

CHAPTER 2

Effective Mass Media Strategies for Drug Abuse Prevention Campaigns

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INTRODUCTION

Mass communication holds substantial promise as a tool for reaching and persuading people to adopt new and healthier lifestyles. This has long been recognized by those interested in prevention of drug abuse and in other unhealthy behaviors (Flay & Sobel, 1983; Rogers & Storey, 1987; Schilling & McAlister, 1990; Wallack, 1989). Prevention efforts, such as the National Institute on Drug Abuse's "Cocaine: The Big Lie" campaign and the Partnership for a Drug-Free America anti-drug campaign, have heavily relied on the promise. It is also reflected in the launching in 1998 of a historic \$2 billion, 5-year, media-based campaign directed at reducing illicit drug use among 9- to 18-year-olds. This campaign, directed by the Office of National Drug Control Policy (ONDCP), has many facets but relies primarily on televised anti-drug public service ads (PSAs) and is by far the largest federally funded drug abuse prevention effort in history.

This strong dependence on the mass media in prevention efforts is not unusual—the mass media are the primary or leading components in a variety of public health campaigns and frequently are the only component (Backer, Rogers, & Sopory, 1992; Flay, 1987; Rice & Atkin, 1989). As Bauman et al. (1991) note, "This is the most common and practical application of mass media in public health and, unlike multiple-component approaches, is capable of ready distribution on a

national level" (p. 602). At the very least, as Romer (1994) observes, "mass-media communication campaigns to alter risky behavior are seen increasingly as a critical adjunct to school-based programs and community-wide interventions" (p. 1073). To what extent is this widespread faith in the power of the media justified?

Although the early history of mass-media campaigns, particularly those involving health, was largely one of failure (Flay & Sobel, 1983; Rogers & Storey, 1987), the promise of reaching large audiences has led to continued efforts, a sharpening of design methodologies, and more realistic campaign expectations. These more sophisticated efforts, combined with more powerful evaluation methodologies, provide evidence that media health campaigns can be effective in changing beliefs, attitudes, intentions, and even behaviors, when properly designed (Backer, 1990; Perloff, 1993; Rogers & Storey, 1987).

Design elements that have contributed to successful campaigns include sophisticated audience segmentation and targeting, the use of formative research in message creation, the development of professional-quality messages that compete effectively with product ads and other features of the communication environment for the attention of the audience, the use of appropriate channels of communication, and the incorporation of more sophisticated theories of persuasion in campaign design (Backer, 1990; Perloff, 1993; Rogers & Storey, 1987). More rigorous techniques of formative, process, and summative evaluation, coupled with more powerful statistical tools, have detected a variety of campaign effects. Such research generally shows that coupling media with other kinds of interventions is more successful than either media or nonmedia efforts alone (Flora, Maibach, & Maccoby, 1989; Rogers & Storey, 1987). There is growing evidence, however, that, when used correctly, media alone can have significant positive impacts on health-related attitudes, beliefs, and behaviors (Beck et al., 1990; Flay, 1987; Flora, Maccoby, & Farquhar, 1989; Zastowny et al., 1993).

So much research has been compiled on successful public health campaigns, either media-only or media supplemented by other channels, that a series of generalizations on the most effective ways to use the media has disseminated widely through the literature for use by communication practitioners (see Backer et al., 1992; Flay, 1987; Flay & Sobel, 1983; Perloff, 1993; Rogers & Storey, 1987). This chapter highlights three of the most important principles—ones that we have found to be highly useful in our own approach to media interventions.

1. Design a campaign that will achieve widespread, frequent, and prolonged exposure to a message.

In traditional advertising terms this means that the media campaign messages must have high reach (the proportion of target audience members exposed to a message at least once) and frequency (the average number of exposures per audience member reached). These goals are much easier to state than to achieve. To accomplish them means that campaign practitioners must develop messages that can elicit high levels of attention from the target audience and disseminate the message through media channels actually used by audience members. It also means that (1) sufficient financial resources must be available to purchase adequate amounts of time or space in desired media vehicles (such as TV and radio, newspapers, magazines), or (2) considerable salesmanship and marketing skill must be used to persuade media gatekeepers to donate these precious resources in times or locations that are likely to be seen by the target audiences, or (3) a combination of both purchased and donated time and/or space should be used. More campaigns are turning to option 3, with an emphasis on purchasing, to achieve campaign goals. These include successful anti-smoking initiatives in California and Massachusetts (Hu, Sung, & Keeler, 1995; Siegel & Biener, 2000) and the ONDCP antidrug campaign. Still, paid media schedules in health campaigns are in the minority, and more research is needed to compare the effectiveness of paid versus donated schedules (Murry, Stam, & Lastovicka, 1996). One recent field experiment

investigating this found no difference in effectiveness; however, the donated campaign in this study emulated the paid campaign closely, something that is rare in practice (Murry et al., 1996). The targeting advantages of paid campaigns ordinarily are substantial, so we would expect the trend toward paid media schedules to continue.

