

⋮

Background Paper

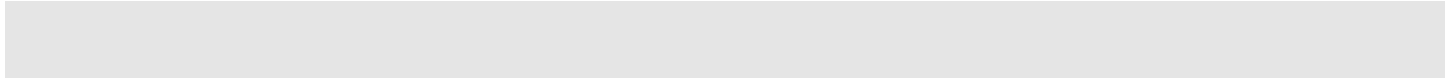
Risk Communication, Children's Health, and Environmental Tobacco Smoke

• • • • • • • • • •



*Vincent T. Covello, Director, Center for Risk
Communication, 39 Claremont Avenue, Suite 71,
New York, New York, 10027 USA*

Tel: +1 212 222 7841; Fax: +1 212 749 3590



1. Introduction

Risk communication is a systematic, structured, scientifically based method for communicating effectively about actions that pose a threat to health, safety, or the environment. As applied to children's health and environmental tobacco smoke (ETS), risk communication involves the exchange of information among stakeholders (interested or affected parties) about the nature, magnitude, significance, or control of the risk to children's health posed by exposure to environmental tobacco smoke. ETS stakeholders include, but are not limited to, government agencies, non-governmental organizations, corporations, industry groups, the media, scientists, professional organizations, teachers, parents, siblings, and peer groups.

Information about the risks to children of ETS is communicated by stakeholders through a variety of channels. These include newspaper and magazine articles, billboards, posters, direct mail letters, pamphlets, brochures, fact sheets, videos, television or radio public service announcements, mass media advertising, educational films, television entertainment shows, community meetings, the internet, health fairs, and popular music.

2. Challenges to Effective Communication about the Risks of ETS

More than three decades of risk communication research indicates that there are four basic challenges to any risk communication. Each of these challenges apply to communications about the risks to children of exposure to ETS. These are:

- Complex, confusing, or inconsistent risk messages.
- Lack of trust and credibility of information sources.
- Distortions by the news media.
- Psychological biases.

Each of these challenges is discussed below. Strategies for dealing with these challenges are discussed in Section 3.

2.1 Complex, Confusing, or Inconsistent Risk Messages

One source of difficulty in communicating information about the risks to children's health of exposure to ETS is the uncertainty and complexity of existing risk data. To make effective decisions, risk managers need to know the potential harm posed by health-related behaviors. Risk assessments are designed to provide this information. Unfortunately, risk assessments seldom provide exact answers. ETS risk assessments suffer from many of the same weaknesses as other health risk assessments. For example, a variety of confounding factors often make it difficult to reach definitive conclusions about cause and effect. This is especially the case when direct testing on humans is ethically prohibited. As a result, the results of any health risk assessment, including ETS risk assessments, must be considered estimates, leaving uncertainties about the actual nature of the risk.

Such uncertainties have, and continue to profoundly affect communications about ETS. For example, the tobacco industry has used these uncertainties to conclude that the risks of exposure to ETS are negligible at best. For example, spokespersons for the U.S. tobacco industry have claimed in various media venues (1) that confounding factors--e.g., diet, exercise, alcohol consumption, and other life style factors—and not ETS, explain the observed relationship between lung cancer and ETS among non-smokers who live with smokers; and (2) that any increase in the probability of contracting lung cancer caused by ETS is substantially less than that caused by bird keeping or pottery making.

2.2 Lack of Trust and Credibility of Information Sources

A central question addressed by the literature on risk communication is why some individuals and organizations are trusted and others are not. This question takes on special importance

given survey results that indicate only modest levels of trust for two of the most prominent sources of information about risk issues--industry and government.

Several factors play a role in creating perceptions of distrust. Three in particular are discussed below.

Debates and Disagreements. In recent years, industry and government scientists have taken radically different positions on the risks of ETS as well as a large number of other potential health or environmental risks. These include the risks of exposure to electric and magnetic fields, lead, asbestos, radon, arsenic, and dioxin as well as the risks of various foods and food additives (e.g., British beef due to mad cow disease, genetically engineered foods, eggs, sugar substitutes, alcohol, caffeine, and food dyes). While such debates and disagreements are constructive for the development of scientific knowledge, they often undermine trust and confidence in science. For example, many people use these debates and disagreements to justify high risk behaviors, such as smoking (e.g., “Scientists have been wrong before and they could be wrong again.”)

Lack of coordination. Coordination among organizations with risk management responsibilities is seldom adequate. In the ETS arena, only limited attempts have been made by health authorities at the local, regional, national, or international level to develop coherent, coordinated, consistent, and interrelated plans, programs, and guidelines for managing or communicating the risks of exposure to ETS. In the United States, for example, several states and localities have passed legislation calling for strict bans against smoking in restaurants, while other states and localities have enacted no such legislation. In addition, several states, especially Florida, have also developed aggressive public service advertising programs focused specifically on ETS and children’s health. However, most states have no such programs.

Inadequate training in risk communication and insensitivity to communication needs .

Many risk communicators lack adequate training in the specific requirements of risk communication. For example, many risk communicators use complex and difficult probabilistic or technical language in communicating information about risks. The use of this language often creates a perception that the communicator is uncertain, unresponsive, aloof, dishonest, or evasive.

Many risk communicators are also insensitive to the special information needs of the targeted population. For example, in the ETS arena, little empirical stakeholder information is available on:

- who is trusted on ETS issues
- who is best suited to communicate ETS messages
- which ETS messages are most persuasive
- where, when, and how ETS messages should be communicated.

2.3 Distortions by the News Media

Surveys and case studies indicate that the news media are critical to the delivery of risk information. A major conclusion from risk communication research focused on the news media is that journalists are biased toward stories containing dramatic or sensational material. As a result, much less attention is given by the news media to health hazards such as ETS that affect many people each year but impact only one life at a time.

Stories about risk are more likely to be reported when they resonant with the needs of journalists looking for newsworthy stories. For example, journalists focus their attention on the same issues that the public uses in evaluating risks -- e.g., dreaded consequences (e.g., cancer among children), lack of trust, lack of familiarity, involuntariness, risks to future

generations, unclear benefits, inequitable distribution of risks and benefits, and potentially irreversible effects.

2.4 Psychological Biases in Assessing Risk Information

Research indicates that a variety of mental short cuts – or heuristics -- are used by people to calculate the probability that an adverse action will happen. One consequence of mental short cutting is that only a small amount of information is used in making decisions about risk.

