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: monitoring children's behavior, talking with children about drugs, and engaging in fun activities with children. In the previous reports, 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; 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 still hold when Wave 5 is added. The interpretation of these trend and cross-sectional results were somewhat ambiguous as to 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. The previous report addressed these concerns with a longitudinal sample of parents interviewed at Wave 1 and re-interviewed at Wave 4. With this report it is possible to examine followup data with parents interviewed at Round 1 (including Waves 1, 2, and 3) and re-interviewed at Round 2 (Waves 4 and 5), which represents an increase of 150 percent in the longitudinal sample compared to the Wave 4 report, which included only 40 percent of the full sample. This permits a more sensitive examination of the possibility that Round 1 exposure to messages predicted change by Round 2 in the outcomes, thus helping to address the concern about causal direction.

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 five waves of data collection. Sections 6.3 and 6.4 present the evidence for cross-sectional and delayed-effects associations of exposure to Campaign advertising with the major outcome variables. The following section reviews results from cross-sectional and delayed-effects analyses of parent exposure on youth outcomes. Finally, Section 6.6 brings together the trend, associational, and delayed-effects analyses and discusses conclusions about Campaign effects.

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 favorable[1] 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.

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 a large number of confounder variables that might have influenced both exposure and outcome and, therefore, were the true cause of the observed association. (See Appendix C for the propensity score methodology that was used.)

Using cross-sectional data, several 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. Capitalizing on a much larger longitudinal sample than the previous report, this report continues to explore delayed-effects analyses that allow 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, as did the previous one, benefits from cohort data available over time; parents interviewed at Wave 1 were re-interviewed at Wave 4, and parents interviewed at Wave 2 and at Wave 3 were re-interviewed at Wave 5. As explained in Chapter 2, the delayed-effects analysis involves examining the association between exposure measured at Round 1 and outcome measured at Round 2, statistically controlling both for the Round 1 levels of the outcomes and for confounders. This delayed-effects association captures both the delayed-effects of exposure at Round 1 if that effect did not emerge until after Round 1, as well as the effects of exposure at Round 1 that flow through exposure at Round 2 to outcome at Round 2.

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. This report introduces analysis of subgroup of parents defined by wave of interview, allowing an examination of whether the effects of the Campaign might vary across the measurement periods. The cross-sectional results are presented according to year of current interview, while the delayed-effects association results are presented according to wave of first interview. 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

[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."

particular groups. If there is no overall effect, the subgroups are examined to see if there is evidence of effect for only a subpopulation.

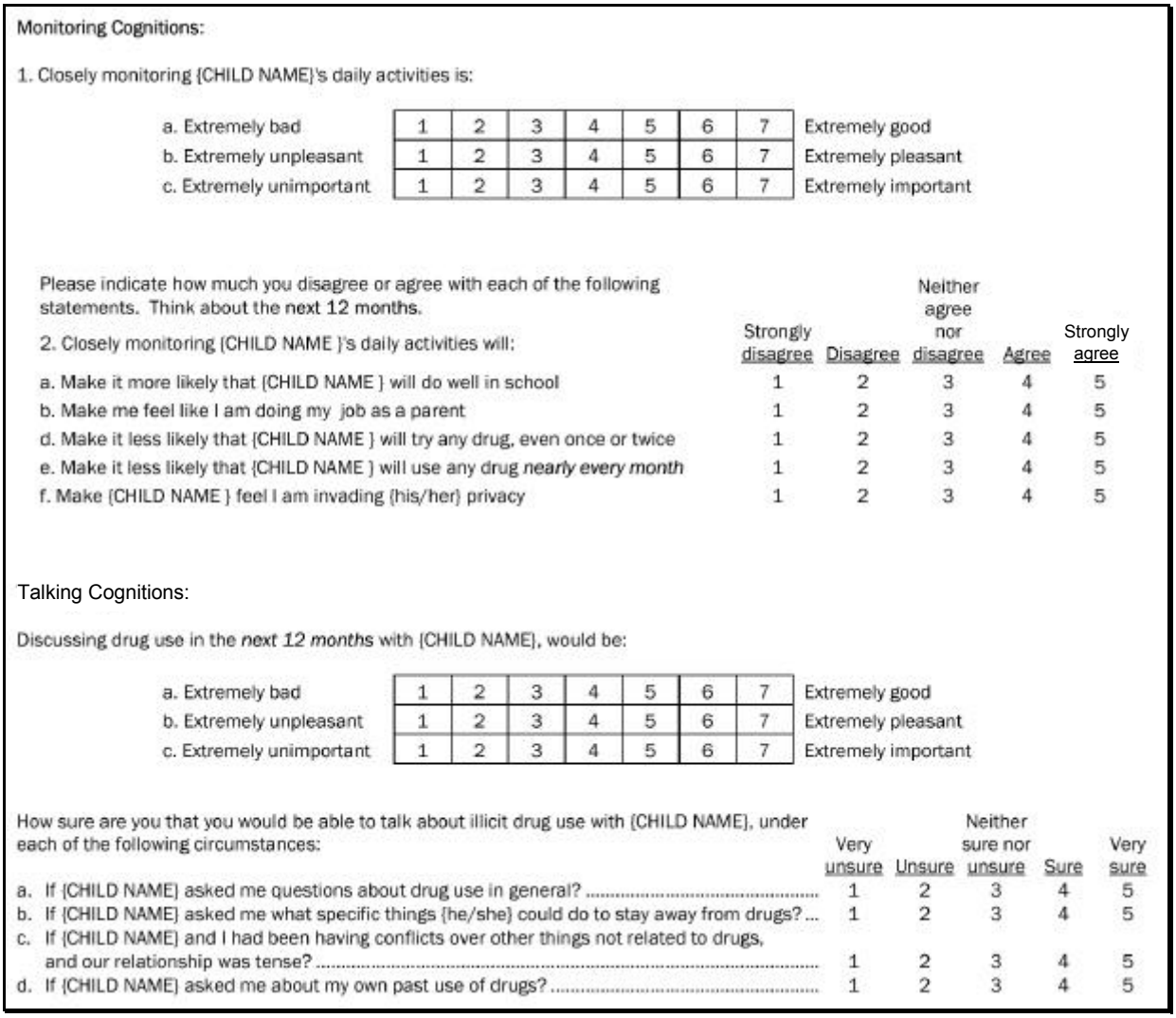
The primary analyses presented focus on five summed outcome measures: talking behavior, talking cognitions, monitoring behavior, monitoring cognitions, and fun activities undertaken. These measures summarize 21 individual measures. Trends in all the individual measures are presented in the Detail Tables, 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 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.

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 *nearly every month*	1	2	3	4	5
f. Make {CHILD NAME } feel I am invading {his/her} privacy	1	2	3	4	5

Talking Cognitions:

Discussing drug use in the *next 12 months* with {CHILD NAME}, would be:

a. Extremely bad	1	2	3	4	5	6	7	Extremely good
b. Extremely unpleasant	1	2	3	4	5	6	7	Extremely pleasant
c. Extremely unimportant	1	2	3	4	5	6	7	Extremely important

How sure are you that you would be able to talk about illicit drug use with {CHILD NAME}, under each of the following circumstances:

	Very unsure	Unsure	Neither sure nor unsure	Sure	Very sure
a. If {CHILD NAME} asked me questions about drug use in general?	1	2	3	4	5
b. If {CHILD NAME} asked me what specific things {he/she} could do to stay away from drugs?	1	2	3	4	5
c. If {CHILD NAME} and I had been having conflicts over other things not related to drugs, and our relationship was tense?	1	2	3	4	5
d. If {CHILD NAME} asked me about my own past use of drugs?	1	2	3	4	5

The previous report illustrated the cross-sectional association between the cognitive indices and their respective behavioral outcomes, which the addition of Wave 5 data only confirms. The association between monitoring cognitions and behavior is particularly strong, with 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. The association between talking cognitions and behavior, though less clear cut, is also substantial, with parents at the low end of the talking cognitions scale reporting 1.5 of the three talking behaviors while those at the high end report 2.7 of the three behaviors.

Delayed-effects analyses of the association between parent behaviors and cognitions at Round 1 and youth outcomes at Round 2 provide additional support for both the validity of the parent measures and, more generally, for Media Campaign goals regarding parental monitoring and involvement in fun activities. The following analyses exclude youth who had used marijuana at Round 1 and their parents.