2. Use audience segmentation strategies to target messages to at-risk audiences.

This is the cornerstone of the social marketing approach. Segmentation or targeting can lead to much more efficient and effective dissemination of campaign messages to those most in need of prevention information. While demographic data can provide a rudimentary beginning, any targeting scheme should also be based on psychographic variables (such as attitudes, values, beliefs, and personality characteristics) linked both to the behavior of interest (marijuana or other substance use) and to the communication channels and message styles most preferred by target audience members (Backer et al., 1992; Slater, 1996).

3. Use formative research throughout the audience segmentation, message design, and channel selection phases.

Such research, both qualitative and quantitative, is essential in determining the relevant needs, beliefs, behaviors, and attitudes of the target audience; in designing messages to attract the attention of and persuade audience members; and in determining the media channels and vehicles most used by the audience (Atkin & Freimuth, 1989; Backer et al., 1992; Rogers & Storey, 1987). The research should involve careful pretesting of prevention message ideas at the concept stage, the "storyboard" or "rough-cut" stages, and the final production stage. Ideally, this testing should be done with members of the target audience, media professionals, and behavioral scientists knowledgeable in both the behavior of interest and theory-based approaches to message design.

Despite encouraging growth in the use of these and other principles, many important questions remain. A number of techniques have been found to be successful, for example, but little is known about the process by which media messages begin to change attitudes and behaviors. What are the causal lag periods involved? Are there more effective ways of designing and placing prevention messages? What amounts of expensive media time and space are needed to bring about the desired change? And one of the most important and vexing questions concerns the effectiveness of different channels in the media mix. Many public communications campaigns, in an effort to maximize effects, have used a variety of media simultaneously, including television, radio, newspapers, magazines, and billboards, as well as nonmedia interventions. This makes it difficult to evaluate the separate contributions of these different channels on observed changes in outcome variables.

EFFECTS OF TELEVISED PUBLIC SERVICE ADS

The effects of television are of particular interest to those involved in drug abuse prevention because of this medium's ability to reach a variety of populations, including adolescents (Klein et al., 1993; Romer, 1994). Television is by far the most widely used means of disseminating prevention messages, usually in the form of PSAs (Backer, 1990). Understanding television's potential effects on at-risk populations, whether when used alone or in conjunction with institutional or other media channels, is vital to campaign designers; so the confounding of television's effects with those of other channels in many otherwise well-designed campaigns is unfortunate. Studies involving the use of televised anti-drug PSAs alone, on the other hand, generally suffer from mistakes in

campaign execution, including violating two of the principles discussed previously: (1) lack of widespread, frequent, and prolonged exposure to messages—in several campaigns, PSAs were aired outside prime time and/or on noncommercial stations, and then only infrequently; and (2) lack of appropriate segmentation or targeting—many anti-drug PSA campaigns have been directed at nonidentifiable audience segments (Flay & Sobel, 1983).

Evaluations of such campaigns tell us little about the potential persuasive effects of well-executed PSA campaigns that use more recently developed and proven techniques. Many of these campaigns, too, have had the limited, and perhaps appropriate, primary objective of increasing knowledge levels or raising the salience of a health-related issue and have not been directly concerned with changing attitudes or behaviors. In addition, when campaigns have been correctly designed and carried out, they are not always evaluated correctly. PSA recall and campaign-issue salience have been the primary measures of effectiveness in many campaigns (especially informational ones). Simple cross-sectional post-test surveys have been used frequently. Longitudinal or panel studies often have involved simple pre- and post-test designs that fail to account for pre- and postcampaign trends in criterion variables. When such longitudinal trends, which yield potentially valuable information about change processes, have been reported, the data usually have been subjected to "eyeball" inspection rather than to appropriate statistical tests of intervention effectiveness, such as time-series analysis (Beck et al., 1990; Hammond, Freimuth, & Morrison, 1987; Krishnamurthi, Narayan, & Raj, 1986; Murry, Stam, & Lastovicka, 1993; Pierce et al., 1986, 1992; Ross & Scott, 1993; Shelley et al., 1991).

Another problem is the failure of most studies of PSA effectiveness to use control communities that are free of confounds from other mass-media efforts. A major exception is a well-controlled, 4-year longitudinal study on the prevention of cigarette smoking in adolescents that compared the impact of mass-media-plus-school interventions in two communities versus school-only interventions in two matched communities (Flynn et al., 1992, 1995). The media intervention, which took the form of four approximately 6-month-long campaigns spaced over 4 years, used a combination of television and radio spots in purchased and donated time in popular teen programming to ensure high saturation. There were significant reductions (which increased annually) in reported smoking, with related effects on smoking attitudes and beliefs, in the media-plus-school compared to the school-only communities. These reductions could be attributed directly to the addition of the PSA components, although it was not possible to distinguish between the effects of television and radio.

Despite this research, it is still an open question whether televised anti-drug PSA campaigns using more advanced principles of campaign design can go beyond well-designed and acknowledged informational or agenda-setting effects to produce significant changes in drug-related attitudes, beliefs, and ultimately behaviors. Reviews concluding that televised PSAs have effects only on knowledge or awareness are based primarily on evaluation of either information-only campaigns, campaigns that were not designed to isolate the effects of televised PSAs, or campaigns that contained flaws in execution or evaluation (Gantz, Fitzmaurice, & Yoo, 1990).

