

# Assessing the Relationship Between Perceived Message Sensation Value and Perceived Message Effectiveness: Analysis of PSAs From an Effective Campaign

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*The current study is an analysis of public service announcements (PSAs) from an effective safer sex campaign that utilized a sensation-seeking targeting (SENTAR) approach. Two random samples of heterosexually active young adults (sample one N = 1,463, sample two N = 895) viewed different sets of safer sex PSAs on a laptop computer and answered questions about their perceived sensation value and perceived effectiveness. Multiple regression analyses examined the impact of (a) demographic, (b) individual difference, (c) sexual context, and (d) message variables including perceived message sensation value (PMSV) on the perceived message effectiveness (PME) of the PSAs. Results indicated that females, African Americans, condom users, and those with less education viewed the PSAs as slightly more effective than males, Caucasians, non-condom users, and those with more education. PMSV and personal utility emerged as the strongest predictors of PME, even after controlling for all of the aforementioned variables. Implications for further research on PMSV and perceived and actual effectiveness of PSAs are offered.*

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A particularly common way to transmit health-related messages to the public is via communication campaigns that utilize public service announcements (PSAs). Although their full potential has yet to be realized in areas such as HIV prevention (see Dejong, Wolf, & Austin, 2001; Freimuth, Hammond, Edgar, & Monahan, 1990; Myhre & Flora, 2000; Noar, 2009; Noar, Palmgreen, Chabot, Dobransky, & Zimmerman, 2009), campaigns based upon televised PSAs remain a critical tool for influencing health. While recent reviews and meta-analyses of health communication campaigns suggest that campaigns have been most successful at influencing health knowledge and attitudes (Abroms & Maibach, 2008; Derzon & Lipsey, 2002), they also suggest that carefully targeted campaigns can impact health-related behaviors (Noar, 2006; Noar et al., 2009; Snyder et al., 2004).

Given that mass media channels such as television have very broad reach, a campaign that is even modestly efficacious is capable of having a major impact (Noar, 2006; Perloff, 2003; Rogers & Storey, 1987; Snyder et al., 2004). Before resources are utilized to put PSAs on the air, however, formative research needs to be conducted in order to determine what messages are likely to be effective with particular audiences (Atkin & Freimuth, 2001). In addition to formative research taking place *before* a campaign launches, research conducted *after* a successful campaign takes place can help to shed light on what the “active ingredients” are in persuasive health messages. In each of these circumstances, the critical question is the following: What makes an effective PSA?

The purpose of the current study was to learn more about the message characteristics responsible for an effective safer sex campaign targeting high-sensation-seeking and impulsive decision-making young adults (Palmgreen, Noar, & Zimmerman, 2008; Zimmerman et al., 2007). In a two-city interrupted time-series design, an intensive, televised safer sex campaign was found to be effective in increasing condom use self-efficacy, behavioral intentions, and condom-use behavior among at-risk young adults. Whereas these positive changes occurred in the campaign community, no such changes occurred in the control community (see Zimmerman et al., 2007). The PSAs used in the campaign were developed through extensive formative research, and principles of effective campaign design were followed throughout (see Noar, Palmgreen, Zimmerman, & Cupp, 2008; Palmgreen et al., 2008). Questions that have yet to be addressed empirically, however, include (a) who the messages may have been most effective with and (b) why the PSA messages were effective; in particular, whether the high-sensation-value aspect of the messages contributed to their perceived and/or actual effectiveness. These questions were examined in the current article.

### *PSA Message Effectiveness*

What makes an effective PSA? This is a complex question, and a number of studies have suggested varying features that may be important to PSA effectiveness. Before

this literature is examined, however, we must address what “effectiveness” means. Although the ultimate test of effectiveness are actual attitude and behavioral changes that might be observed in the final outcome data of a campaign study (actual effectiveness), research on message design often relies on measures that are more proximal in nature, such as *perceptions* of message effectiveness. Are such perceptions accurate predictors of actual message effectiveness? Dillard and his colleagues have provided evidence in several recent papers that strongly suggests that perceptions of message effectiveness are strongly correlated with, and may be casually related to, actual message effectiveness (Dillard & Peck, 2000; Dillard, Shen, & Vail, 2007; Dillard, Weber, & Vail, 2007b). Such perceptions, both in qualitative and quantitative form, are routinely used in formative research to assess the potential impact of campaign messages (Atkin & Freimuth, 2001; Dillard, Shen, & Vail, 2007; Dillard, Weber, & Vail, 2007; Noar et al., 2008). Perceived message effectiveness (PME) is thus used as the central measure of effectiveness in the current study. Although PME is *not* the same thing as actual effectiveness, understanding what message features audiences *believe* make an effective PSA is still a critical component of message design research. Indeed, in the absence of such research, campaign developers would merely have to guess at what types of messages should be utilized in a particular campaign effort.

#### *Characteristics Associated with Effective PSAs*

A number of features of PSAs designed to prevent unhealthy or risky behaviors have been found to be associated with perceptions of effectiveness. For instance, PSAs that bring about various kinds of affective reactions can be persuasive with a target audience (e.g., Dillard & Peck, 2000; Dillard, Plotnick, Godbold, Freimuth, & Edgar, 1996; Fishbein, Hall-Jamieson, Zimmer, von Haeften, & Nabi, 2002), as can PSAs that bring about cognitive processing (Dillard & Peck, 2000; Fishbein et al., 2002). In addition, studies suggest that PSAs that depict individuals with high source credibility, those that are viewed as portraying “realistic” situations, and those that provide clear alternatives to a problem behavior are more likely to be effective than those lacking these features (Derzon & Lipsey, 2002; Fishbein et al., 2002; Palmgreen et al., 1991; Salmon & Atkin, 2003).

