



CHAPTER 2

Communication 101: What's Health Got to Do with It?

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LEARNING OBJECTIVES

By the end of this chapter, the reader will be able to:

- Define *communication* and *health communication*.
- Describe how the perceptual process affects communication.
- Identify key principles of information processing theory used in communication.
- Describe the factors that go into how people make decisions based on communication cues.
- Recognize factors influencing how nonscientific audiences process and understand scientific information.
- Describe how health communication is used to address different levels of health behavior.
- Identify numerous contexts in which health communication occurs.
- Describe how risk perception affects communication effects.

► Introduction

Communication is something we do every day, even if we are not talking. We are communicating when we stand quietly in an elevator with other people, when we go to the movies and scream during a horror film, when we are talking with our friend about an assignment that is due, when we are texting or posting to social media, and yes, when we phone home. Although we take these everyday occurrences for granted, our communication follows culturally specific principles of which we are mostly unaware. In this chapter, we will provide an overview of communication, describe some of the cognitive processes that allow us to communicate, and then discuss the basics of health communication.

► Communication

Think about all the times you have had a failure to communicate with someone: You order food and it does not come the way you asked for it, or you ask your friend to do something and they do not do what you asked. Often the problem is that you do not think the person responded “appropriately” to your instructions. These communication failures illustrate the point that communication travels back and forth between a sender and a receiver. The recipient’s response is how we know that a message has been understood as intended. If the response resembles our expectations, we believe our communication was successful.

BOX 2-1 Definition of Communication

Communication: How people use messages to generate meanings within and across various contexts, cultures, channels, and media.

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At its core, communication is how people perceive and use messages to generate common meaning (**BOX 2-1**). The term *meaning* is where we usually get into trouble. Meaning can change according to the context, the culture, and the channel used to convey a message. Think about this example:

You meet someone new who does not make eye contact. The person only responds to your questions and does not initiate any communication. Later, you may think of that encounter and, judging from your own experience, decide this person was not interested in you, or was even being rude.

Now consider that this encounter happened in a federal Special Supplemental Nutrition Program for Women, Infants, and Children clinic where you were the dietitian and the other person was a young Vietnamese mother meeting you for the first time. In her culture, it is a sign of respect to not make eye contact and not speak unless asked a question. The same situation could occur if you were a teacher and the individual was a young student from a culture with similar societal rules. How would you feel now about the interaction?

The Transactional Model of Communication

In communication, the devil is in the details, and often the details are misunderstood due to a breakdown in what is referred to as the **transactional model of communication**. As Barnlund emphasized in his original presentation of the transactional communication model, communication "...is not a reaction to something, nor an interaction with something, but a transaction in which man invents and attributes meaning to realize his purposes."¹ To simplify greatly, the way this meaning is generated is through a process of encoding and decoding. A first individual (the sender) puts thoughts into words, symbols, or gestures. This process is called *encoding*. The encoded message is then

transmitted through a channel by speaking, gesturing, writing, signaling, or the like to the recipient. Upon receiving the words, symbols, or gestures, the second individual applies meaning to them—*decoding*. But it is not that simple, because the message may encounter "noise." Noise is any type of distortion or distraction. Some examples of noise for you as the recipient include not hearing the message because you are at a loud party; being preoccupied with thoughts about a sick friend; or not speaking the same language as the sender. Another example could be that in your country a raised middle finger means something rude and not "hi there." In addition, encoding and decoding are occurring simultaneously, meaning on both the sender side and the receiver side, making it more complicated. These barriers may then prevent the message from being received or fully understood, and miscommunication occurs.

Communication can be viewed as the transfer of symbolic information within a common symbol system. And that means that a symbol must be understood in the same way for those communicating. This can be difficult if the symbols change or are used differently. Think about slang language or texting language—they may mean different things to different people. Writing with ALL CAPS can be used for emphasis, but in social media the writer may be perceived to be angry or yelling. Ogden and Richards proposed the "semantic triangle" (**FIGURE 2-1**) to illustrate this issue.² It indicates that the concept evoked by a word may be different depending on the receiver. If you hear the word *mustang*, do you first think of an animal or a car? It really depends on the context in which the word is communicated and whether you even know that a mustang could also be the name of a car. The essential point is that if people do not share a common symbol system, communication will be difficult.