Research on the large, long-term, and well-designed Partnership for a Drug-Free America television campaign (supported by more than \$3 billion in donated air time and print space since 1987) provides some evidence of such effects (Black, 1991; Zastowny et al., 1993). Published evaluations of this campaign, however, have been criticized for being based on a series of annual cross-sectional samples that used a controversial mall-intercept design for several years. No satisfactory control population exists for this national campaign. Complicating the assessment of the campaign's effects is the fact that a number of drugs (such as marijuana, cocaine, and amphetamines) were already exhibiting downward trends in use prior to the start of the campaign in 1987. Other history and maturational factors, such as media coverage of drugs, are also uncontrolled in the evaluations.

Still, areas receiving greater partnership PSA saturation have shown much larger changes in annual cross-sectional surveys (compared to less-saturated areas) in drug-related attitudes, beliefs, reported use of a variety of illicit drugs, and intentions to use such drugs (Black, 1991; Block, Morwitz, & Sen, 1996). While these latter findings should be interpreted cautiously because of their cross-sectional nature, they provide the strongest nonlaboratory evidence available that the mass media (at least televised PSAs) can successfully discourage the use of illicit drugs.

WHAT WORKS AND WHY

Despite limited empirical evidence on the effectiveness of the mass media in preventing use of illicit drugs, practitioners can take heart (and guidance) from the much larger body of research literature dealing with the impact of media-based interventions on health-related behaviors in general (Perloff, 1993; Rogers & Storey, 1987) and on the use of licit substances, such as cigarettes (Burns, 1994; Flay, 1987; Flynn et al., 1995; Hu et al., 1995; Siegel & Biener, 2000). This more general literature, as noted earlier, provides ample evidence that well-planned media campaigns can influence a wide variety of health-related attitudes, norms, and behaviors. These studies also address an issue on which the sparse media drug abuse prevention literature (with the exception of the SENTAR approach discussed in the following) is largely silent—what kinds of campaign strategies, persuasive arguments, and other message characteristics work best and why? We have already discussed three important principles for campaign design that have emerged from the public communications campaign literature. We should add, however, one very important empirical finding from this literature—that theory-based media interventions have been much more likely to be successful. Ample evidence exists of successful campaigns that used such guiding frameworks as social learning theory, diffusion of innovations, the theory of reasoned action, the health belief model, the elaboration likelihood model, and protection motivation theory (Flora et al., 1989; Maibach & Parrott, 1995; McAlister et al., 1989; Petty, Baker, & Gleicher, 1991; Rogers, 1995; Rosenstock, 1990; Schilling & McAlister, 1990; Zimmerman & Vernberg, 1994). Other theoretical perspectives, such as peer cluster theory (Oetting & Beauvais, 1987), can be drawn from school- or community-based prevention efforts.

While principles from a number of these theories have been applied, at least implicitly, in drug abuse prevention media campaigns, there has been no systematic evaluation of their relative (or combined) efficacy in such interventions. Still, their success in other health contexts strongly suggests that they can be applied effectively to drug abuse prevention. Schilling and McAlister (1990) offer a number of cogent and detailed suggestions for applying several of the more widely used theories to anti-drug campaigns. The strategic communication plan developed by Porter Novelli for the ONDCP media drug abuse prevention campaign relies heavily on principles derived from social learning theory, peer-cluster theory, and the theory of reasoned action, as well as on empirical findings from a host of media and nonmedia interventions. Evaluation of the campaign's impact will, in effect, be the first major evaluation of the explicit application of these theories in a media-based illicit-drug-abuse prevention campaign.

A SENSATION-SEEKING APPROACH TO DRUG ABUSE PREVENTION

Another theoretical approach represented in the ONDCP campaign's strategic communications plan is one we have been developing over the past 15 years at the University of Kentucky with the support of a series of grants from the National Institute on Drug Abuse. This approach is,

to our knowledge, the only theory-driven approach to media-based illicit-drug-abuse prevention developed specifically for, and tested in, that important context. It revolves around sensation seeking, a particularly potent risk factor for drug use, which can be used at three critical stages in media campaign design: (1) segmenting or targeting the at-risk audience, (2) designing messages that are effective with this audience; and (3) placing these messages in program contexts that are attractive to the target audience. The result is a coherent, parsimonious, and powerful theoretical framework that guides intervention strategies from inception to delivery and meshes well with a number of other theoretical approaches to prevention.

Sensation Seeking

Sensation seeking is a personality trait associated with the need for novel, complex, ambiguous, and emotionally intense stimuli (Zuckerman, 1979, 1994). As measured by Zuckerman's sensation-seeking scale, the concept has four dimensions:

1. **Thrill and Adventure Seeking:** A desire to seek sensation through physically risky activities that provide unusual situations and novel experiences, such as parachuting and scuba diving.
2. **Experience Seeking:** A desire to seek sensation through a nonconforming lifestyle, travel, music, art, drugs, and unconventional friends.
3. **Disinhibition:** A desire to seek sensation through social stimulation, parties, social drinking, and a variety of sex partners.
4. **Boredom Susceptibility:** An aversion to boredom produced by unchanging conditions or persons and great restlessness when things are the same for any period of time.