Figures 6B and 6C present the association between parental reports of monitoring behavior and cognitions at Round 1 and youth reports of marijuana initiation at Round 2. In both cases there is a significant and strong favorable relationship, which holds up even after controlling for youth age (not shown). While only 5 percent of children whose parents reported performing the three monitoring

behaviors at Round 1 had initiated marijuana use at Round 2, 20 percent of children whose parents reported no monitoring behaviors had initiated marijuana use by Round 2. Likewise, and with a more clearly cut linear association, among children of parents who scored on the high end of the monitoring cognitions index at Round 1 only 8 percent reported marijuana initiation at Round 2 versus nearly 33 percent of children with parents scoring on the low end at Round 1.

Figure 6-B. Youth marijuana initiation at Round 2 by parent monitoring behavior at Round 1

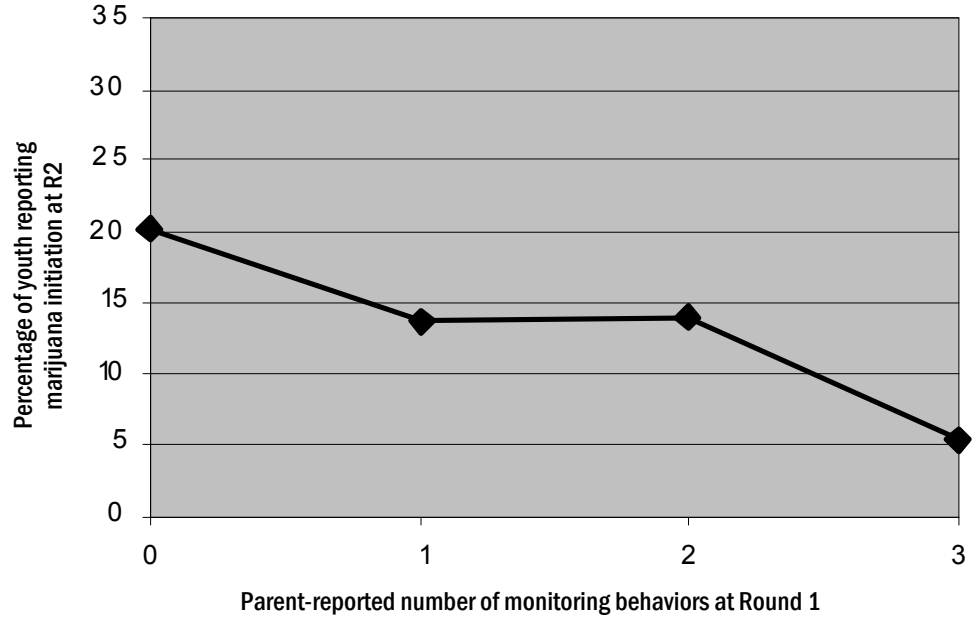
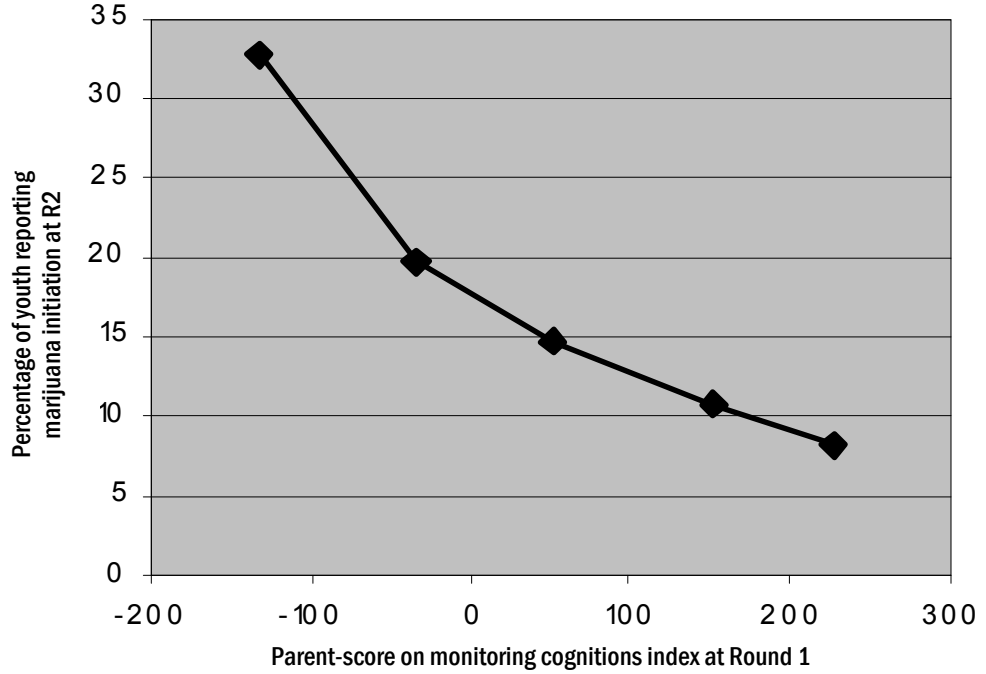
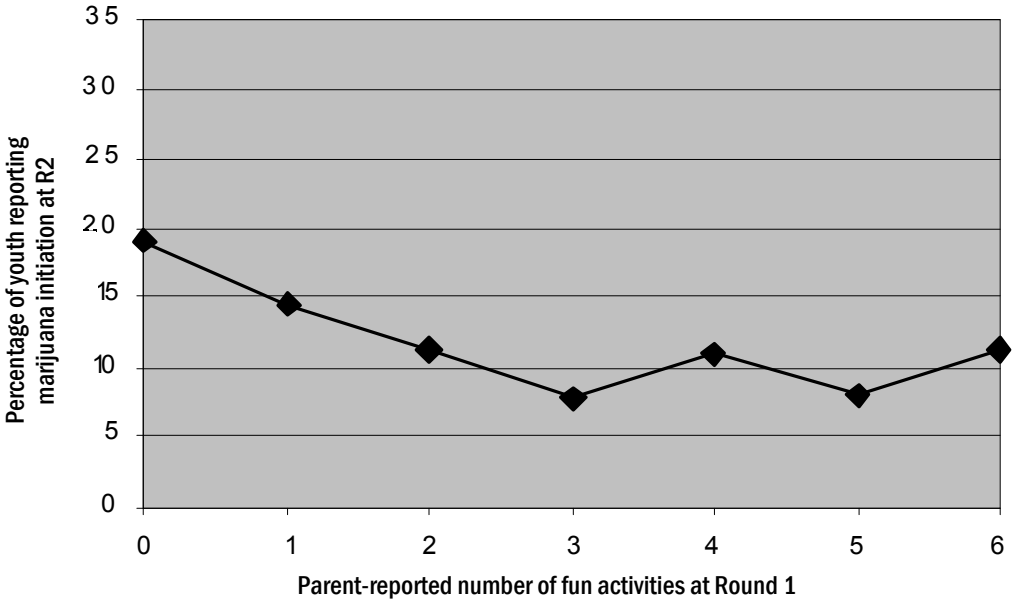


Figure 6-C. Youth marijuana initiation at Round 2 by parent monitoring cognitions at Round 1



The delayed-effects association between parent-reported involvement in fun activities at Round 1 and youth marijuana initiation at Round 2 is also substantial and statistically significant (Figure 6-D). Nineteen percent of children whose parents reported no fun activities in the preceding week at Round 1 reported marijuana initiation at Round 2, as compared to only 11 percent of children whose parents reported having engaged in six fun activities at Round 1.

Figure 6-D. Youth marijuana initiation at Round 2 by parent-reported fun activities at Round 1



By contrast, there is no delayed-effects association between parental reports of talking behaviors and cognitions and youth marijuana initiation. Marijuana initiation at Round 2 was at 13 percent for children of parents who reported no household conversation about drugs and of those who reported all three talking behaviors at Round 1 (Figure 6-E). Children whose parents had earlier reported unfavorable talking cognitions were as likely to initiate marijuana use at Round 2 as were children whose parents scored high on talking cognitions (Figure 6-F).