Although we are beginning to learn more about features of effective PSAs, and treatments of message design offer guidance in designing campaign messages (e.g., Salmon & Atkin, 2003), most useful are theoretically based approaches that can be used to design messages for at-risk audiences. One such approach is *sensation-seeking targeting* (SENTAR). High-sensation seekers tend to desire novel, unusual, and intense stimuli, which may lead them to engage in “risky” behaviors such as drug use and unprotected sex in the first place (Donohew, Lorch, & Palmgreen, 1991; Noar, Zimmerman, Palmgreen, Lustria, & Horosewski, 2006; Zuckerman, 1994). Palmgreen, Donohew, and colleagues (1991, 2001) have demonstrated that these desires and needs also extend to messages preferences, such that *high-sensation-value* messages are more likely to be processed by and influential with high-sensation

seekers when compared to *low-sensation-value* messages (e.g., Harrington et al., 2003; Palmgreen & Donohew, 2003; Stephenson, 2003; Stephenson & Palmgreen, 2001).

*Sensation value* of televised messages is defined as “the degree to which formal and content audio-visual features of a televised message elicit sensory, affective, and arousal responses” (Palmgreen et al., 1991, p. 219). Messages are high in sensation value to the extent that they have the following attributes: (a) novel, creative, or unusual; (b) complex; (c) intense stimuli that are emotionally powerful or physically arousing; (d) graphic or explicit; (e) somewhat ambiguous; (f) unconventional; (g) fast paced; and (h) suspenseful (Everett & Palmgreen, 1995; Palmgreen & Donohew, 2003). It is not necessary for a message to have all of these elements, but rather these elements are “ingredients” that can be carefully integrated into the design of high-sensation value-messages (Donohew et al., 1991).

Perceived message sensation value (PMSV) is the extent to which individuals perceive a message as having high-sensation-value attributes (Palmgreen et al., 1991; Palmgreen, Stephenson, Everett, Basehart, & Francies, 2002). Numerous studies have demonstrated that messages perceived to be high in sensation value are more appealing to and more effective with high-sensation seekers, particularly with regard to affecting changes in antidrug attitudes and behavioral intentions (for reviews, see Donohew, Lorch, & Palmgreen, 1998; Palmgreen & Donohew, 2003). Campaign studies utilizing televised PSAs and targeting high-sensation seekers using a PMSV approach have also produced behavioral changes, most notably in the area of reducing marijuana use among adolescents (Palmgreen, Donohew, Lorch, Hoyle, & Stephenson, 2001; Palmgreen, Lorch, Stephenson, Hoyle, & Donohew, 2007).

More recently, SENTAR has been applied to campaign efforts in the area of safer sexual behavior and HIV prevention (e.g., Noar et al., 2006; Palmgreen et al., 2008; Zimmerman et al., 2007). As noted above, this work has resulted in a successful safer sex campaign to increase condom use among young adults (Zimmerman et al., 2007). The messages in this successful campaign were designed using the SENTAR approach, with high-sensation-value messages targeting high-sensation seekers and impulsive decision makers. Of interest in the current study is the role that the high-sensation-value aspects of these messages play in their perceived effectiveness.

### *The Current Study*

The current study sought to assess the relationship between PMSV and PME among the set of safer sex PSAs used in the campaign effort. This was examined in two large random samples of young adults (sample one  $N = 1,463$ , sample two  $N = 895$ ), who each viewed different sets of PSAs and indicated their reactions to these spots. This provided the opportunity to examine the consistency of findings across two independent samples as well as across two independent sets of PSAs. Of interest was the extent to which young adults perceived these messages to be effective, and whether this differed with regard to a variety of demographic, individual difference, and sexual context variables. It was also of interest how PMSV predicted PME after taking

into account demographic, individual difference, sexual context, and message variables. Message variables included here were those commonly thought to be important to PME, including cognitive reaction, affective reaction, and personal utility. Finally, in this research we tested whether the PMSV-PME association differed in low- versus high-sensation seekers.

### *Research Questions*

The specific research questions and hypotheses were as follows:

RQ1: Is PMSV correlated with PME?

H1: PMSV will be positively associated with PME.

RQ2: In a multiple regression analysis, how do demographic, individual difference, and sexual context variables predict PME? How does PMSV predict PME after taking into account demographic, individual difference, sexual context, and message variables?

H2: PMSV will be positively associated with PME after taking into account these other variables.

RQ3: Do these regression models differ for high- and low-sensation seekers?

H3: The PMSV-PME association will differ in high- versus low-sensation seekers, such that the association will be stronger in high- as compared to low-sensation seekers.

## **Method**

### *Participants*

The data utilized in this article are part of a larger study of the impact of a safer sex mass media campaign targeting young adults in two cities (Lexington, Kentucky, & Knoxville, Tennessee; Palmgreen et al., 2008; Zimmerman et al., 2007). Data were collected by two university survey research centers using a combination of random digit dialing from university registrar's lists, targeted lists of 18- to 26-year-olds purchased from commercial firms, and phone directories available to the public. Since both cities were made up largely of college students, the aim was for approximately 70% of the sample to be currently attending college while the other 30% were community-dwelling individuals of similar age. Approximately 100 individuals were surveyed in each city each month, beginning in May, 2002 and continuing until the end of the study in December, 2004, for use in time-series analyses of campaign effects. The cities were moderate-sized cities in different states in the Southeast and were chosen because of similar demographics. The data examined here are

*precampaign data* on PSAs that were collected between May and December of 2002 in both cities and then combined (sample one), and data on a second set of PSAs that were collected between April and December of 2003 in Knoxville only (sample two). These data were used because the campaign was expected to impact many of the variables examined in the current study. Thus, only precampaign data from respondents who had had no previous exposure to the PSAs were used in the current study.

Individuals who were called and indicated interest in the survey were screened. To be included in the study, participants had to be (a) aged 18–26, (b) heterosexually active (sex with an opposite sex partner) in the past 3 months, and (c) a citizen of the United States. Of those called between May and December of 2002, 1,463 individuals in both cities met these criteria and were surveyed in person using a laptop computer. Of those called between April and December of 2003, 895 individuals in Knoxville met these criteria and were surveyed. In both cities, approximately 60% of initial calls resulted in completion of the brief phone screener, and of those who were eligible, approximately 82% completed interviews for the project.

