

A Review of Research Relevant to Evaluating Social Marketing Mass Media Campaigns

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Overview

Campaign evaluation is the systematic collection and analysis of information about the outputs (activities), outcomes, and impacts of a campaign or program, carried out in order to reduce uncertainties, improve effectiveness, and make decisions with regard to what those programs are doing and affecting (Patton, 1982). Evaluation provides a framework by which to communicate with stakeholders, decisionmakers, and the public about how and why public resources are being used for outreach and, in our case, advertising.

Public outreach is necessary to address nonpoint source water pollution because the behaviors of individuals are so important for addressing the number one source of pollution in our nation’s waterways – stormwater runoff. Mass media is an important vehicle for educating the public regarding stormwater runoff and the behaviors that pollute it. Using mass media well requires strategic planning before the campaign: envisioning desired outcomes, characterizing the target audience, and designing a message that will resonate with that audience and facilitate those outcomes. Analyzing the success of the campaign requires a deliberate process as well. This literature review summarizes research on audience responses to mass media advertising and presents metrics to evaluate a campaign and its effectiveness.

Introduction

In general, the ultimate goals of stormwater outreach are 1) to improve knowledge and awareness of water quality and watershed issues on the part of the target audience, and 2) to improve water quality by encouraging the target audience to cease engaging in less desirable behaviors that contribute to nonpoint source water pollution and adopt behaviors with fewer or no water quality impacts. Mass media can be an important means to help achieve these goals, particularly the first: improving awareness.

A mass media campaign uses television, radio, the internet, and/or print to expose a community to a message (also known as an “ad,” “public service announcement,” “PSA,” or “spot”) or series of messages to achieve a program goal. For purposes of this literature review, we use the term “campaign” to describe a single purchase or “run” of a particular mass medium (usually some number of weeks). We use the term “airtime” to refer to runs of television broadcasting and cablecasting as well as to radio broadcasting. Airtime may be purchased or it may be obtained free through a variety of means, depending on the media outlet. Because of the expense involved, we focus here on paid advertising, that is, airtime purchased from radio and television stations, networks, and providers (“vendors” or “outlets”) as opposed to airtime obtained gratis, such as may be provided by community access television. These and other terms in this literature review are defined in a glossary (Appendix A). Our work focused on radio and television media; however, many of the evaluation principles are applicable to internet, print, and outdoor advertising as well.

In recent years, programs to address social issues have become more sophisticated in their use and evaluation of mass media. There is also a growing body of literature on using mass media to change consumer behavior. We have drawn on these other fields to inform research and methodologies to explicate audience recall of the message, awareness of the issue, understanding of the issue, salience of the issue, and behavior changes that may come about as a result, directly or indirectly, from the media campaign. When planning campaigns to address specific issues, a literature review should be conducted, or one of the online CBSM resources at least consulted (Doug MacKenzie-Mohr’s Fostering Sustainable Behavior website and the Water Words that Work Blog), as more and more practitioners are exchanging ideas and sharing the results of their work using the internet.

Mass media outreach should be selected only after the specific audience and water quality objective have been explicitly identified and the many vehicles for outreach and their relative costs and benefits considered. Whenever possible, mass media should be coupled with other initiatives to reinforce the message and make the desired behavior change easier for the target audience to implement. This is especially true for campaigns with the goal of changing behavior, which can be extremely complex. The emerging field of community-based social marketing (CBSM) (McKenzie-Mohr and Smith, 1999) has contributed a great deal to our understanding of how outreach program components might be most effectively coordinated to bring about behavior changes. However, for simplicity, this literature review will focus on mass media campaign evaluation in isolation of other program components.

There are many resources available on designing messages and identifying audiences for mass media campaigns to maximize effectiveness (e.g., EPA’s Getting in Step series), so this topic is only covered in passing here. Instead, this literature review focuses on evaluation frameworks

that allow mass media campaigns to be evaluated for effectiveness and efficiency across time, space, and medium. The steps involved in evaluating a mass media social marketing campaign are described. A sampling of theories that can help illustrate the logical relationships between the stages of the campaign, starting with message delivery and ending with knowledge or behavior change, are included in an Appendix. Where possible, the literature review focuses on campaigns to address nonpoint source water pollution issues and the public behaviors that contribute to them (e.g., overfertilizing lawns, not picking up pet waste, dumping chemicals in storm drains, etc.).

Types of information and message development

Knowledge communicated by behavior change campaigns can be categorized as one of three types for purposes of the following discussion. **Impact knowledge** is information about the consequences of certain behaviors and/or the problem generally (e.g., “storm drains do not treat stormwater before releasing it to local streams”). **Procedural** knowledge is information the audience can act on (e.g., “you can drop off used motor oil for recycling at these locations”). Finally, **normative knowledge** is information about what others are doing (Schultz, 2008) (e.g., “your neighbors recycle their used motor oil at the local hazardous waste convenience center”).

