudinal results yield fewer of these than cross-sectional analyses did.

Lagged analysis uses the same two exposure measures presented in the preceding section, general and specific exposure, both reported at Wave 1. As with cross-sectional results, parents reported general exposure at substantially higher levels than specific exposure. For example, nearly 47 percent of parents reported general exposure 12 or more times per month, but only 10 percent reported specific exposure at that level (Table 6-S). As was explained previously, because the two measures may capture different aspects of exposure, the evidence of longitudinal 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 Wave 1 and confounder variables using the propensity scoring procedures described in Appendix C. They are the 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. Also, the same four different estimators of Campaign effects are

presented in the associational tables: direct effect, monotonic trend test (Jonckheere-Terpstra), Spearman's rho, and maximum effect.

Table 6-S. Exposures per month reported by parents at Wave 1

	<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures
General exposure	26.2%		26.9%	46.6%
Specific exposure	29.2%	33.1%	28.0%	9.7%

6.5.1 Lagged Association of General and Specific Exposure with Monitoring Behavior and Cognitions Scales

In longitudinal analyses, neither the general nor the specific exposure measure is associated with parent reports of monitoring behavior. This is true for all the parents of 12- to 18-year-olds and for all measures of effects. Table 6-T presents the summary data for both exposure measures. These results parallel those for cross-sectional analyses reported in Table 6-L, with neither general nor specific exposure significantly associated with parent monitoring behavior measured at the same time.

Table 6-T. Lagged analysis of exposure per month and monitoring behavior reported by parents of 12- to 18-year-olds

Score on the monitoring behavior index at Wave 4 by exposure at Wave 1, with 1.43 the overall mean								
Exposure measure	<1 exposure	1-3 exposures	4-11 exposures	12+ exposures	Direct Effect (CI)	Monotonic trend	Spearman's rho	Maximum effect
General	1.48		1.39	1.50	-0.01 -0.11 to 0.09	-	0.01	0.03 -0.13 to 0.18
Specific	1.52	1.41	1.45	1.41	-0.06 -0.17 to 0.06	-	-0.03	-0.11 -0.41 to 0.20

Lagged analyses of the association between general and specific exposure with monitoring cognitions do not render any overall significant monotonic trends either (Table 6-U). The association of general exposure with monitoring cognitions, however, yields a significant unfavorable direct effect. That is, respondents who reported minimal exposure at Wave 1 later scored significantly higher on the monitoring cognition index than the average person in the sample, once the original cross-sectional association is controlled.

Table 6-U. Lagged analysis of exposure per month and monitoring cognitions reported by parents of 12- to 18-year-olds

Score on monitoring cognition index at Wave 4 with 89.51 the overall mean, by parental exposure at Wave 1								
Exposure measure	<1 exposure	1-3 exposures	4-11 exposures	12+ exposures	Direct Effect (CI)	Monotonic trend	Spearman's rho	Maximum effect
General	100.97		88.81	87.90	-9.04* -18.70 to -0.63	-	-0.04	-13.06 -27.77 to 1.64
Specific	98.48	88.21	86.61	93.71	-6.55 -16.74 to 3.63	-	-0.03	-4.77 -31.19 to 21.65

* Significant at $p < 0.05$.

Thus, while the cross-sectional results yielded a significant favorable monotonic trend for the association of general exposure with monitoring cognitions (reported in Table 6-M), there is no evidence for any additional lagged effect of that exposure.

There is only one subgroup with a significant monotonic trend, an unfavorable association of general exposure with monitoring cognitions for parents of White youth 12- to 18-years-old. This subgroup also has significant unfavorable direct and maximum Campaign effects. That is, parents reporting more exposure at Wave 1 scored significantly lower on the monitoring cognitions index at Wave 4. There is no evidence of subgroup diversity in the lagged association of specific exposure and monitoring cognitions.

6.5.2 Lagged Association of General and Specific Exposure with Talking Behavior and Cognitions Scales

Neither general nor specific exposure is associated over time with parent reports of talking behavior over and above the Wave 1 associations (Table 6-V). There were no significant results in the lagged subgroup analyses. All parents of youth 12- to 18-years-old report similar levels of talk at Wave 4, regardless of their level of exposure at Wave 1.

Table 6-V. Lagged analysis of exposure per month and talking behavior reported by parents of 12- to 18-year-olds

Score on the 0 to 3 point talking behavior scale, with overall average at 2.36 across four waves								
Exposure measure	<1 exposure	1-3 exposures	4-11 exposures	12+ exposures	Direct Effect (CI)	Monotonic trend	Spearman's rho	Maximum effect
General	2.35		2.35	2.35	0.01 -0.07 to 0.09	-	0.00	0.00 -0.15 to 0.15
Specific	2.34	2.33	2.40	2.23	0.02 -0.07 to 0.11	-	-0.02	-0.11 -0.39 to 0.18

Likewise, lagged analyses show no overall significant effects for the association of either exposure measure with talking cognitions (Table 6-W). There was one significant trend for fathers, whose specific exposure was favorably related to talking cognitions. No other subgroup showed any significant effect, for either general or specific exposure. As with talking behavior, results of lagged analyses of both exposure measures and talking cognitions contrast with those reported for cross-sectional associations, which yielded significant and consistently favorable associations (see Table 6-O).

