Applications of a Theoretic Model of Information Exposure to Health Interventions

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A theoretic model of attention to messages has been used to guide an extensive series of laboratory and field experiments involving the mass media and, more recently, classroom instruction and health interventions. The model draws on individual differences in need for novelty as a basis both for identifying target audiences most likely to engage in a number of health-risk behaviors, such as drug and alcohol abuse and risky sex, and as a guide for designing messages to attract and hold the attention of these same individuals, who make up the prime target audience for many campaigns. These strategies have been successful in bringing about changes in attitudes and behavioral intentions in experimental studies, and in reaching at-risk audience segments in field studies through novel televised public service announcements placed in appropriate television programming.

There is considerable convergent evidence that human exposure to information relies both on needs for novelty and sensation from our primal past, of which we often are only dimly aware (e.g., Bardo, Donohew, & Harrington, 1996; Cloninger, Adolfson, & Svrakic, 1996; Zuckerman, 1994), and on cognitive needs of which we are conscious (e.g., Cacioppo, Petty, Feinstein, & Jarvis, 1996; Palmgreen, 1984). The needs for novelty and sensation appear to affect the initial

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Research reported in this article was supported by Grant DA03462 from the National Institute on Drug Abuse (Lewis Donohew, PI), Grant DA05312 from the National Institute on Drug Abuse (Lewis Donohew, PI; Philip Palmgreen and Elizabeth Lorch, co-PIs), Grant DA06892-04 from the National Institute on Drug Abuse (Lewis Donohew, PI; Philip Palmgreen, Elizabeth Lorch, and William Skinner, co-PIs), Grant AA10747 from the National Institute on Alcohol Abuse and Alcoholism (Lewis Donohew PI; Rick Zimmerman, co-PI), Grant DA-04887 from the National Institute on Drug Abuse (Lewis Donohew, PI; Richard Clayton, co-PI), and Grant DA06892-08 from the National Institute on Drug Abuse (Lewis Donohew, PI; Philip Palmgreen, Elizabeth Lorch, and Rick Hoyle, Co-PIs).

Human Communication Research, Vol. 24 No. 3, March 1998 454-468

alerting process, making it possible for higher level cognitive processing to take place.

This preliminary alerting stage is the point at which attention is attracted to a given stimulus and away from others that are competing for our attention (Donohew, Palmgreen, & Duncan, 1980; Donohew, Palmgreen, & Lorch, 1994). Some attending behaviors may be guided primarily by arousal responses that quietly tug at the individual for attention, whereas in other instances—often after a source of stimulation has attracted attention—cognitive forces come into greater play. Thus, much of the time when we are engaging in routine although possibly complex behaviors—such as driving home from work or choosing what we will watch on television—guidance of our systems may be left more to routines that are overlearned and familiar, or to affect more than to cognition (Zillmann & Bryant, 1985).

While engaging in these routines, our behaviors are probably influenced by forces of which we are not aware. Occasionally, a novel movement or sound—the siren or flashing light of an emergency vehicle, or the comment of another person—intrudes and brings us to focus our attention processes on the larger world. It is at that point that humans probably behave the way we have assumed they behave all the time (Donohew, 1996). This appears to be true whether the stimulus is a passing ambulance or a public service announcement (PSA) on television and thus has considerable implications for how we communicate both interpersonally and through the mass media.

This article describes an individual-differences model of information exposure that reflects needs for novelty and sensation presumably inherited as survival behaviors from our ancient past. The model has evolved from an earlier activation model developed to explain exposure to information about public affairs (Donohew, 1990; Donohew et al., 1980; Donohew et al., 1994; Donohew, Finn, & Christ, 1988; Donohew, Lorch, & Palmgreen, 1991; Lorch et al., 1994; Palmgreen et al., 1991; Zimmerman & Donohew, 1996). In the following pages, we will briefly describe its biological basis, propose it as a theory in deductive nomological form, offer propositions deduced from its central assumptions, and describe an extensive series of funded health communication studies for which it has provided guidance and that, in turn, have brought about further revision of the theory.