The choice of which types of knowledge to communicate, and in what order, may greatly affect the success of the campaign, so campaign planners might consider testing their media messages against the various theories presented above to see how well the message (knowledge) they intend to present performs using different assumptions and how likely the desired outcomes are to be reached. Beta testing the message with members of the target audience and research on local conditions are recommended regardless of the extent of theoretical analysis and campaign planning (EPA, 2003).

There is a great deal of guidance available on the issue of developing a media campaign. See the EPA’s Getting in Step series, McKenzie-Mohr’s work on community-based social marketing (McKenzie-Mohr and Smith, 1999; Fostering Sustainable Behavior website), and the Communications Toolkit from Cause Communications (Hershey, 2005).

Planning and evaluating mass media campaigns: Two sides of the same coin

In developing the campaign, campaign managers should “begin with the end in mind,” thinking about the desired result of the outreach, and then work backwards into the strategies and activities that will result in the desired outcome. In evaluation terminology, we talk about impacts, outcomes, and outputs, working backward from long-term results to short-term activities that need to be carried out to bring about those results. This is known as “front-end evaluation,” and it is critical to conducting a successful campaign (Coffman, 2002).

These three types of metrics for evaluation are described below. In this discussion, we begin with the most basic concepts and progress to the most complex. (Applications of each concept and examples for evaluation are discussed in greater detail in the following sections.)

- Outputs indicate a level of investment or effort in the outreach campaign. Tracking outputs is the most basic and direct metric of campaign productivity because, for the most part, outputs can be controlled and/or predicted and because they can be quantified. Mass

media campaign output is airtime of the message(s), which may be measured with metrics such as impressions, gross rating points, reach, frequency, etc.

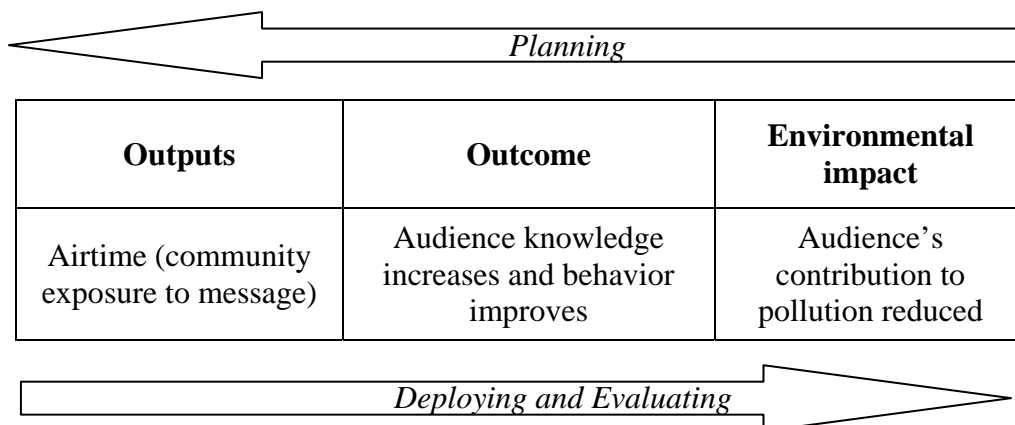
- Outcomes are changes that take place **WITHIN THE AUDIENCE** because of the campaign, such as increased knowledge (WKKF, 2004), increased awareness, considering behavior changes, and individuals attempting to educate themselves about the issue. Audience outcomes are always affected by factors external to the campaign and therefore call for more sophisticated measurement techniques.
- Impacts are the ultimate results of a campaign (WKKF, 2004), such as specific behavior changes or demonstrable water quality improvements. Impacts of outreach are extremely difficult to ascertain because there are so many intervening factors.

Again, these metrics are useful at both the front-end evaluation and the back-end evaluation stages. At the front end, they can be used to design and conduct a campaign that achieves its objectives, can be evaluated, and collects the data necessary for evaluation. Any data available from other campaigns on intensities of specific outputs can provide important information for targeting audiences and negotiating media buys.

At minimum, stormwater outreach managers need to track and report campaign outputs; these metrics are relatively easy data to obtain and track. More sophisticated, higher-order metrics evaluating outcomes or even impacts of a campaign (examples will be discussed below) should be incorporated to the extent possible. Evaluating outcomes and impacts can improve the design of future campaigns, help justify expenditures, and be shared with others doing similar types of work.