One of the most important of these heuristics is the “availability heuristic.” The availability heuristic relates to what people remember, and not to what actually has taken place. People typically overestimate some risks and underestimate others. For example, people tend to overestimate the risks of unusual, dramatic or sensational causes of death, such as natural disasters, and underestimate the risks of less dramatic causes, such as cancer, heart disease, and other health hazards associated with ETS.

This bias is caused in part by the tendency for risk judgments to be influenced by the memorability of past events and by the imaginability of future events. A recent disaster, intense media coverage, or a vivid film heightens the perception of risk. Hazards that are more dramatic and spectacular are more easily remembered. Their greater cognitive “availability” explains why people overrate the risks of such hazards. Conversely, risks that not memorable, obvious, palpable, tangible, or immediate tend to be underestimated.

A second cause of bias is unfounded **optimism**. Unfounded optimism leads people to incorrectly ignore or dismiss risk information because of its perceived lack of personal relevance.

A third cause of bias are the psychological factors identified in the risk perception literature (see below). Each of these factors – e.g., perceived trust, benefits, or control -- can change the perception of a risk by several orders of magnitude.

3. Theoretical Models Underlying Risk Communication

Risk communication is based on a number of theoretical models that describe how risk information is processed, how risk perceptions form, and how risk decisions are made. While each model views these processes from a different perspective, as a whole they compliment one another.

Described below are several of the most important theoretical models and their implications for communications about the risks to children of exposure to ETS.

3.1 Communications Theory

The communications theory perspective grew out of social psychological research on the human communications process. It is the central paradigm of mass communications and diffusion of innovation research.

The basic communications theory model postulates an analogy with a telephone, i.e., an information source, channel, message, and receiver. Research conducted within this paradigm includes studies on attitude formation, mass communications, health education, health beliefs, social marketing, advertising, and public information campaigns.

What makes this research relevant to ETS communication is the difficulty of bringing about long term health related attitudinal or behavioral change. In most cases, message resistance or rejection are more the norm rather than the exception.

For any change to take place, a large variety of psychological, social, and other conditions must be met. Knowledge of significant adverse health effects is seldom a sufficient

condition. For example, most people are aware of the significant health risks associated with smoking. Yet in almost all countries of the world more than one quarter of all adults still smoke as well as increasing numbers of teenagers.

3.1.1 Motivation

One of the key findings from this literature is that communication effectiveness is intimately linked to motivation and motivating factors. Motivation is the readiness and interest of the receiver to process information.

Motivating factors are internal factors that arouse, energize, and urge individuals to respond to messages. Motivating factors include security, wealth, success, strength, pleasure, social approval, achievement, protection, and self realization. These needs can be hierarchically arranged. For example, according to Maslow, the human needs hierarchy consists of five different levels: (1) physiological needs, e.g., hunger, thirst, sex; (2) safety needs, e.g., security, stability, protection; (3) the need for belongingness and love, e.g., friendship, relationship, companionship; (4) the need for esteem, e.g., strength, achievement, recognition; and (5) self actualization needs, e.g., the achievement of an individual's highest potential. Messages are more likely to be attended to and/or result in attitude change if a relationship has been established between the message and the receiver's needs.

Human needs for belongingness, love, and esteem play a particularly important role in ETS communications when the risk messages are targeted to parents or children. For example, peer pressure, combined with the need to belong and the desire to conform to group expectations, can be enlisted to support communications about the risks to children of ETS. Peer pressure can be stimulated through advertising and other promotional programs focused on encouraging peers to act aggressively in discouraging parents and others from smoking in the presence of children.

Human needs for safety play a central role in ETS communications when the focus is on policy makers, parents, teachers, and children. As described in the literature on health belief formation, the following four factors (also discussed later in this paper in the section on fear arousing messages) influence safety related attitudes, beliefs, and behaviors, the more severe or damaging the perceived costs or outcomes:

- 1) the higher the perceived probability of an undesirable outcome.
- 2) the greater the perceived efficacy of an action.
- 3) the higher the sense of self-efficacy.

Perceived costs or outcomes may be physical or psychological. Physical costs or outcomes include physical harm, physical effort, and monetary loss. Psychological costs or outcomes include anxiety, worry, fear, embarrassment, and peer disapproval.

Since perceived costs and outcomes play such an important role in information processing, regardless of whether they are actual or anticipated, information relating to these costs and outcomes should be a central element in all ETS risk communications. Cost and outcome information should be communicated through a variety of arguments or appeals. Based on theories of argumentation, at a minimum these include:

- appeals to authority
- appeals to reason
- appeals to emotion or values

To be processed, the information content of these appeals, in reference to ETS, must:

- 1) be perceived as personally relevant by making reference to:
 - personal interests (e.g., compromising the health of current and future family members)
 - values (e.g., unfairly subjecting children to a risk that they did not choose and that

- provides little or no benefit)
 - self-esteem (e.g., being perceived as a good or responsible parent).
- 2) trigger personal involvement with the issue, the content, or the source (e.g. testimonials on the importance of the issue from those that are admired or trusted).

3.1.2 Message Characteristics

Research has identified four classes of message characteristics that affect the effectiveness of a risk communication. These are (a) message style; (b) message order; (c) message bias; and (d) message arguments and appeals. Each is discussed below.

3.1.2.1 Message style.

Message style refers principally to the selection and arrangement of linguistic features. Major dimensions of message style include (1) clarity; (2) forcefulness; (3) intensity; (4) humor; (5) opinionated language; (6) originality; and (7) figurativeness. As described below, these elements can substantially influence the effectiveness of a risk message.

(1) **Clarity.** Clarity is reflected in messages that evoke in the receiver the intended meaning of the sender. Clear messages eliminate any information that is not needed for informed decision making.

Clarity is enhanced by the use of language (a) that is concrete rather than abstract, (b) that elicits similar past experiences, and (c) whose meaning is understood by the target audience.

Two factors that diminish the clarity of a risk message are technical complexity and jargon. To be comprehensible, a risk message must be translated into terms that non-experts can understand.