BACKGROUND

An important theoretical underpinning for our research is the concept of sensation seeking. In a recent minor revision of his 1979 definition, Zuckerman (1994) wrote that sensation seeking is a trait defined by "the

seeking of varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experience" (p. 27).

Describing differences between high sensation seekers [HSSs] and low sensation seekers [LSSs], Zuckerman (1988) states,

> The [HSS] is receptive to novel stimuli; the low tends to reject them, preferring the familiar and less complex. The [HSS'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 [LSS] may have a type of nervous system that rejects such stimulation or inhibits critical reactivity to high intensity stimuli. (pp. 181-182)

According to Zuckerman (1990), sensation seeking and sensation avoidance may represent adaptation to a dangerous environment in which novel stimuli can be either sources of reward or a threat to survival. It has been proposed that the search for novelty (Cloninger, Pryzbeck, Svrakic, & Wetzel, 1994; Zuckerman, 1994) is a fundamental survival behavior, in which detection of novel stimuli leads to alerting the system for fight or flight (Franklin, Donohew, Dhoundiyal, & Cook, 1988).

Biological Connections

According to Bardo et al. (1996), the mesolimbic dopamine reward (DA) pathway has presumably evolved because it subserves behaviors that are vital to survival and particularly because it is posited to be responsible for producing reinforcement (Glickman & Schiff, 1967; Vaccarino, Schiff, & Glickman 1989). Sensation seeking has been connected with the mesolimbic dopamine pathway in work by Zuckerman (1979, 1988, 1994), which found an association with levels of monoamine oxidase (MAO-B)—the brain-specific enzyme that breaks down dopamine and other neurotransmitters—and with the male hormone testosterone. Other biological research includes work by Bardo and associates (Bardo, Neiswander, & Pierce, 1989; Bardo, Lacy, & Mattingly, 1990; Bardo & Mueller, 1991) that has connected novelty seeking and neurochemistry in animal models, and work reported recently by teams conducting research at the National Institutes of Health and in Israel (Benjamin et al., 1996; Cloninger et al., 1996; Ebstein et al., 1996) connecting novelty seeking and the D4 dopamine receptor gene (cf. Vandenbergh, Zonderman, Wang, Uhl, & Costa, 1997).

A substantial body of psychopharmacological and genetic research also has implicated the DA pathway as a critical link mediating drug reward (e.g., Koob, Le, & Creese, 1987; Wise, & Rompre, 1989). Bardo and associates

(Bardo, Bowling, Robinet, Rowlett, Lacy, & Mattingly, 1993; Bardo & Hammer, 1991; Bardo, Neisewander, & Pierce, 1989) have studied responses to novelty and selected drugs and their relationship to dopamine D1 and D2 receptors in animals. They have suggested that novelty-seeking and drug-seeking behaviors may involve activation of a common neural substrate (in the mesolimbic dopamine system), supporting the possibility that novel or high-sensation stimulation may substitute for drug reward. Clearly, however, stimuli possessing stimulation-generating characteristics are likely to be sought over those that do not, especially by individuals with higher need for novelty. Although need for novelty and sensation may be measured in a number of ways, such as through blood sample measures of testosterone or MAO-B, it is most commonly (and most easily) measured by Zuckerman's (1979) sensation-seeking scale or Cloninger et al.'s (1994) novelty-seeking scale.

In our program of research, we also have established that a strong connection exists between sensation seeking and early drug use by adolescents and young adults and a personality style characterized by novelty seeking and risk taking. Other research has shown that sensation seeking also predicts drug and alcohol use and risky sexual behaviors in these populations (Barnea, Teichman, & Rahav, 1992; Clayton, Cattarello, & Walden, 1991; Zimmerman & Donohew, 1996; Zuckerman, 1979, 1983, 1984). Thus, sensation seeking offers an avenue both for targeting prime at-risk groups and for designing messages and programs to reach them.

