Predictors of Exposure From an Antimarijuana Media Campaign: Outcome Research Assessing Sensation Seeking Targeting

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Using data from a large-scale antimarijuana media campaign, this investigation examined the demographic and psychographic variables associated with exposure to public service announcements designed to target high sensation-seeking adolescents. The literature on sensation seeking indicates that adolescents high in this trait are at...
greater risk for substance abuse. Analyses assessed the predictive utility of various risk and protective factors, normative influences, demographic variables, and marijuana-related attitudes, intentions, and behaviors on campaign message exposure. Results confirm that level of sensation seeking was positively associated with greater message exposure. In addition, viewers reporting greater exposure were younger adolescents who indicated that they had poor family relations, promarijuana attitudes, and friends and family who used marijuana. Implications for designing future antimarijuana messages based on these findings are discussed.

The success of a recent drug prevention campaign demonstrates the effectiveness of a theory-based media strategy in changing the target audience’s drug-related behaviors. Specifically, three 4-month television-only campaigns preceded a substantial drop in 30-day marijuana use among high sensation-seeking adolescents (Palmgreen, Donohew, Lorch, Hoyle, & Stephenson, 2001). The results were replicated in two geographic regions of the United States. From this study, researchers reinforced two primary conclusions: One, contrary to some previous research, a television-only campaign is an efficacious option in drug prevention; and two, the campaign’s strategy offers an effective method for future media prevention efforts.

The framework employed in the campaign, called SENTAR (Sensation-Seeking Targeting), primarily involved creating high sensation value (HSV) television spots (those with formal and content audiovisual features that elicit sensory, affective, and arousal responses) to convey the consequences of using marijuana to high sensation seekers (HSS). HSS manifest a need for novelty and stimulation, a trait that may lead them to engage in risky health behaviors, like marijuana use (Zuckerman, 1979, 1994). Consequently, HSS have been targeted because their need for stimulation is also fulfilled by the content and formal features characteristic of HSV messages. Therefore, HSV spots offered a potentially effective vehicle with which to convey the consequences of using marijuana.

The purpose of this study is to perform a detailed examination of the target audience’s exposure to the media campaign. Our first objective is to evaluate differences in exposure between HSS and low sensation seekers (LSS). Grounding the campaign in the SENTAR approach should lead to greater campaign exposure among HSS than LSS. Our second objective is to examine other important demographic and psychographic variables, beyond sensation seeking, associated with exposure. Regarding the significance of this research in light of the established behavioral effects, “the effect or outcome is paramount, but you also need to know what happened, how and why which elements worked, and to analyze what should be changed in future programs” (National Institutes of Health, 1992, p. 63). Thus, the knowledge gained from this study is potentially meaningful for two reasons: The research objectives provide an opportunity to evaluate (and refine) the SENTAR framework to campaign design, while determining the predictors of
message exposure renders practical information for conceptualizing and creating future antimarijuana public service announcements (PSAs). We begin by reviewing the advances associated with conceptualizing and developing campaigns for specific target audiences.

OVERVIEW OF TARGETING

Targeting strategies involve tailoring and directing a campaign to a specific audience demographic rather than a generalized mass public. Typically, “the audience [is] segmented into internally homogenous subgroups that may be more at risk than other segments and that can be reached through certain types of messages” (Everett & Palmgreen, 1995, p. 226). Effective audience segmentation strategies became more prevalent after ineffective targeting was cited as one major reason mass media campaigns fail (Flay & Sobel, 1983; Rogers & Storey, 1987). Now, effective targeting is the cornerstone of the social marketing approach to prevention campaign design. Although demographics can provide a rudimentary beginning, any targeting scheme should also segment on the basis of psychographic variables (e.g., attitudes, values, beliefs, personality characteristics) linked both to the behavior of interest (e.g., marijuana use) and to the communication channels and message styles most preferred by target audience members (Backer, Rogers, & Sopory, 1992; Slater, 1996).

Slater (1995) suggested that campaign planners now rarely overlook careful targeting and audience segmentation strategies, noting that “it is second nature to adapt the style and content of our communication to the idiosyncrasies of our audience” (p. 186). In addition, we have advanced our knowledge on statistical techniques (such as Q-Sort, cluster analysis, logistic regression) that can be employed in “discovering sensible patterns of needs, wants, desires, and tendencies among groups within a target population” (Albrecht & Bryant, 1996, p. 66). “The crucial point here is that it is more efficient, in terms of maximizing impact with given resources, to identify people who are similar in important respects and tailor one’s communication content and delivery to them” (Slater, 1995, p. 187).