Describing differences between high and low sensation seekers, Zuckerman (1988) has observed that:

The high sensation seeker is receptive to novel stimuli; the low tends to reject them, preferring the more familiar and less complex. The high sensation seeker's optimal level of stimulation may depend on the levels set by the characteristic level of arousal produced by novel stimuli. Anything producing lower arousal levels may be considered 'boring.' . . . Apart from the voluntary avoidance of high intensities of stimulation, the low sensation seeker may have a type of nervous system that rejects such stimulation or inhibits cortical reactivity to high intensity stimuli. (pp. 181–182).

Sensation Seeking and Substance Use

Sensation seeking is a consistent predictor of use of a variety of drugs and earlier onset of use (Kilpatrick et al., 1976; Segal, Huba, & Singer, 1980; Zuckerman, 1979, 1983, 1994). In data from our recent study of prevention of adolescent marijuana use (Palmgreen et al., 2001), sensation seeking also correlates positively with the other five risk factors measured (deviance and lack of opportunity, and peer, family, and community use of marijuana) and negatively with all six protective factors (self-acceptance, absence of depression, quality of home life, law abidance, religiosity, perceived sanctions against marijuana use). As such, the concept of sensation seeking offers an important avenue for targeting at-risk groups and designing messages to reach them. The construct is based on psychobiological theory and has been shown to have a high heritability factor (Fulker, Eysenck, & Zuckerman, 1980; Zuckerman, 1990, 1994). It has a number of biochemical correlates, including testosterone, monoamines and their metabolites (particularly monoamine

oxidase), and endorphins (Zuckerman, 1979, 1986, 1994). Research by Bardo and his colleagues (Bardo, Nieswander, & Pierce, 1989; Bardo & Mueller, 1991; Bardo, Donohew, & Harrington, 1996) strongly suggests that novelty-seeking behavior and self-administration of drugs in animals may involve a common dopamine system in the brain.

A moderate to strong association of sensation seeking with alcohol and illicit drug use has been demonstrated in a large number of studies in a variety of populations (e.g., Kilpatrick et al., 1976; Pederson, 1991; Segal et al., 1980; Zuckerman, 1979, 1994). Strong evidence has emerged in the past decade that the relationship also holds with adolescents (Barnea, Teichman, & Rahav, 1992; Clayton, Cattarello, & Walden, 1991; Huba, Newcomb, & Bentler, 1981; Newcomb & McGee, 1989; Pederson, 1991; Teichman, Barnea, & Rahav, 1989; Thombs et al., 1994), including those from different cultures (Barnea et al., 1992; Pederson, 1991; Teichman et al., 1989). In a study of junior and senior high school students in Fayette County, Kentucky, high-sensation seekers (HSS), as defined by median splits, were twice as likely as low-sensation seekers (LSS) to report use of beer and alcohol during the prior 30 days and up to 10 times as likely to report use of other drugs (Donohew, 1988, 1990). Similar patterns of HSS versus LSS differences in drug use were found among a cohort of Fayette County students measured at four timepoints from the sixth to the eighth grades as part of an evaluation of Drug Abuse Resistance Education (DARE) (Clayton et al., 1991). In addition, HSS adolescents in our most recent study (Palmgreen, et al., 2001) were up to four times as likely to exhibit past 30-day use of marijuana. Sensation seeking has been related to adolescent alcohol use in several recent studies (Huba et al., 1981; Newcomb & McGee, 1989; Pederson, 1991; Thombs et al., 1994; Webb et al., 1991); and in a cross-sectional study of 1,900 Israeli high school students, it was strongly associated with use of a number of licit and illicit drugs (Barnea et al., 1992; Teichman et al., 1989). A California study of 1,068 adolescents found moderate relationships between various sensation-seeking dimensions and a number of illicit and licit substances (Huba, et al., 1981).

In a 20-month Norwegian longitudinal study of 553 adolescents, sensation seeking was characterized by a relatively high degree of temporal stability and was a consistent and important predictor of use of cannabis, alcohol, benzodiazepine, and cigarettes (Pederson, 1991). Longitudinal studies of variables closely related to the dimensions of the sensation-seeking scale also offer strong evidence of the ability of a sensation-seeking "superfactor" to predict risk-related behaviors across long developmental time spans. A study of 1,034 boys measured at ages 6 and 10 years showed that those high on novelty seeking and low on harm avoidance at age 6 (as measured by Cloninger's personality scale) exhibited earlier onset of substance use (Masse & Tremblay, 1997). A study in New Zealand followed a cohort from age 3 ($n = 1,037$) to age 21 ($n = 961$) (Caspi et al., 1997). At age 3, study participants were rated on 22 behavioral characteristics. At age 18 they were administered the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982), and at age 21 they were measured on four different health-risk behaviors: alcohol dependence, violent crime, risky sexual behavior, and dangerous driving habits. It was found that those who exhibited each of these risky behaviors scored much lower (in comparison to those not exhibiting) on the MPQ scales of Harm Avoidance (the inverse of Thrill and Adventure Seeking), Control (roughly the inverse of Experience Seeking), and Traditionalism (in many ways the inverse of Disinhibition), and higher on Aggression (and, in some cases, on Alienation). The greatest differences on these traits were displayed by those involved in multiple risky behaviors. Moreover, those possessing this "risky personality" configuration at age 18 had displayed similar temperament qualities at age 3 (Caspi & Silva, 1995). Drawing upon other data gathered on the cohort at ages 5, 7, 9, 11, and 13 years, Caspi et al. (1997) suggest that "the origins of a personality type at risk for health-risk behaviors may be found early in life and . . . the type stabilizes during adolescence." (p. 1061).