Figure 6-E. Youth marijuana initiation at Round 2 by parent talking behavior at Round 1

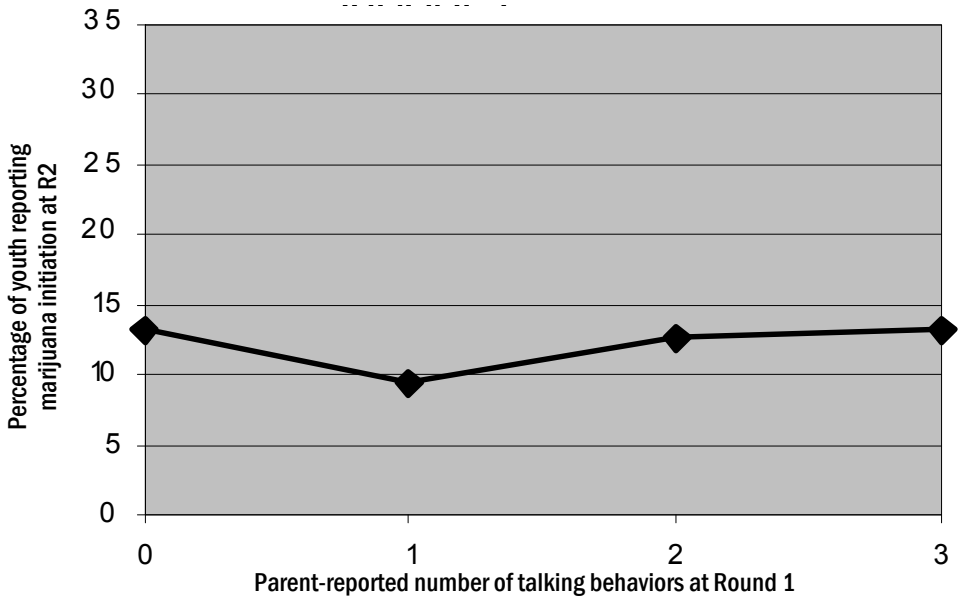
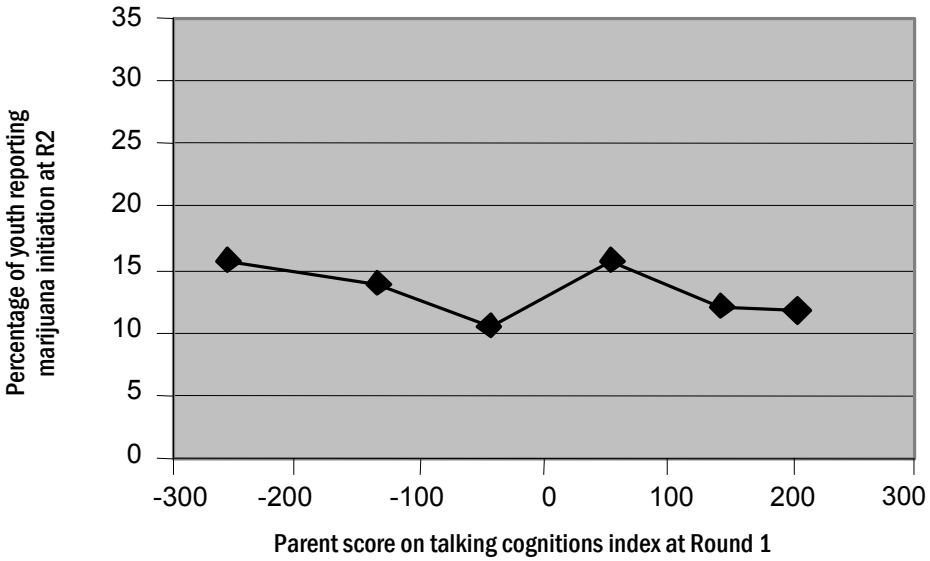


Figure 6-F. Youth marijuana initiation at Round 2 by parent talking cognitions at Round 1



These delayed-effects results are consistent with the cross-sectional results reported in the Third Semi-Annual Report (Hornik et al, 2001). That report showed clear associations of monitoring cognitions and behavior with drug use and intentions, but no such favorable associations for talking cognitions or behavior with drug use or intentions. There are also strong associations between parent reports of engaging in fun activities with their children and marijuana intentions and behaviors. Parents who engage in more activities with their children are less likely to have children who intend to use, or who actually report use of marijuana, even controlling for age of child.

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. Trend analyses will focus on changes between year 2000 and Wave 5 (January to June, 2002) given that these largely reflect pre-existing patterns between the yearly averages for years 2000 and 2001. Changes between year 2001 and Wave 5 are in the same direction but, for the most part, are not statistically significant (see Detail Tables 6-1 to 6-54).

6.2.1 Monitoring Behaviors

Table 6-A presents evidence of changes in monitoring behavior over the study period and the test for statistical significance of the difference between estimates for 2000 (Waves 1 and 2) and the first half of 2002. 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 statistically significant trend toward a favorable change. There is also a statistically significant favorable trend for two of the age subgroups, parents of 12- to 13-year-olds and of 14- to 15-year-olds. Since the recommendation for increased monitoring as an approach to prevention of drug use has often focused

on younger children, the finding of a significant trend among these parents is particularly encouraging. Thus the overall conclusion is that in the first half of 2002 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)

	Number of Monitoring Behaviors				
Age groups	Year 2000 (Mean)	Year 2001 (Mean)	Wave 5 (Jan-June 2002) (Mean)	2000 to Wave 5 Change (95% CI)	2001 to Wave 5 Change (95% CI)
12 to 13	1.65	1.80	1.82	**0.17* (0.06 to 0.28)**	0.02 (-0.07 to 0.11)
14 to 15	1.47	1.46	1.60	**0.13* (0.02 to 0.23)**	**0.14* (0.04 to 0.25)**
16 to 18	1.17	1.21	1.21	0.04 (-0.06 to 0.14)	0.00 (-0.11 to 0.12)
14 to 18	1.31	1.32	1.38	0.07 (-0.01 to 0.15)	0.06 (-0.03 to 0.14)
12 to 18	1.41	1.46	1.51	**0.10* (0.04 to 0.16)**	0.05 (-0.02 to 0.11)

* Change 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, 71 percent of 12- to 13-year-olds' parents, but only 51 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, 72 percent of 12- to 13-year-olds' parents versus 53 percent of 16- to 18-year-olds' parents always or almost always know their child's plans for the coming day. Finally, 38 percent of 12- to 13-year-olds' parents versus 17 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 62 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 49 percent of youth agreed; 63 percent of parents but only 32 percent of youth claimed that parents always or almost always knew the child's plans for the coming day. Finally, 27 percent of parents, but only 8 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)

	Number of Monitoring Behaviors				
Age groups	Year 2000 (Mean)	Year 2001 (Mean)	Wave 5 (Jan-June 2002) (Mean)	2000 to Wave 5 Change (95% CI)	2001 to Wave 5 Change (95% CI)
12 to 13	1.03	1.08	1.10	0.07 (-0.01 to 0.15)	0.01 (-0.07 to 0.09)
14 to 15	0.87	0.88	0.94	0.07 (-0.03 to 0.17)	0.05 (-0.05 to 0.16)
16 to 18	0.75	0.70	0.71	-0.04 (-0.11 to 0.04)	0.01 (-0.07 to 0.09)
14 to 18	0.80	0.78	0.81	0.01 (-0.06 to 0.07)	0.02 (-0.04 to 0.09)
12 to 18	0.87	0.87	0.89	0.03 (-0.02 to 0.07)	0.02 (-0.03 to 0.07)

6.2.2 Monitoring Cognitions

The change in parents' monitoring cognitions over the five 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 aged 12 to 18 with all of the age subgroups showing change in the same direction. All of the change on this measure had apparently taken place between 2000 and 2001, with the 2001 level already at 92.66 for the parents of 12- to 18-year-olds.

Table 6-C. Parental monitoring cognitions by youth age

	Score on the index with 100 as the average[1]				
Age groups	Year 2000 (Mean)	Year 2001 (Mean)	Wave 5 (Jan-June 2002) (Mean)	2000 to Wave 5 Change (95% CI)	2001 to Wave 5 Change (95% CI)
12 to 13	114.80	122.95	122.20	7.40 (-0.73 to 15.53)	0.75 (-7.34 to 5.84)
14 to 15	91.55	94.47	94.93	3.39 (-6.69 to 13.46)	0.46 (-8.41 to 9.33)
16 to 18	62.07	67.43	68.51	6.43 (-2.47 to 15.34)	1.08 (-10.76 to 12.92)
14 to 18	75.67	79.96	79.95	4.28 (-2.66 to 11.23)	-0.01 (-7.69 to 7.68)
12 to 18	87.18	92.66	92.55	**5.38* (0. 31 to 10.44)**	-0.11 (-5.93 to 5.71)

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

* Change significant at $p < 0.05$.