#### *Public Service Announcements*

Two sets of PSAs were used in the current study. Sample one viewed five PSAs that were collected from various organizations during the early formative research phase of the safer sex mass media campaign study. The five specific safer sex PSAs used were chosen from the larger group of PSAs because (a) they were all 30-second televised PSAs, and (b) they were those that both the research team and young adults in focus groups thought had the most positive persuasive attributes. These spots were shown to participants early in the time-series data collection process, as they were available before the original campaign PSAs (discussed next) had been developed.

Sample two viewed five PSAs that were developed by our research group specifically for the safer sex campaigns. These PSAs were (a) based on theoretical concepts from health behavior theories such as perceived threat, attitudes, social norms, self-efficacy, and stages of change (Noar & Zimmerman, 2005) and (b) designed to be high in sensation value as to be attractive to high-sensation seekers who have been shown to engage in high rates of risky sex (Donohew et al., 2000). These PSAs were also 30-seconds in length and were designed to focus on increasing condom use with young adults (Noar et al., 2008). Because our survey procedures (as well as response burden concerns) limited us to showing five PSAs per participant, we replaced the five spots mentioned above with these PSAs once they were available. This allowed us to collect several months of data on both sets of PSAs.

Descriptions of the PSAs viewed by samples one and two can be found in Tables 1 and 2, respectively. As can be seen, the spots in Table 1 focused on different aspects of safer sex, such as perceived threat of STDs (Nightclub) and eroticizing condom use (Boys Who Talk). The PSAs also utilized different approaches, such as a focus on humor (Pick-Up Lines) and “rave” party club scenes (Nightclub). All of these PSAs were produced by the Henry J. Kaiser Family Foundation. Further, the spots in Table 2 also focused on different aspects of safer sex, such as negative consequences

**Table 1** Titles and Descriptions of the Donated Safer Sex Public Service Announcements (Sample One)

PSA	TITLE	DESCRIPTION
1	Profiles Version B	Rapid cuts (and various angles) to different individuals against a black background. Series of different individuals with various lifestyles are shown rapidly. Text between cuts spells out whether they have an STD or not. Narrator delivers message: “You never know what you’ll find just beneath the surface. Wrap it up every time. For more information on safer sex, call toll-free, 1-888-BE SAFE-1.” Scene ends with a condom being taken out of its package.
2	Pick-Up Lines	Bar Scene: Series of different men talk into the camera saying various funny lines that they use to “pick up” women (e.g., I lost my number . . . can I borrow yours?). Narrator delivers message: “More than one in five men carry a sexually transmitted disease, but that’s not a line you are likely to hear. No excuses, no regrets.” Scene ends with a picture of a condom.
3	Don’t be irresponsible	Road Scene: Couple in a car make out as they drive a convertible down a dangerous mountain road. As the action between the couple heats up, the text display “Don’t be irresponsible, always use a condom” is superimposed on the screen.
4	Nightclub	Rave Scene: Young adult tries to get into a club. He meets several attendants asking him which STD he has. When they identify the correct STD, they give him a shirt to wear with the disease on it. Inside the club, everyone who has an STD wears bright yellow shirts and waves neon yellow glow sticks as they dance. The party thrives with loud music and laser lights as the following text is superimposed on the screen: “If the world were like this you’d know who really has an STD.”
5	Boys Who Talk	Rapid cuts to close-ups of different men who are seductively talking to the camera. These attractive men talk about what they like most about different kinds of condoms. The PSA ends with a man stating, “I like sex with a condom . . . I wouldn’t do it any other way.”

*Note.* STD = sexually transmitted disease; PSA = public service announcement.

of unprotected sex (Translation) and condom-use self-efficacy (Boyfriend). These PSAs also used different approaches including acted out mini-dramas and, in one case, a dramatic testimonial (My Story). The PSAs were developed by our research team with input from numerous focus groups of young adults (which were segmented on gender, race, and other variables) and were produced by RTV, Inc. (Noar et al., 2008).

**Table 2** Titles and Descriptions of the Original Safer Sex Public Service Announcements (Sample Two)

PSA	TITLE	DESCRIPTION
1	Boyfriend	Begins with rapid cuts of men doing extreme sports. Female narrator says "My boyfriend does some crazy things . . . living on the edge . . . taking chances . . ." then cut to scene of couple making out in bed and then reaching for a condom. Female narrator continues, "But I never let him take chances with me . . . we always use a condom." Ad ends with the following text superimposed on the screen: "Use a condom. Every partner. Every time."
2	Street Smarts	Man walks down busy street talking to his female friend on his cell phone. While she lists the reasons he should practice safe sex on his date that night, the man runs into reminders everywhere he turns: He sees a father pushing a baby cart and reads a street sign with statistics about STDs. Then as he is persuaded to go into a drugstore to buy some condoms, he sees another poster saying that there is no cure for AIDS. Superimposed on the same poster is the campaign slogan: "Use a condom. Every partner. Every time."
3	Translation	Ad begins with people dancing to loud music in the background. The text "Believe everything you hear?" is superimposed. Rapid cut to close-up of young male telling female "I can give you everything you've ever dreamed of." This blurs into the background as the following text is stamped on screen in big bold letters: 'DIRTY DIAPERS, SCREAMING BABIES.' This cuts to close-up of a female who says "I can give you something you'll never forget." The image blurs into the background as this text appears: "GONORRHEA, CHLAMYDIA, AIDS." The next cut is to a male who says, "I can put a smile on your face for weeks." This cuts to the following text: "HE'S RIGHT . . . HE USES CONDOMS." The ad ends with the campaign slogan: "Use a condom. Every partner. Every time."
4	Big Date	Two related stories play out on split screens. One screen shows a young <i>woman</i> getting ready to go out on a date. The other shows a young <i>man</i> getting ready to go out on a date. Both are with their friends as they get ready for their dates. The woman asks her roommate if she has a condom. As the roommate rummages through her purse she says "I thought you trusted the guy." In the meantime, the man frantically searches for a condom as his roommate comments "You said Kelly's on the

(Continued)



**Table 2** Continued

PSA	TITLE	DESCRIPTION
5	My Story	<p>pill and she doesn't mess around." On the other screen, Kelly tells her friend, "Still, you don't know who he's been with." Similarly, the man tells his roommate "but I'm not her first either." The ad ends with the campaign slogan superimposed on screen: "Use a condom. Every partner. Every time."</p> <p>The PSA begins with a young woman dancing at a party, then kissing a man on the couch. In the background, the female narrator relates her story about being a party person and "hooking up" with various men but says that she always made sure she had safe sex. Scene cuts to close-up of the girl. She looks sad and pensive as she relays the rest of her story. "I was always safe except when I got into a relationship . . . I never thought I would get an STD from my own boyfriend." She relates how she got herpes and how her boyfriend had said he loved her and would give her anything, "he gave me something he can't ever take back," she says. The ad ends with campaign slogan superimposed on screen: "Use a condom. Every partner. Every time."</p>

*Note.* STD = sexually transmitted disease; PSA = public service announcement.