SENTAR

SENTAR is a prevention strategy and framework designed to specifically target members of the population who are high in sensation seeking (Palmgreen & Donohew, in press). HSS are an attractive targeting demographic because of their psychobiological disposition to engage in thrill-seeking behaviors. This drive for novel, complex, and intense sensations and experiences is typically satisfied by a willingness to take more social risks (e.g., impulsive behaviors, sexual promiscuity), physical risks (e.g., skydiving, bungee jumping, driving fast), legal risks (e.g., getting arrested and put in jail), and financial risks (e.g., not paying fines, impulsive
purchases; Zuckerman, 1979, 1994). In contrast, individuals with a low need for sensation are less likely to engage in these behaviors. Health practitioners and campaign planners are typically interested in HSS’s tendency to engage in thrill-seeking behaviors, such as risky sex or illicit substances use to fulfill their needs for sensation (Barnea, Teichman, & Rahav, 1992; Clayton, Cattarello, & Walden, 1991; Newcomb & McGee, 1991; Zuckerman, 1979, 1994).

Consistent with their need for novelty and stimulation, HSS report clear and distinct preferences for specific media message characteristics (Donohew, Palmgreen, & Lorch, 1991). After more than a decade of research involving focus groups and laboratory and field experiments with adolescents and young adults, SENTAR emerged as the framework linking the health and media perspectives. Primarily created for the prevention of substance use, this model is summarized by the following principles: (a) Employ the sensation-seeking trait as a major targeting variable, (b) design prevention messages that are high in sensation value to reach HSS, (c) employ formative research with high sensation-seeking members of the target audience, and (d) place prevention messages in HSV contexts. The impetus of SENTAR is that messages designed to appeal specifically to the needs of HSS will be more effective in reaching and ultimately influencing this high-risk group.

Using SENTAR in a mass media campaign. The first evidence for the effectiveness of a SENTAR-based antidrug campaign was generated from a field study involving a televised PSA campaign targeting young adults (Palmgreen et al., 1995). Those results implied that sensation seeking and use status leveraged attention and exposure to the campaign’s HSV PSAs.

Most recently, the SENTAR strategy was employed to evaluate the effectiveness of television antidrug campaigns on young adolescents’ attitudes toward—and use of—marijuana. Televised PSAs (4 developed specifically for this campaign and 3 from the Partnership for a Drug Free America) targeting high sensation-seeking 8th to 12th graders were aired in a Southeastern metropolitan city from January through April 1997 and January through April 1998. Using a combination of purchased and donated television airtime on broadcast and cable stations, an average of 777 paid spots and 1,160 unpaid spots aired in each campaign (Stephenson et al., 1999). Gross rating point (GRP) data, a measure of audience exposure, revealed that at least 70% of the targeted age group was exposed to a minimum of three campaign ads per week for a sustained period of 4 months. Monthly time series profiles depicted a considerable, statistically significant decrease in 30-day marijuana use among the target audience after the campaigns were broadcast (Palmgreen et al., 2001).

Given these behavioral effects, analyses thus far have not, however, examined the association between sensation seeking and exposure to these campaign messages. Such information would be useful in interpreting the impact on the target audience. Given the observed behavioral changes in adolescent 30-day marijuana
use, we predict that (H1) HSS will report significantly greater message exposure than LSS. In line with the SENTAR emphasis on the stronger need for stimulation by HSS adolescents, we would also predict that (H2) HSS marijuana users and nonusers will report greater campaign message exposure than LSS marijuana users and nonusers. This does not preclude the possibility that LSS were reached, only that HSS are expected to report greater campaign exposure.

Historically, however, researchers have not compared high and low risk groups to determine if changes in drug-related attitudes were markedly different (cf. Sussman et al., 1987). We know that previous antidrug media campaigns (like those from the Partnership for a Drug Free America) have been successful in shifting attitudes in a direction less favorable to drug use (Black, 1991). Nonetheless, a portion of the population still holds favorable attitudes toward marijuana, which in turn, should affect perceptions of antidrug PSAs. Promarijuana attitudes and behaviors suggest high involvement with the PSA message content (e.g., Flora & Maibach, 1990), and therefore, we predict that (H3) exposure rates will be higher among respondents with favorable attitudes toward marijuana use. In addition, (H4) exposure rates will be higher among respondents who report past marijuana use.

An additional persuasive outcome variable typically examined with attitudes and behaviors is one’s intent of engaging in a specific behavior, in this case marijuana use. From a prevention perspective, it is particularly important to reach those who have not yet tried marijuana, but believe they may do so in the future. Because attitudes and intention are correlated (Ajzen & Fishbein, 1980; Kim & Hunter, 1993), we would also predict that (H5) exposure will be higher among respondents who intend to use marijuana at least once in the future (excluding those who have already used marijuana).

**Other Factors Associated With Campaign Exposure**

Although sensation seeking was the primary drug risk factor employed in the campaign, numerous other factors have been identified in the etiology of adolescent drug use.