Trends in the individual questions that make up the monitoring cognitions scale are presented in Detail Tables 6-39 through 6-44 and Detail Table 6-51. Many of the individual questions show a parallel pattern of favorable change.

6.2.3 Talking Behaviors

Table 6-D summarizes the information about the extent of parent–child conversations about drugs (see also Detail Table 6-4). Parents could earn up to three points if they reported talking about drugs at least twice in the past 6 months, as well as talking about family rules about drugs, and about specific things a child could do to avoid drugs.

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

	Number of Talking Behaviors (0 to 3)				
Age groups	Year 2000 (Mean)	Year 2001 (Mean)	Wave 5 (Jan-June 2002) (Mean)	2000 to Wave 5 Change (95% CI)	2001 to Wave 5 Change (95% CI)
12 to 13	2.29	2.38	2.42	**0.13* (0.06 to 0.21)**	0.04 (-0.04 to 0.13)
14 to 15	2.28	2.39	2.48	**0.20* (0.06 to 0.3)**	**0.09* (0.00 to 0.18)**
16 to 18	2.21	2.33	2.31	0.10 (-0.03 to 0.23)	-0.01 (-0.13 to 0.10)
14 to 18	2.24	2.36	2.39	**0.14* (0.03 to 0.25)**	0.03 (-0.04 to 0.10)
12 to 18	2.26	2.36	2.40	**0.14* (0.06 to 0.23)**	0.03 (-0.03 to 0.10)

* Change significant at $p < 0.05$.

Parents are widely claiming to do a good deal of talking about drugs with their children. The average parent claims to engage in 2.4 out of the 3 measured talking behaviors. As with the monitoring results above, parents report more frequent talk with younger children than with 16- to 18-year-olds.

This table also shows an overall pattern of increasing talk. The size of the absolute change is small, from 2.26 to 2.40. Each of the individual questions showed a change of only around 4.5 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 2.4 out of 3 behaviors, their children report approximately 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 favorable parent-reported trends among parents of all youth aged 12 to 18 complement a strong cross-sectional association between exposure and talking behavior. However, the lack of support in child reports of talking behavior 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)

	Number of Talking Behaviors (0 to 3)				
Age groups	Year 2000 (Mean)	Year 2001 (Mean)	Wave 5 (Jan-June 2002) (Mean)	2000 to Wave 5 Change (95% CI)	2001 to Wave 5 Change (95% CI)
12 to 13	1.74	1.58	1.53	**-0.20* (-0.32 to –0.09)**	-0.05 (-0.17 to 0.07)
14 to 15	1.56	1.42	1.42	**-0.14* (-0.26 to -0.02)**	0.00 (-0.14 to 0.14)
16 to 18	1.32	1.27	1.24	-0.08 (-0.18 to 0.02)	-0.03 (-0.14 to 0.07)
14 to 18	1.43	1.34	1.31	**-0.11* (-0.19 to –0.04)**	-0.02 (-0.11 to 0.06)
12 to 18	1.52	1.41	1.38	**-0.14* (-0.20 to –0.07)**	-0.03 (-0.10 to 0.04)

* Change 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 with the other group. About half of the parents of 12- to 18-year-olds and a little more than one-quarter of youth reported such conversations. There is evidence that the rate of conversations about the anti-drug ads reported by parents increased from 2000 to the first half of 2002. Youth reports, however, show no significant change over this same period (see also 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 no overall statistically significant pattern of improvement for parents of all youth aged 12 to 18, although the 95 percent confidence interval barely overlaps zero. There is a statistically significant favorable trend for parents of 14- to 18-year-olds (see also Detail Table 6-2).

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

	Score on summed scale with average = 100 at Wave 1				
Age groups	Year 2000 (Mean)	Year 2001 (Mean)	Wave 5 (Jan-June 2002) (Mean)	2000 to Wave 5 Change (95% CI)	2001 to Wave 5 Change (95% CI)
12 to 13	109.29	112.07	107.84	-1.45 (-9.03 to 6.13)	-4.23 (-12.96 to 4.50)
14 to 15	103.15	108.63	108.97	5.82 (-4.87 to 16.50)	0.34 (-10.06 to 10.73)
16 to 18	81.63	90.74	92.90	**11.27* (1.39 to 21.15)**	2.16 (-8.04 to 12.36)
14 to 18	91.56	99.03	99.86	**8.30* (1.19 to 15.41)**	0.83 (-7.07 to 8.73)
12 to 18	96.77	102.88	102.24	5.47 (-0.11 to 11.04)	-0.64 (-7.15 to 5.87)

* Change significant at $p < 0.05$.

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 Tables 6-5, 6-16, and 6-17).

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

	Percent saying they did three or more activities per week				
Age groups	Year 2000 (Mean)	Year 2001 (Mean)	Wave 5 (Jan-June 2002) (Mean)	2000 to Wave 5 Change (95% CI)	2001 to Wave 5 Change (95% CI)
12 to 13	74.8	74.7	73.4	-1.4 (-5.0 to 2.1)	-1.3 (-4.9 to 2.4)
14 to 15	67.8	64.3	62.5	**-5.3* (-10.3 to - 0.3)**	-1.9 (-6.5 to 2.8)
16 to 18	51.1	51.9	50.9	-0.1 (-5.4 to 5.1)	-1.0 (-5.7 to 3.8)
14 to 18	58.8	57.7	55.9	-2.8 (-6.5 to 0.8)	-1.7 (-5.1 to 1.7)
12 to 18	63.5	62.7	61.2	-2.4 (-5.4 to 0.7)	-2.4 (-4.3 to 1.2)

* Change significant at $p < 0.05$.

Table 6-G offers three striking results. First, parents report doing a lot of fun activities with their children. More than 60 percent claim to be doing three or more activities from the start. This created something of a ceiling for the Campaign: if most parents already saw themselves as doing fun activities with their children, then a message to do fun activities might not have suggested a deficit in current behavior that needed improvement. Second, the level of activity is sharply associated with the age of the child. Across all five waves, 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 (Detail Table 6-5). In contrast to the results for talking and monitoring, youth and parent reports of fun activities are consistent in their average levels. The fun activities questions were asked of youth only in 2001 and 2002. However in those years, the proportions claiming to do three or more activities were within one percentage point for youth and parents. Finally, the evidence does not support a claim of increasing levels of activity for parents of 12- to 18-year olds or any subgroups. 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 when respondents were first interviewed. The lack of upward trend after that wave may reflect the subsequent change in Campaign focus.

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 favorable change for parents of 12- to 18-year-olds on monitoring behavior, so the question is whether trends were different for different subgroups. The observed absolute change from year 2000 to the first half of 2002 was larger for some groups than others (see Detail Table 6-3), and 11 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 trends.

While the differences in trends are not statistically significant, it is worth noting that the actual behaviors, averaged across the five waves, are different by subgroups. Parents are more likely to monitor girls (1.54 on the 0 to 3 scale) than they are boys (1.28), although boy monitoring is catching up: boy monitoring showed a significant increase from 2000 to the first half of 2002, while girl monitoring also increased but not significantly so. Most notably, the previous report, which first incorporated risk for marijuana use in the subgroup analyses, found consistent differences with regard to monitoring behavior and various measures of monitoring beliefs and attitudes by risk group. These differences held up even after controlling for child age.

Wave 5 data confirm this pattern of significant differences by child risk. Table 6-H presents the five-wave averages of parent reports of monitoring behaviors, monitoring cognitions, and intentions to monitor. Only parents of youth aged 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.

Eight of the nine comparisons yield statistically significant differences when controlling for child age. Parents of children at higher risk across all age groups report fewer monitoring behaviors and hold less favorable views regarding monitoring. Parents of the youngest and oldest youth at higher risk also report fewer intentions to monitor.

Table 6-H. Parent monitoring behaviors and cognitions by child age and risk

Youth characteristics		Parent reports averaged across five waves of:		
Age groups	Risk	Monitoring behavior mean (CI)	Monitoring cognitions mean (CI)	Intention to monitor mean (CI)
12 to 13	Higher	**1.34** (1.20 to 1.49)	**88.2** (73.5 to 102.9)	**1.38** (1.30 to 1.46)
	Lower	**1.81** (1.76 to 1.85)	**124.6** (119.1 to 125.3)	**1.57** (1.55 to 1.59)
14 to 15	Higher	**1.38** (1.26 to 1.50)	**71.32** (59.2 to 83.5)	**1.43** (1.38 to 1.48)
	Lower	**1.65** (1.59 to 1.71)	**111.5** (105.8 to 117.3)	**1.51** (1.47 to 1.54)
16 to 18	Higher	**1.21** (1.10 to 1.31)	**70.3** (59.9 to 80.7)	**1.12** (1.06 to 1.18)
	Lower	**1.55** (1.45 to 1.65)	**96.5** (87.8 to 105.2)	**1.30** (1.25 to 1.36)

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

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 (see Detail Table 6-4). The appropriate conclusion is that the observed change in talking behavior between years was widely shared.