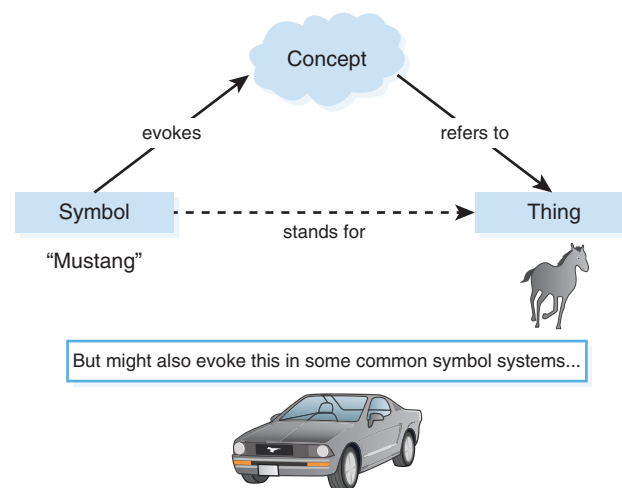


FIGURE 2-1 Semantic triangle.

It's All in Your Head

The field of communication has benefited from discoveries in psychology and neurology, but also extensively from artificial intelligence and information technology. The way we attend to and process stimuli—our perceptions—and the way we remember and assign meaning to these stimuli all have a bearing on our communication abilities.

Perceptual Process and Attribution Theory

Anaïs Nin, referring to an ancient religious text, penned, “We do not see things as they are, we see them as we are.”³ We can imagine two lovers looking at the Seine river flowing through Paris, and one sees a shimmering path and the other sees only dead fish and garbage. We can imagine that one was feeling happy and the other, maybe not so much. Mood is one of many factors that influence our ability to use our senses to take in information. **FIGURE 2-2** illustrates the **perceptual process** and the factors that operate to shape and sometimes distort perception.

Our perceptions are influenced by our internal attitudes, motives, experiences, and expectations. However, characteristics of the object being perceived (e.g., its motion, sounds, size, novelty) or the context

of the situation (e.g., time, place, ambient conditions) can also influence perception. In fact, as we are in the act of perceiving an event or a behavior, we also are attempting to determine what brought it about, or its cause. The social psychological term for this calculation is *attribution*.

Attribution theory, which was developed by Weiner,⁴ posits that when an individual observes an event or a behavior, the thought process goes something like this: Was what I just saw intentional? Is it caused by something internal to the individual or external to the individual? Weiner classified the mental calculations we make in this manner:

- **Distinctiveness:** Does this person behave in this manner in other situations?
- **Consensus:** Do other people behave in the same manner?
- **Consistency:** Does this person behave in the same manner at other times?

Here is an example: You are at a party and see your friend, James, smoking a cigarette. Your thoughts might go like this: Have I ever seen James smoking before (distinctiveness)? Is James with a group of other people who are smoking (consensus)? Have I been at other parties where I've seen James smoke (consistency)?