They go on to say that, in public health interventions:

Individual differences in personality may influence (different) steps in the persuasion process (Cacioppo, 1986). Thus, different types of individuals may attend to, comprehend, accept, and retain different types of messages. Our research shows that young adults who engage in health-risk behaviors are different psychologically from their peers. If we know the personality characteristics of a target audience, it may be possible to tailor campaigns to zero-in on the characteristic motivations, attitudes, and feelings of that audience (Plant & Plant, 1992). Knowledge of the psychological characteristics that motivate youth to engage in health-risk behaviors may thus help public health officials choose more effective campaigns that would motivate risk takers to minimize harm. (p. 1061)

Message Sensation Value and SENTAR

We have followed the path described previously in designing our own approach to drug abuse prevention—SENTAR (for SENSATION-seeking TARGETing). It is well established that high-sensation seekers, including the important target group of HSS adolescents, are particularly drawn to the stimulation and/or mood-altering effects of a variety of drugs. What is especially important from a prevention perspective, however, is that they also have distinct and consistent preferences for particular kinds of messages based on their needs for the novel, the unusual, and the intense (Donohew, Lorch, & Palmgreen, 1991; Zuckerman, 1979, 1990, 1994). High-sensation seekers (usually defined as those above the median on the sensation-seeking scale) strongly prefer messages that are high in sensation value, that is, the degree to which the content and formal features of a message elicit sensory, affective, and arousal responses. These same individuals dislike messages low in sensation value; low-sensation seekers generally display the opposite pattern of message preferences. Our own extensive program of focus-group research involving HSS and LSS adolescents and young adults has confirmed that these preferences extend to televised commercials and PSAs (Donohew et al., 1991). This research shows that HSS prefer messages that have higher levels of the following attributes: (1) novel, creative, or unusual; (2) complex; (3) intense stimuli that are emotionally powerful or physically arousing; (4) graphic or explicit; (5) somewhat ambiguous; (6) unconventional; (7) fast paced; and (8) suspenseful. Of course, it is not necessary for a message to have all of these characteristics at high levels to be attractive to high-sensation seekers; but we can say with some confidence that the greater the number of these characteristics a message has, the more attractive it will be to high-sensation seekers. If any one of these characteristics is of primary importance though, it is high levels of novelty. Zuckerman (1990) has reviewed research showing that HSS “tend to give stronger physiological orienting responses than lows to novel stimuli of moderate intensity, particularly when such stimuli are of specific interest” (p. 313).

High-sensation-value messages thus may elicit more favorable evaluations and greater attention from HSS, but are they more persuasive? In one laboratory experiment we designed and produced two versions of a televised antidrug PSA—one high in sensation value (HSV) and one low in sensation value (LSV). With high-sensation-seeking young adults, the HSV message produced greater intent to call a hotline featured in each PSA than did an otherwise comparable LSV message. The opposite pattern was observed for LSS (Donohew et al., 1991; Palmgreen et al., 1991). In another experiment a perceived message sensation value scale was developed and used to classify (based on the responses of 50 subjects in a pilot study) 13 existing TV anticocaine PSAs as either HSV or LSV PSAs. The HSV PSAs were much more effective than the LSV spots with high-sensation-seeking young adults on the dependent variables of free and cued recall of message content, attitude toward cocaine, and behavioral intention to use cocaine. Low-sensation seekers displayed the

opposite pattern for both free and cued recall but showed no significant HSV versus LSV difference on the attitude and behavioral intention measures (Everett & Palmgreen, 1995). The amount of variance accounted for by these interactions was high, particularly for free and cued recall.

Evidence for the persuasive impact of high-sensation-value anti-drug PSAs was also found in a field study involving an actual televised PSA campaign conducted in Lexington, Kentucky (Palmgreen et al., 1995). The campaign targeted young adults and older teens and included five PSAs developed through formative research with focus groups consisting of high-sensation seekers. The high-sensation-value spots concluded with an appeal to call a hotline for more information about exciting alternatives to drug use. The PSAs were the sole source of information about the hotline. More than 2,100 calls to the hotline were received over the course of the 5-month campaign, with 98% calling to get information for themselves (as opposed to calling to get information for friends, children, etc.). This is a relatively large number of calls from a small market and a narrowly defined target audience. More than 73% of the callers were above the population median on the sensation-seeking scale, as determined by a survey of hotline callers and by a probability survey of the general population of 18- to 25-year-olds in Lexington (the age range in which most of the callers fell). Within-campaign surveys indicated that high-sensation seekers were indeed reached frequently by the PSAs, more so than low-sensation seekers. A postcampaign probability survey also revealed the combined influence of sensation seeking and drug use on exposure to the two most-aired PSAs. Both PSAs displayed the same recall pattern, with HSS users of illicit drugs in the past 30 days displaying the highest recall certainty, followed closely by the small group of LSS users (whose use status apparently rendered the PSAs salient to them). Close behind this group were the HSS nonusers, another very important group to reach in a prevention campaign. Trailing these groups by a substantial margin (but still manifesting good recall certainty levels) was the large group of LSS nonusers, the segment least at-risk for use of illicit substances. Reported frequency of exposure was related to sensation seeking and drug use in a similar fashion.

