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Can a Personality Trait Predict Talk About Science?

Sensation Seeking as a Science Communication Targeting Variable

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Sensation seeking, a trait that has been invoked by public health campaign scholars as a targeting variable, also holds promise for informal science education professionals who seek to engage social networks in their promotion efforts. The authors contend that sensation seeking should positively predict talk about science, even after controlling for often-cited predictors such as education, relevant employment, perceived understanding of science, perceived relevance of science, and attitude toward science. Data from a random digit dial telephone survey ($N = 667$) supported the authors' hypothesis. The authors note connections to the science communication and opinion leadership literatures and encourage future work in this vein.

Keywords: *conversation; interpersonal communication; media campaigns; sensation seeking; individual differences*

Science communication researchers interested in identifying target audiences for their efforts typically categorize people according to variables such as educational attainment, experience with science, and perceived or objective relevance of science topics (e.g., Kahlor, Dunwoody, & Griffin, 2004). In addition to these undoubtedly useful variables, we propose here an

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addition to that list, namely sensation seeking. Whereas much contemporary work in science communication has sought to predict science information engagement, the case for justifying increased attention to sensation seeking hinges not on the variable's role in explaining science knowledge per se but rather on its role in identifying potentially important social network hubs. Moreover, because sensation seeking is ostensibly both a personality trait and a known predictor of media use, the variable should prove useful at the level of audience conceptualization and targeting for efforts in which talk about science is a valued outcome.

Sensation seeking (Zuckerman, 1979, 1994), which refers to the underlying variance in level of preferred stimulation among individuals, has often been used to identify those likely to engage in risky behavior and then to target those individuals with media campaign efforts. We highlight a different role for sensation seeking here. Whereas much of the relevant health literature has focused on the negative consequences of stimulation and sensation sought by high sensation seekers (e.g., Ball & Schottenfeld, 1997; Martin et al., 2004; or Stephenson et al., 2001), this study attends to one potentially positive (or at least neutral) consequence of sensation seeking: active participation in conversations and, consequently, status as an active hub in a social network. By testing whether sensation seeking is positively related to conversation specifically about science, we provide evidence relevant to the possibility of using sensation seeking as a strategic tool for identifying active members of a social network who might be targeted with key messages about science and scientists (which they then, in turn, might pass along to others not reached by initial campaign efforts). Before providing such evidence, however, we first should discuss what we know about sensation seeking as a construct. We turn to that next.

Sensation Seeking

Sensation seeking has been defined as "the seeking of varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experience" (Zuckerman, 1994, p. 27). This need for sensation is typically expressed by risky behaviors such as bungee jumping, parachuting, skydiving, hand gliding, fast and risky driving, attending X-rated movies and horror films, sexual promiscuity, getting arrested, gambling, and impulsive purchases (Roberti, 2004; Stephenson et al., 2001; Stephenson & Southwell, 2006; Zuckerman, 1994; Zuckerman & Kuhlman, 2000).

The difference in divergent experiences sought by high and low sensation seekers has at least a partly biological basis. Consequently, sensation seeking can be regarded as a trait or personality based on biological individual differences (Lang, Shin, & Lee, 2005; Zuckerman, 1994). Biochemical differences determined primarily by dopamine apparently drive sensation-seeking variance (Netter & Rammsayer, 1991; Rammsayer, 2004). Greater tendency to seek sensation is often associated with lower default levels of dopamine (see Stephenson & Southwell, 2006, or Donohew, Bardo, & Zimmerman, 2004, for discussion). In other words, high sensation seekers have higher optimal levels of stimulation and arousal (Martin, Sherrard, & Wentzel, 2005; Zuckerman, 1994) because they have lower default levels of dopamine. The aforementioned activities provide high sensation seekers with the necessary stimulation to achieve an optimal level of physiological arousal, whereas low sensation seekers need less such external stimulation (Bardo, Donohew, & Harrington, 1996; Donohew et al., 2004).