**Risk and protective factors.** Newcomb and Felix-Ortiz (1992), among others (see Huba, Wingard, & Bentler, 1980) have stressed the importance of various factors which appear to protect the individual against drug use and abuse, including performance in school (GPA), religiosity, self-acceptance, law-abidance, educational aspirations, deviance, and perceived peer drug use. Likewise, data from the annual Monitoring the Future Survey indicate that those adolescents possessing certain risk factors display the greatest year-to-year shifts in drug use, whereas those with a greater number of protective factors (e.g., religiosity) show the least change (Bachman, Johnson, & O’Malley, 1991).
Such risk and protective factors thus may be important variables that moderate the effectiveness of media drug abuse prevention campaigns. Those high or low on risk and protective factor indexes may vary in their susceptibility to persuasion through media and other channels. Consequently, one goal of this analysis was to determine which risk and protective factors were associated with campaign exposure. Although these risk and protective factors are correlated to some extent with sensation seeking (Newcomb & Felix-Ortiz, 1992), determining which risk and protective factors are associated with exposure provides a richer understanding of the targeted audience. Therefore, we ask Research Question 1 (RQ1): What risk and protective factors, beyond sensation seeking, are associated with campaign exposure?

**Normative components.** Beyond the aforementioned factors, social relations are often considerable influences on the attitudes and behaviors of adolescents, particularly pertaining to substance use (e.g., Iannotti, Bush, & Weinfurt, 1996; Leventhal, Fleming, & Glynn, 1988). Ajzen and Fishbein’s (1980) theory of reasoned action highlights the considerable influence others can have on one’s intention to perform a specific behavior, such as smoking marijuana. Studies demonstrated the influence of peers and family members (Botvin, Malgady, Griffin, Scheier, & Epstein, 1998) as well as school and neighborhood environmental factors (Allison et al., 1999). In light of this research, our interest is in the importance attributed to these social factors by campaign viewers. We believe that if social norms do not support substance use, the dissonance created by teens’ substance use will cause them to pay greater attention to drug abuse prevention messages. Therefore, we also ask (RQ2): What normative influences were associated with campaign exposure?

**Demographic factors.** Finally, demographic factors are also interesting and useful in establishing a profile of those exposed to campaign messages. Thus (RQ3): What demographic factors were associated with campaign exposure, and do any demographic factors moderate the relation of the risk and protective, normative, or persuasive outcome variables with exposure?

**METHOD**

**Participants**

Participants were 785 adolescents in grades 7 through 12 recruited by telephone from class rolls in a Southeastern metropolitan city. A grade-stratified random sample of approximately 100 participants was recruited each of the four postcampaign months used in this analysis. This sample was 45% boys and 18% non-White. Most participants were in the 9th (18%), 10th (24%), 11th (23%),
and 12th (19%) grade. Some were in the 7th (< 1%) or 8th grade (6%), or had graduated or dropped out (9%).

Procedure

To enlist participants, a parent or guardian was contacted by telephone requesting the child to participate in this study. An interview time was scheduled in the teenager’s home only if both the parent and the teen agreed to the adolescent’s participation. After consent forms were obtained from parents, the interview was conducted somewhere in the home where nothing could be overheard. Parents signed consent forms and answered a series of demographic questions before leaving the room for the confidential interview. The interview was administered on a laptop computer, with responses to sensitive questions (i.e., drug use) keyed in by the participant. This assisted with confidentiality in that only the participant knew how the questions were answered. This also prevented responses to sensitive questions from being answered aloud. Each interview lasted about 40 min. Adolescent participants received certificates for a free movie rental and a pizza for participating.

Measures

Sensation seeking. Sensation seeking was measured using the 8-item Brief Sensation-Seeking Scale (Hoyle & Stephenson, in press; Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, in press). This scale, which was developed for this line of research with adolescents, was created by adopting items from the sensation seeking scale–form V (SSS–V; Zuckerman, Eysenck, & Eysenck, 1978) and a set of items derived from the SSS–V but tailored for adolescents (Huba, Newcomb, & Bentler, 1981). Items were adapted for use with adolescents and revised to reflect contemporary language (e.g., “swinger” was changed to “party-er”). The four dimensions represented in Zuckerman’s SSS–V are equally represented. Because sensation seeking often is used to predict substance use, items that referred to alcohol or drug use were not included in the new scale.

This scale demonstrated good construct validity (Hoyle et al., in press). Specifically, the scale is moderately correlated with multiple lifetime and 30-day substance use measures (including alcohol, tobacco, marijuana, and inhalants, with Pearson rs ranging from 0.22–0.49). In addition, the scale is positively correlated with indexes of drug risk factors (such as deviance, perceived peer use, and perceived family use, with Pearson rs ranging from 0.29–0.41) and negatively correlated with drug protective factors (such as law abidance, family life, and perceived sanctions, with Pearson rs ranging from 0.22–0.40).
Because about half the teenage population are HSS, a median split on the sum of the eight items was used to define HSS and LSS, which follows the procedures employed in most studies of sensation seeking (Zuckerman, 1979). On a scale ranging from 1 (strongly disagree) to 5 (strongly agree), participants responded to the eight items, such as “I like wild parties,” “I would like to have new and exciting experiences, even if they are illegal,” and “I prefer friends who are excitingly unpredictable.” These measures generated acceptable reliability ($\alpha = .74$).