A logic model is one common, systematic, and visual way for a program to plan, communicate and evaluate the relationship among the activities and expected results of a campaign (WKKF, 2004). A campaign logic model can be utilized in the planning stages (once campaign objectives have been defined) to help show relationships and assumptions among campaign outputs, outcomes, and impacts. It is important to test the assumptions in the campaign logic model with research (primary or from the literature) to verify to the extent possible that the audience will make the connections necessary to bring out the desired outcomes and impacts. The logic model can also be elucidate the post-hoc campaign evaluation and verify whether each stage of the outreach process successfully led to the next stage.

A generic logic model for a single mass media stormwater outreach campaign. (Based on the learning hierarchy model, a simplified approach to outreach)



Measuring mass media campaign outputs

Evaluation can be conducted most efficiently when it is factored into the overall program and/or media campaign from very beginning, to ensure that the data needed to conduct evaluations are collected. For example, mass media buyers should make their data needs for campaign outputs known to the mass media vendors when negotiating the purchase, as these might affect how the buy is structured and which audiences are targeted.

As defined before, outputs are the direct products of the campaign. If the campaign is a mass media campaign, the outputs will be airtime of the spots, which can be measured in terms of reach, frequency, impressions, gross ratings points, etc. Outputs are the most basic level of information, and they can be easily compared across time and space. These data are easily obtained from media vendors.

It is important to note that outputs do not measure on any attention, action, or response on the part of the audience. They are measurements of purely the campaign itself. Most metrics can be reported in terms of gross attainment, or the numbers for the entire population in the outreach area, or in terms of target attainment, the numbers for the population targeted by the outreach campaign in question. To reduce confusion, it is important to specify “gross” or “target” when presenting particular campaign intensity measures.

Applicable Metrics	Medium					
	TV Ads	News-paper Ads	Magazine Ads	Radio Ads	Web Ads	Outdoor Ads
Raw number of ads aired/printed	x	x	x	x		
Frequency (gross/targeted)	x	x	x	x	x	x
Reach (gross/targeted)	x	x	x	x	x	x
Rating points (gross/targeted)	x	x		x		
Impressions (gross/targeted)	x	x	x	x	x	x
Cost per point/cost per thousand	x	x	x	x	x	

Mass media stormwater campaign outcomes and impacts

Outcomes are the interim goals of a campaign, and impacts are the ultimate final goal(s). Generally, with a mass media campaign, outcomes would be community awareness and saliency and impacts would be behavior changes in the outreach target population. The ultimate goal (desired impact) of any stormwater outreach campaign usually is reduction in water quality pollution attributable to the outreach target population.

These different kinds of outcomes and impacts of social mass media marketing campaigns can be described as a spectrum moving from simplest (short-term outcomes) to most complex (long-term impacts). Note, however, that research is needed to determine the “stages” the audience might actually experience for the issue in question. See the Appendix for different theories on the relationships between various states of audience experience.

- Ad recall
Ad recall measures how well a community remembers the message of a specific ad and where the saw or heard it. It is not the most accurate outcome measurement because

when surveyed, audience members have a hard time articulating how (by what medium) they were exposed to the ad.

- Audience awareness
Awareness measures evaluate the audience's awareness and understanding of the underlying campaign message. Questions asking if respondents know what a watershed is or whether storm drains receive treatment before discharge measure audience awareness.
- Saliency
Saliency on the part of the audience is a measure of the importance of the issue for the audience. Sometimes saliency and awareness can work in counterintuitive ways – people with high awareness may show the least increases in saliency, but they may show it faster, whereas people with lower saliency may show the greatest and most sustained amount of saliency increase, but slowly (Henry, 2001).
- Behavior intention
Behavior intention is a proxy measure of the likelihood that a person will engage in a specific behavior (Coffman, 2002). This can be a good measurement of the long-term audience impact of stormwater behavior, since intention is a natural precursor to changes in behavior.
- Behavior changes
Although the most difficult measurement to measure, actual behavior change is the “gold standard” indicator of campaign effectiveness since it represents the ultimate desired audience impact (Coffman, 2002). Behavior changes should be most immediately apparent on the part of individuals who received outreach, but over time, individuals in the larger community may change behaviors even if they did not receive outreach. This is because there may be ripple effects of social diffusion and changing community norms resulting from outreach on critical target populations. Ripple effects are especially likely if the target population includes “opinion leaders” in the community, or trusted community participants whose attitudes and behaviors influence others.
- Water quality improvements
Water quality is the ultimate indicator of campaign effectiveness, but due to the complexity of measuring and evaluating water quality changes, it is rare that campaigns are evaluated in terms of ambient surface water quality in the target area.

Measuring mass media stormwater campaign outcomes and impacts

When managers begin to measure the outcomes and impacts of communication campaigns, they must consider and plan for the limitations of their research. In any type of research, the more factors that must be controlled for, the more sophisticated the techniques for measuring the effects must be. Outcomes are influenced by a huge number of factors, both internal (e.g., audience demographic characteristics) and external (e.g., issues competing for the audience's attention on the media). This is even more true of impacts on the audience, which may take well after the conclusion of the outreach. Evaluating a mass media campaign in terms of its outcomes

and impacts therefore requires more time, resources, and methodological attention than measuring outputs.