Evidence for the impact of a SENTAR campaign on actual illicit drug use stems from a recent study (Palmgreen et al., 2001) that involved an innovative controlled interrupted time-series design to evaluate the effectiveness of televised antimarijuana PSA campaigns targeted at high-sensation-seeking adolescents in two matched cities: Lexington (Fayette County), Kentucky, and Knoxville (Knox County), Tennessee. Specifically, televised antimarijuana PSAs, designed and developed through formative research, were shown (using a combination of paid and donated time) from January through April 1997 in Lexington. Similar campaigns were conducted from January through April 1998 in both Lexington and Knoxville (see Figure 2.1). Beginning 8 months prior to the first Lexington campaign and ending 8 months after the 1998 campaigns, personal interviews (computer assisted, self-administered) were conducted with 100 randomly selected (without replacement) students in each county during each month (total $n = 6,400$). The

Fayette County	baseline $O_1 \dots O_8$	campaign 1 $O_9 \dots O_{12}$	post-campaign $O_{13} \dots O_{20}$	campaign 2 $O_{21} \dots O_{24}$	post-campaign $O_{25} \dots O_{32}$
Knox County	baseline $O_1 \dots O_8$	baseline $O_9 \dots O_{12}$	baseline $O_{13} \dots O_{20}$	campaign 1 $O_{21} \dots O_{24}$	post-campaign $O_{25} \dots O_{32}$

Note: O_i corresponds to the i th observation. Observations are separated by one month and are based on means of 100 participants each. Total $N = 3,200$ per county.

FIGURE 2.1. Overview of Controlled Interrupted Time-Series Design with Switching Replications.

population cohort followed was in the 7th through 10th grades initially and in the 10th grade through 9 months after high school graduation upon completion.

During the first 8 months of the study (O_1 to O_8), participants provided data on marijuana use patterns in each county prior to the first Lexington campaign. During the next 4 months, students in Fayette County were exposed to a televised anti-drug ad campaign employing high-sensation value messages developed by the research team. Data collection continued in the two counties (O_9 to O_{12}), permitting comparisons of marijuana use with and without a campaign. Data gathered over the next 8 months (O_{13} to O_{20}) established marijuana use trends after the first campaign in Lexington and extended the baseline trend in Knox County prior to that county's first campaign. During the ensuing 4 months (O_{21} to O_{24}), students in both counties were exposed to campaigns identical to the first Fayette campaign, except a few new PSAs were introduced in both counties to add novelty in Fayette. Data collection then continued (O_{24} to O_{32}) to measure postcampaign trends.

The design controlled for trends in marijuana use prior to the campaigns and allowed estimation of postcampaign trajectories. It also partially controlled for history, because any national events affecting drug use should have affected both counties. In addition, contacts with school drug prevention staff and daily monitoring of the major newspapers in each county revealed no local or regional events or prevention efforts threatening comparability.

Because the cohorts in each county aged as the study progressed, marijuana use tended to increase due to sociodevelopmental or maturational factors. However, because teens in both counties reflected this secular trend, each county served as an appropriate control for the other. Because each monthly sample was independent, sensitization, testing, and attrition were minimized. External validity was enhanced by campaign replication at different sites and times, and the design allowed both within- and between-county evaluations of campaign impact.

Full sample medians were used to separate the Knox and Fayette monthly samples into groups of high- and low-sensation seekers. Time-series regression analyses indicated that all three campaigns not only arrested but also actually reversed upward changes in 30-day marijuana use among HSS adolescents. For example, 30-day use among Knoxville HSS rose in linear fashion from 16.6% initially to 33% over the 20-month precampaign period, then fell to 24% from the start of the campaign to the completion of data gathering 12 months later. The drop in the proportion of HSS using marijuana was 26.7%. The Lexington campaign results were similar. The first campaign also reversed a strong upward trend in 30-day use among HSS. Perhaps because Lexington HSS were higher than their Knoxville counterparts on most risk factors and lower on most protective factors, the effects of the first campaign appeared to wear off about 6 months after the campaign, as indicated by the resumption of an upward trend. This trend, however, was also reversed by the second or "booster" Lexington campaign, and marijuana use continued to fall until the completion of data gathering. The time-series regression models indicated that all changes in slopes were statistically significant ($p < .003$).