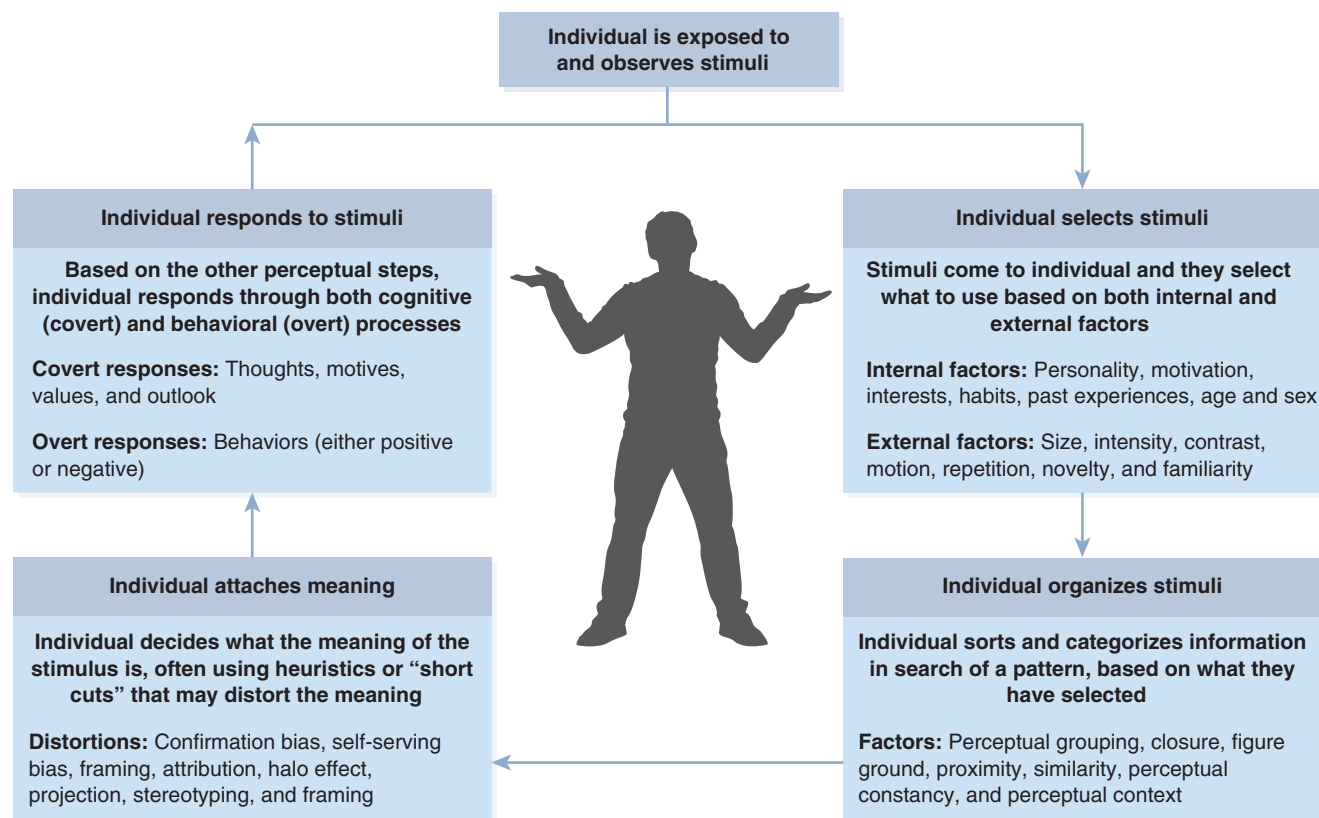


FIGURE 2-2 Perceptual process.

(See **FIGURE 2-3**.) If you come to the decision that your friend James only smokes when others are smoking at a party, you would decide that his smoking was intentional but “externally attributed,” meaning that it was the party that contributed to him smoking. If instead you have seen James smoking in other environments, and not just at parties, the smoking is intentional, but “internally attributed,” meaning that it is something he does all the time and is not being caused by some external factor.

Here is a second example, same party: You see your friend Amy, whom you have known to be a “goody two shoes” since childhood, very intoxicated. This is completely inconsistent with your concept of Amy. You look around and do not see others behaving in this manner (lack of consensus), but you notice that Amy is drinking something pink and sweet. You conclude that either Amy did not realize how much alcohol was in her drink, or worse, that somebody

put something in her drink to make her so drunk or possibly drugged. So, you consider this behavior to be unintentional on Amy’s part and externally attributed.

Cognitive Dissonance

You are still shaking your head over Amy and James, right? This is in part explained by a concept put forth by Leon Festinger called **cognitive dissonance**.⁵ Humans tolerate inconsistencies poorly. We feel most comfortable when our affect (emotion), cognition (reasoning), and behavior are in harmony.⁶ Misalignment of our thoughts, feelings, and behaviors results in an uncomfortable state—cognitive dissonance. To restore a state of comfort, we try to change the condition that is out of line with the others—change our attitudes and beliefs to align with our behavior, or change our behavior to align with our attitudes and beliefs (**FIGURE 2-4**).⁷ James may experience cognitive

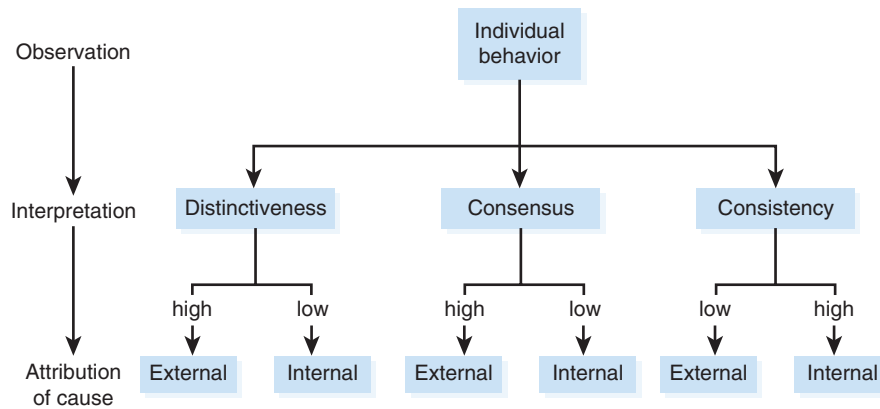


FIGURE 2-3 Attribution theory.

Robbins SP, Judge TA. *Organizational Behavior*. 15th ed. Upper Saddle River, NJ: Prentice Hall; 2013. Reprinted by permission of Pearson Education, Inc., New York, NY.