A summary of potential methods of assessing outcomes and/or impacts of a communication campaign on an audience follows:

- Pre- and post-campaign surveys

Surveys can be effective means of measuring change in community attitudes, salience, ad recall, and even behavior change. It is an especially valid metric when there are no other reasonable alternative explanations for change other than the communication campaign (Hornik, Jacobs & Coffman, 2007). Pre-campaign data is usually needed in order to compare any changes in the survey population determined based on a post-campaign survey.

Surveys can be repeated and can reach a broad geographic base; however, their validity is dependent on the response rate (Stormwater Manager's Resource Center, 1995). In order to accurately capture the effects of the campaign, surveys should be targeted to the audience targeted for the media campaign (geographically and demographically). If the survey asks whether people recall seeing or hearing an ad, it is important that responses be obtained within a few weeks of the conclusion of the campaign. Research is needed on how long assessors have to capture ad recall effects.

- Rolling sample surveys

Rolling sample surveys keep track of what day responses were received and would be useful in a very detailed evaluation of a specific mass media campaign to determine salience and audience response time. Researchers Gary Henry and Craig Gordon used a rolling sample survey to evaluate the effectiveness of the Voluntary Ozone Action Program in Atlanta based on ozone action days. This method is considered more experimental (Henry and Gordon, 2001).

- Cohort studies

A cohort methodology approach would track a given subset of individuals longitudinally. Cohort studies can be used to evaluate lagged exposure effects that manifest over an extended period of time (Hornik, Jacobs & Coffman, 2007). Cohort studies provide an opportunity to delve more deeply into cause-and-effect relationships, but take much longer to produce conclusive findings.

- Direct response tracking

In its advertisements, a campaign might ask for immediate and measurable action of the audience, such as mailing in a blow-in (a card stapled to the inside of magazines) or calling an 800 number. Usually participants will receive some sort of benefit like a coupon or toolkit for their participation.

- Observed audience action or audits/"revealed preference" studies

Target audience's behaviors may be more accurately gauged using more sophisticated methodologies in which the audience is directly observed in real-world settings. Examples include calls to stormwater hotlines, traffic on an advertised website, or amount of motor oil recycled at hazardous household waste facilities and auto parts stores

in the area receiving outreach. Waverly Council in Sydney, Australia conducted visual audits of residential property and observation of negative behavior (Elton Consulting, 2008).

- Qualitative studies

Qualitative data would be narratives and anecdotes, usually obtained to supplement and clarify more quantitative data. Qualitative data can be collected through interviews, focus groups, or even simple phone calls. Vivek Shandas at the University of Portland, OR used coupled qualitative data collection with revealed preference studies to analyze correspondence between riparian landowners' visual preferences and actual yard maintenance behaviors (Shandas, 2007).

- Traffic to websites about the issue

This method is an inexpensive proxy metric for behavior intention, community awareness, and salience if a website URL is included in the spots aired (CWEP, 2008), as those considering changing their behavior may seek first to learn more about the costs (barriers) and benefits to changing their behavior by researching the issue. The website must be set up to collect statistics on visitation, and it is important to focus on tracking the statistics that most effectively capture the effect in question. CWEP tracks unique visitors, visitors staying longer than 30 seconds, and number of visitors "favoriting" the site or adding it to their bookmarked sites.

More advanced programs may consider having one easy-to-remember URL for use in media campaigns to help track the portion of web traffic that can be attributed to the campaign. CWEP uses a voluntary one-question web poll on the home page during media campaigns asking visitors "What brings you to our site today?" with possible responses as a web search, a media campaign, a link on another website, etc. to help attribute traffic to particular media campaigns.

- Water quality assessments

Obviously, studies on environmental impacts need to account for the large number of external and environmental factors that may affect water quality, such as land use changes in the watershed, precipitation, best management practices (both structural and nonstructural), etc. Because of the complexity of this task, few programs have attempted to quantify the effects of outreach in terms of improvements to ambient environmental quality (none were discovered during the course of this research). Paired watershed studies or pre- and post-intervention water quality monitoring may eventually become viable methods of assessing impacts of outreach campaigns if ambient monitoring and outreach campaign evaluation methods are sufficiently detailed and matched.

Measuring outcomes usually involves some surveys and self-reporting (Galvin, 2005; Kaiser et al., 2003). The validity of self-reported behavior has been debated, as some individuals may attempt to tell the surveyor or interviewer what they believe they want to hear. However, some research has found that self-reports can provide sound information on an individual's ecological behaviors (Kaiser et al., 2003). Stormwater behavior it is not sensitive or personal compared to other behaviors individuals may be surveyed about (e.g., binge drinking), and there is little incentive for survey/interview participants to falsify information.