That the need for sensation translates into risky health behaviors is well documented (e.g., Ball & Schottenfeld, 1997; Donohew et al., 1999; Donohew et al., 2000; Kalichman, Heckman, & Kelly, 1996; Newcomb & Felix-Ortiz, 1992; Sheer & Cline, 1994; Yanovitzky, 2005; Zuckerman, Ball, & Black, 1990). Health campaign planners not only use sensation seeking as a variable to predict and identify those who are likely to engage in risky behaviors, but also use it as a strategic tool to tailor messages to their target audiences (e.g., Palmgreen, Stephenson, Everett, Basesheart, & Francies, 2002; or Stephenson et al., 2001). Although sensation sought by high sensation seekers has been traditionally thought of in terms of the seekers' connection to risky and socially deviant behaviors, our effort to invoke the variable in a science communication context focuses on the sociability aspect of sensation (Zuckerman, 1994, 1996) and its consequences for conversational tendency.

Sensation Seeking and Conversation About Science

Scholars who have studied the linkage between the sensation-seeking personality and social relationships have found that high and low sensation seekers have different conversational tendencies. Zuckerman (1994), for example, reported that his colleagues in earlier studies on sensation seeking (e.g., Zuckerman, Persky, Link, & Basu, 1968), observed that high sensation seekers, paired with low sensation seekers, seemed to talk relatively more in a social confinement situation in which two participants were put

into a room together for 8 hours. In addition, Franken, Gibson, and Mohan (1990) found a positive relationship between sensation seeking and the inclination to disclose personal thoughts and feelings to others; high sensation seekers were found to be more uninhibited and open in their interactions with causal or close friends. These differences in conversational tendency are explained by the stimulating nature of social relationships and conversation. Zuckerman and Link (1968), for example, noted that high sensation seekers needed others primarily as an audience for their performance. Zuckerman (1994) also argued that social relationships were a major source of stimulation and arousal for sensation seekers.

Few studies, however, have formally tested the proposed relationship between sensation seeking and conversational tendency. While alluding to the aforementioned higher conversational tendency of high sensation seekers, Zuckerman acknowledged that it was not based on systematic observation (see Zuckerman, 1994, for discussion). Franken et al. (1990), as well, did not directly test participants' conversational tendency; they tested people's disclosure tendency. Williams and Ryckman's (1984) study tested a series of possibilities of interaction effects between sensation-seeking propensity and attitudinal similarity of conversational partner on people's conversation pattern. They, however, failed to test the main effects of sensation seeking on conversation.

David, Cappella, and Fishbein's (2006) study is exceptional in this sense. They directly investigated the relationship between sensation seeking and conversational tendency. In an experimental setting, participants were encouraged to talk after being shown five antimarijuana ads. Respondents' conversation—not only about ad stimuli but about other people as well—was aggregated to measure individuals' total amount of talk. By correlating the total talk score with sensation seeking, the researchers found that high sensation seekers talked significantly more than their counterparts, that is, medium and low sensation-seeking participants. Although their study provides evidence for the relationship between sensation seeking and conversation, there can be some alternative explanations for the findings of their study. High sensation seekers may have been more likely to talk about marijuana (or campaign ads) because (a) the topic was more relevant to them or (b) they had more favorable attitudes toward marijuana. In fact, past research suggests such possibilities.

Scholars have noticed that people tend to talk more frequently about topics that are relevant or important to them. Hass and Sherman (1982) and Sehulster (2006), for example, found gender differences in conversation frequency of conversational topics (e.g., men's greater tendency talk about

sports). Sehulster explains these differences by a close connection between conversational topics and cognitive structure. He argues that the contents of our conversations are drawn from our memory and a topic more frequently discussed tends to take up larger cognitive spaces. Past works on word of mouth, in addition, show that people's attitude toward a conversational topic can influence their tendency to talk about the given topic. Liu (2006), for example, reported that positive word of mouth or movies are more often observed compared to negative word of mouth on the Internet, implying that people tend to talk more when they have positive opinions about a topic.

These past studies present a possibility that the perceived relevance of a topic and attitudes toward a topic can affect people's conversational activities. Thus, this study attempts to examine the effects of these two potentially confounding variables and tests whether sensation seeking is a significant predictor of conversations about science on its own.

Sensation Seeking, Conversations About Science, and Opinion Leadership

Given that a commonly held goal of science communication is nurturing critical thinking and deeper understanding, generating conversations about science can be an important strategic goal for science communication professionals. As Southwell and Yzer (2007) note in their review, past studies show that conversation can play an important role in information or knowledge diffusion. A wide array of scholars has begun to study the specific role of conversations in knowledge diffusion, focusing their research in arenas such as political communication (e.g., Eveland & Thomson, 2006) and health communication (e.g., Engelberg, Flora, & Nass, 1995). Science communication is not an exception. Science communication researchers have consistently found that interpersonal discussion relates to the level of people's science knowledge. Powell, Dunwoody, Griffin, and Neuwirth (2007), for example, show that those who had more frequent interpersonal conversations about fish contamination reported higher levels of perceived knowledge about fish risk. Likewise, Stamm, Clark, and Eblacas (2000) also found that those who had interpersonal communication about global warming had higher understanding of the causes, effects, and solutions of global warming.