### Measures

All multiple-item scales used 5-point Likert response formats. In addition, items were re-coded when necessary so higher scale scores indicated higher endorsement of variables.

### Demographics

Individuals were asked general demographic questions including gender, race/ethnicity, age, whether one was a college student or not (*student*), and highest grade in school completed (*highest grade*).

### Sexual descriptors

Individuals were asked questions including whether or not they were in an intimate relationship and how many sexual partners they had had (in the past year). In addition, they were asked about their recent condom-use behaviors. Specifically, condom use was measured by asking individuals how often they (or their sexual partner) used condoms in the past 3 months. Respondents answered on a 5-point scale that ranged from "Never" to "Every Time."

### *Sensation seeking*

Sensation seeking was assessed using Hoyle, Stephenson, Palmgreen, Lorch, and Donohew's (2002) eight-item brief sensation-seeking scale. Participants were asked how much they agreed or disagreed (on a 5-point response scale) with items such as "I would like to explore strange places" and "I like wild parties." Coefficient alphas for the scale were 0.75 (sample one) and 0.71 (sample two). To classify individuals into low- and high-sensation seeking, a median split controlling for gender and race was employed.

### *Impulsive decision making*

Impulsive decision making was measured with the 12-item decision-making styles scale (Donohew et al., 2000). The measure asked, "Please indicate how often you do each of the following things: When I do something . . ." Items included "I think about all of my choices very carefully" (reverse scored) and "I do the first thing that comes into my mind." Respondents indicated how often these things took place on a 5-point response scale that ranged from "Never" to "Always." Coefficient alphas for the scale were 0.86 (sample one) and 0.85 (sample two).

### *Cognitive and affective reactions*

The cognitive reaction measure assessed respondents' perceptions of the ability of each PSA to make them think about the message. Respondents were specifically asked, "Did it make you think?", and answered on a 5-point Likert-type scale (from "Strongly Disagree" to Strongly Agree"). The affective reaction measure assessed respondents' perceptions of the ability of each PSA to elicit an emotional response. Respondents were specifically asked, "Did it make you feel strong feelings?", and answered on a 5-point Likert-type scale (from "Strongly Disagree" to 'Strongly Agree").

### *Personal utility*

This was assessed by asking respondents to rate the PSAs they saw on two dimensions, specifically: (a) how useful the PSA was in terms of giving them information, ideas, or skills they could use, and (b) how relevant it was to them, meaning that it made them think of their own life. Respondents indicated their agreement using a 5-point Likert-type scale (from "Strongly Disagree" to 'Strongly Agree"). The resulting two-item scale yielded mean coefficient alphas across the five PSAs of 0.67 (sample one) and 0.64 (sample two).

### *Perceived message sensation value*

Perceived Message Sensation Value (PMSV) was measured using five items from Palmgreen et al.'s (1991) 17-item PMSV scale. In the current study, respondents were asked to rate the PSAs they saw on a number of dimensions. These dimensions were those that were found to load highly on the two most important dimensions of

the original scale and were: emotional, exciting, dramatic, powerful, and intense. Respondents indicated their agreement using a 5-point Likert-type scale (from “Strongly Disagree” to “Strongly Agree”). The PMSV scale yielded mean coefficient alphas across the PSAs of 0.84 in both samples.

#### *Perceived message effectiveness (PME)*

Perceived message effectiveness was measured with two-items that asked respondents to indicate how effective a PSA would be at (a) persuading someone to use a condom more often and (b) persuading someone to talk to their sexual partner more often about using condoms. Respondents indicated the perceived effectiveness of each PSA on a 5-point Likert-type scale (from “Not effective at all” to “Extremely effective”). This scale had a mean coefficient alpha across the PSAs of 0.91 in both samples one and two.

#### *Procedure*

Individuals in both samples who were eligible and interested on the telephone were invited to participate in the main survey. They were given various options where they could take the survey, including at their home, at the survey research center, or at another location (e.g., public library, coffee shop). The interviews were conducted in a systematic manner. First, informed consent was obtained before the interview began. Next, participants were asked a small number of questions (e.g., demographics) by the interviewer. Then, the majority of the interview was self-administered via a laptop computer. The laptop allowed for participants to actually view the five PSAs (once each), which were embedded in the survey. PMSV, PME, and personal utility were assessed immediately after each PSA was viewed. To protect against survey order effects, these measures (as well as all scales with Likert-response formats) were asked in a randomized order. The laptop procedure also allowed for randomization of the order in which the PSAs were viewed as well as greater privacy. Finally, individuals were paid approximately \$30 for their participation. The Institutional Review Boards at both participating universities approved these recruiting and interviewing procedures.

#### **Results**

Demographics and sexual descriptors of samples one ( $N = 1,463$ ) and two ( $N = 895$ ) are reported in Table 3. The samples were quite similar on a number of demographic variables. In addition, 72% (sample one) and 74% (sample two) of these individuals were in intimate relationships, and the length of these relationships was similar in both samples. Condom use was also similar in both samples, with individuals similarly spread across the categories of never using condoms, sometimes using condoms, and using condoms every time they had sex in the past 3 months.