**Total viewing time.** Because of expected differences in total time viewing television on weekdays and on weekends, total viewing time was assessed with two separate questions. Participants responded to “How many hours of TV do you watch per weekday, not including videotapes that you have rented or bought?” and “On a typical Saturday or Sunday, how many hours of TV do you watch per day, not including videotapes that you have rented or bought?” Because the reliability of this type of measure has been questioned in certain lines of media research (e.g., Hirsch, 1980; Potter, 1993; Shoemaker & Reese, 1990), a check of the internal consistency was justified, even though the items were treated separately in analyses. The reliability results suggest participants are generally answering the question consistently ($\alpha = .74$).

**Risk and protective factors.** Participants responded to a series of items designed to assess their standing on a variety of risk and protective factors for drug use and other problem behaviors (e.g., Newcomb & Felix-Ortiz, 1992; Newcomb, Maddahian, & Bentler, 1986). Participants responded to measures of religiosity (e.g., “I believe/do not believe in religion” and “I feel that prayers are answered/praying is a waste”; $\alpha = .82$), self acceptance (e.g., “I regard myself as a failure/regard myself as a success” and “I like/dislike myself for who I am”; $\alpha = .78$), and family relations (e.g., “My family is very close/not very close” and “There is a lot/not much happiness in my family”; $\alpha = .79$). Participants also reported their GPA which was measured on a scale ranging from 1 (all Fs) to 10 (all As).

**Normative factors.** In single-item measures, participants indicated their perceptions of marijuana use by their friends (e.g., “Among your friends, how many use marijuana?”), family (e.g., “Among the people in your family, including parents, brothers, sisters, grandparents, aunts, uncles, and cousins, how many use marijuana?”), and community (e.g., “Among the people you know in your community—for example, people in your neighborhood, members of your church—NOT including your family and friends, how many use marijuana?”). Participants also responded to single-item measures of their family, friend, and community’s approval of their own use of marijuana, as well as perceived friend and parental reaction to finding out they used marijuana.
**Attitudes.** Participants responded to seven items (e.g., “Occasional use of marijuana is okay”; α = .91) about occasional use of marijuana on a scale ranging from 1 (disagree strongly) to 4 (agree strongly).

**Intentions.** Participants indicated their intent to engage in experimental marijuana use (e.g. “In the future do you think you will try marijuana at least once?”) and regular marijuana use (e.g., “In the future, do you think you will use marijuana regularly?”) on a scale ranging from 1 (definitely will not) to 4 (definitely will). Both were treated as single-item measures.

**Behavior.** Participants reported their lifetime marijuana use (e.g., “Have you ever used marijuana?”). By answering yes or no to this question, participants were asked to report their 30-day marijuana use (e.g., “Please type in the number of days between 0 and 30 that you have used marijuana in the last 30 days”). Both were treated as single-item measures.

**Demographics.** Participants indicated their sex, grade in school, and ethnicity.

**Exposure to antimarijuana PSAs.** To assess whether participants had been exposed to the messages, adolescents read a four-sentence description of each of the four campaign PSAs. Participants indicated their certainty in viewing each PSA on a scale ranging from 1 (very certain I did not see it) to 4 (very certain I saw it). Exposure scores were summed across the four PSAs to create the dependent variable (exposure) for these analyses. Individuals were generally consistent in their responses to certainty of exposure (α = .74; however, alpha could be somewhat attenuated as individuals may actually have seen some ads and not seen others, producing variation in responses that would be calculated as instability by alpha).  

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1To assess the accuracy of the measure, exposure to the messages was assessed at least 1 month prior to airing each PSA. For each PSA, the percentage of respondents who were very certain they had viewed the PSA was minimal before it aired, although substantially higher the month it first aired, as well as 1 month after it first aired. PSA1: 4% 1 month before, 54% month of first airing, 67% 1 month after first airing; PSA2: 4% 1 month before, 52% month of first airing, 56% 1 month after; PSA3: 3% 1 month before, 24% month of first airing (midmonth start), 53% 1 month after; PSA4: 4% 1 month before, 19% month of first airing (midmonth start), 58% 1 month after. Exposure certainty typically peaked between 70% to 75% in the ensuing months. Illustrations in Palmgreen et al. (2001) indicated large increases in exposure as GRPs mount in all campaigns. We also continuously measured exposure in a control city where the campaign was not broadcast. The percentage of control-county respondents who were very certain they had viewed the PSA was also very small, averaging only 2% over the 4-month campaign period. Naturally, as is demonstrated, a small portion of respondents reported seeing the PSAs due to errors in memory or social desirability.
Although exposure has historically been used as a dependent variable, we employ it here with the caveat that exposure is not equivalent to learning (Robinson & Levy, 1986), retention (Lemert, Wanta, & Lee, 1999), or attention (Chaffee & Schleuder, 1986) in regard to the content of the messages. The issue is generally framed in terms of one’s active or passive use of the media. Research has demonstrated, however, that exposure measures are associated with attitude change. Price and Zaller (1993) found that, in some cases, exposure predicted recall of news content, noting that “it is at least conceivable that simple exposure to news media … is sufficient to produce various attitudinal effects that interest communication researchers” (p. 159). Bartels (1993) argued and demonstrated that media exposure effects, although admittedly modest, are often attenuated by measurement error. In evaluating media exposure and opinion change during the 1980 presidential election, Bartel reported that “attention to the effects of measurement error significantly increased the apparent impact of media exposure on opinion change” (p. 274). We highlight these viewpoints simply to emphasize that the conclusions of this research are based solely on exposure to these messages.