Eveland's (2004) discussion about the process of political knowledge gain via conversations can be helpful in understanding the process through

which conversations about science induce science knowledge gain. Of the three possible routes proposed by Eveland, the first route is based on the basic notion of the two-step flow of communication (Katz & Lazarsfeld, 1955; Lazarsfeld, Berelson, & Gaudet, 1968), which suggests that conversations with others can work as an additional opportunity for exposure to the information. According to this explanation, conversations about science can provide opportunities for those who are less likely to be exposed to mass-mediated science information. The second explanation, anticipatory elaboration explanation, suggests that people tend to more actively gather and process news information when they anticipate future conversation with others. From this perspective, it is expected that those who expect to have conversations about science in the near future are more likely to seek and process science information. Discussion-generated elaboration explanation, the last route proposed, suggests that elaboration occurring at the time of discussion can enhance the level of people's knowledge. Condit, Parrott, and Harris (2002), in fact, observed this process in their focus groups. After group discussion about the relationship between race and genetics, the participants shared more elaborated and progressive collective knowledge and opinion through participants' mutual correction and augmentation. Discussion matters, and it matters for a number of different reasons.

In such information diffusion and acquisition processes, opinion leaders play an important role, as we know that people are not uniformly likely to generate conversation. We know that so-called opinion leaders can be usefully viewed as nodes of information diffusion (Katz & Lazarsfeld, 1955; Rogers, 2003; Schuster et al., 2006). According to the notion of two-step flow of communication (Lazarsfeld et al., 1968), opinion leaders are the mediators who filter mass media information and relay it to less active sectors of the population. Because of this mediating role of opinion leaders, tapping opinion leaders can be a vital part of proactive diffusion efforts (Schenk & Döbler, 2002).

The problem is that locating opinion leaders is not always easy. One of the interesting findings of past opinion leadership literature is that topical interests or knowledge alone cannot fully explain opinion leadership; opinion leaders share various common traits and it may be something beyond interests and simple demographic factors that describe network hubs (Katz & Lazarsfeld, 1955; Schenk & Döbler, 2002). Although past researchers have strived to find traits of opinion leaders beyond topical interests and demographical factors such as socioeconomic status and education, we have not made much progress in this area. Katz and Lazarsfeld (1955), for example, introduced gregariousness as a possible factor of opinion leadership but failed to conceptualize it further and the potentially tautological

nature of that proposition is a limitation. In addition, scholars such as Noelle-Neumann have looked at so-called personality strength as a potential indicator of opinion leadership (for review, see Weimann, 1991). The scale, however, still does not provide us an intuitive or theoretical explanation for potential individual differences that characterize opinion leaders, or at least social network hubs. In this sense, sensation seeking, an easily measured trait, might offer noteworthy progress in our journey to understand the nature of opinion leaders.

If we can confirm that high sensation seekers have higher conversational tendency, we could use sensation seeking as an idea to identify and locate potential hubs of diffusion. Numerous studies have found that those who talk more are more likely to be perceived as leaders. For example, Palmer (1989) reported that participants, after reading natural dialogue, evaluated the one who talked more in the script as more dominant. In an experimental study where he manipulated the interaction rate, Stang (1973) found that leadership increases monotonically as the interaction rate goes up. More specifically, as the length of conversational turn of a speaker increased from short to long, ratings on the speaker's leadership increased. This monotonic increasing function of interaction rate is consistent with what Cappella (1985) suggested as a model of the relationship between the two. In addition, Sorrentino and Boutillier (1975) reported that, as the quantity of verbal interaction of a trained confederate increased, participants' evaluation of the confederate's competence, confidence, influence, and, most importantly, leadership ability increased. (Interestingly, when the confederate manipulated the quality of verbal interaction, it did not have a significant effect on leadership ability evaluation.)