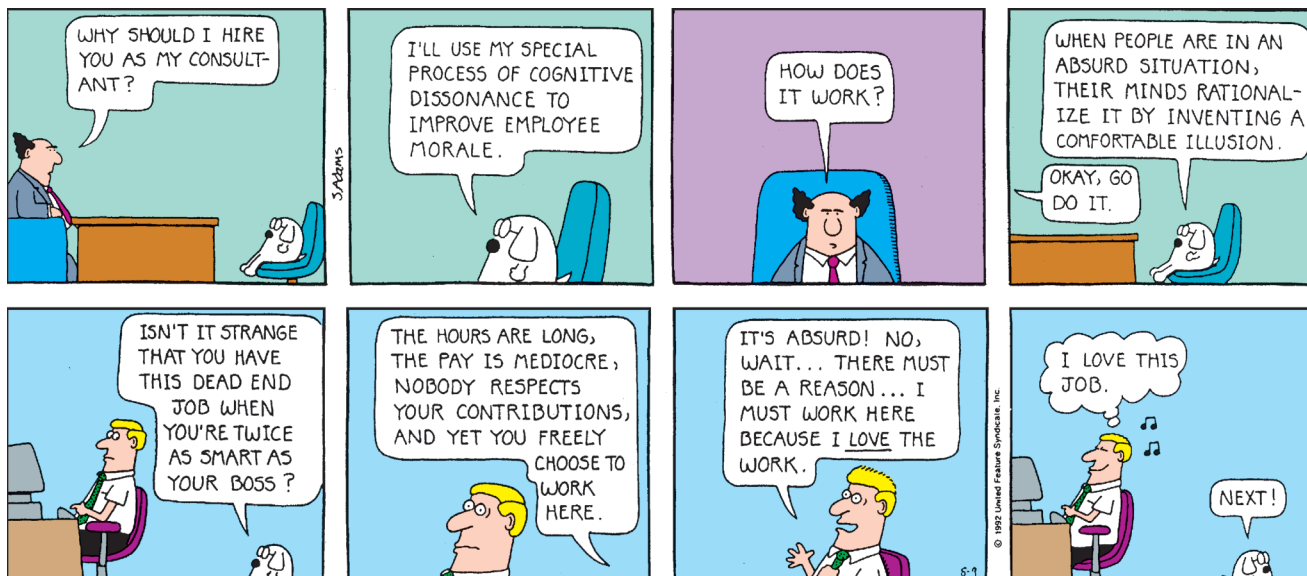


FIGURE 2-4 Cognitive dissonance.

DILBERT © 1992 Scott Adams. Used By permission of UNIVERSAL UCLICK. All rights reserved.

dissonance if he enjoys smoking but also knows that smoking is bad for him. To reduce this dissonance, he can either change his behavior (stop smoking) or change his attitudes/beliefs about smoking (“I can get away with this because I’m still young and, besides, the risks are exaggerated”). A growing field of counseling psychology focuses on aligning self-identity with healthier behaviors (e.g., I’m the kind of person who loves fresh air), more than trying to modify behavior without an attitudinal adjustment. This approach has been adopted in communication efforts, as discussed later in this chapter.

Information Processing Theory

The preceding concepts (perception, attribution theory, and cognitive dissonance) have been a lot to take in. No wonder, because humans are limited in how much information they can process at one time. As infants, we learn to associate word units of sound (phonemes) and meaning (morphemes). Throughout our lives, there are millions of bits of new information passing by our sensory system daily—that is, all the sights, sounds, smells, tastes, and textures we either recognize as “information” or ignore. We also learn to pay attention and attach significance to some of those sights, smells, tastes, textures, and nonverbal sounds. By the time we reach adulthood, our brains have been literally reshaped by stimuli that underlie our knowledge, attitudes, and beliefs as well as by unrecognized cultural and environmental stimuli.

There are thousands of words, numbers, and other organized packets of information that reach us every day, some of which we are capable of processing for memory or action and some of which we are not. On top of our inherent human limitations, *individual* limitations also affect the ability to use complex information to varying degrees. One way the brain deals with information overload is by simplifying and linking new information to old. Once we have managed to learn something, we tend to rely on it as a kind of “shortcut” to interpret new information.

There is extensive literature on these shortcuts for decision making—logical rules or heuristics.⁸ When faced with a complex problem, we tend to focus on one piece of information and draw inferences from it instead of analyzing an entire set of factors—most notably ignoring probability (the likelihood of an event) and denominators (the size of the population in which it is occurring). Some of these heuristics include the following:

- *Selective perception*: Interpretation of what we see based on our own interests, background, experiences, and attitudes and the tendency to overlook information that contradicts those beliefs. (Some

news channels and an increasing number of apps are designed from this perspective.)