Propositions derived from the theoretic model described in this program (Donohew et al., 1980; Donohew et al., 1988) predict attention to messages based on their novelty and sensation values, with persons who have a high need for sensation tending to tolerate or even require more powerful or novel messages to attract and hold their attention (Donohew, Helm, Lawrence, & Shatzer, 1990). Intervention programs that test hypotheses emerging from the model rely on the manipulation of these characteristics of classroom instruction or media messages to attract and hold the attention of specific higher risk audiences and, ultimately, to persuade them to engage in healthy behaviors.

A THEORY OF INFORMATION EXPOSURE

The theoretic model described here is based on an activation model of information exposure (Donohew et al., 1980), which offers propositions about information choice behaviors based on cognitive and activation needs. Need for activation is presumed to be a function of the catecholamine system (Zuckerman, 1979). A fundamental assumption of the theory is that human beings have individual levels of need for activation or arousal at which they are most comfortable and that are largely biologi-

cally based. It follows then that, aside from any cognitive motivation of which the audience member might be aware, attention is a function primarily of an individual's level of need for stimulation and the level of stimulation provided by a stimulus source (see also Zillmann & Bryant, 1985). We can further deduce that if individuals do not achieve or maintain this state of exposure to a message, it is very likely that they will turn away and seek another source of stimulation—which might be another message—that helps them achieve the desired state. If activation remains within some acceptable range, however, individuals are most likely to continue to expose themselves to the information.

As noted by Donohew et al. (1988), the activation theory does not imply that individuals will read, watch, or listen to only those items that maintain arousal levels within desired boundaries. They add that,

> although arousal needs do appear to guide them in their selections, they may choose to override these affective tugs for any of a number of reasons, such as desire to learn more about a topic of importance to them in which they perceive themselves to be deficient. (p. 195)

Drawing on a notational scheme offered by Hempel (1965), a fuller explication of the theory is offered in Table 1. The conditions under which law-like statements of the theory are operative are expressed in the C statements. Fundamental assumptions of the theory are represented as L1 and L2, and propositions deduced from these fundamental assumptions are represented as L3, L4, and L5. These propositions, which form the basis for the hypotheses, lead to explanations of E, the phenomenon that is explained.

The theory thus holds that considerably more novel and powerful messages will be required, either through the media or in a classroom setting, to attract and hold the attention of individuals who are HSSs. Operationally, this does not mean that LSSs are reached with messages with little or no sensation value. Such messages might not reach either highs or lows; conversely, some messages might be so high in sensation value—gory films, for example—that they exceed the upper tolerances of most persons from both groups.

The sensation value of a message is defined by Palmgreen et al. (1991) as its ability to elicit sensory, affective, and arousal responses. Message sensation value "should be an important factor in attracting and holding the attention of individuals with varying degrees of need for sensation" (Lorch et al., 1994, p. 395). Thus, we have proposed that messages high in sensation value (HSV messages) should be more attractive to HSSs, whereas low sensation value messages (LSV messages) should be preferred by LSSs. According to Zuckerman (1990), HSSs "tend to give stronger physiological orienting responses than lows to novel stimuli of

TABLE 1
An Activation Theory of Information Exposure

Characteristics	
C1:	Individuals vary in their levels of need for stimulation as a function of their inherited drives and learned needs based on rewarded and nonrewarded experiences. High sensation seekers have higher needs for stimulation than low sensation seekers.
C2:	In messages, stimulation is provided by formal features, including (a) fast action, (b) novelty, (c) color, (d) stimulus intensity, (e) complexity, and others, and by the verbal content, including dramatic qualities and emotional intensity.
Laws (theoretical statements)	
L1:	Individuals seek to achieve or maintain a level of activation at which they feel most comfortable.
L2:	Attention to a message is a function of (a) individual level of need for stimulation or cognition and (b) level of stimulation provided by a stimulus source (such as a message).
Deduced propositions	
L3:	Individuals will attend to messages that fulfill their needs for activation.
L4:	Individuals will turn away from messages that fail to generate enough arousal to meet their needs for activation to seek more exciting stimuli.
L5:	Individuals will turn away from messages that generate too much arousal to seek less exciting stimuli.
Explanandum	
E:	Operational hypotheses, based on the propositions expressed in L3, L4, and L5 above may concern exposure to information, attitude or behavior changes, or other variables.