Thirty-day use levels among LSS in both cities were less than one-third of HSS levels. LSS also exhibited no upward trends in use during the 32 months of the study in either community. Because of the "floor effect" of low use levels, and because LSS were not targeted by the campaign, LSS displayed no indication of campaign effects. These patterns give further emphasis to the importance of targeting high-sensation seekers with prevention messages and illustrate the strengths of an interrupted time-series design with a control community in detecting campaign effects.

PROGRAM CONTEXT. We also applied the concept of message sensation value to the TV program context of antidrug messages. Viewers ordinarily tune in to watch programs, not commercials and PSAs. It follows that to reach high-sensation seekers at risk for drug use, PSAs

should be placed, if at all possible, in programs preferred by high-sensation seekers. Our research shows that such programs have characteristics associated with high sensation value PSAs and commercials (Lorch et al., 1994). In a large laboratory experiment involving 328 young adults, we found that antidrug PSAs embedded in HSV programming received considerably higher attention levels from high-sensation seekers than did those placed in LSV programming. Exposure to the programming and ads took place with subjects placed individually in a naturalistic living room setting with various reading options available if they chose not to watch television. Results from this experiment were applied in the two campaign studies described previously by purchasing PSA time in programming preferred by HSS audience members in precampaign audience surveys. This use of HSV program contexts undoubtedly contributed to the success of these campaigns in reaching the target audience of high-sensation seekers.

Summary of SENTAR Principles

The SENTAR approach to the prevention of substance use and abuse (as well as risky sex, reckless driving, and other risk behaviors) can be summarized in the following principles.

1. *Use the sensation-seeking trait as one major segmentation variable.* While sensation seeking certainly is not the only risk factor in substance use and abuse, it is positively correlated with most other risk factors identified in the literature and is moderately to strongly related to use of a wide variety of substances. It also is longitudinally stable and predictive of drug initiation and use over long developmental time spans. While the trait should not be the only segmentation variable, it should play a major role in any psychographic/demographic or other multivariate targeting scheme.
2. *Design prevention messages high in sensation value to reach high-sensation seekers.* Designing messages that have as many high-sensation-value characteristics as possible (especially novelty) is essential to gain the attention of at-risk audience members in the highly cluttered context in which most media exposure takes place. Messages too low in sensation value are very likely to be ignored by those whom prevention practitioners would most like to reach, especially when such messages run counter to audience attitudes and behavior patterns. Breaking through the clutter is critical, and HSV messages are most likely to accomplish this and go on to effect desired changes in attitudes, beliefs, and behaviors.
3. *Use formative research with high- (and sometimes low-) sensation-seeking members of the target audience.* Such research is invaluable in determining the informational, social, and other needs of the target audience regarding the behavior of interest, in designing effective messages, and in choosing appropriate media channels and program contexts. Such research at the message-design stage is especially important since there are many ways to blend HSV message characteristics in novel and effective (or ineffective) ways. The SENTAR approach offers no rigid prescriptions for message design, but rather is an overarching theoretical framework in which there is much room for creative talent to operate. Such freedom is essential if one is to succeed at the task of constantly generating novel messages for an easily bored or habituated audience.
4. *Place prevention messages in high-sensation-value contexts.* The most elegant message consigned to a media channel or program context that no one in the target audience pays attention to is like the beautiful hemlock falling in the forest—except that in a prevention campaign it clearly makes no sound of consequence, nor is anyone there to appreciate its

beauty. Social marketers, of course, have long been aware of this important but often overlooked maxim. Our research, however, has identified clear differences in the TV channel and program preferences of high- and low-sensation seekers, based on the presence or absence of HSV attributes. Because this research also indicates that HSS older teens and young adults watch considerably less television than do LSS (as much as 45 minutes less per day), information about HSS program preferences obtained through audience surveys prior to (and during) a campaign provides valuable guidance for placement decisions. Such HSS versus LSS media consumption differences probably also extend to media channels other than television, although research has not addressed this issue.

Sensation seeking, then, can be extremely useful in drug abuse prevention campaigns from the social-marketing perspective of audience segmentation. As Slater (1996) observed in a highly sophisticated treatment of health-audience segmentation, "It is essential that segments be predictive of the targeted behavior—if there is no association between segment membership and the behavior of interest, the segment will have little or no value to the campaign designer or health educator." (p. 272). But "to better guide channel selection and intervention decisions, the segments should also be predictive of distinctive patterns of media use or reliance on different organizational, community, or interpersonal channels." (Slater, 1996, p. 272). In other words, the ideal segmentation variable should also predict use of communication channels through which the target audience might be reached. We would add one more provision: that it also specify the characteristics of messages most preferred by target audience members. Most risk and protective factors associated with drug use can satisfy criterion No. 1—they singly or multiply predict use of a variety of illicit substances. Most, however, can provide little theoretical guidance in fulfilling criterion No. 2—use of communication channels (although formative research can describe the channels used by those high or low on a particular factor). And almost none can also meet the third criterion of specifying characteristics of effective messages. Sensation seeking, on the other hand, satisfies all three criteria defining an ideal segmentation variable for drug abuse prevention. Moreover, the SENTAR approach provides both a theoretical basis and empirical evidence for the connections between sensation seeking and each segmentation criterion.