Table 6-W. Lagged analysis of exposure per month and talking cognitions reported by parents of 12- to 18-year-olds

Score on talking cognition index at Wave 4 with 100.48 the overall mean, by parental exposure at Wave 1								
Exposure measure	<1 exposure	1-3 exposures	4-11 exposures	12+ exposures	Direct Effect (CI)	Monotonic trend	Spearman's rho	Maximum effect
General	103.23		90.67	106.60	-2.74 -11.46 to 5.97	-	0.01	3.37 -11.01 to 17.74
Specific	99.83	96.56	98.13	119.88	0.66 -8.65 to 9.96	-	0.06	20.05 -0.13 to 40.22

6.5.3 Lagged Association of General and Specific Exposure with Fun Activities

Parent claims of engaging in fun activities with their children is the only outcome to show a favorable significant monotonic trend. For the specific exposure measure, parents with the highest level of exposure at Wave 1 were more likely to report high levels of fun activities with their children at Wave 4 than were parents whose exposure levels were lower. This is consistent with the results from the cross-sectional analyses, where high exposed parents were more likely to report concurrent levels of high fun activities. The lagged associations of general exposure and fun activity reports were not significant, overall of far any subgroup. (Table 6-X).

Table 6-X. Lagged analysis of exposure per month and fun activities reported by parents of 12- to 18-year-olds

Percent of parents doing three or more activities per week at Wave 4 with overall average at 65 percent by exposure at Wave 1								
Exposure measure	<1 exposure	1-3 exposures	4-11 exposures	12+ exposures	Direct Effect (CI)	Monotonic trend	Spearman's rho	Maximum effect
General	65		65	66	1 -4 to 6	-	0.01	1 -6 to 9
Specific	67	63	66	73	-1 -6 to 3	0.05	0.05	6 -6 to 18

This result is interesting in that the Campaign emphasized this topic precisely during the period of Wave 1 data collection, when exposure was measured for this lagged analysis. However, there does remain some difficulty in making a strong inference of Campaign effects on fun activities: there is no over time upward trend in parents claiming to engage in such activities.

6.6 Discussion of Effects Results

The inferential logic laid out at the start of the chapter suggested that, in cross-sectional analyses, support for Campaign effects would reflect two favorable results: a favorable trend on a target outcome, and a favorable association between exposure to the Campaign and the outcome. For three of the five outcomes, under this logic, there was good reason after Wave 3, and once again after analysis of Wave 4, data to claim some support for an inference of Campaign effects. Table 6-Y summarizes the evidence for the five-focus indices. In two of the cases (talking behavior and cognitions) there is both a significant trend and a pair of significant associations with exposure for the overall population of parents of 12- to 18-year-olds. There is, moreover, an overall pattern of results that is consistent with a claim that the effects are widely shared. There is a particularly consistent pattern of associations for fathers, even when there was no overall association. However, there was no cross-sectional associational evidence for the overall sample that parent exposure was associated with lower marijuana consumption, despite some inconsistent results for subgroups.

In longitudinal analyses, support for Campaign effects relies on the existence of significant associations of parental exposure at the first time point (Wave 1) with parent outcomes at the second time point (Wave 4). Table 6-Z summarizes these results.

Table 6-Y. Summary of cross-sectional trend and association results for parents

Index	12 to 18			If No for 12 to 18, is there a significant association for a subgroup?		
	Trend	Association		Trend	Association	
		General	Specific		General	Specific
Talking behavior	Yes	Yes	Yes	--	--	--
Talking cognitions	Yes	Yes	Yes	--	--	--
Monitoring behavior	Yes	No	No	--	No	Fathers, parents of male youth
Monitoring cognitions	Yes	Yes	No	--	--	Fathers, parents with college education
Doing fun activities	No	Yes	Yes	No	--	--
Youth marijuana use in the previous year	No	No	No	12-13 year old AA ¹ youth (favorable)	Hispanic youth, (unfavorable)	Parents of higher risk and White youth (unfavorable)

Yes: Significant monotonic association at p<0.05.

--: Subgroup test not statistically different from result for full sample.