moderate intensity, particularly when such stimuli are of specific interest" (p. 313).

In extensive formative research involving HSS and LSS young adults and adolescents, media messages and instructional materials found to be most effective with HSS—which should be the primary target audience in the many health campaigns—are those that are (a) novel, creative, or unusual; (b) complex; (c) intense (auditory and visual stimuli that are emotionally strong or physically arousing; i.e., exciting or stimulating); (d) graphic or explicit; (e) ambiguous; (f) unconventional; (g) fast paced; or (h) suspenseful. Although not all of these characteristics of HSV messages need be included in a single message to reach HSSs, more effective messages tend to be characterized by a greater number of these features.

APPLICATIONS

This model offers an alternative to theories assuming greater reliance on rational decision making alone that frequently have not been successful in predicting behaviors. One of the preeminent rational models used in the field of health communication, the health belief model, has been

criticized by Freimuth (1992) as "disappointing" in explaining risk-taking behavior related to HIV infection and in predicting change in HIV-preventive behaviors. She adds that the problem is that it is a "rational-cognitive model and assumes a 'rational' decision-maker." She contends that "most adolescents, and many adults, do not seem to approach the AIDS issue from such a logical perspective." Risk-taking behaviors not explained by rational models are evident in drug use as well.

The model has guided both laboratory and large-scale field studies involving both media and classroom interventions in our program of prevention research in which attention and information are key elements. These studies have investigated (or currently are investigating) (a) the role of message sensation value in differentially influencing the responses of high and low sensation seeking young adults; (b) the role of the sensation value of a television program context for antidrug PSAs in differentially eliciting attention from HSSs and LSSs; (c) the effectiveness of a message targeting strategy using message sensation value and program sensation value in television antidrug PSA campaigns to reach HSS; (d) the processes of attitude and behavior change in a two-city interrupted time-series analysis of antidrug media campaigns, with and without replications that are aimed at HSSs; and (e) the effectiveness of using HSV school-based HIV instructional materials and methods in a two-city project with and without a media condition. The results of these studies are providing important direction for the design of campaigns with regard to the critical issues of effective message design and placement.

Laboratory Experiments

To test the effects of HSV and LSV versions of a televised antidrug PSA on HSSs and LSSs, we first conducted formative research that revealed characteristics of televised messages that have differential appeal for HSSs and LSSs among young adults. The responses of HSS or LSS focus groups to a selection of product ads and PSAs demonstrated that HSS subjects reacted more positively to more novel formats and unusual use of formal features. HSS participants also responded more positively to high levels of suspense, tension, drama, and emotional impact than did LSS participants. We developed two 30-second, televised, antidrug PSAs. Both used the same concept, but one included characteristics that appealed to HSSs and one included features preferred by LSSs. We conducted a laboratory test of the effects of the HSV and LSV versions of the PSA on high and low sensation-seeking young adults. Eighteen- to 22-year-old participants recruited from a variety of sources completed Zuckerman's (1979) Sensation Seeking Scale (Form V). A median split on the sum of the 37 non-drug-related items was used to define LSSs and HSSs, who then were randomly assigned to one of the experimental conditions (n = 165) or the control

group (n = 42). Participants in groups of 5 to 6 were shown a 7½-minute videotape from a network show with two presentations of the HSV or LSV PSA embedded in it. Participants then completed measures of behavioral intention to call a hot line mentioned in the test PSAs, attitude toward drugs, and drug use scales. Control group participants participated in all procedures, except the antidrug PSAs were not included in the video content.