In recent years, numerous studies have been conducted to determine how to accomplish such translations effectively. Aiding this task is the fact that most computer word processors incorporate elements of this task into their grammar checkers and grade level comprehension routines. For example, most word processors check for comprehension and readability using the following six tests: (1) vocabulary; (2) polysyllabic words; (3) sentence length; (4) paragraph length; (5) active versus passive construction; and (6) verb and subject placement. In the absence of specific knowledge about the intended audience, a default option for comprehension generally accepted by risk communication practitioners is 4 grade levels below the average grade level of the intended audience.

With reference to ETS, this means that the grade level of all ETS risk communications should vary between and within countries. In the U.S., for example, the comprehension level for ETS related communications targeted to the general public would be at the 6th to 8th grade level (approximately that of 12 or 13 year old).

An even more effective technique for achieving clarity is to layer the information in hierarchical tiers ranging from simple to complex. For example, material might be written at a extremely low grade level (e.g., 4th or 5th grade level) at the beginning and then increase in complexity concluding with references to technical reports or documents. One advantage of this method is that it gives control to the individual. It allows a person to access the information at whatever level they feel comfortable.

(2) **Forcefulness.** Forcefulness is reflected in the vitality of language and in the intensity of message presentation or delivery. Vitality depends heavily on the structure of sentences (e.g., active or passive, simple or complex, short or long, loose or periodic). In general, active sentences – e.g., “Smart people don’t smoke when children are present.” – are more forceful and easier to comprehend than passive sentences – e.g., Smoking when children are present is

not done by smart people.” Short, forceful sentences (7 to 12 words maximum) are also positively correlated with message attention and recall.

(3) **Intensity/Enthusiasm.** Intensity and enthusiasm are reflected largely through commitment to the message through verbal and nonverbal cues. Researchers have found a strong and direct relationship between intense and enthusiastic message delivery and persuasiveness. Intensity and enthusiasm are also important factor in attracting attention. The dry, factual, reserved, detached and monotonic delivery style used by many scientists who specialize in ETS issues is often at odds with this principle.

3) **Humor.** Humor is a powerful communication tool. Humor enhances message persuasiveness through a variety of means. If used effectively, for example, it can (a) attract and increase attention to the message or messenger; (b) create or reinforce learning, comprehension, and retention of the message; (c) provide perspective (e.g., through exaggeration); (d) relax the audience and create a positive mood; (e) create a distraction that blocks counter-arguments; (f) increase the appeal of the message source (e.g., by mirroring the audience and humanizing the speaker).

Humor is, however, extremely difficult to use effectively. Moreover, if not used well, it can be counterproductive. For example, inappropriate or poor use of humor can distract attention from the main message, interfere with retention and recall, imply that the sender does not care or is not taking the issue seriously, or create a negative image of the message source.

Since inappropriate humor can indicate insensitivity and lack of caring, a basic dictum of the risk communication literature, applicable to ETS, is to avoid humor in high concern/low trust situations.

(4) **Originality.** Originally refers primarily to messages that convey ideas in novel and fresh ways. Original ideas tend to attract more attention and are generally more effective in communicating meaning. Perceptions of originality are especially enhanced through the use of creative imagery and figurative language (see below). A prime example of the use of creative imagery and figurative language are the public service announcements on ETS and children developed for television by the Florida Department of Health.

(5) **Figurativeness.** Figurativeness refers primarily to the use of pictorial and metaphorical language. Although figurative language expresses ideas less directly than literal language, its major advantage as a communication technique is that it is more memorable. For example, calling a health hazard such as ETS a "loaded pistol aimed at children" or a "time bomb planted in the lungs of our children" conveys threat and danger more strongly than literal language.

Several advantages of figurative language over literal language are idea clarification, explication, and visualization. Figurative language can, in many situations, enhance attention and retention of the message as much as 50 percent. Techniques include anecdotal story telling and analogies adapted to the intended audience.

3.1.2.1.1 Message order.

Message order is the second class of message variables that impact the effectiveness of a risk communication. Research indicates that the order and organization of risk messages can be as important as message content. For example, effective organization can significantly improve message comprehension, can increase listener attentiveness and interest, and can increase the credibility of the message source.

Five specific issues need to be addressed to determine the proper order and organization of risk messages: (a) the placement of refutations of opposing arguments; (b) the placement of

the main thesis; (c) the ordering of arguments with respect to their strength; (d) the ordering of arguments with respect to desirability, and (e) the effects of primacy and recency (i.e., people tend to remember most the first and last things they hear).

One finding of this literature with direct application to ETS is the importance of placing a limited number of key risk messages (1 to 3 maximum) at the beginning of the risk communication and repeating them again at the end using precisely the same words. Presenting key risk messages at the outset and conclusion serves several functions. First, it helps clarify the issues under consideration. Second, it helps direct the listener to attend and respond to the message in specific ways.

3.1.2.1.2 Message Bias.

Message bias is the third class of message variables that affect communication effectiveness. A central question addressed by studies of message bias is how to present opposing and/or supporting views.

While ethical considerations must be given primary consideration in developing any ETS risk communication, research indicates that there are four situations where a one-sided ETS risk communication would be more persuasive than a more balanced risk communication. In general, a one-sided risk communication will be more effective when: (1) listeners are favorably disposed toward the communicator's position; (2) listeners are poorly informed about the issue; or (3) listeners are required to make a public commitment after exposure to the message (e.g., to refrain from smoking in the presence of children).

In general, a more balanced ETS risk communication will be more persuasive when: (1) listeners are initially opposed to the communicator's position; (2) listeners are well informed on the issue; or (3) listeners are likely to be exposed to persuasive counter-arguments by the tobacco industry or others.

3.1.2.2 Message Arguments and Appeals.

Message arguments and appeals form the fourth class of message variables that affect communication effectiveness. A basic step in any communication is the decision regarding what type of argument and appeal to use. The four basic types of arguments and appeals are: (1) logical appeals; (2) emotional appeals; (3) positive (reward or benefit) appeals; and (4) negative (fear) appeals. Each type is described below.

(1) **Logical Appeals.** Logical appeals are based on evidence and reasoning. Two questions are addressed by logical appeals: (1) what type of evidence will listeners accept in order to support the sender's main argument or claim; and (2) what type of evidence will listeners accept as relevant to their decision making.

Evidence is perceived as relevant when it possesses one or more of the following attributes: (1) it is consistent with the listener's knowledge and attitudes; (2) it is consistent with listener's experience; (3) it comes from a highly credible source; and (4) it includes specific and credible ideas.