¹African American

Table 6-Z. Summary of lagged association results for parents (Wave 1 exposure per month and Wave 4 outcomes)

Outcome		<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures	Spearman rho	Significance
Talking behavior (0 to 3 scale)	General exposure	2.35		2.35	2.35	0.00	ns
	Specific exposure	2.34	2.33	2.40	2.23	-0.02	ns
Talking cognitions	General exposure	103.23		90.67	106.60	0.01	ns
	Specific exposure	99.83	96.56	98.13	119.88	0.06	ns
Monitoring behavior	General exposure	1.48		1.39	1.50	0.01	ns
	Specific exposure	1.52	1.41	1.45	1.41	-0.03	ns
Monitoring cognitions	General exposure	100.97		88.81	87.90	-0.04	ns
	Specific exposure	98.48	88.21	86.61	93.71	-0.03	ns
Doing fun activities	General exposure	65		65	66	0.01	ns
	Specific exposure	67	63	66	73	0.05	Yes

The goal of the longitudinal analyses was to try to better understand the source of the strong observed pattern of associations between the exposure variables and the parent outcome measures. They were meant to address the issue of whether the cross-sectional associations were due to the Campaign causing the outcomes, or the outcomes (which represent parent engagement with their children) causing recall of campaign exposure. Overall, these analyses did not provide additional support to a

casual claim. Only in one case was the lagged association significant, and that result reflected the difference between the highest level of exposure and the other three categories which were essentially the same. The interpretation of the lack of evidence is ambiguous. It is consistent with the possibility that the causal chain runs from outcomes to recalled exposure. It is consistent with the possibility that there was not enough additional influence of Wave 1 exposure over and above that already seen in the Wave 1 outcome to be detected.

The parent analyses in this semi-annual report had two innovative elements. One was the longitudinal analysis, meant to help sort through the causal order question. The second one was the incorporation of a youth behavior measure into the parent cross-sectional analysis. This also did not show support for Campaign success. The behavior variable was introduced in the context of the supportive evidence for association between exposure and the intermediary outcomes. It was natural to ask the next (and crucial question) as to whether the possible changes produced by the Campaign in the intermediary outcomes had translated into actual behavior change. There is no evidence to date supporting that claim.

How could it be that the associations of exposure and parent outcomes did not translate into an association of parent exposures and youth outcomes? The effect depends on the product of two links: the influence of parent exposure on parent cognitions and behaviors, and the influence of those cognitions and (particularly) behaviors on youth behavior. Therefore, the total effect could dissipate if either effect were missing, or the product of the effects were too small to be detected. The best explanation for the lack of statistically significant association between parent exposure and youth behavior is the combination of these two.

There was no association overall between parent exposure and monitoring behavior. Thus the overall path from parent exposure through monitoring behavior has to be zero, even though it turns out that monitoring behavior is the best predictor of youth behavior.

In contrast, exposure is related to talking cognitions and talking behavior. But, neither of those is related to youth behavior in a consistent direction. Thus, there is little possibility of an influence of parental exposure on youth behavior through talking cognitions or behavior. We have noted the lack of consistency between parent reports of talking and youth reports of talking. The lack of association of parent talk and youth behavior may reflect either that the behavior does not produce an effect, or that the parent reports of the behavior do not reflect what talk actually takes place.

There was an association of exposure and monitoring cognitions at Wave 1 and between monitoring cognitions at wave 1 and youth behavior. That would suggest that this might be a viable path for the influence of exposure on youth behavior. However, the exposure to cognitions cross-sectional association was weak (rho was .06 for general exposure and nonsignificant for specific exposure (.03)). Even with a small association between monitoring cognitions with youth behavior, the product of those two associations (which determines the overall association of exposure and outcome) is too small to expect detection. Parents' reports of engagement in fun family activities was related to exposure, but it showed no favorable trend over time. On that basis, there is some reason to be skeptical of the presence of a causal relationship, altogether. However, even if it was an intermediary variable between exposure and outcome, the strength of each of the two component relationships is too weak to expect to find statistical significance for the overall path.

In summary, there are trends and cross-sectional associations consistent with Campaign effects on parent outcomes, including talking behavior and cognitions, and monitoring cognitions. These are

most consistent for fathers. The longitudinal data do not provide the hoped for additional evidence to sort out the alternative explanations for the observed associations. Also, the evidence does not yet provide support for an effect of parent exposure on youth behavior, despite the evidence consistent with an effect on parent outcomes. This may reflect the apparent lack of relevance of some of the parent outcomes to youth behavior (talking), the weak associations of exposure and outcome (monitoring behavior), or that more time is required to influence youth behavior. With the next wave of data, the sample for the longitudinal analyses will grow by 150 percent. This may make it possible to detect longitudinal effects, particularly in subgroups, that were not apparent in these analyses. Indeed, the parent associations that are described in this chapter appeared only when the Wave 2 and Wave 3 data were joined to the Wave 1 data. A parallel effect may also occur when the full longitudinal sample is available.