One method of minimizing false responses in surveys is to solicit dichotomized answers (“I do know” or “I don’t know”) (Kaiser et al., 2003). Another strategy is triangulation, which utilizes both quantitative and qualitative measurements to corroborate a conclusion (Hornik, Jacobs & Coffman, 2007). Surveys could also be corroborated to some extent by conducting focus groups, interviews, home assessments, and other types of evaluations on a subset of survey respondents to assess the validity of the population’s survey responses.

Intensity and scope of the outreach program

Theories that there is a “magic number” of times that the audience should be exposed to an advertisement lack wide empirical support from product marketing research (Tellis, 2004). When developing a campaign, the intensity of campaign outputs should be determined based on the complexity of the message, the time between campaigns, the audience’s level of awareness or knowledge, the salience of the issue, and numerous other factors. “Process evaluation” can help determine optimal distribution, placement, and exposure levels for campaign outputs (Coffman, 2002), either before the campaign in a beta testing environment or after the campaign to improve future campaigns. To reduce the need for ad-hoc process evaluations of individual, discrete stormwater knowledge and behavior change campaigns, additional research is needed on optimal levels of campaign outputs in different situations.

It is important to keep in mind that the relationship between outputs and outcomes may not be linear, especially at very high and very low exposure frequencies. At low frequencies, the audience may not retain the message at all. At higher frequencies, the target audience becomes “saturated” and additional expense and messaging does not increase the likelihood of ad recall or behavior change (Simon and Arndt, 1980; Tellis, 2004). Adverse effects are even possible with very long or very intense campaigns: after a lot of repetition or if campaign duration is long (e.g., six to twelve weeks), audiences get bored and even annoyed by a campaign, a phenomenon known as “wearout.” Wearout may occur more slowly if an ad is complex, uses emotional appeal or the exposures are scheduled with breaks (Tellis, 2004).

A common truism in behavior change outreach is to pair action messages (telling the audience what to do) with awareness messages (there is a problem and the audience is part of the solution). In theory, over time after outreach campaign effects begin to accumulate, the audience (if it is a stable population) should need fewer “awareness” messages to bring about desired behavior changes (actions); the audience would understand that there is a problem and that their behaviors contribute to it. We did not encounter any guidelines on how to know when it is appropriate begin to replace awareness messages with action messages.

Primary CWEP research (conducted as part of a larger project related to this literature review) will elucidate the question of whether there is discernible relationship between higher levels of knowledge in individuals and the degree to which those individuals engage in environmentally preferable behaviors (Bruce and Lancaster, 2009). If there is little relationship between higher levels of awareness/knowledge and environmentally preferable behaviors, increasing audience awareness may prove fruitless in terms of reducing audience contribution to nonpoint source pollution. Community-based social marketing proponents would argue that investing and promoting tools to behavior change, or at least undertaking media campaigns in conjunction with other outreach components, would bring the biggest “bang for the buck” in terms of behavior change and ultimate water quality improvements.

Caveats of mass media advertising campaign evaluation

Cost and complexity are just a few challenges in evaluating the effectiveness of a mass media marketing campaign. Connecting a mass media outreach campaign to measurable outcomes and impacts has a few other notable limitations (below). In planning and especially in evaluating a campaign, it is important to recognize and reduce impacts from exogenous variables on the evaluation.

- Measurements need to be targeted as closely to the campaign as possible.
A mass media campaign should be targeted to a particular subgroup but may reach much larger numbers of people. Analysis and evaluation should focus on the target population (Hornik, Jacobs & Coffman, 2007). If the surveying methods are not specific to the target audience, the effects of the mass media campaign impact may appear diluted.
- The impacts of a campaign may take time to manifest.
Conversely, the audience impact of mass media stormwater outreach may ripple into the future, so measuring behavior changes immediately following a campaign may not capture the full long-term effects. Projections of the delays on ad effect can vary drastically (Tellis, 2004; Hornik, Jacobs & Coffman, 2007) because the timing of impacts will vary depending on the message, the audience, the level of exposure, and exogenous variables such as barriers to behavior change.
- The impact of a campaign may be subtle in magnitude.
Outreach campaigns may target small, incremental behavior changes. For example, a campaign may focus on getting people to wash their vehicle at a car wash rather than in the driveway, but most people only wash their car a few times a year. Evaluation must be sophisticated enough to detect small effects (Hornik, Jacobs & Coffman, 2007).
- It may be difficult to link campaign output with its impact.
Measuring the effectiveness of a mass media outreach campaign becomes increasingly difficult as you move away from simply measuring outputs of a campaign (e.g. number of ads placed and frequency) to impacts on the audience, and especially then connecting audience impacts to environmental impacts. Linking behavior to a specific ad campaign is expensive, complex, and highly variable (Galvin, 2005; Hornik, Jacobs & Coffman, 2007). Thus, conducting effective evaluations can be difficult, expensive, and possibly unproductive.