The most important result from a targeting perspective is an interaction between message sensation value and sensation seeking on an index of intent to call the hot line. As hypothesized, the HSV message was more effective with HSSs in inducing participants' intentions to call the hot line, whereas the LSV message was more effective with LSS participants. HSS users of illicit drugs in the past 30 days showed the strongest impact on behavioral intention, as well as more negative attitudes toward drugs relative to their control group. The results of this experiment (Donohew et al., 1991; Palmgreen et al., 1991) provide evidence that sensation seeking and message sensation value can be employed in concert to target televised antidrug PSAs to older teens and young adults who are users of illicit drugs or at risk of becoming users.

A related experiment prompted by this study sought to increase external validity by using several televised PSAs created by the Partnership for a Drug-Free America in the HSV and LSV conditions and by embedding these PSAs in either HSV or LSV program contexts. Thirteen televised anticocaine PSAs were pretested with a perceived message sensation value scale developed for this study, with the 4 PSAs scoring highest on the scale classified as HSV and the 4 scoring lowest classified as LSV. A sample of 120 HSS and LSS young adults were randomly assigned to one of four experimental viewing conditions, representing all combinations of HSV or LSV anticocaine PSAs and HSV or LSV television program context. After viewing, free/cued PSA recall, attitude toward cocaine, and behavioral intention to use cocaine were assessed. Sensation seeking and message sensation value interacted strongly to affect PSA recall, attitude, and behavioral intentions. After viewing HSV as compared to LSV PSAs, HSSs recalled more PSA content, had more negative attitudes toward cocaine, and cited less likelihood to use cocaine. HSSs exhibited greater recall of PSAs (particularly HSV PSAs) in HSV contexts (Everett & Palmgreen, 1995).

The experiments described above involved a typical paradigm of "forced" exposure to the messages. The participants were instructed to attend to the test videotapes. Therefore, participants' attention to messages was assumed and not measured, particularly in relation to the sensation value of the program context of the PSA. Viewers ordinarily tune in to watch programs, not advertisements and PSAs. Recent research

has emphasized the importance of ongoing attention to the program in encouraging attention to ads and other messages within the program. This research shows that the longer a viewer has been visually attending to television, the more likely he or she will continue to do so (see, e.g., Anderson, Choi, & Lorch, 1987), a phenomenon termed *attentional inertia.* The attentional inertia effect suggests that if the sensation value of a program differentially influences attention in HSS and LSS viewers, it may in turn influence attention to a PSA embedded in the program.

In the next experiment, we evaluated the effects of program sensation value and PSA sensation value on the visual attention of HSS and LSS individuals, using a more naturalistic setting. A total of 318 high and low sensation-seeking young adults participated one at a time in a simulated living room and were given other options to television viewing, such as magazines. Two showings of the HSV or LSV PSA described earlier were embedded within 30 minutes of programming and product ads. Programs were pretested for appeal to HSS and LSS young adults, and included an HSV drama, an HSV comedy, an LSV drama, and an LSV comedy. In this experiment, the sensation value of the PSA did not influence visual attention to the television. The major finding, however, was that HSSs paid significantly more attention to HSV programming than to LSV programming. As a result, HSSs attended more to PSAs and ads embedded in HSV programming. Although LSSs' attention was not significantly different for HSV and LSV programming, they paid more attention to PSAs embedded in a LSV context than PSAs presented in a HSV context (Lorch et al., 1994). Therefore, the sensation value of the program context is an important determinant of attention to a message, particularly for HSSs. However, the results indicate that many LSSs are also reached by messages embedded in programming preferred by HSSs. These findings suggest that although interventions designed for LSSs are not likely to reach HSSs, messages designed for HSSs reach both HSSs and LSSs. Such a finding is particularly crucial for design of classroom interventions, where it would be difficult to separate classes according to sensation-seeking level.