As an effort to test whether sensation-seeking propensity can be a characteristic of opinion leaders, we test here David et al.'s (2006) finding in a science communication context. In other words, we test whether sensation seeking can predict people's propensity of engagement in conversations about science. This study, however, goes one step further. We test whether sensation seeking can predict conversations about science even after controlling for two potential confounding variables, that is, people's perceived relevance of science and attitudes toward science. If we can show that sensation seeking is a significant predictor of science conversations even after controlling for relevant variables, sensation seeking might help us to identify those who are likely to be active members of social networks over and above what we might predict on the basis of existing attitudes toward science.

We should be able to predict conversations about science with several layers of variables. First, demographic factors may have an impact on

people's conversations about science. Such factors of interest here include education and science-related occupation. People should be more likely to engage in conversations about science when they are better educated (and ostensibly have more exposure to science) or if they have science-related jobs. In addition, because previous work has shown that perceived ability to understand science predicted conversations about science (Southwell & Torres, 2006), we also included perceived understanding of science and math in the model. Finally, we included perceived relevance of science and attitudes toward science to tease out the effects of sensation seeking from the effects of such perceptions. Over and above these predictors, nonetheless, we also expect that sensation seeking will predict conversations about science. In light of these ideas, our hypothesis is as follows:

Hypothesis 1: Sensation seeking will be positively associated with conversations about science, even after controlling for education, science organization employment, perceived ability to understand science, perceived relevance of science, and attitudes toward science.

Methods

Procedure

Study staff recruited participants from the 10-county designated market area (DMA) of Buffalo, New York, using random digit dialing. Specifically, the counties included in our random digit dialing sampling frame were the following: Allegany (NY), Cattaraugus (NY), Chautauqua (NY), Erie (NY), Genesee (NY), Niagara (NY), Orleans (NY), Wyoming (NY), McKean (PA), and Potter (PA). Among people we contacted, only adults (18 and older) reporting that they watched local television news at least twice a week in the previous 3 months (on average) were invited to participate, a move we made because this study was part of a larger effort to gather evaluation evidence for a television news project funded by the National Science Foundation. Accordingly, our results can be viewed as generalizable at least to regular TV news viewers in a midsize U.S. DMA.

A cooperation rate of our random digit dialing efforts was 26%, which is far better than most random mail samples. Using this approach, we recruited an initial pool of 1,285 people and a subset of 667 participants, who met every criterion of the larger project, was included in the analyses.

A comparison of those initially recruited but not completing the study with those completing the study showed no significant differences between the two groups and, accordingly, assuaged any concerns about generalizability problems. The participants were sent a $30 gift card to a local department store as compensation for their time and effort.

Measures

We measured sensation seeking using Stephenson, Hoyle, Palmgreen, and Slater's (2003) Brief Sensation Seeking Scale-4 (BSSS-4) because this scale has a strong conceptual link to much longer counterpart scales, such as the BSSS (Holye, Stephenson, Palmgreen, Lorch, & Donohew, 2002) and ImpSS (Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993), with only a slight decrease in predictive power relative to those longer-form measures. Respondents were asked to report their agreement on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with the following four statements: "I would like to explore strange places (experience seeking)"; "I like to do frightening things (thrill and adventure seeking)"; "I like new and exciting experiences, even if I have to break the rules (disinhibition)"; and "I prefer friends who are exciting and unpredictable (boredom susceptibility)." Showing a good internal consistency ($\alpha = .72$), responses were averaged into a single measure ranging from 1 to 5. The mean sensation-seeking score was 2.89 ($SD = .90$).

We measured conversations about science by asking respondents to report on their conversation behavior during the past week. Respondents reported (either *yes* or *no*) whether they had talked with anyone about science, technology, engineering, or mathematics in general during the past 7 days. This time frame, the past 7 days, was based on the time frame of the aforementioned larger television news project in which this study was embedded.

We also assessed three covariates, that is, perceived ability to understand science, perceived relevance of science, and attitude toward science. To measure perceived understanding of science, we asked respondents to indicate their agreement on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with the statement that "science and math are topics that people like me can understand." (This item reflects the fact that we assess here perceptions rather than objective knowledge of facts per se.) We measured people's perceived relevance of science by asking respondents to indicate the extent to which they agreed that science and math were relevant to them personally on a 5-point Likert-type scale. Likewise, respondents' attitudes toward science was measured by asking respondents to

indicate their agreement on the same 5-point scale with the statement that "overall, modern science does more harm than good." This variable was recoded such that a higher value indicated more favorable attitude.