Logical appeals are based on reasoning, i.e., the process of establishing a relationship between evidence and conclusions. The five basic types of reasoning patterns are (1) induction; (2) analogy; (3) sign; (4) causal relation; and (5) deduction. Reasoning by induction is the process of making inferences from specific events to generalities. Reasoning by analogy is the process of making inferences from one particular event to another. Reasoning by sign is the process of using one event as proof for the existence of another state of affairs. Reasoning by causal relation is the process of explaining why a state of affairs exists or will exist. Reasoning by deduction is the process of making inferences from general beliefs to specific events.

Although the decision as to which type of reasoning to use in any ETS communication depends on issue and the target audience, research indicates that communications in high concern situations are most effective when they provide a minimum of two and no more than three to four reasons for any single key risk message.

(2) **Emotional Appeals.** Emotional appeals typically use affective language and imagery to persuade the receiver. While ethical considerations must once again be primary, research indicates that there are situations in which emotional appeals – e.g., babies and young children experiencing breathing difficulties due to exposure to ETS -- are substantially more persuasive than other types of appeals. For example, several studies have found that emotional appeals are often more effective when presented to listeners who are not likely to engage in additional information searching.

(3) **Positive (Reward/Benefit) Appeals.** Positive appeals typically use rewards, benefits, and other positive incentives to persuade the listener. In general, persuasive messages accompanied by rewards produced significantly greater change than messages that did not include rewards. An example would be reductions in health insurance premiums for parents who indicate that they do not smoke, or do not allow others to smoke, when children are present.

(4) **Fear Arousing (Negative) Message Appeals.** The purpose of message appeals based on fear arousal is to use fear to motivate protective action. Examples include public health or safety campaigns that highlight the adverse consequences of specific target behaviors (e.g., smoking or drunk driving). Although many studies of fear arousing messages are ambiguous in their findings, the research generally supports the conclusion that fear arousing message appeals, if constructed carefully (see below), can be effective in motivating protective action.

Among the many questions that are still unresolved, one of the most important is what level of fear arousal is most effective. In general, the higher the perceived threat and the greater the amount of fear that is aroused, the greater the motivation to take protective action.

There are two major components to a fear arousing message: (1) the risk (or threat) component, and (2) the control component. The risk component has two basic dimensions:

- 1) The severity dimension – i.e., the magnitude of harm that could occur (e.g., “The lungs of children are slowly and irreversibly destroyed by exposure to second hand tobacco smoke”).
- 2) The probability (or susceptibility) dimension, the likelihood of experiencing a harm (e.g., “Children exposed to second hand tobacco smoke are more likely than other children to contract one or more respiratory diseases in their lifetime.”)

Research related to optimism bias indicates that many children will see themselves are unlikely to experience harm from exposure to ETS. Children frequently believe that being young, in and of itself, provides general invulnerability to many health risks and provides specific protection from the risks associated with unhealthy life styles (such as smoking).

One implication of this finding is the importance of raising awareness among children of the health impacts of exposure to ETS and the special vulnerability of children to these impacts.

Fear, as a motivating factor, is therefore aroused when a person is persuaded (1) that an action or behavior will result in severe consequences and (2) that the probability that these consequences will occur is high.

If individuals believe that a risk poses trivial consequences to them (i.e., low perceived severity, or if they believe it is a low probability event or is irrelevant to them (i.e., low perceived probability or susceptibility), they will ignore the risk message and not take protective action.

The control component of a fear-arousing message also has two dimensions:

- 1) Action-efficacy. Action-efficacy refers to perceived effectiveness of the recommended response action in averting or mitigating harm (e.g., beliefs regarding the a cause and effect relationship between second hand tobacco smoke and disease).

- 2) Self-efficacy. Self-efficacy refers to an individual's perceived ability to perform the recommended control action (e.g., for an adult, "Can I stop smoking in the presence of children?" Will I be able to ask a person who is smoking to put his or her cigarette out when children are present?" For a child, "Can I avoid contact with adults or other children who are smoking? Will I be able to ask the person who is smoking to put his or her cigarette out?"). Many factors can contribute to a lack of perceived self-efficacy. These include: social, cultural, economic, or religious factors; fatalism; peer pressure; addiction; and social disapproval.

If individuals (1) are persuaded that the risk is severe and its occurrence is highly probable, but (2) are not persuaded that they are capable of engaging in the recommended control actions, they are likely to experience fear but will not take action. Instead, they will control their fear through a variety of mechanisms, including defensive avoidance or denial. Examples of statements that may indicate defensive avoidance, denial, and other maladaptive responses include: For adults, "Nothing will happen to my children because they are young and strong or because God is protecting them;" "Since I can't stop my own smoking or that of others, I'm just not going to think about it;" "I think it's part of a government conspiracy to get me to stop smoking." "My home is my castle: What I do at home and when I do it, including smoking, is my business." For children, "It won't happen to me because I am young and strong or because God is protecting me;" "Since I can't control the behavior of adults or that of my friends who smoke, I'm just not going to think about it;" "I think it's part of a conspiracy to scare kids away from smoking."

Similarly, if individuals (1) are persuaded that the risk is severe and its occurrence is likely, but (2) are not persuaded that the recommended response action will successfully prevent the threat from materializing, they are likely to experience fear but will not take protective action.

One implication of this research for ETS message development is that message construction can begin only after empirical information is collected on stakeholder knowledge and perceptions related to:

- (1) the risk component of the ETS threat (severity and probability).
- (2) the control component of the ETS threat (action-efficacy and self-efficacy).

3.1.3 Health Risk Information Campaigns

Most health risk information campaigns are based on communications theory and use a combination of one or more of the four basic types of message arguments and appeals: logical appeals; emotional appeals, positive appeals; and fear arousing (negative) message appeals. The overall goal of the typical campaign is to produce large-scale and long-term changes in health attitudes and behaviors.

Numerous research studies indicate that health risk information campaigns seldom achieve their intended objectives. In most cases, only a small percentage of the target population change their attitudes or behaviors as a result of the campaign.

Several lessons from previous health risk information campaigns can be applied to risk communication efforts focused on children's health and ETS. In general, significant long-term ETS related attitude and behavior change is most likely to occur when the ETS campaign is based on a 15 point program.