Talking cognitions, as presented in Table 6-F, showed no significant change from 2000 to the first half of 2002 for the full population of parents of youth aged 12 to 18. There were significant favorable trends for parents of 14- to 18-year-olds (see Detail Table 6-2).

There were, however, a few significant subgroup differences in absolute levels of talking behavior and cognitions averaged across the five waves. Mothers were more likely to report household talk than were fathers (2.45 vs. 2.30); mothers also reported significantly more favorable talking cognitions than did fathers (111 vs. 87). Parents of African American and Hispanic children reported more household talk than parents of White children (2.57 and 2.66 vs. 2.31); they also reported significantly more favorable talking cognitions than did parents of White children (136 and 124 vs. 90). Finally, parents with a high school education or less reported significantly more favorable talking cognitions than parents with some college education or more (106 vs. 95).

In sharp contrast with the consistent differences in monitoring behavior and cognitions by risk subgroup, the previous report found that parents of children at higher and lower risk report similar levels of talking behavior and cognitions within age subgroups. This absence of subgroup differences is confirmed in Wave 5.

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 parental reports of household talking behavior and cognitions do not vary by child risk.

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, use alcohol, and find it harder to monitor them, and that is also reflected in their beliefs and attitudes about monitoring.

Interestingly, as in the previous report, children's accounts of parental monitoring and talking behaviors parallel these results. 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.

Diversity of Trends for Reports of Fun Activities

No trend was found in reports of fun activities for the total population of parents of 12- to 18-year-olds (Table 6-G). When the data for subgroups were examined, almost all differences between the average estimates for year 2000 and the first half of 2002 were not statistically significant but all were in an unfavorable direction, overall and for any subgroup. There were two subgroups for which a monotonically decreasing trend was found from 2000 to the first half of 2002: parents of 14- to 15-year-olds, and parents of high sensation-seekers.

In summary, the trend data provides evidence of favorable change for both monitoring behavior and cognitions, and for talking behavior for part of the sample for talking cognitions, and no change at all for fun activities. In general, 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.

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 12 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-I presents the distributions for both general and specific exposure for all parents of 12- to 18-year-olds (see also Detail Tables 6-55, 6-66).

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

	<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures
General exposure	30.7%		26.7%	42.6%
Specific exposure	24.1%	32.6%	31.6%	11.6%

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 three 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 what the average person in the entire population is projected to have been like had the population only had minimal exposure. It is the best estimate of the average effects of the Campaign across the population. Gamma, the second estimator, is a measure of the magnitude of association that indicates whether there is an overall pattern for those who have higher exposure to be higher on the outcome variable. It varies from –1 to +1, with estimates closer to either end showing stronger associations. Where the confidence interval for gamma does not include 0, the association between exposure and outcome is statistically significant at the $p<.05$ level. 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 make a claim for Campaign effects.

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), and by interview rounds (Waves 1 to 3 and Waves 4 and 5).

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-J presents the summary data for both exposure measures, with the full version in Detail Tables 6-61 and 6-62.

Table 6-J. 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 1.45 the overall mean across five waves							
	<1 exposure	1 – 3 exposures	4 – 11 exposures	12+ exposures	Direct effect (CI)	Gamma (CI)	Maximum effect (CI)
General exposure	1.44		1.45	1.49	0.02 (-0.05 to 0.08)	0.024 (-0.02 to 0.07)	0.05 (-0.04 to 0.14)
Specific exposure	1.45	1.43	1.46	1.50	0.00 (-0.06 to 0.06)	0.019 (-0.03 to 0.07)	0.05 (-0.10 to 0.20)

In contrast to their reports of behavior, parent reports of cognitions about monitoring do show association with exposure. All three estimates of effects are statistically significant for general exposure, and in a consistent direction for the specific exposure measure. However, none of the estimates of effects for specific exposure was significant. These data are presented in Table 6-K, which summarizes the information that is fully presented in Detail Tables 6-57 and 6-58.

Table 6-K. 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 90.55 the overall mean across five waves							
	<1 exposure	1 – 3 exposures	4 – 11 exposures	12+ exposures	Direct effect (CI)	Gamma (CI)	Maximum effect (CI)
General exposure	82.99		88.00	96.50	**7.56* (1.95 to 13.17)**	**0.053* (0.02 to 0.08)**	**13.51* (5.61 to 21.41)**
Specific exposure	86.41	87.85	90.62	97.52	4.14 (-2.83 to 11.11)	0.028 (-0.01 to 0.07)	11.11 (-3.03 to 25.24)

* Significant at $p < 0.05$.

The general exposure measure is correctly ordered with regard to the monitoring cognitions index, with the mean score larger at each succeeding level. Though larger than for the association between the two measures of exposure and monitoring behavior, the gamma estimates for the associations with monitoring cognitions are fairly small (0.053 and 0.028 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-L presents the evidence for the association with talking behaviors, with the complete results in Detail Tables 6-63 and 6-64.

Table 6-L. 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 2.33 across five waves							
	<1 exposure	1 – 3 exposures	4 – 11 exposures	12+ exposures	Direct effect (CI)	Gamma (CI)	Maximum effect (CI)
General exposure	2.19		2.32	2.46	**0.14* (0.08 to 0.19)**	**0.149* (0.10 to 0.20)**	**0.26* (0.18 to 0.35)**
Specific exposure	2.26	2.27	2.41	2.46	**0.07* (0.01 to 0.13)**	**0.129* (0.07 to 0.18)**	**0.20* (0.08 to 0.31)**

* Significant at $p < 0.05$.

Both the general and specific exposure measures are associated with talking for all three tests: direct effects, gamma, and maximum potential effect. That is, parents of 12- to 18-year olds who report more exposure to the Campaign's messages are more likely to report talking to their children as well.

Table 6-M 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 greater than 20 percentage points, after major potential confounding variables are controlled, a very large difference. Likewise, gamma estimates 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-M. Cross-sectional association of exposure per month and talking cognitions reported by parents of 12- to 18-year-olds

Score on the talking cognitions index with 100.35 the overall average across five waves							
	<1 exposure	1 – 3 exposures	4 – 11 exposures	12+ exposures	Direct effect (CI)	Gamma (CI)	Maximum effect (CI)
General exposure	86.57		94.55	115.84	**13.78* (9.03 to 18.52)**	**0.102* (0.07 to 0.13)**	**29.26* (21.77 to 36.76)**
Specific exposure	92.31	93.18	106.72	118.96	**8.04* (1.57 to 14.51)**	**0.084* (0.04 to 0.12)**	**26.65* (13.65 to 39.65)**

* Significant at $p < 0.05$.

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

Table 6-N 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 and the specific exposure measures, all three tests of association are statistically significant. This is a somewhat surprising result, given the lack of an overall upward trend in the previously reported data (see Table 6-G) 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-N. 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 five waves							
Exposure measure	<1 exposure	1-3 exposures	4-11 exposures	12+ exposures	Direct effect (CI)	Gamma (CI)	Maximum effect (CI)
General	56.9		63.2	65.5	**5.8* (3.2 to 8.4)**	**0.121* (7 to 17)**	**8.6* (5.0 to 12.2)**
Specific	55.3	62.6	63.0	71.7	**7.4* (4.5 to 10.3)**	**0.175* (12 to 23)**	**16.4* (10.7 to 22.1)**

* 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? Second, in the presence of overall associations, is there evidence that these are significantly different among subgroups? This section addresses these two questions. In general, there is no evidence of differential associations in Detail Tables 6-57 through 6-66 across subgroups.

Each of the five outcome variables was subject to three 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: the associations of general and specific exposure with the two talking outcomes, with reports of fun activities, and the association between general exposure and monitoring cognitions. Generally, most of the subgroup analyses in each of those analyses were also significant, and none could be shown to be different in terms of its overall association (gamma) from the pattern found for the whole sample. 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 117 comparisons. Only 2 of the 117 showed a statistically significant association as measured by gamma. Both times, the subgroup to show a significant effect was fathers. Thus, in 9 out of 10 outcomes, the reasonable inference was that there was an association for fathers: either the overall association was significant (and the fathers' association was not different from the overall significant association), or there was a subgroup association for fathers in the absence of an overall association. The only exception was for the general exposure association with monitoring behavior.