In addition, because of the potential influence of formal education and current employment to science-related jobs on science conversations, we included these two measures in our questionnaire. Respondents were asked to report whether they had completed less than a high school degree, high school or an equivalent program, some college or an associate's degree, a 4-year college degree, or more. For the purposes of analysis, these education categories were recoded into estimates of years complete, with less than high school counting as 10 years, high school as 12, some college as 14, a 4-year college degree as 16, and a graduate degree as 18. We also asked respondents whether they currently work for an organization or institution that is directly involved in science, technology, engineering, or mathematics.

Description of Respondents

As noted above, all respondents in the study were 18 or older and reported watching local television news regularly in recent months. Participants ranged from 18 years old to 90 years old and mean age in the sample was 51 (SD = 15.65). Whereas approximately 93% of the sample was White or Caucasian, a little more than 4% of the sample was African American, and another 2% of participants identified with a different racial category. In addition to racial description, approximately 2% of the sample reported being Latino (or Latina) or Hispanic. Approximately 53% of the final data set was female and 47% was male. Attained formal education was mixed in the group, with 40% having completed at least a 4-year undergraduate degree and 60% reporting some college or less (with a mean of 14.4 years and standard deviation of 2.26 on our interval recoding). In addition, approximately a quarter of participants reported that they currently work for an organization or institution directly involved in science.

Analysis

As a preliminary analysis, bivariate correlation analysis provided initial evidence of a general relationship between variables. For final hypothesis testing, we used logistic regression analysis because our dependent measure, conversations about science, was a dichotomous indicator. We entered sensation seeking as a predictor in the full model only after other relevant

Table 1
Correlations, Means, and Standard Deviations for All Measures

Variable	1	2	3	4	5	6	7
1. Education (n = 666)	—						
2. Science job (n = 663)	.15***	—					
3. Perceived understanding (n = 667)	.23***	.16***	—				
4. Relevance (n = 667)	.25***	.13**	.48***	—			
5. Attitude (n = 667)	.22***	.07	.17***	.14***	—		
6. Sensation seeking (n = 667)	.03	.04	.17***	.09*	.04	—	
7. Science talk (n = 666)	.17***	.15***	.20***	.24***	.16***	.23***	—
M	14.4	0.3	3.8	3.9	4.1	2.9	0.6
SD	2.3	0.4	1.0	1.0	1.0	0.9	0.5

*p < .05. **p < .01. ***p < .001.

covariates had been entered. To support our hypothesis, in other words, sensation seeking needed to emerge as a significant predictor over and above those other relevant predictors.

Results

Means, standard deviations, and bivariate correlations between all variables included in the analysis are presented in Table 1. By and large, participants demonstrated a modestly high sensation-seeking tendency (M = 2.9, SD = 0.9) and a little more than half of them reported that they had talked about science in general during the past 7 days (M = 0.6, SD = 0.5). Furthermore, respondents generally agreed that people like them had an ability to understand topics like science and math (M = 3.8, SD = 1.0), that science and math are relevant to them personally (M = 3.9, SD = 1.0), and that overall, modern science does more good than harm (M = 4.1, SD = 1.0).

The pattern of correlations in this table was consistent with the study's general prediction. As expected, the conversation variable was significantly correlated with each of the predictors: education (.17), having a science-related job (.15), perceived understanding (.20), perceived relevance (.24), attitude (.16), and sensation seeking (.23). Every bivariate correlation was statistically significant at the .001 level.

Table 2
Logistic Regression Results for Prediction of Conversation About Science

	Step 1			Step 2			Step 3		
Variable	*B*	*SE B*	Odds Ratio	*B*	*SE B*	Odds Ratio	*B*	*SE B*	Odds Ratio
Constant	−1.98***	.52	.14***	−3.86***	.64	.02***	−5.205***	.72	.01***
Demographic									
Education	0.14***	.04	1.15***	.08	.04	1.08	.08*	.04	1.09*
Science job	0.64**	.19	1.90**	.53**	.19	1.70**	.52**	.20	1.67**
Perceived understanding				.17	.10	1.18	.10	.10	1.11
Relevance				.33**	.09	1.39**	.33**	.10	1.39**
Attitude				.23**	.09	1.26**	.23**	.09	1.26**
Sensation seeking							.51***	.10	1.67***
Cox and Snell R^2	.047			.096			.135		

Note: $N = 661$.
*$p < .05$. **$p < .01$. ***$p < .001$.