Method of Analysis

Two media campaigns (January to April 1997 and January to April 1998) preceded the data employed in subsequent analyses. The data are from adolescent responses given by participants over the 4-month periods following two media campaigns (approximately 100 interviews per month in May to August 1997 and May to August 1998). Factorial analysis of variance was used to evaluate H1 and H2. Multiple regression was used to assess H3 through H5 and RQ1 through RQ3, where two variables accounting for total TV viewing time on weekdays and weekends were entered first to control for their influence on the dependent variable.

RESULTS

H1 and H2

In support of H1, a significant main effect for sensation seeking was detected on exposure, $F(1, 777) = 6.02, p = .01, \eta^2 = .01$, where HSS ($M = 3.22$) reported viewing greater exposure than LSS ($M = 3.06$). No other main effects or interactions were significant. In addition, the results to H2 demonstrated a significant main effect for sensation seeking on message exposure, $F(3, 754) = 3.90, p = .009, \eta^2 = .02$. This hypothesis, however, is only partially supported, as multiple comparison tests revealed the only significant difference ($p < .05$) to be HSS nonusers ($M = 3.24$) reporting greater exposure than LSS nonusers ($M = 3.02$). HSS users ($M = 3.16$) also
reported greater exposure than LSS nonusers, but the difference was only marginally significant ($p = .09$).

**H3 and H4**

Controlling for weekday and weekend television viewing time, results indicate that individuals with more favorable attitudes about marijuana were more likely to see the antimarijuana PSAs ($\beta = .15, p < .01, R^2 = .02; \text{see Table 1}$). Similarly, these viewers were likely to have used at least some marijuana in the past 30-days ($\beta = -.08, p < .05, R^2 = .01$). Therefore, these hypotheses were supported.

**H5**

After removing those who had previously used marijuana and controlling for television viewing time, one’s intention to try marijuana at least once in the future was a significant predictor of campaign message exposure. Specifically, individuals more likely to try marijuana at least once were more likely to report exposure to campaign messages ($\beta = .12, p < .01, R^2 = .02; \text{see Table 2}$). Intent to use marijuana regularly in the future was not a significant predictor of exposure, although as might be expected, there was little variance to be explained in this variable. This hypothesis is partially supported.

**RQ1**

Beyond sensation seeking, only family relations was a significant predictor of campaign exposure. Specifically, individuals with strained family relations indicated greater certainty in seeing the message than those with good family relations ($\beta = -.10, p < .05, R^2 = .01; \text{see Table 3}$).

### TABLE 1

**Regression Coefficients of Attitudes and Use on Message Exposure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Predictors</th>
<th>$\beta$</th>
<th>$sr$</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Weekday TV viewing</td>
<td>.07</td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weekend TV viewing</td>
<td>.13**</td>
<td>.10</td>
<td>.03***</td>
</tr>
<tr>
<td></td>
<td>Block $R^2$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Attitude toward marijuana</td>
<td>.15**</td>
<td>.14</td>
<td>.02***</td>
</tr>
<tr>
<td></td>
<td>Days used marijuana past month</td>
<td>-.08*</td>
<td>-.07</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Block $R^2$</td>
<td></td>
<td></td>
<td>.05***</td>
</tr>
<tr>
<td></td>
<td>Total $R^2$</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. $N = 785.$

*p < .05. **p < .01. ***p < .001.*
After television viewing covariates, results indicate that several normative influence variables were predictors of exposure to the antidrug PSAs ($R^2 = .06$; see Table 4). Specifically, adolescents who perceived that more of their friends ($\beta = .13, p < .05$) and family members ($\beta = .12, p < .01$) used marijuana were more likely to report message exposure. Likewise, these individuals generally believed their friends would not react adversely to their own use of marijuana. However, those reporting greater exposure also perceived less community approval ($\beta = –.09, p < .05$) and less peer approval ($\beta = –.13, p < .01$) of marijuana use. Thus, although peers generally might not approve, those most likely to re-
port exposure did not feel that their friends would do anything to discourage them from using it (β = .17, p < .01).