The mean levels of the perceived impact of the PSAs, assessed by PME, were examined first. In sample one, Profiles Version B was perceived to be the most effective

**Table 3** Demographics and Sexual Descriptors of the Samples

Variable	SAMPLE 1 <sup>a</sup> (N = 1463)				SAMPLE 2 <sup>b</sup> (N = 895)			
	<i>n</i>	%	Mean	Median	<i>n</i>	%	Mean	Median
Gender								
Male	645	44	–	–	398	45	–	–
Female	818	56	–	–	497	55	–	–
Age (range 18–26)	–	–	21.6	21.5	–	–	21.9	21.5
Race								
White or Caucasian	1249	85	–	–	784	88	–	–
Black or African American	168	12	–	–	85	9	–	–
Other/Multiracial	46	3	–	–	25	3	–	–
Education completed			13.6	13.0			14.1	14.0
(12 = high school degree, 16 = college degree)								
Some high school	55	4			14	2		
High school degree/GED	511	35			181	20		
Some college	647	44			544	61		
College degree	195	13			112	12		
Some graduate school/ Graduate degree	55	4			42	5		
Currently enrolled in college								
Yes	1027	71			714	80		
No	430	29			175	20		
Currently in a relationship								
Yes	1055	72			663	74		
No	408	28			230	26		
Length of current relationship <sup>c</sup>								
Less than 1 year	427	41		–	257	39		–
1–3 years	391	37		–	240	36		–
More than 3 years	236	22		–	166	25		–
Age at first sexual intercourse	–	–	16.5	16.0	–	–	16.9	17.0
No. of sex partners in the past year								
Male respondents	–	–	3.0	2.0	–	–	2.7	2.0
Female respondents	–	–	2.2	1.0	–	–	2.2	1.0
Condom use in past 3 months								
Never	440	30			298	34		
Sometimes	645	44			360	40		
Every time	378	26			235	26		

<sup>a</sup>Where *n* does not sum to 1463, this reflects missing data.

<sup>b</sup>Where *n* does not sum to 895, this reflects missing data.

<sup>c</sup>Analyzed with regard to only those in relationships.

PSA, with a mean of 3.15 (Standard Deviation [ $SD$ ] = .95) for PME on a 5-point scale. This was followed by Pick-Up Lines ( $M=3.05$ ,  $SD=1.03$ ), Nightclub ( $M=3.03$ ,  $SD=1.07$ ), Boys Who Talk ( $M=2.71$ ,  $SD=1.15$ ), and Don't Be Irresponsible ( $M=2.41$ ,  $SD=1.06$ ).

In sample two, My Story was reported to be the most effective PSA with a mean of 3.75 ( $SD=.87$ ) for PME on a 5-point scale. This was followed by Translation ( $M=3.34$ ,  $SD=1.00$ ), Big Date ( $M=2.86$ ,  $SD=.91$ ), Boyfriend ( $M=2.86$ ,  $SD=.92$ ), and Street Smarts (PME:  $M=2.76$ ,  $SD=.98$ ).

### *Associations Among Variables*

In order to examine the associations among the key independent variables, PMSV, the other message variables, and PME (H1), we calculated the correlations and present them in Table 4. Data from both sample 1 (bottom half of matrix) and sample 2 (top half of matrix) indicated that PMSV was significantly associated with PME (sample 1,  $r=.60$ ,  $p<.001$ , sample 2,  $r=.65$ ,  $p<.001$ ). These results indicate support for H1. This matrix also reveals remarkable similarity in associations in both samples across a number of variables. For example, in both samples the message variables were significantly correlated with one another, while other variables tended to be either modestly associated or not related at all.

### *Multiple Regression Analyses*

Next, hierarchical multiple regression analyses were calculated in order to examine, by PSA, which features of messages were most important in predicting PME (H2). Variables were entered into the regression analysis in this order: Step 1: Demographic variables; Step 2: Individual Difference variables (sensation seeking, impulsive decision making); Step 3: Sexual Context variables (relationship status, number of sexual partners in the past year, condom-use frequency); Step 4: Message variables (cognitive reaction, affective reaction, personal utility, and PMSV). This ordering was chosen for several reasons. First, it was important to control for a variety of demographic and other variables before the message variables were entered, as this provides the strongest test of the association of the message variables (including PMSV) to PME. In the absence of such control variables, spurious findings could result. Second, although limited data on PME exist, it was thought that demographic variables would be least related to PME, followed by individual differences and sexual context variables. Message variables were thought to be most highly related to PME and thus were entered last. The set of regression analyses was calculated first for sample one and secondly for sample two.

### *Multiple Regression Analyses: Results for Sample One*

The results of the multiple regression analyses for sample one can be seen in Table 5. All multiple  $R$ s at all steps of the five regression analyses were significant at the  $p<.001$  level. The final step of the regression analyses indicated significance for each

**Table 4** Correlation Matrix of Independent and Dependent Variables for Samples 1 and 2

	SS	DM	RS	SP	CU	CR	AR	PU	PMSV	PME
SS	<b>1.00</b>	.24***	-.13***	.17***	-.01	-.06*	-.07*	-.01	-.06*	-.05
DM	.21***	<b>1.00</b>	-.11**	.17***	-.01	-.07*	-.07*	-.05	-.05	-.05
RS	-.10***	-.06*	<b>1.00</b>	-.27***	-.17***	.03	.05	-.02	.02	.06
SP	.12***	.10***	-.30***	<b>1.00</b>	.09**	-.02	-.03	-.01	-.03	.01
CU	-.05	-.02	-.19***	.08**	<b>1.00</b>	.03	-.01	.05	.04	.01
CR	.01	-.05	-.02	-.03	.07*	<b>1.00</b>	.59***	.64***	.59***	.62***
AR	.01	-.01	.01	-.01	.04	.57***	<b>1.00</b>	.55***	.59***	.74***
PU	.03	-.01	-.03	.05	.08	.51***	.45***	<b>1.00</b>	.58***	.59***
PMSV	-.01	-.04	.01	-.04	.05	.47***	.43***	.59***	<b>1.00</b>	.65***
PME	-.01	-.01	.03	-.04	.03	.50***	.57***	.61***	.60***	<b>1.00</b>

*Note.* Bottom half of matrix is sample 1 and top half of matrix is sample 2. Correlations are averages across the five PSAs. SS = sensation seeking; DM = decision making; RS = relationship status; SP = sex partners; CU = condom use; CR = cognitive reaction; AR = affective reaction; PU = personal utility; PMSV = perceived message-sensation value; PME = perceived message effectiveness.