In summary, where there were overall associations, most subgroups also showed statistically significant associations as well. Where there was no association for the entire population, only one subgroup, fathers, showed a significant association.

6.4 Delayed-effects Analyses of Parent Outcomes

Delayed-effects analyses involve examining the association between exposure measured at Round 1 and outcome measured at Round 2, statistically controlling for Round 1 values of the outcomes as well as confounders. This delayed-effects association captures both the delayed-effects of exposure at Round 1 if that effect did not emerge until after Round 1, as well as the effects of exposure at Round 1

that flow through exposure at Round 2 to outcome at Round 2. These analyses examine the association of Round 1 exposure and Round 2 outcomes, over and above the association of Round 1 exposure with Round 1 outcomes. They will not detect any effects of exposure on outcomes that have already affected the Round 1 measures. The focus of delayed-effects analyses presented here is parents of youth who were 12 to 18 at Round 2, when they were re-interviewed. The detail tables also contain information about each specific longitudinal pair-up (Wave 1 with Wave 4, Wave 2 with Wave 5, and Wave 3 with Wave 5). Though emphasis is placed on Round 1 to Round 2 analyses, distinctive patterns of change for specific longitudinal pair-ups are also noted. Subgroup and subsample differences are also noted, though longitudinal results yield fewer of these than cross-sectional analyses did.

Delayed-effects analyses uses the same two exposure measures presented in the preceding section, general and specific exposure, both reported at Round 1. As with cross-sectional results, parents reported general exposure at substantially higher levels than specific exposure. For example, 43 percent of parents reported general exposure 12 or more times per month, but only 9 percent reported specific exposure at that level (Table 6-O). For delayed-effects analyses involving the specific exposure measure, only three categories of exposure are used: parents who reported exposure less than 1 time per month, 1 to 3 times per month, and 4 or more times per month. As it was explained previously, because the two measures may capture different aspects of exposure, the evidence of delayed-effects association is presented for both, with the interpretation strengthened when both show the same pattern of effects. In all exposure analyses, the effects are corrected for the influence of outcomes measured at Round 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 measured variables that were associated with exposure. Also, the same three different estimators of Campaign effects are presented in the associational tables: direct effect, gamma, and maximum effect.

Table 6-O. Exposures per month reported by parents at Round 1

	<1 exposure	1 to 3 exposures	4 to 11 exposures	12+ exposures
General exposure	29.1%		27.8%	43.1
Specific exposure	28.5%	34.6%	36.9%	

6.4.1 Delayed-effects Association of General and Specific Exposure with Monitoring Behavior and Cognitions Scales

The previous report found that neither the general nor the specific exposure measure were associated with longitudinal parent reports of monitoring behavior. This remains true for all the parents of 12- to 18-year-olds and for all measures of effects in this report as well. Table 6-P presents the summary data for both exposure measures. These results parallel those for cross-sectional analyses reported in Table 6-J, with neither general nor specific exposure significantly associated with parent monitoring behavior measured at the same time.

No delayed-effects subgroup associations were found for specific exposure. For general exposure, there were a few scattered additional results across subgroups. Given the number of tests of statistical significance performed and the lack of significant overall subgroup associations, it is plausible that these results reflect mere chance associations.

Table 6-P. Delayed-effects analyses of exposure per month and monitoring behavior reported by parents of 12- to 18-year-olds

Score on the monitoring behavior index at Round 2 by exposure at Round 1, with 1.49 the overall mean							
Exposure measure	<1 exposure	1-3 exposures	4-11 exposures	12+ exposures	Direct effect (CI)	Gamma (CI)	Maximum effect (CI)
General	1.55		1.44	1.51	-0.07 (-0.14 to 0.01)	-0.019 (-0.07 to 0.04)	-0.04 (-0.15 to 0.07)
Specific	1.47	1.43	1.49		0.02 (-0.07 to 0.11)	0.008 (-0.06 to 0.07)	0.02 (-0.11 to 0.15)

Delayed-effects analyses of the association between general and specific exposure with monitoring cognitions do not render any overall significant effect either (Table 6-Q). The previous report noted a significant unfavorable direct effect of general exposure on monitoring cognitions; this finding is not sustained with the complete Round 1-Round 2 sample. Despite the fact that the propensity scores were re-estimated since the last report, the Wave 1 to Wave 4 delayed-effects association still holds, with significant unfavorable direct and maximum effects (see Detail Tables 6-67 and 6-68).

Table 6-Q. Delayed-effects analyses of exposure per month and monitoring cognitions reported by parents of 12- to 18-year-olds

Score on monitoring cognition index at Round 2 with 90.76 the overall mean, by parental exposure at Round 1							
Exposure measure	<1 exposure	1-3 exposures	4-11 exposures	12+ exposures	Direct effect (CI)	Gamma (CI)	Maximum effect (CI)
General	99.21		92.40	95.77	-8.45 (-17.55 to 0.65)	-0.020 (-0.06 to 0.03)	-3.45 (-15.34 to 8.45)
Specific	92.26	89.45	89.67		-1.49 (-11.35 to 8.36)	-0.011 (-0.07 to 0.05)	-2.59 (-18.64 to 13.47)

Thus, while the cross-sectional results yielded favorable direct, overall and maximum associations of general exposure with monitoring cognitions, there is no evidence for any additional delayed-effects of general exposure at Round 1 on monitoring cognitions at Round 2.

There is also no evidence of consistent patterns of subgroup effects in the delayed-effects associations of general and specific exposure and monitoring cognitions (see Detail Tables 6-67 and 6-68).

6.4.2 Delayed-effects Association of General and Specific Exposure with Talking Behavior and Cognitions Scales

The previous report found no significant delayed-effects associations of either exposure measure with talking behavior. In contrast, with the current larger samples for parents of 12- to 18-year-olds, there was a favorable overall effect of general exposure on talking behavior (Table 6-R). That is, parents who reported more general exposure at Round 1 reported significantly more household talk at Round 2. The association is also monotonic. However, the effect as measured by gamma is fairly small (0.083).

There is no evidence of significant delayed-effects associations of specific exposure and talking behavior for the whole sample nor for any subgroup or subsample (see Detail Table 6-74).

Table 6-R. Delayed-effects analyses 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 at Round 2, with 2.40 the overall mean, by parental exposure at Round 1							
Exposure measure	<1 exposure	1-3 exposures	4-11 exposures	12+ exposures	Direct effect (CI)	Gamma (CI)	Maximum effect (CI)
General	2.34		2.42	2.46	0.06 (-0.03 to 0.15)	**0.083* (0.01 to 0.16)**	0.12 (0.00 to 0.24)
Specific	2.41	2.36	2.44		-0.01 (-0.07 to 0.05)	0.029 (-0.03 to 0.09)	0.03 (-0.06 to 0.12)

* Significant at $p < 0.05$.

Delayed-effects analyses show no statistically significant overall effects for the association of either exposure measure with talking cognitions (Table 6-S). No consistent pattern of effects was found across subgroups, for either general or specific exposure (see Detail Tables 6-69, 6-70). Results of delayed-effects analyses of both exposure measures and talking cognitions contrast with those reported for cross-sectional associations, which yielded a significant and favorable overall association (see Table 6-M).

Table 6-S. Delayed-effects analyses of exposure per month and talking cognitions reported by parents of 12- to 18-year-olds

Score on talking cognition index at Round 2 with 100.08 the overall mean, by parental exposure at Round 1							
Exposure measure	<1 exposure	1-3 exposures	4-11 exposures	12+ exposures	Direct effect (CI)	Gamma (CI)	Maximum effect (CI)
General	98.48		93.40	110.08	1.60 (-6.58 to 9.78)	0.046 (-0.00 to 0.09)	**11.60* (0.10 to 23.10)**
Specific	102.28	97.36	102.38		-2.19 (-10.39 to 6.01)	0.012 (-0.04 to 0.06)	0.11 (-12.52 to 12.73)

* Significant at $p < 0.05$.