Specifically, the campaign should:

- (1) Be itself long term.
- (2) Be based on multiple, reinforcing communication channels and media.
- (3) Be accompanied by a carefully designed educational and instructional program.
- (4) Be targeted to the information needs and concerns of highly specified groups.
- (5) Be designed to include opportunities for fact to face communications.
- (6) Be coordinated with community organizations.
- (7) Use interpersonal networks and support groups to reinforce messages.
- (8) Use positive incentives and rewards.
- (9) Use messages that are vivid, interesting, and arousing.
- (10) Involve leaders from community and other groups in program design and implementation.
- (11) Involve existing organizations and networks in the dissemination of information.
- (12) Use empirical information obtained through surveys and other means to identify credible and trustworthy campaign spokespersons.
- (13) Use empirical information to identify preferred channels of communication.
- (14) Include plans for extensive pre-testing.
- (15) Set out with modest objectives.

Two final sets of recommendations for ETS health risk campaigns can be offered. First, consistent with research on the availability heuristic, messages relating to the risks to children of exposure to ETS are more likely to be attended to when they are presented:

- On a continuous basis through information channels that are attended to by the target audience on a regular basis.
- In a manner and style that contains dramatic material.

Second, long term benefits can accrue from efforts focused on helping adults and children understand the methods and assumptions underlying ETS risk calculations. Since many disagreements about levels of risk stem from disagreements about methods and assumptions (e.g., assumptions about dose, exposure, and response), candid disclosure of information is critical to establishing trust and credibility. A model program for this purpose are the health risk assessment instructional modules developed for classroom and community use by the Science Education for Public Understanding Program (SEPUP) at the University of California at Berkeley.

3.1.4 Mental Noise Theory

Mental noise theory focuses primarily on how people process information under stress and how changes in the way information is processed affects the risk communication. Research indicates that when people are in a state of high concern caused by perceptions of a significant health threat, their ability to process information effectively and efficiently is severely impacted. When people feel that that which they value is being threatened, they experience a wide range of emotions. These range from anxiety to anger. The emotional arousal and/or mental agitation generated by strong feelings of anxiety, worry, fear, hostility, anger, panic, and outrage creates mental noise. Much like atmospheric static and its effect on radio communications, mental noise can reduce the ability of the individual to process information efficiently and effectively by as much as 80%.

Research further indicates that exposure to risks associated with negative psychological attributes (e.g., risks perceived to be involuntary, not under one's control, low in benefits,

unfair, and dreaded—see below) are often accompanied by severe mental noise. Severe mental noise, in turn, can interfere with the ability of individuals to engage in rational discourse.

Several communication tools and techniques can be used to overcome the effects of mental noise. Many of these tools and techniques are the same as those mentioned in Section 3.2.2. The critical difference is that they are not just recommended; they are essential.

The most important of these tools and techniques are those that produce messages that are clear and concise.

Clear messages are those that are easily processed by the receiver and that are easily understood. Important tools and techniques for enhancing message clarity are:

- 1) Message repetition, e.g., messages that are repeated exactly the same way two to four times within the same presentation.
- 2) Message visualization, e.g., messages enhanced by the use of audio-visual material (graphs, charts, photographs, exhibits, or video) or by the use of word pictures (analogies or story telling).
- 3) Structured messages (e.g., messages embedded in a highly organized argument).
- 4) Message readability/comprehension, e.g., messages geared to the knowledge/comprehension level of the target audience.

Characteristics of concise messages include:

- 1) A limited number of key messages, e.g., no more than three to four key messages in any risk communication.
- 2) A limited number of words for each risk message, e.g., no more than 12 words per key message.
- 3) A limited number of supporting facts for each risk message, e.g., a minimum of two and no more than 3-4 supporting facts, authorities, reasons, arguments, or examples for each message.
- 4) A limited amount of time for the formal presentation of risk messages, e.g., no more than 15-20 minutes for presentations and no more than 2 minutes for answering specific questions.

3.2. Risk Perception Theory

Beginning in the 1960's, a large research effort was initiated focused on the complexity of factors involved in risk perception and judgements of risk acceptability. A major conclusion of this research is that even though perceptions of levels of risk are related to levels of worry and decisions about acceptability, it is far from a perfect correlation. Many factors affect the way risks are perceived.

At least eighteen of the factors identified to date by risk perception researchers have direct relevance to communications about the risks to children of exposure to ETS. These are:

- 1) **Voluntariness.** Risks from activities perceived to be involuntary or imposed are less readily accepted and perceived to be greater than risks from activities perceived to be voluntary.
- 2) **Controllability.** Risks from activities perceived to be under the control of others are less readily accepted and perceived to be greater than risks from activities under the control of the individual.
- 3) **Familiarity.** Risks from activities perceived to be unfamiliar are less readily accepted and perceived to be greater than risks from activities perceived to be familiar.
- 4) **Fairness.** Risks from activities perceived as unfair are less readily accepted than risks from activities perceived as fair or involving fair processes.

- 5) **Benefits.** Risks from activities perceived to have unclear or questionable benefits are less readily accepted and perceived to be greater than risks from activities perceived to have clear benefits.
- 6) **Understanding.** Risks from activities perceived to be poorly understood are less readily accepted and perceived to be greater than risks from activities perceived to be well understood or self-explanatory.
- 7) **Uncertainty.** Risks from activities perceived as relatively unknown or that pose highly uncertain risks are less readily accepted than risks from activities that are relatively known to science.
- 8) **Effects on children.** Risks from activities perceived to put children specifically at risk are less readily accepted and perceived to be greater than risks from activities perceived as not putting children specifically or directly at risk.
- 9) **Effects on future generations.** Risks from activities perceived to pose a threat to future generations are perceived to be greater than risks from activities perceived to pose no special threat to future generations.
- 10) **Dread.** Risks from activities that evoke fear, terror, or anxiety are less readily accepted and perceived to be greater than risks from activities that do not arouse such feelings or emotions.
- 11) **Trust in institutions.** Risks from activities associated with institutions or organizations lacking in trust and credibility are less readily accepted and perceived to be greater than risks from activities associated with trustworthy and credible institutions and organizations.
- 12) **Reversibility.** Risks from activities perceived to have potentially irreversible adverse effects are less readily accepted and perceived to be greater than risks from activities perceived to have reversible adverse effects.
- 13) **Personal stake.** Risks from activities perceived by people to place them personally and directly at risk are less readily accepted and perceived to be greater than risks from activities that pose no direct or personal risk.
- 14) **Ethical/Moral nature.** Risks from activities perceived to be ethically objectionable or morally wrong are less readily accepted and perceived to be greater than risks from activities perceived not to be ethically objectionable or morally wrong.
- 15) **Human vs. natural origin.** Risks perceived to be generated by human action are less readily accepted and perceived to be greater than risks perceived to be caused by nature or "Acts of God."
- 16) **Victim identity.** Risks from activities that produce identifiable victims are less readily accepted and perceived to be greater than risks from activities that produce statistical victims.
- 17) **Nature of evidence.** Risks based on evidence from human studies are less readily accepted and perceived to be greater than risks based on animal studies.
- 18) **Effects manifestation.** Risks from activities perceived as having delayed effects are less readily accepted and perceived to be greater than risks from activities perceived to have immediate effects.