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

PSA ( $p < .001$ ), with a mean multiple  $R$  across all five PSAs of 0.70. Each regression equation explained, on average, 49% of the variance ( $R^2 = .49$ ) in the final step (in which all variables were entered). However, at some steps the *change* in  $R^2$  ( $\Delta R^2$ ) was either *not* statistically significant or was statistically significant but did not explain a meaningful proportion of variance.

At step 1, the main finding was that both females and African Americans tended to view the PSAs as more effective than males and Caucasians did. Mean  $\beta$  weights calculated across the five PSAs were  $\beta = -.11$  (males) and  $\beta = .08$  (African Americans). At step 2, the  $\Delta R^2$  was significant for only three of the PSAs, with sensation seeking and impulsive decision making having few significant associations with the outcome. At step 3, the  $\Delta R^2$  was significant ( $p < .001$ ) for three of five PSAs, and results indicated that more consistent condom users viewed the PSAs as more effective than less consistent users (mean  $\beta = .08$  across the five PSAs). Finally, in step 4 the message variables added significant variance ( $p < .001$ ) in all five of the regression analyses, with both personal utility (mean  $\beta = .27$ ) and PMSV (mean  $\beta = .26$ ) having the highest mean  $\beta$  weights. Once the message variables were taken into account in the regressions (in step 4), all other variables had little influence (see Table 5). These results provided support for H2.

#### *Multiple Regression Analyses: Results for Sample Two*

The results of the same set of multiple regression analyses, calculated on sample two, can be seen in Table 6. All multiple  $R$ s at all steps of the five regression analyses were significant at the  $p < .001$  level. The final step of the regression analyses indicated significance for each PSA ( $p < .001$ ), with a mean multiple  $R$  across all five PSAs of 0.73. Each regression equation explained, on average, 53% of the variance ( $R^2 = .53$ ) in the final step (in which all variables were entered). However, similar to the sample one results, at some steps the *change* in  $R^2$  ( $\Delta R^2$ ) was either *not* statistically significant or was statistically significant but did not explain a meaningful proportion of variance.

At step 1, the main finding was that both females and those with less education tended to view the PSAs as more effective than males and those with more education did. At step 2, the  $\Delta R^2$  was not significant in any of the regressions. At step 3, the  $\Delta R^2$  was significant ( $p < .05$ ) for only the "Boyfriend" PSA, indicating a tendency for more consistent condom users to view this PSA as more effective than less consistent users. Finally, step 4 added significant additional variance ( $p < .001$ ) in all five of the regression analyses, with PMSV (mean  $\beta = .31$ ) and personal utility (mean  $\beta = .21$ ) having the highest mean  $\beta$  weights. Again, once the message variables were taken into account in the regressions (in step 4), all other variables had little influence (see Table 6). These results again provided support for H2.

Finally, this set of hierarchical multiple regressions was again calculated, except separately for high- and low-sensation seekers (H3). Each multiple regression had significant multiple  $R$ s ( $p < .001$ ) at each step, and the mean multiple  $R$  for both high- and low-sensation seekers was  $R = .70$  for sample one and  $R = .73$  for sample

**Table 5** Five Hierarchical Multiple Regression Analyses Predicting Perceived Message Effectiveness (Sample 1)

Variable	Profiles version B				Pick-up lines				Don't be irresponsible				Nightclub				Boys who talk			
	$\beta$	R	R <sup>2</sup>	$\Delta R^2$	$\beta$	R	R <sup>2</sup>	$\Delta R^2$	$\beta$	R	R <sup>2</sup>	$\Delta R^2$	$\beta$	R	R <sup>2</sup>	$\Delta R^2$	$\beta$	R	R <sup>2</sup>	$\Delta R^2$
Step 1		.20***	.04	.04***		.14***	.02	.02***		.09	.01	.01		.14***	.02	.02***		.28***	.07	.07***
Male	-.13***				-.12***				.01				-.07*				-.24***			
African American	.11***				.01				.03				.11***				.12***			
Other	-.01				.00				.01				.02				.01			
Age	-.08*				-.10**				-.01				-.05				-.05			
Student	-.07*				-.03				-.04				-.04				-.02			
Highest grade	.02				.03				-.07*				.00				-.01			
Step 2		.21***	.05	.01*		.17***	.03	.01**		.11*	.01	.00		.15	.02	.00		.29***	.08	.01*
Male	-.14***				-.12***				-.01				-.07**				-.25***			
African American	.10***				-.01				.03				.11***				.12***			
Other	-.01				.01				.01				.02				.01			
Age	-.08*				-.10**				-.02				-.05				-.06			
Student	-.07*				-.03				-.04				-.04				-.02			
Highest grade	.01				.02				-.07*				-.01				-.02			
SS	-.05*				-.03				-.05				.01				-.05			
DM	-.05				-.07**				-.01				-.04				-.04			
Step 3		.22***	.05	.00		.18***	.03	.00		.15***	.02	.01**		.17***	.03	.01**		.31***	.10	.02**
Male	-.15***				-.13***				-.01				-.07*				-.23***			
African American	.10***				-.01				.02				.11***				.12***			
Other	-.01				.01				.01				.02				.01			
Age	-.07*				-.09**				.01				-.04				-.05			
Student	-.08*				-.04				-.05				-.05				-.03			