The Burnt Mill Creek outreach and demonstration project in Wilmington, North Carolina was evaluated using a quasi-experimental study. Researchers focused intense outreach (workshops, brochures) to a geographically targeted group and initiated a mass media campaign to the entire city. They then compared the differences in watershed awareness, attitudes, behavior and message exposure before and after the outreach “treatment.” Even though the researchers identified statistically significant numbers of people who reported being exposed to the messages, there were only a few significant changes in the population’s watershed awareness and behavior change. The researchers concluded that few of the changes measured in the study could be explained by the mass media campaign (Imperial and Jones, 2005), although the validity of the study is subject to effects from attrition (immigration and outmigration), maturation and history (time elapse and exogenous changes), and testing (self-reporting bias). The Burnt Mill Creek evaluation is a good example of the complexities of evaluating outreach generally: the

lack of discernible effect could be a function of the campaign (e.g., the intensity of outreach was insufficient), the evaluation (e.g., the study was not sophisticated enough to detect the outcomes and impacts), or possibly both.

Conclusion

Mass media marketers for social programs can learn from product and public health advertising evaluation research. This literature review attempts to introduce stormwater campaign managers to the theory, metrics and strategies for evaluating the effectiveness of their mass media campaigns. Although evaluation can be a complex task, even a little bit of measurement and evaluation is better than none at all. Evaluation done well can help improve overall program efficiency by informing the optimal structure and character of public outreach campaigns.

Appendix: Theories regarding Relationships between Media Exposure and Audience Experience

How does a certain behavior come about in an individual? In planning a media campaign, those purchasing media (“buyers”) will usually make some combination of assumptions, educated guesses, and studied projections about the process audience members who actually see or hear a spot undergo to bring about the desired behavior change. Unfortunately, this thought process is not always explicit, well informed, or rational. For example, many environmental education campaigns operate under the assumption that once people are told about a problem, they will logically follow through with whatever behavior changes are needed or requested.

Unfortunately, information alone is often insufficient to bring about the desired behavior change (McKenzie-Mohr and Smith, 1999).

There are at least four models that can describe stages the audience undergoes and ultimate campaign impacts. Note that not all of the models begin with audience awareness (which would presumably result from being exposed to the media message), nor do all models necessarily conclude with behavior change. Each model is briefly described along with a few notes about its utility in various situations.

- Learning hierarchy (rational theory or knowledge-deficit model)

Audience stages: Awareness > Attitude > Behavior

The learning hierarchy most closely represents the usual approach to stormwater outreach campaign planning. It assumes a direct causal relationship between message exposure and desired changes in audience behavior. According to this model, an individual takes action after learning about a problem and applies the knowledge to decisions. The underlying assumption is that the individual simply lacked the knowledge to make the correct decision. However, even if the audience was lacking knowledge, there is usually more to behavior change than introducing “correct” knowledge.

If the goal is simply to increase awareness of an issue and not change behavior, this model has utility. The knowledge-deficit model may also work well if the audience cares about the issue a great deal, if there are clear differences between alternative behaviors (Ray, 1973; Tellis, 2004), and if there are no other barriers to the audience adopting the preferred behavior. Simple behavior changes, such as product substitution, might also be addressed under this framework.

- Dissonance/attribution hierarchy

Audience stages: Behavior > Attitude > Awareness > Confirmation of action

The dissonance/attribution model is the opposite of the learning hierarchy. Under this model, people behave a certain way out of need, change their attitudes to suit the new behavior, and then rationalize the behavior and the attitudes based on newfound information after the fact (Ray, 1973; Tellis, 2004). Consider the case of an individual who picks up after his dog because he doesn’t want to bother his neighbors. After seeing an advertisement on the water quality benefits of disposing pet waste, he may use the information on water quality benefits to confirm the validity of his existing behavior.

- Low-involvement hierarchy

Audience stages: Trial > Recognition > Behavior (eventually > Attitude)

This model is based on the notion that the audience members don't care or are not involved and that their behavior stems from blind choices or trial. In a low-involvement hierarchy, the interim step of awareness is initially skipped. It's simply not necessary; the behavior only requires a simple recognition (Ray, 1973; Tellis, 2004).