RQ3

After controlling for television viewing time, age and lifetime marijuana use were significant predictors of message exposure ($R^2 = .01$; see Table 5). Specifically, younger adolescents were more likely to report exposure to campaign messages (β = –.09, $p < .05$), as were individuals who had used marijuana at least once in their lifetime (β = .08, $p < .05$). Gender was not a significant predictor.

DISCUSSION

The overarching goal here was to perform outcome research on a recently completed antimarijuana campaign targeting high sensation-seeking adolescents. We examined and evaluated the relation between sensation seeking, marijuana use, time spent viewing television, and campaign message exposure. In addition, we examined the risk, protective, and normative factors (beyond sensation seeking) associated with campaign exposure, with the understanding that some might enhance message design strategies in future campaigns. Because the latter is a particularly new contribution to this literature, we begin with a review of the variables associated with message exposure as explored in H3 through H5 and RQ1 through RQ3 before turning to a discussion on SENTAR-based outcomes.

TABLE 4
Regression Coefficients of Normative Factors on Message Exposure

<table>
<thead>
<tr>
<th>Step</th>
<th>Predictors</th>
<th>β</th>
<th>sr</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Weekday TV viewing</td>
<td>.07</td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weekend TV viewing</td>
<td>.13**</td>
<td>.10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Block R²</td>
<td></td>
<td></td>
<td>.03***</td>
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<tr>
<td>2</td>
<td>Perceived community use</td>
<td>.01</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perceived friend use</td>
<td>.13*</td>
<td>.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perceived family use</td>
<td>.12**</td>
<td>.11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perceived community approval</td>
<td>–.09*</td>
<td>–.08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perceived friend approval</td>
<td>–.13**</td>
<td>–.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perceived family approval</td>
<td>–.02</td>
<td>–.02</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perceived friend reaction</td>
<td>.17***</td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perceived parent reaction</td>
<td>–.03</td>
<td>–.03</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Block R²</td>
<td></td>
<td></td>
<td>.06***</td>
</tr>
<tr>
<td></td>
<td>Total R²</td>
<td></td>
<td></td>
<td>.09***</td>
</tr>
</tbody>
</table>

*Note. N = 785. *p < .05. **p < .01. ***p < .001.
Associations With Campaign Exposure

Risk, protective, and normative factors. A series of variables beyond sensation seeking provides useful information about who reported viewing campaign messages. Specifically, individuals who reported experiencing poor family relations were more likely to report message exposure. Although sensation seeking is correlated with poor family relations ($r = .27$), the size of the correlation suggests that this risk factor is a subset of individuals somewhat distinct from HSS (i.e., sharing only about 10% of the variance with sensation seeking; see Table 6). Furthermore, the antimarijuana campaign was salient to the behavior of individuals high in this risk factor, as lifetime marijuana use was positively associated with poor family relations ($r = .28$). Consequently, this campaign appears to have reached at-risk viewers who are not necessarily HSS, but who do exhibit some risk in using marijuana.

Normative components and campaign exposure. Several normative components were also associated with campaign message exposure. Viewers apparently perceived some marijuana use by family members (broadly defined) despite general perceptions that community standards were not favorable toward marijuana. Although none of the campaign PSAs singled out the family unit, the consequences of using marijuana were depicted in the PSAs as being harmful to friends and significant others. Again, it appears that the salience of messages about marijuana may be driving higher rates of exposure among adolescents who are at higher risk.

Adolescents indicating greater exposure also perceived an association between friendship and their own marijuana use. Specifically, those more likely to see the PSAs generally believed that their friends used some marijuana. These viewers

### Table 5

Regression Coefficients of Gender, Lifetime Marijuana Use, and Age on Message Exposure

<table>
<thead>
<tr>
<th>Step</th>
<th>Predictors</th>
<th>$\beta$</th>
<th>$sr$</th>
<th>$\Delta R^2$</th>
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<tbody>
<tr>
<td>1</td>
<td>Weekday TV viewing</td>
<td>.06</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Weekend TV viewing</td>
<td>.14**</td>
<td>.11</td>
<td>.03***</td>
</tr>
<tr>
<td></td>
<td>Block $R^2$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Gender</td>
<td>.01</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lifetime marijuana use</td>
<td>.08*</td>
<td>.06</td>
<td>.01*</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>−.09*</td>
<td>−.07</td>
<td>.04***</td>
</tr>
<tr>
<td></td>
<td>Block $R^2$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total $R^2$</td>
<td></td>
<td></td>
<td>.04***</td>
</tr>
</tbody>
</table>

*Note. $N = 783.$

* $p < .05$. ** $p < .01$. *** $p < .001$. 
also believed that their friendships would not be jeopardized (i.e., quit being friends, get turned in to the police) by their own use of marijuana. These findings portray reciprocal relationships between viewers and their friends: Some of their friends use marijuana and those friendships will be maintained if the viewer uses marijuana as well.