**Table 6** Five Hierarchical Multiple Regression Analyses Predicting Perceived Message Effectiveness (Sample 2)

Variable	Boyfriend				Street smarts				Translation				Big date				My story			
	$\beta$	R	R <sup>2</sup>	$\Delta R^2$	$\beta$	R	R <sup>2</sup>	$\Delta R^2$	$\beta$	R	R <sup>2</sup>	$\Delta R^2$	$\beta$	R	R <sup>2</sup>	$\Delta R^2$	$\beta$	R	R <sup>2</sup>	$\Delta R^2$
Step 1		.18***	.03	.03***		.23***	.05	.05***		.19***	.04	.04***		.20***	.04	.04***		.25***	.06	.06***
Male	-.13***				-.05				-.15***				-.12***				-.15***			
African American	.01				.14***				.04				-.01				.17***			
Other	.03				.05				.05				.05				.04			
Age	.02				.03				.03				.06				-.01			
Student	-.01				-.07				-.04				-.02				-.04			
Highest grade	-.13**				-.17**				-.10*				-.18***				-.04			
Step 2		.20***	.04	.01		.23***	.05	.00		.20***	.04	.00		.22***	.05	.01		.26***	.07	.01
Male	-.12***				-.05				-.13***				-.11**				-.14***			
African American	.01				.14***				.04				-.01				.17***			
Other	.04				.06				.06				.06				.04			
Age	.02				.03				.02				.06				-.01			
Student	-.02				-.07				-.04				-.02				-.04			
Highest grade	-.14**				-.13**				-.10*				-.19***				-.06			
SS	-.02				.03				-.03				.01				-.03			
DM	-.07				-.05				-.04				-.08*				-.06			
Step 3		.22***	.05	.01*		.24***	.06	.01		.22***	.05	.01		.22***	.05	.00		.26***	.07	.00
Male	-.13***				-.05				-.13***				-.11**				-.14***			
African American	.01				.15***				.05				-.01				.17***			
Other	.04				.06				.06				.06				.05			
Age	.03				.04				.03				.06				.01			

Student	-.02	-.08*	-.05	-.02	-.05	-.02	-.05
Highest grade	-.14**	-.13**	-.11*	-.19***	-.07	-.19***	-.07
SS	-.02	.03	-.02	.02	-.03	.02	-.03
DM	-.07	-.05	-.03	-.07*	-.06	-.07*	-.06
Relationship status	-.02	-.02	.04	.03	-.01	.03	-.01
Sex partners	-.02	-.04	-.05	-.03	-.02	-.03	-.02
Condom use	.09**	.04	.07	.04	.05	.04	.05
Step 4	.74***	.55	.50***	.76***	.57	.51***	.73***
Male	.01	-.01	-.01	-.01	.01	-.01	.01
African American	.01	.06**	.01	-.03	.08**	-.03	.08**
Other	.01	.02	.03	.02	.01	.02	.01
Age	-.03	-.03	-.02	.04	-.05	.04	-.05
Student	-.03	-.07*	-.02	-.02	-.05	-.02	-.05
Highest grade	-.02	-.01	-.08**	-.10**	-.04	-.10**	-.04
SS	-.02	.01	.00	.01	-.04	.01	-.04
DM	-.01	.01	-.02	-.03	.01	-.03	.01
Relationship status	-.03	-.01	.01	.01	-.02	.01	-.02
Sex partners	-.01	-.04	-.05*	-.02	-.02	-.02	-.02
Condom use	.03	.02	.01	.01	.05	.01	.05
Cognitive reaction	.21***	.20***	.14***	.12***	.18***	.12***	.18***
Affective reaction	.12**	.17***	.12**	.12**	.16***	.12**	.16***
Personal utility	.25***	.22***	.23***	.24***	.10*	.24***	.10*
PMSV	.28***	.27***	.35***	.34***	.32***	.34***	.32***
Step 5	.68***	.46	.39***	.72***	.52	.47***	.68***

Note. SS = sensation seeking; DM = decision making; PMSV = Perceived Message-Sensation Value.  
\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

two. However, close inspection of the results did not reveal meaningful differences on the predictor variables ( $\beta$  weights) for high- as compared to low-sensation seekers in either sample. Therefore, H3 was not supported, and the analyses are not presented in table form due to the lack of significant results.

## Discussion

The purpose of the current study was to examine the perceived effectiveness of safer sex PSAs and to specifically examine the role that PMSV may have played in an effective safer sex mass media campaign. We first consider the findings with regard to demographic, individual difference, and sexual context variables and then discuss the findings related to the message variables and PMSV.

Our overall results in the two samples demonstrate that gender, race, educational level, and condom-use frequency of participants had small but statistically significant relationships to perceived effectiveness, whereas age, whether one was a college student or not, sensation seeking, impulsivity, relationship status, and number of sex partners had little to no meaningful relationships with perceived PSA impact. Those who were female, African American, those with less education, and those who used condoms more often viewed some of the PSAs as more effective. Many of the PSAs (Pick-Up Lines, Boys Who Talk, Boyfriend, My Story) were clearly targeted toward females, and this may explain why females viewed some of the PSAs as more effective than males. Similar explanations may ring true for African Americans, who appeared to view many of the spots with racially diverse characters as more effective than those without such characters. In some cases, however, it appeared that both females and African Americans may have simply been less critical of the PSAs than males and Caucasians. Also, not surprisingly, those engaging in the advocated behavior (condom use) viewed the PSAs as more effective than non-condom users.

Once the message variables (including PMSV) were entered in the final step of the regression analyses, however, most of these previously significant relationships became nonsignificant. This suggests that individuals' reactions to and impressions of the PSAs, as encapsulated in these messages variables, are more much important to perceived effectiveness than any of the demographic variables. This finding, combined with the strong relationship of PMSV to PME, suggests that PMSV is an important contributor to perceived PSA effectiveness. Higher sensation-value messages about safer sex were viewed as more effective by members of this young adult target audience, and these findings are largely consistent with previous research on SENTAR and PMSV (Palmgreen & Donohew, 2003; Stephenson, 2002, 2003; Stephenson & Palmgreen, 2001). Indeed, the results imply that the high-sensation-value aspect of these PSAs may have played a role in the successful televised mass media campaign that utilized the 10 PSAs under examination here (Noar et al., 2008; Palmgreen et al., 2008; Zimmerman et al., 2007).