In a stormwater outreach campaign, this model might be useful for communicating easy, "sound bite" tasks that do not require a lot of explanation (e.g. "change a light bulb, change the world"). This model was initially recognized in 1965 in assessing why television advertising had such a strong aggregate effect without having a large effect on individual attitude change (Krugman, 1965). It might be interesting to research the tendency of an audience in a media-saturated world to translate all messages into low-involvement. (This literature review did not encounter any such research.)

- High-involvement hierarchy

Audience stages: Communication > Relationship > Lifetime commitment

This social marketing paradigm holds that communication campaigns need to go beyond communicating knowledge because information alone will not change behavior. CBSM proponents McKenzie-Mohr and Smith (1999) state that an outreach campaign needs to target barriers and obtain intermediate commitments that build to the desired behavior change. The goal of social marketing outreach is go beyond promoting a discrete individual behavior changes to actually building a relationship. In the world of advertising, this is referred to as a high-involvement campaign. It is difficult to successfully conduct this type of campaign using mass media alone. CBSM proponents would suggest that other tools should be utilized to bring about and maintain desired behavior changes.

Resources

Works Cited

Bruce and Lancaster (2009). Pre- and Post-Media Campaign Survey Analyses and Comparisons. Available online: <http://www.nccleanwater.org/outreach/evaluation.php>

Coffman, Julie (2002) Public communication campaign evaluation: An environmental scan of challenges, criticisms, practice and opportunities. Cambridge, MA: Harvard Family Research. Available online at: <http://www.hfrp.org/evaluation/publications-resources/public-communication-campaign-evaluation-an-environmental-scan-of-challenges-criticisms-practice-and-opportunities>

Dietz, Michael, John Clausen, & Karen Filchak (2004) Education and changes in residential nonpoint source pollution. *Environmental Management* 34, 5: 684-690.

Eckl, Eric (2008) Various posts on the Water words that work blog, accessed on 11-20-08, available online at: <http://waterwordsthatwork.com/category/media/>.

Elton Consulting (2008) Effective environmental education campaigns. A report for the Waverly Council in Sydney, Australia. Available online at: <http://www.environment.nsw.gov.au/stormwater/casestudies/environedn.htm>.

Fisher, Marc (2008) "Weakening signals" *Washington Post*, June 1, 2008.

Galvin, David (2005) Measuring results from outreach and education programs: Can we see improvements downstream? Manuscript from 4th National Conference on Nonpoint Source and Stormwater Pollution Education Programs, October 2005, Chicago, Illinois.

Henry, Gary T. & Craig Gordon (2001) Tracking issue attention: Specifying the dynamics of the public agenda. *Public Opinion Quarterly*, 65, 157-177.

Hershey, R. Christine (2005) *Communications Toolkit: A guide to navigating communications for the nonprofit world*. Cause Communications. Santa Monica, California.

Hornik, Robert, Lawrence Jacobs & Julie Coffman (2007) Evaluating communication campaigns: A report of the 2007 Research and Evaluation Conference. Robert Wood Johnson Foundation, reported by Lori DeMillo. Available online at: <http://www.rwjf.org/files/research/evaluatingcommcampaings2008.pdf>

Kaiser, Florian, Gabor Doka, Patrick Hofstetter & Michael Ranney (2003) Ecological behavior and its environmental consequences: A life cycle assessment of a self-report measure. *Journal of Environmental Psychology*, vol. 23, p. 11-20.

Krugman, H.E. (1965) The impact of television advertising: Learning without involvement. *Public Opinion Quarterly*, vol. 29, p. 349-356.

Marketing Evolution (2006) Measuring media effectiveness: Comparing media contribution throughout the purchase funnel full study. Magazine Publishers of America, New York, NY, December 2006. Downloaded on October 12, 2008 from <http://www.magazine.org/content/Files/MEFullStudy2006.pdf>.

McKenzie-Mohr, Doug and William Smith (1999) Fostering sustainable behavior: An introduction to community-based social marketing. New Society Publishers, Gabriola Island B.C., Canada.

Patton, M. (1982) Practical Evaluation. Thousand Oaks, California: Sage.

Peacock, James (2002) Radio effectiveness compendium. Radio Advertising Effectiveness Laboratory. Downloaded October 12, 2008 from www.radioadlab.org/studyDocs/RALResearchCompendium.doc.

Imperial, Mark & Lloyd Jones (2005) Evaluation of the Burnt Mill Creek Outreach and Demonstration Project. Final Report, University of North Carolina at Wilmington.

Ray, Michael L. (1973) Marketing communication and the hierarchy-of-effects. Excerpted from New Models for Mass Communication Research. Sage Series in Communication Research.

Schultz, P. Wesley (2008) Knowledge, information and household recycling: Examining the knowledge-deficit model of behavior change. Excerpted from New Tools for Environmental Protection: Education, Information and Voluntary Measures1. Edited by Thomas Dietz and Paul C. Available online at <http://www.epa.gov/epawaste/rcc/resources/meetings/rcc-2008/sessions/msw/attitudes/schultz2.pdf>

Simon, Julian L. & Johan Arndt (1980) The shape of the advertising return function. Journal of Advertising Research, Vol. 20, No. 4, August 1980, 11-28.