We assessed our main hypothesis, which predicted that sensation seeking would influence conversations about science, using a logistic regression. As Table 2 displays, science talk was a function of every predictor included in the model except perceived understanding of science. In Step 1 analysis, demographic variables, that is, education and science-job employment, were included as predictors of science talk. As predicted, those respondents who had higher levels of education and science jobs were more likely to talk about science. Perceived ability to understand science, perceived relevance of science, and attitude also were entered as predictors in Step 2 and, as expected, relevance and attitude were significant predictors of conversations about science. (Somewhat inconsistent with previous results, e.g., Southwell & Torres, 2006, is the fact that perceived understanding of science dropped out of final models as a significant predictor, though this is likely a function of the high correlation between relevance and perceived understanding, a minor complication here, given that our goal in including these variables was simply to rule out confounding between sensation seeking and such perceptions in general in predicting talk.)

Most importantly for our purposes, in Step 3 (the full model), sensation seeking ($B = 0.51$, $p < .001$) turned out to be a significant predictor of conversations about science even after controlling for all of the aforementioned

variables. Therefore, data support the hypothesis. Cox and Snell for the full logistic model was .14, $N = 661$.

Discussion

This study suggests that sensation seeking can predict conversations about science. More specifically, sensation seeking, as a trait, can explain science conversational tendency over and above other relevant predictors such as educational background; having a job relevant to science, engineering, technology, or mathematics; perceived understanding of science; perceived relevance of science; and attitude toward science. This study extends the finding of David et al.'s (2006) study in a sense that sensation seeking on its own can predict people's conversational tendency independent of topical relevance and attitude. This study also specifically assesses sensation seeking in the context of science communication, something previously not done in this way. These results suggest that there is room for inborn and inherited nature, as reflected by one's sensation-seeking tendency, to explain conversational tendency beyond the simple influence of nurture, that is, as reflected by knowledge or interest. This is consistent with the findings of past opinion leadership literature that there exist some characteristics beyond topical interests or knowledge that explain opinion leadership (Katz & Lazarsfeld, 1955).

Given that sensation seekers are more likely to talk about science and that conversation is a key to information or knowledge diffusion, sensation seeking can be a useful concept to science communication efforts. This represents an innovation in science communication work; sensation seeking has been a relatively untapped variable in much contemporary science communication research. Strategic communication planners in various domains have started to pay attention to the concept because of its strategic usefulness. It is time for science communication campaign staff to consider a similar move. Although, admittedly, scholars studying sensation seeking have continued work ahead of them, we should not underestimate the immediate utility of the concept for science communication efforts.

It may be possible to design and place science-related media content such that it can appeal to high sensation seekers. A series of sensation-seeking targeting articles (e.g., Everett & Palmgreen, 1995; Stephenson et al., 2001) report that people's sensation-seeking propensity interacts with the sensation value of the message or message sensation value (MSV). Specifically, high sensation seekers are more likely to recall campaign messages and have more

favorable attitudes and behavioral intention when they are exposed to high sensation-value campaign messages compared to low sensation-value campaign messages. In addition, high sensation seekers recalled campaign messages better when the campaign messages were embedded in a high sensation-value program as opposed to a low sensation-value program. This interaction has been explained by the activation model (for review, see Stephenson & Southwell, 2006), which argues that individuals have different levels of optimal arousal and, accordingly, they are more likely to respond positively to messages that fit their needs.

Sensation-seeking targeting strategy can be utilized for both design and placement decisions. Science communication professionals can design structure or format (e.g., edits, camera angles, movement, or sound effects) of science communication messages so that the messages are high in three factors of message sensation value—emotional arousal, dramatic impact, and novelty (Stephenson et al., 2001). In addition, and equally as important, science communication practitioners can strategically place science messages near programs high in sensation value. In fact, one might even argue that placement strategy is less appreciated than message design strategy, currently. Many science communication professionals already have a sense that messages ought not be excessively dull if possible, but few think in terms of placing content on the basis of what media content high sensation seekers typically view and in which they engage. If science information is presented in such ways, we can have at least some confidence that we will be reaching an audience likely to talk with others about science.