A third result pertaining to friends is less consistent. Adolescents indicating greater message exposure indicated that their friends would not approve of their (the respondents’) own marijuana use. This finding is puzzling in light of the previous two significant predictors of viewing. On one hand, perhaps this finding is consistent with the idea that expected disapproval made the message more salient. On the other hand, it is also possible that this is a methodological issue, where survey questions inquiring about respondents’ friends were worded inconsistently, leaving participants unable to distinguish between close friends and peers. Whereas close friendships might be tolerant and perhaps even supportive of marijuana use, respondents may have felt less certain about the approval of casual friendships (other peers and classmates, but not close friends). Because it is generally believed that individuals cultivate friendships with those who have similar interests (including marijuana use), it seems reasonable to speculate that those most likely to be exposed to the campaign PSAs had some marijuana-using friends, which in turn, allowed the partici-

### TABLE 6
Correlations of Variables With Sensation Seeking, Lifetime Marijuana Use, 30-Day Marijuana Use, and Message Exposure

<table>
<thead>
<tr>
<th></th>
<th>Sensation Seeking</th>
<th>Message Exposure</th>
<th>Lifetime Marijuana Use</th>
<th>30-Day Marijuana Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived community use</td>
<td>.17</td>
<td>.06</td>
<td>.31</td>
<td>.31</td>
</tr>
<tr>
<td>Perceived friend use</td>
<td>.35</td>
<td>.12</td>
<td>.51</td>
<td>.47</td>
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<td>Perceived family use</td>
<td>.18</td>
<td>.14</td>
<td>.33</td>
<td>.34</td>
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<tr>
<td>Perceived community approval</td>
<td>.08</td>
<td>-.05</td>
<td>.21</td>
<td>.21</td>
</tr>
<tr>
<td>Perceived friend approval</td>
<td>.35</td>
<td>.04</td>
<td>.52</td>
<td>.44</td>
</tr>
<tr>
<td>Perceived family approval</td>
<td>.14</td>
<td>.00</td>
<td>.28</td>
<td>.26</td>
</tr>
<tr>
<td>Reaction friend</td>
<td>-.30</td>
<td>-.13</td>
<td>-.39</td>
<td>-.26</td>
</tr>
<tr>
<td>Reaction parent</td>
<td>.10</td>
<td>.00</td>
<td>.19</td>
<td>-.21</td>
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<tr>
<td>Try once</td>
<td>.42</td>
<td>.12</td>
<td>.57</td>
<td>.45</td>
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<tr>
<td>Use marijuana regularly</td>
<td>.25</td>
<td>.07</td>
<td>.45</td>
<td>.67</td>
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<td>Religiosity</td>
<td>-.20</td>
<td>-.05</td>
<td>-.27</td>
<td>-.29</td>
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<tr>
<td>Self-acceptance</td>
<td>-.16</td>
<td>-.04</td>
<td>-.18</td>
<td>-.14</td>
</tr>
<tr>
<td>Family relations</td>
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<td>-.10</td>
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<td>-.19</td>
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<tr>
<td>Attitudes</td>
<td>.46</td>
<td>.10</td>
<td>.60</td>
<td>.42</td>
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<tr>
<td>Age</td>
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<td>-.08</td>
<td>.26</td>
<td>.12</td>
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<tr>
<td>GPA</td>
<td>-.15</td>
<td>-.02</td>
<td>-.32</td>
<td>-.23</td>
</tr>
</tbody>
</table>

*Note.* Ns range from 783 to 785; rs greater than ±.07 are statistically significant at p < .05.
pants to infer that these friendships would not be jeopardized by their own use of marijuana. Perhaps respondents were feeling some dissonance when they also reported that their friends might not approve of their own marijuana use. Obviously to untangle these inconsistencies, further research is warranted.

**Attitudes, intentions, demographic factors, and campaign viewing.** Individuals with favorable attitudes toward marijuana reported greater exposure to campaign messages. In addition, even after excluding previous marijuana users, those indicating their intent to try marijuana at least once in the future were also more likely to have viewed the PSAs. Conceivably, the promarijuana attitudes and intentions to use may have increased the salience of the campaign messages for those who report being exposed to them, whereas those who already had a negative attitude toward marijuana or had no intention of using marijuana tuned them out. These results are particularly interesting and encouraging from a prevention perspective, in that the messages were viewed by a critically important promarijuana subpopulation in a drug prevention campaign such as this one.

Finally, some of our results suggest that younger viewers remembered viewing the antidrug messages, consistent with the notion that older teenagers may be more involved in school activities, have more homework assignments, and be more independently mobile with their own transportation. Also, younger viewers may be in the process of forming their attitudes toward marijuana and thus may have found antimarijuana messages more relevant. Gender did not predict campaign viewing.