These factors play a large role in determining levels of concern, worry, anger, and fear. Concern, worry, anger, and fear, can in turn, result in significant attitudinal and behavioral change. For example, levels of concern, worry, anger and fear tend to be most intense when the risk in question – e.g., exposure to ETS -- is perceived to be:

- involuntary,
- unfair,
- not under one's personal control
- low in benefits
- threatening to children
- caused by untrustworthy organizations
- associated with dreaded adverse, irreversible outcomes

Because of the intense feelings such perceptions can generate, these characteristics are often referred to in the risk communication literature as “outrage” factors. Research indicates that an individual’s perception of risk is based on a combination of hazard (e.g., mortality and morbidity statistics) and outrage. When present, outrage factors take on strong moral and emotional overtones. They predispose an individual to react emotionally, which can in turn significantly amplify levels of perceived risk and worry.

3.3 Trust Theory

A common thread in all risk communication strategies is the need to be proactive in establishing trust. Only when trust has been established can other goals, such as education and dialogue, be achieved.

Research indicates that trust cannot be built quickly. Instead, it is the result of ongoing programs, partnerships, actions, performance, and skill in communications.

Key to the success of these efforts is the principle of trust transference. Trust transference states that a lower trusted source takes on the trust of the highest trusted source that agrees with its position on a risk issue. Surveys done in various nations indicate that organizations and individuals perceived to have relatively high to medium trust on health risk issues include:

- Health professionals (e.g., physicians, nurses, dentists, and pharmacists)
- Educators
- Professional and scientific organizations
- The media
- Non-profit voluntary health organizations
- Consumer activist groups

Coordination, collaboration, and dialogue with such groups can substantially enhance trust in messages concerning the risks to children of exposure to ETS. It also limits the effectiveness of challenges to these messages, since a lower trusted source that attacks a higher trusted source generally loses further trust. Any attack on, or criticism of, risk messages provided by the information source becomes an attack on, or criticism of, the higher trusted source that support the information source.

An interesting paradox observed in the literature is that trust tends to increase when risk messages are offered by organizations that appear to be acting counter to their own self interest. This finding is explained in part by a natural suspiciousness toward sources whose self-interest is served by the position they advocate. An example would be a representative of the tobacco industry who argues for stricter regulation of exposure to environmental tobacco smoke. This type of message tends to be even more persuasive than similar messages offered by other stakeholders.

In addition to these observations, a variety of factors affect the degree of trust attributed to a source of risk information. The most important of these are described below.

3.3.1 Source Attractiveness

Source attractiveness plays a key role in the effectiveness of a risk communication. Through identification with a source perceived to be attractive—either physically or psychologically—individuals strengthen their sense of self, social position or role relationships. Identification, in turn, leads to greater trust and a greater willingness to accept a message offered by a source.

This finding is the basis for advertising campaigns that use attractive spokespeople. Celebrities perform a variety of functions, including attracting attention to the message and generating increased message recall. Attractive celebrities tend to be most effective when they are directly associated with the message, e.g., they changed their own attitudes or behavior. Celebrities are least effective when they themselves compete with the message for attention.

A variety of implications for ETS communications can be drawn from this research. For example, the literature on source attractiveness would argue for recruiting celebrity spokespersons associated in the public mind with children (e.g., well known authors of children's books or child actors.)

3.3.2 Source Power.

The five basic types of source power are (1) expert power; (2) reward power; (3) coercive power; (4) legitimate power; and (5) attribute power. Each is described below.

3.3.2.1 Expert Power

Expert power derives primarily from perceptions of the source as an authority figure and a knowledgeable source of information in a specific field. In the ETS arena, this would include nurses, pediatricians, pharmacists, and other health professionals. All other factors held constant, the higher the perceived expertise of the source, the greater the degree of influence on the receiver.

Perceptions of expertise derive primarily from perceptions that the source is knowledgeable and an authority on the issue.

Numerous factors are used to judge expertise, including indicators of:

- Intelligence
- Training
- Authority
- Experience
- Educational level
- Professional reputation and attainment.

Several advantages accrue to those perceived to be expert. For example, studies have found that subjects exposed to information from a source perceived to possess a high level of expertise changed their attitudes significantly more than subjects exposed to information from sources perceived to have lower levels of expertise.

3.3.2.2 Reward Power

Reward power derives primarily from perceptions that the sender has the ability to control rewards and other reinforcements for the desired attitude or behavior. Rewards may be physical (e.g., monetary) or psychological (e.g., praise). In the ETS arena, this would include parents expressing their appreciation in public to other parents for not smoking when children are present. All other factors held constant, the higher the perceived reward power of the source, the greater the degree of influence on the receiver.

3.3.2.3 Coercive Power

Coercive power is closely related to reward power and derives primarily from perceptions that the source has the ability to punish undesired attitudes or behavior – i.e., smoking when children are present. In the ETS arena, this could include statements by health authorities indicating that smoking when children are present is a form of child abuse. All other factors held constant, the higher the perceived coercive power of the source, the greater the degree of influence on the receiver, at least in the short run. Coercive power is generally less effective

than reward power for changes that the sender wants to be internalized since it often creates psychological resistance.

3.3.2.4 Legitimate Power

Legitimate power derives primarily from perceptions that the source is a natural and valid source of influence. One example is the perception that physicians and other health authorities have the "right" to give health care advice. All other factors held constant, the higher the perceived legitimate power of the source, the greater the degree of influence on the receiver. Perceived legitimacy has a powerful influence on communication effectiveness even when no other power base is involved.