Campaign Study

Given that HSSs are at an increased risk for drug abuse, the next step was to test whether the procedures used to design and evaluate messages and program contexts in the laboratory could be implemented effectively with an actual televised campaign targeted at HSS young adults. The campaign was founded on three major elements: (a) the creation and use of PSAs that, according to formative research, appealed to HSS young adults; (b) the presentation in the PSAs of exciting alternative activities to drug use to meet sensation needs; and (3) the placement of spots (through

purchased and donated time) in programming that had been determined to have a high degree of HSS viewership in a survey of young adults.

The campaign was carried out during a 5-month period in Lexington, Kentucky—a city of 225,000—and included five different spots. Each spot concluded with an appeal to call a hot line for more information about exciting alternatives to drug use. Callers to the hot line received a full-color, 20-page guidebook called "A Thrillseeker's Guide" to the area, which explained the concept of sensation seeking and its connection to drug use and listed a wide variety of activities available in the county and in surrounding areas. During the campaign, 615 purchased spots and 887 donated spots were televised. Information obtained in the precampaign survey (see below) on television program preferences of HSSs was used by a professional media buyer to guide placement of the campaign PSAs. Evaluation of the campaign was based on several different surveys.

Precampaign survey. For the month before the campaign began, a precampaign survey (face-to-face interviews) of 597 randomly selected 16- to 25-year-olds in Fayette County (Lexington) produced data on television program preferences, general antidrug ad recall, use of alcohol and nine illicit drugs, drug attitudes, leisure activity, and demographics. Sensation seeking was measured with Zuckerman's (1979) Sensation Seeking Scale (Form V), minus three drug-related items.

Within-campaign surveys. Four random telephone surveys were conducted at 1-month intervals during the campaign. For each survey, approximately 100 16- to 25-year-old Fayette County residents were asked to describe any antidrug ads they had seen on television during the past 4 weeks. Sensation seeking (using 10 items selected from the full scale through discriminant analysis of previous data) and demographics also were measured.

Hot-line panel survey. Callers to the hot line who indicated that they were calling for themselves and who were 18 years of age or older were invited to participate in a study of campaign effectiveness. Those who agreed filled out a mailed questionnaire concerning television viewing, sensation seeking, leisure-time activities, drug attitudes, and drug use.

Postcampaign survey. In the month following the end of the campaign, interviewers were able to contact 525 (88%) of the original 597 precampaign respondents. The personal interview consisted of the questions asked during the precampaign survey, as well as measures of free recall, recognition, and frequency of exposure to campaign PSAs.

Targeting effectiveness. The campaign proved successful in targeting young adult HSSs. More than 2,100 calls to the hot line were received, with 98% calling for themselves. This is a relatively large number of calls from a small market and a narrowly defined target audience. Hot-line call records indicated that 60% of the callers were 18 to 25 years of age, and 80% were 16 to 25 years of age. Other evidence of effective targeting comes from a comparison of the general population of 18- to 25-year-olds in the Lexington market (based on 500 18- to 25-year-olds in the precampaign survey) with callers to the hot line (based on 749 18- to 25-year-old respondents in the hot-line panel survey). Levels of sensation seeking were defined in terms of a median split of the 18- to 25-year-olds in the precampaign (general population) sample. By comparison to the 50% of precampaign sample respondents classified as HSSs, 73% of the hot-line survey participants were classified as HSSs. Separate analyses for males and females revealed the same sensation-seeking difference between the groups.