Although the other message variables examined here were in many ways "control" variables, they had statistically significant relationships to PME. While the findings for cognitive and affective reactions are largely consistent with previous research

(e.g., Dillard & Peck, 2000; Fishbein et al., 2002), the finding that stands out most is that of personal utility, which had associations with PME that were nearly the same magnitude as PMSV. The concept of personal utility, or the extent to which personal connections are made to a message, can be traced as far back in the literature as Krugman's (1965) work on personal involvement in advertising. From this perspective, messages move us to act when we can relate to them and we feel that they speak to us personally. Krugman's work suggests that if we do not make any type of personal connection to a message, that persuasion is unlikely. This is also consistent with the Elaboration Likelihood Model's suggestion that increased personal relevance of a message is more likely to encourage one to attend to that message, to process it centrally, and ultimately to be persuaded by it (Petty & Cacioppo, 1986). This aspect of messages might be more formally examined in future studies of the effectiveness of PSAs in order to better understand what leads individuals to feel personally connected to a message.

It should be pointed out that *all* of the message variables were intercorrelated with one another, raising the possibility that there may be an underlying dimension related to "positive feelings" toward a given PSA. For example, it is possible that perceived effectiveness itself is a broad dimension that could be better assessed through a multiple item scale including items assessing cognitive reaction, emotional reaction, and personal utility, among others. To date, PME has been conceptualized and measured in a variety of ways, and it remains unclear as to the most valid and reliable assessment of this construct (see Dillard, Shen, & Vail, 2007; Dillard, Weber, & Vail, 2007). Issues to be considered include not only the content domains of the PME concept and measures but also whether to specify a "referent" in such measures (and if so, which referent). That is, in the current study individuals were asked whether the PSAs would be effective with "someone." While most PME measures simply ask whether a PSA is persuasive, without mentioning a referent (Dillard, Weber, & Vail, 2007), one could ask whether a PSA would be effective with "you" or "someone like you." The issue of which referent to utilize in such measures, if any, remains unclear from the research to date (see Dillard, Weber, & Vail, 2007). Developing broader, more empirically (and conceptually) based PME measures should be the subject of future research. Indeed, the science of message design applied to health campaigns is still a young science, and there is much work to be done, especially with regard to theoretical development in this important area (Cappella, 2006; Noar, 2006).

Contrary to the hypothesis, no differences were found in the predictive ability of PMSV in predicting PME in low- as compared to high-sensation seekers. Why was this the case when the messages were specifically designed for high-sensation seekers? The Activation Model of Information Exposure (Donohew et al., 1998; Harrington, Lane, Donohew, & Zimmerman, 2006), upon which SENTAR is based, proposes that an individual's attention to a message is a function of (a) the individual's need for sensation (stimulation) and (b) the level of stimulation that is provided by the message. If stimulation remains within an acceptable range, the individual will maintain their exposure to the message and perhaps ultimately be persuaded by it. If stimulation is either too low or high, the individual will turn away and seek out another

“better fitting” level of stimulation. Messages for high-sensation seekers are designed to be high enough in message sensation value to attract and keep the attention of members of that group. Such messages will only “turn off” low-sensation seekers, however, if they are high enough in level of sensation value that they reach a critical threshold (Donohew et al., 1998). It is likely that the messages used in this campaign did *not* reach such a threshold (also see limitations below). Indeed, a challenge with safer sex PSAs is that if they are too graphic and arousing with regard to sexual content, television stations will not air them, which restricts the ability to create safer sex PSAs that are *very high* in PMSV. Campaign designers are very cognizant of this when developing such campaigns, as were we when developing the current safer sex campaign (see Noar et al., 2008). Indeed, this is a common challenge in the area of safer sex and HIV prevention—namely, creating materials and messages that promote safer sex in a way that will garner the attention of the target audience and be persuasive without turning off or offending other audiences such as the general public and those who fund the research.

It should also be pointed out that some data *do* suggest that high-sensation-value messages may, in some cases, be effective with low-sensation seekers (see Everett & Palmgreen, 1995; Harrington et al., 2003; Palmgreen et al., 1991). An important point to make here is that the reverse of this is *not* the case. Namely, low-sensation-value messages tend *not* to be effective with high-sensation seekers. Because sensation seeking is related to many risky health behaviors (Zuckerman, 1994), the focus of campaigns is often on high-sensation seekers. For this reason, whether high-sensation-value messages work with low-sensation seekers is often not of much theoretical or practical interest. Moreover, when full-blown campaigns have been implemented and rigorously evaluated, the existing data suggest that the SENTAR approach results in the greatest impact on the behaviors of high-sensation seekers (see Palmgreen et al., 2001, 2007, 2008).

### *Limitations and Future Directions*

There were several limitations to the current study. First, since the sets of PSAs came from a successful campaign study, they were relatively homogeneous as a group. This may have limited the predictive abilities of some of the independent variables as well as limited the ability to detect differences in low- versus high-sensation seekers. Future studies that wish to examine differences in reactions of high- versus low-sensation seekers should utilize PSAs that vary greatly on PMSV, as some past studies have done (see Palmgreen & Donohew, 2003). Second, the current study used PME as the sole indicator of “PSA effectiveness.” Although PME is associated with and may be causally related to actual effectiveness (Dillard, Shen, & Vail, 2007; Dillard, Weber, & Vail, 2007), the two are not synonymous. A future longitudinal study should examine the ability of PME and PMSV to predict actual changes in behaviors in response to a mass media campaign; as such a study design would provide the most compelling evidence that PME and PMSV play a causal role in the actual effectiveness of mass media campaigns. Third, the PME measure used here

was only two items and was framed in terms of a PSA influencing “someone.” Future measures might consider integrating more items as well as framing some items in terms of “you” to avoid a potential third-person effect (Perloff, 1993). Of course, as mentioned above, most measures of PME to date have not specified a referent at all, and thus the measure used in the current study was clearer in that it did so. In addition, Dillard, Weber, and Vail (2007) have hypothesized that a reverse third-person effect is also possible in this area, and thus it currently remains unclear as to the best manner in which to frame PME measures.

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