3.3.2.5 Attribute Power

Attribute power derives primarily from perceptions that the source has a variety of positive attributes. Two of the most important of these are:

- caring/empathy/commitment
- honesty/openness

In low trust situations, the single most important factor in determining trust and credibility is perceived caring, empathy, and commitment. Caring, empathy and commitment are communicated through a variety of means, including:

- 1) Actions and performance.
- 2) Verbal statements supported by biographical or personal data.
- 3) Non-verbal indicators (eyes, posture, hands, vocal, and 28 other characteristics).

Message testing indicates that people often decide if the communicator is caring, empathetic, and committed within the first two minutes of the communication and often in as little as 9 to 30 seconds. Once this judgment is made, it is often highly resistant to change.

One of the most powerful tools for communicating caring and empathy is mirroring. The power of mirroring is grounded in perceptions of similarity. People typically assign greater trust and credibility to those perceived to be similar to themselves.

Mirroring is produced by several types of information of verbal and non-verbal information, including information from the source or others indicating that the source:

- Cares about the same things
- Shares the same tastes, interests, opinions, and attitudes
- Holds the same values
- Engages in the same activities
- Has the same or similar background

Perceptions of commitment are influenced by beliefs that the communicator is:

- Hardworking (for example, willing to work overtime or go beyond the call of duty and requirements of the job).
- Enthusiastic.
- Diligent .

The second set of factors contributing to attribute power are perceptions of honesty and openness. Various types of information contribute to perceptions of honesty, including information from the source or others indicating that they are:

- Just
- Objective
- Altruistic
- Sincere
- Disinterested

- Accessible
- Forthcoming

Judgements concerning each of these attributes are influenced to a significant degree by non-verbal cues. Research indicates that over 50 percent, and in some cases, as much as 90 percent of the message is communicated through non-verbal cues.

Research also indicates that gender plays a significant role related to these attributes. For example, women in general receive substantially higher initial ratings than men on caring, empathy, commitment, honesty, and openness. These attributes, in turn, substantially affect judgements of trust. Therefore, a woman ETS spokesperson, especially one perceived as also competent and expert, can significantly outrank most men in ratings of trust.

Attribute power is particularly important when the target audience ignores or dismisses risk information because the risk being considered is seen as a proxy or surrogate for other societal concerns or agendas. People often suspect, not without reason, that the risks that society focuses on reflects basic beliefs about values, social institutions, nature, and moral behavior. Risks tend to be exaggerated or minimized accordingly.

All other factors held constant, the higher the perceived caring, empathy, commitment, honesty, and openness of the source, the greater the degree of influence on the receiver. Attribute power produces audience loyalty and audience identification with the source. This in turn produces internalization of the source's ideas, attitudes, and values. Attribute power also operates by producing greater feelings of self-control on the part of the receiver, which in turn increases attitudinal and behavioral commitment.

3.3.3 Implications

A variety of other implications follow upon research on trust and credibility. The first, and most important of these, is the need for greater attention to be given to the training of ETS risk communicators and to the selection of ETS spokespersons. A second implication is the need for greater attention to be given to developing alliances and linkages with credible third parties on ETS issues.

4. Conclusions

As should be clear from this review of the risk communication literature, effective communication about the risks to children of exposure to environmental tobacco smoke is a complex undertaking requiring a great deal of knowledge, planning, and preparation. Only by harnessing this knowledge and devoting sufficient resources for planning and preparation can the goals of the risk communication effort be achieved.

Most important of all is the need for strategies to regain trust. One of the costs of the recent history of mistrust is the reluctance on the part of people to believe information related to any new risk. When perceptions of trust and credibility are missing or weak, the primary goal of risk communication is to strengthen them.

SELECTED READINGS

RISK COMMUNICATION AND RISK PERCEPTION: SELECTED INTERNATIONAL CONTRIBUTIONS

Adams, J. 1995. *Risk*. London: UCL Press.

Bastide, S., Moatti, J-P., Pages, J-P., and Fagnani, F. (1989) Risk perception and the social acceptability of technologies: The French case, *Risk Analysis* 9, 215-23.

Berry, J.W., Poortinga, Y.H., Segall, M.H. and Dasen, P.R. (1992) *Cross-Cultural Psychology: Research and Applications*, Cambridge: Cambridge University Press.

Cvetcovich, G.T. and Earle, T.C. (eds) (1991) Special issue on 'Risk and Culture', *Journal of Cultural Psychology* 22.

Davidson, D.J. and Freudenburg, W.R. (1996) Gender and environmental risk concerns. A review analysis of available research, *Environment and Behavior* 28, 302-339.

Douglas, M. 1992. *Risk and Blame*, London: Routledge.

Douglas, M. and Wildavsky A. (1982) *Risk and Culture: An Essay on the Selection of Technological and Environmental Dangers*, Berkeley, University of California Press.

Faucheaux, C. (1976) Cross-cultural research in experimental social psychology, *European Journal of Social Psychology* 6, 269-322.

Miller-Loessi, K. (1995) *Comparative Social Psychology. Cross-cultural and cross-national*, in K..S. Cook, G.A. Fine and J.S. House (eds) *Sociological Perspectives of Social Psychology*, Boston: Allyn and Bacon, 397-420.

Rappaport, R.A. (1996) Risk and the human environment, *Annals of the American Academy of the Political and Social Sciences* 545, 64-74.

Royal Society Study Group, (1992) *Risk: analysis, perception and management*, Report of a Royal Society Study Group, London: The Royal Society.

Sjoberg, L. (1995) *Explaining Risk Perception: An Empirical and Quantitative Evaluation of Cultural Theory*, Stockholm: Centre for Risk Research.

Sjoberg, L. (1996) A discussions of the limitations of the psychometric and cultural theory approaches to risk perception, *Radiation Protection Dosimetry* 68, 219-25.

Stallings, R.A. (1990) Media discourse and the social construction of risk, *Social Problems* 37, 80-95.

Vlek, C.J.H. and Stallen, P.J.M., (1980) Rational and personal aspects of risk, *Acta Psychologica* 45, 273-300.

Vlek, C.J.H. and Stallen, P.J.M. (1981) Judging risks and benefits in the small and in the large, *Organizational Behavior and Human Performance* 28, 235-71.