**Sensation Seeking and Television**

Consistent with our expectations and previous research, H1 revealed that HSS indicated significantly greater exposure than their LSS counterparts. We learn in more detail from H2 that HSS nonusers (and to some extent, HSS users) indicated greater exposure than LSS nonusers. From a prevention perspective, this finding is interesting because HSS nonusers generally are more predisposed to begin using marijuana than are LSS nonusers. Given the cross-sectional nature of the longitudinal behavioral data, however, it is not entirely clear whether the observed reduction in 30-day marijuana use among HSS occurred among existing users, those experimenting for the first time, or some combination of the two. With the results to both hypotheses indicating exposure rates were generally greater among HSS than LSS, we see that the targeting strategies (e.g., purchasing airtime and placing messages in preferred television programming) employed in the campaign in combination with the salience of the PSA content increased the chances that HSS would be exposed to the antidrug information. The results, however, should be interpreted cautiously in light of the admittedly unimpressive effect size associated with these results.
Time spent watching television, interestingly, is probably not a viable explanation for why HSS reported more exposure. Although LSS adolescents viewed slightly more television than HSS adolescents both on weekdays (LSS = 2.75 hr, HSS = 2.57 hr) and weekends (LSS = 2.84 hr, HSS = 2.64 hr), the differences between HSS and LSS were not statistically significant. These nonsignificant differences, however, should not overshadow the important implication for campaign targeting—that there is roughly a 2-hr window of time each day to reach HSS through television messages. This reaffirms the need advocated by SENTAR to purchase specific advertising time and strategically place antidrug messages in television programming most viewed by HSS. Beyond this, however, is the implication that other media, such as radio or the Internet, may need to be included in campaigns directed at adolescents.

SENTAR Campaign and Message Design

This SENTAR-based campaign strategy appears useful given that a SENTAR-designed campaign preceded a substantial decrease in 30-day marijuana use among HSS. The SENTAR approach also values message placement and the purchase of advertising time. For adolescents, these principles are important given that these results indicate that most adolescents watch television only a few hours a day (although it is unclear whether even this viewing is active or passive). In this antimarijuana campaign, planners employed the services of a media buyer who consulted television ratings to determine which programs were most viewed by the target audience. The ratings were cross-validated with the responses from the 100 adolescents interviewed each month. With channel diversification and limited free air time, message placement and purchased advertising time are important factors to consider in reaching the target audience.

The results of this study provide useful information about campaign viewers that could be incorporated into the content of HSV messages. For example, regarding viewers with poor family relations, an antimarijuana message could depict a teenager turning to marijuana to cope with his or her feelings after a quarrel with parents, or alternatively, being ignored by parents or siblings. As the teenager leaves the house to light up a marijuana joint, a friend comes along and encourages other ways to blow off the stress. The message could then depict quick cuts from activity to activity offering alternatives to smoking marijuana. This example is similar to a PSA called “Common” and used in our previous campaign in the early 1990s. Common featured heavy metal music and quick action cuts from one high-sensation activity to another. The spot included a voice-over that stated, “The one thing all these people have in common? They don’t need drugs.”

Targeting viewer characteristics increases message identification, which in turn increases the chances of having an impact on attitudes and behaviors. Of course,
messages should conform to established principles of reaching high sensation-seeking youth in addition to targeting specific factors affecting message exposure.

Limitations

Although we feel the results are useful and make some contribution to the health campaigns literature, we temper our results in light of the low effect sizes in some of the analyses. The possibility exists that some of the significant results would not emerge with a smaller sample size. In addition, as we noted, our measures of television viewing time and campaign exposure do not provide what might be the best information available from these measures.

CONCLUSIONS

The results of this analysis suggest that those most likely to have been exposed to the antimarijuana campaign, other than reporting higher levels of sensation seeking, experienced poor family relations, perceived their friends and some family members to use marijuana, generally maintained favorable attitudes toward marijuana, may be likely to use marijuana at least once in the future, and were likely to be younger adolescents. Future formative research with HSS would benefit by investigating these characteristics. Specifically, how salient are these risk factors in the lives of adolescent HSS? How does the use of marijuana facilitate or inhibit the prevalence of these factors? In addition, how can antimarijuana campaign messages effectively address these risks associated with marijuana use?

In general, these results also affirm the campaign design principles advocated by SENTAR: HSS indicated more campaign exposure than LSS. These results reinforce the usefulness of strategically purchasing advertising time and placing messages in shows most viewed by the intended target audience, HSS. We also attribute greater campaign exposure among HSS to the HSV content which depicts activities and behaviors that appeal to the target audience, or to featuring message content consistent with their lifestyle. This, in combination with the additional information on normative, attitudinal, and demographic data offers new information for future drug prevention message design.

ACKNOWLEDGMENT

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