The Flexibility of SENTAR

The SENTAR approach to media drug abuse prevention does not compete with other successful theoretically based approaches, such as social cognitive theory, the theory of reasoned action, or peer cluster theory. Rather, it can and should be used in conjunction with one or more of these established approaches. For example, the televised PSAs we developed for our recent anti-marijuana campaign study primarily follow a theory of reasoned action approach in presenting a number of negatively valued social, physical, and aspirational consequences of adolescent marijuana use. Certain positively valued consequences of nonuse also portrayed, particularly by drawing upon principles from social-learning and peer cluster theories. One PSA, which used principles from all three theories, shows a group of five White and African-American teenage girls interacting socially in a family room with a television on in the background. On the screen is a white male authority figure ranting (in "Reefer Madness" style) about the evils of marijuana. One girl, in exasperation, clicks off the television with the remote and says, "Are they still trying to feed us that junk about weed?" She then proceeds to roll a joint. One of her friends replies, "Maybe you need to listen, girl. Maybe you won't become an addict on the streets; but like my cousin Derek, he sure got hung up on it." She goes on to say that "you can stop caring about

things—like school, like your friends.” Another friend chimes in with “and girls let me tell ya—it can sure mess up your lungs.” This is followed by a pregnant pause in which the first girl stops rolling the joint, then huffs, “Well, I can see I’m in the wrong place,” and gets up and leaves the room. During a closing message board containing the words, “When you know more about marijuana, you learn not to use it,” we hear a buzz of conversation from the remaining members of the group, unintelligible except for “She’s headed for a whole lot of trouble.”

This spot combines theory of reasoned action and peer cluster theory perspectives by presenting certain negatively valued consequences, such as physical and psychological dependence, loss of focus on schoolwork, and the social consequences of coming under fire from your peer group (including social isolation). Social learning theory is incorporated as the members of the group model ways in which to argue against marijuana use with peers. From a SENTAR perspective, the PSA also contributes novelty and creativity (through the bizarre and attention-getting “Reefer Madness” harangue by the authority figure on the TV screen, the rarely portrayed frank peer-group discussion of marijuana, and unusual camera angles and movement); drama (in the realistic “slice-of-life” social interaction); complexity (there is a great deal going on visually and auditorily in the room); ambiguity/suspense (concerning what action the girl rolling the joint will take at the end of the PSA, after the suspenseful pause); and stimulus intensity (through amplified natural sounds from the room—dropped remote control striking the coffee table, the rustle of paper as the joint is rolled, and other distinctive sounds—in the absence of a music track).

As this spot shows, incorporating HSV characteristics into a prevention message often has more to do with how message arguments are presented rather than with the content of the persuasive elements themselves (although content can also be involved, as in depicting graphic physical consequences of heroin use). The important principle here is that the drug prevention practitioner should use those theoretical schemes deemed most appropriate and effective for a particular audience when developing persuasive messages, but should target the messages at high-sensation seekers using the principles we have described. In other words, we should pay attention to the communication needs of our audiences, particularly when those needs are tied so closely to the behaviors we wish to prevent.

Extensions to Nonmedia Settings

Although our primary focus here is on media campaigns, the flexibility of the SENTAR approach allows it to be extended to nonmedia settings as well, such as school-based prevention programs or to multiple-modality interventions involving media, school, and community channels. It may be extended as well to risky behaviors other than drug use. An example is provided by a SENTAR school-based intervention project directed at HIV prevention and alcohol abuse among adolescents, currently being conducted in two midwestern cities with funding from the National Institute on Alcohol Abuse and Alcoholism. This study draws on theory and data from our media research on sensation seeking and message design to adapt a nationally respected classroom-based curriculum, *Reducing the Risk*, to make it more appealing to higher sensation seekers and impulsive decision makers.

Although the content of the curriculum was left essentially unchanged, its format was altered to add trigger films to enhance interest in topics for discussion. Talk-show formats were used for other discussions, with video cameras placed in the hands of student participants and proceedings videotaped and played back for further discussion. Contests were held for best role-plays, and small prizes were awarded. The intervention also included greater participation in instruction by group leaders chosen from the classroom and trained for their roles and training of teachers for

the revised format of classroom instruction. All programs used formative research in their development, with focus and reaction groups chosen from students similar to those in the intervention classes participating in development and testing of the classroom programs. In one of the cities, a radio campaign was developed following SENTAR principles and used to prime audiences for the classroom instruction. The radio campaign used paid and unpaid spots placed in programs popular with high sensation seekers. Results showed significantly greater gains in knowledge and on a number of the efficacy variables and significantly lower onset of sexual activity among members of the primary target group (high-sensation seekers) receiving the curriculum than in groups receiving other or no organized curricula.

This offers further evidence that it is vital in any prevention intervention aimed at risky behaviors to pay close attention to the sensation-related communication needs and preferences of the target population, no matter what delivery channels are used. The design of the HIV study also illustrates how a prevention framework based on these sensation needs can be used to integrate both media and nonmedia strategies in a theoretically coherent fashion. Such coherence, rarely achieved in prevention practice, is greatly facilitated on one very important level by following the approaches we have recommended in this chapter.

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