Wohlberg, A. and Sjoberg, L. (1997) *Risk Perception and the Media. A Review of Research on Media Influence on Public Risk Perception*, Stockholm: Center for Risk Research.

RISK COMMUNICATION AND RISK PERCEPTION: SELECTED U.S. CONTRIBUTIONS

Arkin, E. B. 1989. "Translation of Risk Information for the Public: Message Development." *Effective Risk Communication: The Role and Responsibility of Government and Nongovernment Organizations*, editors V. T. Covello, D. B. McCalum, and M. T. Pavlova, pages 127-135. Plenum Press, New York.

Covello, V. T., P. M. Sandman, and P. Slovic. 1988. *Risk Communication, Risk Statistics, and Risk Comparisons: A Manual for Plant Managers*. Chemical Manufacturers Association, Washington, D.C.

Covello, V. T., D. B. McCallum, and M. T. Pavlova. 1989. "Principles and Guidelines for Improving Risk Communication." *Effective Risk Communication: The Role and Responsibility of Government and Nongovernment Organizations*, editors V. T. Covello, D. B. McCalum, and M. T. Pavlova, pages 3-16. Plenum Press, New York.

Covello, V. T. (1983), "The Perception of Technological Risks: A Literature Review". Technological Forecasting and Social Change 23, 1983, 285-297.

Covello, V.T. (1988), "Informing the Public About Health and Environmental Risks: Problems and Opportunities for Effective Risk Communication," in N. Lind (ed.) Risk Communication: A Symposium Waterloo: University of Waterloo.

Covello, V. (1989), "Issues and Problems in Using Risk Comparisons for Communicating Right-to-Know Information on Chemical Risks," Environmental Science and Technology, 23, No. 12, pp. 1444-1449.

Covello, V.T. (1991), "Risk Comparisons and Risk Communication," in R. Kasperson, R. and P. J. Stallen, eds., Communicating Risks to the Public Boston: Kluwer Academic Publishers.

Covello, V.T. (1992), "Risk Communication, Trust, and Credibility," Health and Environmental Digest, April 1992, Volume 6, No. 1.

Covello, V.T. (1993), "Risk Communication and Occupational Medicine," Journal of Occupational Medicine, Vol. 35 (1):18-19 (January).

Covello, V., D. von Winterfeldt, and P. Slovic (1987), "Communicating Risk Information to the Public," in J.C. Davies, V. Covello, and F. Allen, eds., Risk Communication Washington, D.C.: The Conservation Foundation.

Fischhoff, B. 1989. "Helping the Public Make Health Risk Decisions." In *Effective Risk Communication: The Role and Responsibility of Government and Nongovernment Organizations*, editors V. T. Covello, D. B. McCalum, and M. T. Pavlova, pages 111-116. Plenum Press, New York.

Hance, B. J. C. Chess, and P. M. Sandman. 1990. *Industry Risk Communication Manual*. CRC Press/Lewis Publishers, Boca Raton, Florida.

Hovland, C.I., Janis, I.L., and Kelley, H.H. Communication and Persuasion New Haven, CN: Yale University Press, 1968.

Janis, I.L., and Feshbach, D. Effects of fear arousing communications. Journal of Abnormal and Social Psychology, 48, 1953, 78-92.

Johnson, B. and V. Covello, eds. (1987), The Social and Cultural Construction of Risk: Essays on Risk Selection and Perception Boston: Reidel.

Kahneman, D., and Tversky, A. (1973). On the psychology of prediction. *Psychological Review*, 80:237-251.

Maslow, A.H. Motivation and personality. New York, NY: Harper and Row, 1970.

McGuire, W.J. The nature of attitudes and attitude change. In G. Lindzey and E. Aronson (eds.), The Handbook of Social Psychology Reading, MA: Addison-Wesley, 1969.

McGuire, W.J. Attitudes and attitude change. In Lindzey and Aronson (eds.), Handbook of Social Psychology, 1985.

McQuail, D. and Wendahl, S. Communications models for the study of mass communications New York: Longman, 1983.

Morgan, G., B. Fischhoff, A. Bostrom, L. Lave, and C. J. Atman. 1992. "Communicating Risk to the Public." *Environ. Sci. Technol.* 26(11): 2048-2056.

National Research Council. 1989. *Improving Risk Communication*. National Academy Press, Washington, D.C.

Petty, R.E. and E. Cacioppo. The elaboration likelihood model of persuasion. Advances in Experimental Social Psychology(19):123-205. 1986

Renn O and Levine D (1991), Credibility and trust in risk communication, in Kasperson and Stallen (eds.) *Communicating Risks to the Public*, Dordrecht, the Netherlands: Kluwer Academic Publishers.

Rice, R.E. and W.J. Paisley (eds.), Public communication campaigns Beverly Hills: Sage Publications, 1981.

Rodgers, E.M. Diffusion of Innovation 3rd ed., Free Press, New York, N.Y., 1983

Rogers, R.W. Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In J. Cacioppo and R. Petty (eds.), Social Psychophysiology. New York, NY: Guilford Press, 1983.

Sandman, P. M. 1989. "Hazard versus Outrage in the Public Perception of Risk." *Effective Risk Communication: The Role and Responsibility of Government and Nongovernment Organizations*, editors V. T. Covello, D. B. McCallum, and M. T. Pavlova, pages 45-49. Plenum Press, New York.

Slovic, P. (1986), "Informing and Educating the Public About Risk," Risk Analysis, Vol. 4: 403-415.

Sternthal B, Phillips LW and Dholakia R (1978), The persuasive effect of source credibility: A situational analysis, *Public Opinion Quarterly* 42:285-314.

Slovic, P. (1987), "Perception of Risk," Science 236: 280-285.

Slovic, P., N. Krauss, and V. Covello (1990), "What Should We Know about Making Risk Comparisons," Risk Analysis, 10: 389-392.

Weinstein, N.D. Unrealistic optimism about future life events. Journal of Personality and Social Psychology, 39, 1980, 106- 120.

Weinstein, N.D. Unrealistic optimism about susceptibility to health problems.Journal of Behavioral Medicine, 5, 1982, 441-460.

Weinstein, N.D. Why it won't happen to me: Perceptions of risk factors and susceptibility. Health Psychology, 3, 1984, 431- 457.

Wildavsky, A. and Dake, K. (1990) Theories of risk perception: who fears what and why, Daedalus 112, 41-0.