6.4.3 Delayed-effects Association of General and Specific Exposure with Fun Activities

The previous report found a favorable overall delayed-effects association of specific exposure with parent reports of fun activities. In this report, for parents of 12- to 18-year-olds, favorable overall and maximum effects were found for general exposure to anti-drug advertising on parent reports of fun activities. That is, parents who at Round 1 reported a higher level of general exposure to anti-drug advertising were more likely to report high levels of fun activities at Round 2. For general exposure, there were six subgroups for which significant delayed-effects associations were found. However, for all subgroups the confidence intervals for the estimates of effects in subgroups overlapped with the confidence interval for the overall estimate (see Detail Table 6-75).

The delayed-effects associations of specific exposure and fun activity reports were not statistically significant, overall and for any subgroup (see Table 6-T and Detail Table 6-76).

Table 6-T. Delayed-effects analyses of exposure per month and fun activities reported by parents of 12- to 18-year-olds

Proportion of parents doing three or more activities per week at Round 2 with overall average at .61, by exposure at Round 1							
Exposure measure	<1 exposure	1-3 exposures	4-11 exposures	12+ exposures	Direct effect (CI)	Gamma (CI)	Maximum effect (CI)
General	.57		.58	.65	**.04* (0.00 to 0.08)**	**0.098* (0.02 to 0.18)**	**.07* (0.01 to 0.13)**
Specific	.60	.60	.63		0.02 (-0.03 to 0.06)	0.038 (-0.04 to 0.12)	0.03 (-0.03 to 0.09)

* Significant at $p < 0.05$.

6.5 Evidence of Association of Parent Exposure with Youth Outcomes

While parent cognitions and behaviors are conceived as intermediate variables meant to influence youth, it is worthwhile to ask whether there is a direct association of parent exposure and the youth cognitive and behavioral outcomes of main interest. These are marijuana use, intentions to use, attitudes/beliefs about marijuana, perception of social norms regarding marijuana, and self-efficacy to refuse marijuana offers. Examining this direct association is particularly advisable given the number of significant favorable associations of parent exposure with parent outcomes in cross-sectional analyses and the delayed-effects association of parent behaviors and cognitions with youth outcomes (see section 6-1). The following sections describe these cross-sectional and delayed-effects overall associations between parent exposure and youth outcomes.

6.5.1 Cross-sectional Association of Parent Exposure with Youth Outcomes

Table 6-U presents the results, with more extensive information provided in Detail Tables 6-77 through 6-86.

For all youth aged 12 to 18, there were no cross-sectional overall associations for either measure of parental exposure and youth past year marijuana use. There was one significant association by subgroup: for the general exposure measure there were unfavorable direct, overall, and maximum associations for Hispanic youth. This subgroup association was not found in the previous report. For the specific exposure measure, there were no significant associations. This subgroup result must therefore be interpreted with caution.

For all youth 12 to 18 years old, there were no significant overall associations between either measure of exposure and intentions to not use marijuana, anti-marijuana beliefs and attitudes, perceived anti-marijuana social norms, and self-efficacy to refuse marijuana.

There were 414 tests of significance undertaken for subgroup analyses (17 subgroups by 5 outcomes by 2 measures of exposure, each tested for the direct effect, the overall association (gamma) and the maximal effect). Of the 414, 15 were significant. Among these were 138 tests for overall association (gamma), out of which only 4 were significant. Overall, this pattern of rare significant results is

Table 6-U. Cross-sectional association between parental exposure youth outcomes among all youths 12 to 18

Youth outcomes across 5 waves		Parental exposure level				Gamma (CI)
		<1 exposure	1 – 3 exposures	4 – 11 exposures	12 + exposures	
Percent reporting marijuana initiation	General exposure	15.0%		15.4%	15.7%	0.018 (-0.05 to 0.08)
	Specific exposure	14.6%	15.2%	15.4%	17.6%	0.057 (-0.05 to 0.17)
Percent definitely not intending to use	General exposure	73.9%		72.7%	73.7%	-0.003 (-0.07 to 0.06)
	Specific exposure	76.1%	72.8%	72.6%	74.1%	-0.028 (-0.10 to 0.05)
Attitudes/Beliefs Index (Mean score)	General exposure	77.04		72.91	77.69	0.001 (-0.03 to 0.03)
	Specific exposure	79.4	75.86	72.51	81.96	0.002 (-0.03 to 0.04
Social Norms Index (Mean score)	General exposure	73.75		69.77	72.60	-0.005 (-0.03 to 0.02)
	Specific exposure	77.18	73.31	69.22	70.44	-0.020 (-0.06 to 0.02)
Self-efficacy Index (Mean score)	General exposure	93.33		91.52	91.29	-0.016 (-0.04 to 0.01)
	Specific exposure	94.56	90.73	91.02	96.76	-0.005 (-0.04 to 0.03)

consistent with what might be expected by chance. However, there was one pattern of results justifying further consideration. Several significant subgroup associations were found, in an unfavorable direction, for parents of Hispanic youth (see Detail Tables 6-77 through 6-86). For parents of Hispanic youth, 6 of 30 tests were significant involving four of the five outcomes and always involving measures of general exposure. The interpretation of subgroup results is always subject to revision when a large number of tests are undertaken. Nonetheless, the repeated unfavorable pattern for the parents of Hispanic youth is worth some concern. However the essential conclusion from these analyses is that the cross-sectional associations of parent exposure and parent outcomes have not yet shown evidence of indirect positive effects of parent exposure on youth.

6.5.2 Delayed-effects Association of Parent Exposure with Youth Outcomes

The following delayed-effects analyses involve examining the association of parent exposure at Round 1 with youth cognitive and behavioral outcomes at Round 2 over and above the cross-sectional association between parent exposure and youth outcomes at Round 1. The analyses include only nonusing youth at Round 1 who were 12 to 18 years old at followup and their parents.

For all youth 12 to 18 years old, there were no significant delayed-effects associations between either measure of parent exposure and youth outcomes (Table 6-V).

Table 6-V. Parental exposure at Round 1 and youth outcomes at Round 2 among 12- to 18-year-olds who were nonusers of marijuana at Round 1

Round 2 Youth Outcome		Parental exposure at Round 1				Gamma (CI)
		<1 exposure	1 – 3 exposure	4 – 11 exposures	12 + exposures	
Percent reporting marijuana initiation	General exposure	13.6%		10.8%	13.4%	-0.019 (-0.12 to 0.08)
	Specific exposure	11.8%	12.1%	14.1%		0.018 (-0.09 to 0.12)
Percent definitely not intending to use	General exposure	78.3%		79.1%	76.6%	-0.010 (-0.10 to 0.08)
	Specific exposure	76.7%	78.6%	78.9%		0.049 (-0.05 to 0.15)
Attitudes/Beliefs Index (Mean score)	General exposure	89.49		95.25	86.85	-0.006 (-0.05 to 0.04)
	Specific exposure	91.95	90.62	88.40		-0.006 -0.05 to 0.04
Social Norms Index (Mean score)	General exposure	87.89		88.66	79.54	-0.026 (-0.07 to 0.02)
	Specific exposure	81.64	87.27	80.36		0.000 (-0.05 to 0.05)
Self-efficacy Index (Mean score)	General exposure	115.27		111.67	101.93	-0.059 (-0.12 to 0.00)
	Specific exposure	108.67	110.70	102.82		-0.012 (-0.07 to 0.05)

In the absence of overall effects, significant delayed-effects associations for subgroups are of particular interest. There were 22 significant subgroup associations out of 420 examined, suggesting only chance results. Only one subgroup showed a consistent pattern and only for one outcome (see Detail Tables 6-87 to 6-96). Hispanic youth, whose parents were more highly exposed to both general and specific anti-drug advertising at Round 1, perceived more strongly anti-marijuana social norms in their environment. This favorable result should be interpreted with caution: Parents of Hispanic youth showed unfavorable cross-sectional associations of general ad exposure with all the other youth outcomes. Perceived anti-marijuana social norms is the only outcome for which no cross-sectional associations were found for parents of Hispanic youth (see section 6.5.1). Also, given the number of tests of statistical significance performed for subgroup analyses, the delayed-effects associations found cannot be easily separated from what one would expect to find by chance.