Another indication of successful targeting came from the within-campaign surveys. Thirty-eight percent of HSSs (those scoring in the upper 40% on the 10-item scale) could recall (uncued) at least one campaign PSA compared to only 22% of LSSs (lower 40%). By comparison, 37% of LSS respondents could recall noncampaign, antidrug PSAs versus 31% for HSSs. Of those who recalled seeing any antidrug PSAs, HSSs were more likely to describe campaign PSAs (55% campaign vs. 45% noncampaign), whereas LSSs were more likely to describe noncampaign PSAs (63% noncampaign vs. 37% campaign). Finally, analysis of postcampaign survey data revealed that both sensation seeking and drug use were positively related to certainty of recognition of and frequency of exposure to the campaign PSAs.

Thus, the data from several sources converge on the conclusion that the campaign was successful in reaching the target audience of high sensation-seeking young adults with prevention messages. The relative impact of the sensation value of the messages and the sensation value of the programs in which the messages were placed could not be determined in this research design, but the combination was highly effective in reaching and motivating HSSs to call a prevention hot line (Palmgreen, Lorch, Donohew, Harrington, Dsilva, & Helm, 1995).

The findings of these laboratory experiments and the campaign study thus make important contributions to the development, targeting, and execution of televised antidrug PSA campaigns. However, the evidence at this point for persuasive effects of HSV antidrug PSAs on drug use and attitudes rests on laboratory experiments that measured behavioral intention rather than actual use. The PSAs employed in the campaign study were designed primarily to elicit calls to a prevention hot line, not to bring about direct changes in drug use and attitudes. An important question left

unresolved by our prior research, therefore, was whether the message design and targeting strategies developed in this research could be employed successfully in an actual televised PSA campaign designed to change drug-related attitudes and drug use. An additional important issue was whether these strategies, which had been employed only with young adults, could be adapted to the adolescent target audience. A study currently underway is designed to answer these questions and is a further illustration of ways in which the theoretical approaches to message design and placement described here can be applied in health campaigns.

The study involves an interrupted, time-series analysis in which monthly samples of 100 adolescents are measured on exposure to anti-marijuana PSAs, marijuana attitudes and use, and a number of other variables in two matched cities during a 32-month period. A 4-month television campaign using PSAs designed and placed to reach high sensation-seeking adolescents, was conducted in one of the cities in 1997 and then a year later in both cities. The time-series analysis is expected to reveal not only the evolution of changes in attitudes and behaviors over time but also the effects of other variables, such as sensation seeking, that are likely to affect the process.

Another possible application of the approach to televised messages indicated by the activation model involves the work by Lang and associates (Lang, Dhillon, & Dong, 1995) exploring a limited capacity theory of attention to television that has found differences in television recall to be a function of "content arousingness." Content arousingness would appear to be related to what we have termed message sensation value, and it might be expected that sensation seeking (need for activation) might play a major mediating role in television processing.

An HIV, sexual risk-taking, and alcohol use prevention study also underway draws on findings from our earlier media research on sensation seeking and message design and from extensive research by Zimmerman and associates (Langer, Zimmerman, Warheit, & Duncan, 1993) on impulsive decision making in a classroom setting. It is expected that adolescents who are above the median on indicators of sensation seeking and impulsive decision making would be particularly difficult to reach using conventional skills-based classroom curricula based on models of rational decision making. In the experimental condition, this project involves a radio-based media campaign with novel messages designed to attract the primary target audience as well as a faster paced, more novel curriculum in which there is greater student involvement. Schools in which other curricula and no organized curricula on the topics are offered will serve as comparisons. Multiple follow-up assessments will occur during a 3-year time interval in two cities, one involving a media campaign and the other not involving a media campaign.

The marijuana and HIV studies are but two examples of the theoretical and practical implications of the sensation-seeking activation approach to health communication campaigns outlined here. In fact, any health-related behavior that is related to risk taking and/or to novelty seeking is amenable to this approach. Other problem areas that have been the focus of communication campaigns that might benefit from this targeting strategy include alcohol use and abuse, cigarette use, and accident prevention. Even areas where the behavior of interest is uncorrelated with sensation seeking can profit from a perspective that offers clear guidelines for designing different messages to reach audience members with varying needs for arousal and stimulation in their communication environment.

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