Shandas, Vivek (2007) An Empirical Study of Streamside Landowners' Interest in Riparian Conservation. Journal of the American Planning Association, Vol 73, No. 2.

Sissors, Jack & Roger Baron (2002) Advertising media planning, 6th edition. McGraw-Hill.

Stormwater Manager's Resource Center (1995) Indicator profile sheets. Available online at: <http://www.stormwatercenter.net/>

Swann, Chris (2000) A survey of nutrient behavior among residents in the Chesapeake Bay watershed. Pages 230-237 in Proceedings of the National Conference on Tools of Urban Water Resource Management and Protection, February 7-10, 2000, Chicago, Illinois. Available online at <http://www.epa.gov/ord/WebPubs/nctuW/Swann.pdf>.

Tellis, Gerard J (2004) Effective advertising: Understanding when, how and why advertising works. Sage Publications, University of South Carolina.

W.K. Kellogg Foundation (WKKF) (2004) Logic Model Development Guide. Battle Creek, MI. Available at <http://www.wkkf.org/Pubs/Tools/Evaluation/Pub3669.pdf>.

Other Resources

Bischoff-Turner, Shelli (2005) Practical evaluation of outreach and public relations strategies. Manuscript from 4th National Conference on Nonpoint Source and Stormwater Pollution Education Programs, October 2005, Chicago, Illinois.

Coffman, Julie (2003) Lessons in evaluating communication campaigns: Five case studies. Cambridge, MA: Harvard Family Research Project. Available online at: <http://www.mediaevaluationproject.org/HFRP2.pdf>.

Environmental Protection Agency (EPA) (2003) Getting in step: A guide for conducting watershed outreach campaigns, December 2003, EPA 841-B-03-002. Available online at: <http://www.epa.gov/owow/nps/toolbox/print/getnstepguide.pdf>.

Feldman, Jack and John Lynch (1988) Self-generated validity and other effects of measurement on belief, attitude, intention and behavior. *Journal of Applied Psychology* 73, No. 3, 421-435.

Henry, Gary, Margaret Brackett & Craig Gordon (1998) Ozone reduction survey results: Spring, summer and fall 1998. Report for Georgia State University's Applied Research Center, School of Policy Studies. Available online at: <http://aysps.gsu.edu/publications/arc/ozone/Download/FallReportFinal.pdf>

Neiswender, Catherine & Robin Shepard (2003) Elements of successful stormwater outreach and education. Paper for EPA National Conference on Urban Stormwater. February 2003. Available online at: <http://www.epa.gov/nps/natlstormwater03/25Neiswender.pdf>

Shepard, Robin & Catherine Neiswender (2003) A process for determining appropriate impact indicators for watershed projects. Paper for EPA National Conference on Urban Stormwater. February 2003. Available online at: <http://www.epa.gov/nps/natlstormwater03/34Shepard.pdf>

Examples of Stormwater Outreach Evaluation Reports

2008 Residential Survey Report on San Diego's Think Blue Stormwater Program Outreach: <http://www.sandiego.gov/thinkblue/pdf/2008ressurveyfinalreport.pdf>

Think Blue's Strategic Plan: <http://www.sandiego.gov/thinkblue/pdf/stratplanassess.pdf>

Glossary

Ad

Advertisement, also “spot.” The term public service announcement (PSA) is often used interchangeably in stormwater outreach because of the public nature of our message, but the term PSA connotes that the advertising was obtained for free.

Airtime

Runs of television broadcasting and cablecasting as well as to radio broadcasting, May be paid or unpaid (free) airtime

Audience

The demographic or population targeted for the outreach campaign. In mass media outreach, demographic characteristics are usually included (e.g., “adults over 18,” “men ages 35-54,” etc.).

Campaign

A single purchase or “run” of a particular mass media (usually some number of weeks)

Carryover

Any delay in the effect of an ad on members of the target audience

CBSM

Community-Based Social Marketing

Frequency

Measurement that tells you the average number of times members of the target audience or population hears your message in a given period of time

Message

What you want the audience to understand or do

Rating points

Measurement used in broadcast media like television or radio that tells you the percent of your audience that will be reached by a given time, location and channel

Reach

Measurement that tells you how many people your message reached in your general or target audience, expressed as a percentage or a count of individuals reached

Spot

See “ad”

Triangulation

The process of reaching a conclusion about a single communication campaign by using a number of measurements, rather than relying on a single measurement.

Vendor

Media airtime provider, such as a specific television channel, radio network, or cable service.