6.6 Summary and Discussion

The inferential logic laid out at the start of this chapter suggests that support for Campaign effects would reflect three favorable results: a favorable trend on a target outcome, a favorable cross-sectional association between exposure to the Campaign and the outcome, and finally a favorable delayed-effects association between exposure and the subsequent outcome measure. Table 6-W summarizes the results for all of the outcomes on each of these criteria. Each row in that table indicates whether there was a full sample trend, whether there was a full sample cross-sectional association with the general or specific exposure measures, and whether there was a full sample delayed-effects association with the two exposure measures. The association criterion is whether or not the gamma estimate was significant at the $p<.05$ level. In addition, each row in the table indicates whether a subgroup of the

Table 6-W. Summary of all parent effects on parent and youth outcomes among all parents of 12- to 18-year olds

	All parents of 12 to 18 youth					If not significant for all parents of youth aged 12 to18, for which subgroups?				
		Cross-sectional association		Lagged Association			Cross-sectional association		Lagged association	
	Trend	General	Specific	General	Specific	Trend	General	Specific	General	Specific
Parent Outcomes										
Talking behavior	**Favorable**	**Favorable**	**Favorable**	**Favorable**	No	--	--	--	--	No
Talking Cognitions	No	**Favorable**	**Favorable**	No	No	**16-18 (F)**	--	--	**White (F)**	No
Monitoring Behavior	**Favorable**	No	No	No	No	--	None	**Fathers (F)**	None	No
Monitoring Cognitions	**Favorable**	**Favorable**	No	No	No	--	--	**Fathers (F)**	No	No
Doing Fun Activities	No	**Favorable**	**Favorable**	**Favorable**	No	**14-15 (U) Higher sensation-seekers (U)**	--	--	--	No
Youth MJ Outcomes										
Past year use	No	No	No	No	No	**African American(U)**	**Hispanic (U)**	None	None	**12-13 (U)**
Intentions to use	No	No	No	No	No	**14-18 (U) Lower Risk (U)**	None	None	None	No
Attitudes & Beliefs	No	No	No	No	No	None	None	**12-13 (U)**	None	No
Social Norms	**Unfavorable**	No	No	No	No	--	None	**Females (U)**	**14-18 (U) African Am. (U) Hispanic (F) High Risk (U)**	**Hispanic (F)**
Self Efficacy	**Favorable**	No	No	No	No	--	**Higher risk (U)**	None	**Low sensation-seekers (U)**	**W2 → 5 (U)**

Favorable or (F): Significant result at p<.05 favorable to Campaign goals.

Unfavorable or (U): Significant result at p<.05 unfavorable to Campaign goals.

-- Subgroup tests not significantly different than result for full sample.

No – No significant effect overall.

None – No significant effect for any subgroup, when there was no overall effect.

population showed one of those effects, even if the full sample did not. (It also would have shown if a subgroup was significantly different from the full sample, even if there was a full sample effect, but that did not occur.)

This table suggests that a claim of Campaign effect on parents has some support, most notably for talking behavior. A claim that the Campaign effect on parents led to a youth effect has no support.

Each of the outcomes is reviewed in turn. The best results are for the talking behavior measure. Parents claim to have done more of it as the Campaign progressed. Both of the exposure measures are associated with parent claims of talk measured at the same time. The general exposure measure is also predictive of delayed-effects on the talk measure, reducing a concern that the cross-sectional association reflects a reverse causal effect. Only the delayed-effects analysis with the specific exposure failed to support an inference of Campaign effect. These results provide substantial support for the existence of Campaign effect on talking behavior. However there are two concerns about this claim. As has been shown, youth report a very different picture about parent talk with them about drug topics. Youth reports of talking are much lower than parent reports, and more notably youth report that drug talk with parents is declining over the course of the Campaign. This creates concern about the confidence to be placed in the upward trend reported by parents. Also, there is little evidence that the talk variable, as measured here, is related to youth drug use. Parent reports of talk do not predict any lowered likelihood of youth initiating marijuana use for nonusing youth. Thus any claim of a Campaign effect on parents is tempered by a concern that it is an effect on an outcome with an uncertain relation to youth behavior.

Talking cognitions offers similar but lesser support of a Campaign effect. Its trend is no longer significant overall, although it is still positive for the older youth who are the majority of the sample. As in previous reports, both the general and specific exposure measures have a significant cross-sectional association with talking cognitions. However, there are no delayed-effects associations overall for either exposure measure or for any subgroup, leaving somewhat reduced confidence in which variable is cause and which is effect. In addition, there is no evidence that talking cognitions are associated with youth marijuana intentions or behavior. Even if the Campaign is affecting talking cognitions, and such cognitions produce change in talk behavior, there is no strong basis for expecting an effect of such behavior on youth.

Monitoring behavior provides the least evidence for a Campaign effect. There is a significant upward trend, and there is a significant cross-sectional association between specific exposure and monitoring behavior for fathers. However no other subgroup shows such an association, and there is no cross-sectional association for the general exposure measure, nor any delayed-effects association with either exposure measure overall or for any subgroup. The evidence for a Campaign effect on this outcome has to be seen as weak. This is unfortunate since, in contrast to the talking outcomes, monitoring behavior is an important predictor of the initiation of marijuana use.

The monitoring cognitions scale shows a positive trend over time as well as a specific exposure cross-sectional association for fathers as does monitoring behavior. In addition, the scale shows a cross-sectional association for general exposure for the full sample. However, there is no evidence for a delayed-effects association overall or for any subgroup with either of the exposure measures. There is good reason to think that affecting parental monitoring cognitions would affect youth behavior. The monitoring cognition scale has a substantial association with monitoring behavior, and like monitoring behavior, is associated with youth marijuana use and intentions. However, the evidence for a Campaign effect on monitoring cognitions, while stronger than for monitoring behavior itself,

remains positive but not definitive. Without the evidence for a delayed effect, so that the causal order issue can be sorted out, it remains unclear whether parent ad exposure affects their beliefs about the value of monitoring, or their commitment to engaging with their children influences their monitoring beliefs and their attention and recall of the advertising.

The final direct parent outcome, doing fun things with their children also presents a mixed bag of evidence. There are significant favorable cross-sectional associations with both exposure measures as well as a significant delayed-effects association with general exposure. There is no significant positive trend, however, and for two groups (14- to 15-year-olds and higher sensation-seekers) the trend is downward. However, there are two interpretations of the lack of a trend that might still be consistent with a claim of effect for the Campaign. Trend data can reflect many influences in addition to the Campaign. There might have been external forces that were producing downward pressure on this behavior and the Campaign served to maintain the current level. Or, the lack of a positive trend might be attributable to the fact that this theme was only explicitly part of the Campaign during the first Wave. Then the level of "doing fun activities" was already reflecting the Campaign's influence during 2000. However, this interpretation would suggest that the associations of fun activity with exposure ought to be highest for those exposed in Wave 1 or in 2000, and that is not the case. In sum, there is suggestive evidence of a Campaign effect on this behavior among parents, but it does not satisfy all three of the criteria set out a priori for making a strong claim of effect. It is worth noting that, like the monitoring measures, parent claims of doing fun activity are associated with lower intentions for using marijuana and reduced initiation of marijuana use among youth.

Table 6-W then shows mixed evidence for the effects of parent exposure on parent behavior, but at least some of the evidence supports such a Campaign effect. When the summary turns to effects of parent exposure on youth outcomes, however, there is no supportive evidence. There are no reported full sample youth outcome effects. Subgroup effects are rare and, when they appear, they are consistently in an unfavorable direction.

How is this pattern of supportive evidence for Campaign effects of parent exposure on parent behavior, but no positive effects of parent exposure on youth outcomes to be explained? Three explanations fit these data. The claim of Campaign effects on parent outcomes might be mistaken. None of the outcomes has evidence that satisfies all of the a priori criteria for strong claims of effect, and if there were no effect, in fact, then one would not expect an indirect effect on youth. Second, talking behavior, the outcome with the clearest evidence for effects for parents, is not related to youth marijuana use or intentions, so even if there had been a Campaign effect on such talking it would not have been expected to affect youth outcomes. Third, indirect effects are hard to detect. If there were a small effect of the Campaign on a behavior, and a small effect of that behavior on the youth outcome, the resulting indirect effect would be the product of those two effects. For example, if the effect of the Campaign on monitoring behavior were .10, and the effect of monitoring behavior on youth marijuana use were .20, the expected effect of the Campaign exposure on marijuana use would be the product of those two effects, or .02 (.10 x .20). An effect of .02 could not be detected. The Campaign's indirect effects through parents could only be detected if there had been effects on several of the parent behaviors and each of those were related to the youth outcomes, and the sum of all the individual indirect paths had been large enough as a set to produce a detectable cumulative effect. All of these three explanations remain possible. Each of them may explain the current conclusion about the parent component of the Campaign: there is evidence consistent with an effect of the Campaign on some parent outcomes, but no evidence for indirect effects of parent exposure to the Campaign on youth outcomes.