Science communication professionals can use this sensation-seeking targeting idea to spark conversations and discussions about science in the society. This is a strategy clearly distinct from the traditional approach of trying to reach all segments of the population at once with a broadcast approach. A sensation-seeking targeting strategy could be effective compared to the traditional approaches in terms of science information diffusion because many interpersonal communication networks are believed to offer extended range beyond what initial mass media audiences alone can garner (Chaffee & Mutz, 1988; Lazarsfeld et al., 1968). It is important to note that such a strategy would not inherently exclude low sensation seekers, but rather would initially target high sensation seekers as a way of facilitating diffusion among broad cross-sections of the population.

This study is not without limitations. Despite our use of random digit dialing for sample recruitment, it is true that participants who agreed to be in the study differ somewhat from other members of the general population because of the data gathering constraints noted earlier. Because this study was part of a larger evaluation and the sample was limited to regular local television news

viewers in the Buffalo area, it is conceivable that these results are limited in their generalizability to that context. At the same time, a theoretically compelling reason why this would be the case is less apparent as sensation seeking likely operates across typical demographic categories.

Also potentially limiting is the fact that we intended our measurement of science-related job employment to indicate the simple potential for any heightened opportunity for science-related conversation. Consequently, we aimed for a liberal assessment, asking respondents if their job was at all connected to science, technology, engineering, or mathematics. That approach did garner substantial variance, but it also left us with what was perhaps an overestimation, as a quarter of our sample reported that they worked for an organization or institution that was directly involved in science, technology, engineering, or mathematics. In hindsight, some respondents may have answered affirmatively to the question even if their own specific job is only tangentially related to science, technology, engineering, or mathematics. We certainly controlled for heightened opportunity for conversation at work, but may have classified some as having a substantial work-related connection when they do not in practice. Even this broad interpretation, however, does not seem to undermine the generalizability of our results because this question was not used to screen potential respondents and is simply a covariate.

In addition, the measurement of conversations about science in this study was not as sophisticated as it might have been. Our measure does not provide information about respondents' conversation frequency because of its dichotomous nature. Moreover, it does not grasp the content of conversations about science. The measurement does not provide information about what kind of topics were discussed and in which valence the topics were discussed. Exploring the topics of conversations and the valence of those conversations is an important task because information conveyed in the conversation can be irrelevant, incorrect, or even value-negative. If this is the case, science talk may even produce negative outcomes. In fact, David et al. (2006) found that participants of the discussion condition had more positive attitudes toward marijuana use because of promarijuana messages conveyed in conversations.

We hope that these results set an agenda for future research to address these issues. Evaluation of whether specific science communication efforts that focus on placing key messages or information in programming typically sought by high sensation seekers results in eventual widespread information diffusion would be worthwhile. An experimental study that randomly assigns participants to high and low sensation-value science messages and then records their subsequent conversation content also could reveal whether that approach to sensation-seeking targeting works (though, as we noted, many science communication professionals already often implicitly aim for at least

somewhat high sensation-value message strategies). Future work could devise measurement strategies to assess what kind of topics are discussed in this context and could assess the prevailing valence of those conversations. Longitudinal surveys to assess whether sensation seeking is positively correlated with traditional opinion leadership scales, such as personality strength, could be useful and also might allow researchers to assess whether conversation about science can, in fact, eventually impact people's information or knowledge gain. Such research could reaffirm our arguments about the usefulness of sensation seeking in identifying opinion leaders and the importance of science conversations in science knowledge gain.

Conclusions

We have argued that science communication scholars should attend to sensation seeking more so than has been the case historically. Science communication professionals interested in diffusing knowledge and nurturing the kind of interpersonal exchange that might solicit interest and critical thinking about science ought to consider venturing into mass media venues typically favored by high sensation seekers. Such a change in media message placement strategy might yield a tremendous harvest of information diffusion and "buzz" relative to current approaches.

Here we hypothesized that sensation seeking would positively predict talk about science, even after controlling for often-cited predictors such as education, relevant employment, perceived understanding of science, perceived relevance, and attitude, and found supportive evidence in the form of a logistic regression in which sensation seeking maintained a significant predictive role. Our work empirically clarifies previous allusions to the possibility of these relationships in contexts outside of science communication and affirms the relevance of the general sensation-seeking literature for science communication professionals. For these reasons, this work not only offers useful insight for science communication researchers and practitioners but also suggests future directions for the opinion leadership literature.

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