- *Halo effect*: A general impression about someone/something based on a single characteristic (e.g., eye color [“Scandinavian”] or height [“You must play basketball”]).
- *Contrast effect*: The comparative evaluation of a person, object, or characteristic as better, or worse, than our own (e.g., “They have a better smile than I do”).
- *Projection*: Attribution of our own characteristics to others (e.g., “If I’m nice, they must be nice, too”).
- *Representativeness*: How much a new perception resembles something that we have seen before, again based on a limited set of characteristics. This is a little complicated but works like this: We have a prototype in our head, attribute this to a class, consider whether the new perception belongs to this class, and then ascribe the prototype’s characteristics to it (e.g., thinking every fresh herb will taste like mint). Recognition is based on similarity to a class prototype.
- *Stereotyping*: A form of representativeness based on our perception of the group to which we believe someone belongs (e.g., gender, profession, religion, or ethnicity).
- *Availability*: The use of only readily available information to make a decision. This happens when you estimate your chance of having a problem or condition by counting only how many of your friends have had something similar.
- *Anchoring and adjustment*: In quantitative situations, people start with a “ballpark” figure (the anchor) and adjust up or down to reach an estimate. These estimates can be wildly inaccurate and influenced by context. Tversky and Kahneman⁹ gave the example of two groups of high school students given 5 seconds to estimate the product of either $8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$ or $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8$. The students who started with the higher numbers had a mean product estimate of 2250, whereas those who started at the lower end came up with 512. (The correct answer is 40,320.)

Heuristics help us, but they can also lead us to make decisions based on false or inadequate estimates.

Elaboration Likelihood Model

Building on the previous models, our ability to pay attention to new information is also affected by how much we care about it. The **elaboration likelihood model (ELM)**¹⁰ suggests that if you are already engaged in an issue, you will pay more attention to

new information about it. Women who are hoping to get pregnant will pay a lot of attention to information (e.g., advertising) about pregnancy or baby care, whereas women not interested in getting pregnant or who do not have a baby will not look twice at ads for diapers.

Without engagement, other stimuli are needed to grab our attention. An example is the use of appealing images to sell things like cologne or personal care products. Most of these ads are aimed at men who do not spend a lot of time thinking about shampoo and body wash. Appealing models may grab their awareness and cause them to pay attention to and “elaborate” the product information presented by the advertiser.

FIGURE 2-5 shows the model developed by Petty and Cacioppo,^{10,11} which posits two routes by which we process and are persuaded by information: a *central route* and a *peripheral route*. In the central route, we are actively engaged in the topic and think about the information carefully (i.e., “elaborate” it), as we decide. In the peripheral route, we are less engaged in the topic, if at all. Other cues, usually culturally specific spokespersons, images, languages, sounds, and the like, are necessary to both get our attention and perhaps persuade us about the merits of a position. In the peripheral route, the cues may have no logical connection to the subject matter, but they help to form an emotional bridge to the information. The ELM suggests that most people will read the pamphlets their doctors give them if they have been diagnosed with a disease but will throw away materials that they feel do not pertain to them. A good example of this model is its use in the national folic acid campaign. The Centers for Disease Control and Prevention (CDC) and the March of Dimes have collaborated in a long-running campaign to prevent birth defects due to a lack of folic acid at the time of conception.¹² The original campaign segmented women of child-bearing age into

two groups: women actively contemplating pregnancy and women who felt they were not ready to think about having children. Using ELM, the “pregnancy contemplators” were motivated to pay attention and elaborate on persuasive messages pertaining to childbirth because they were highly involved with the issue. Those who were “not ready” would tune out information pertaining to pregnancy. Ads featuring cute babies made no impression on them. To reach these women, a peripheral route would be necessary that featured other cues (images, music, role models) and messages that resonated with their attitudes toward being young and healthy. FIGURE 2-6 shows the different communication strategies.

So, before knowing anything else about an individual or a group, and before concerning ourselves with a specific topic, what we have learned from our study of cognition and information processing theory suggests that the most successful communication will:

- Be simple
- Be brief
- Show clear lines of cause and effect
- Grab attention
- Take advantage of decision rules and heuristics

Perception, how we process information, and heuristics all influence not only how a message is received, but also whether someone chooses to act on that message. We will now look at how these basic principles are applied to *health* communication.

► Communicating About Health

We communicate all the time in our daily life (except, arguably, when we are asleep) and encounter health communication nearly as often. BOX 2-2 shows examples of when and how we might encounter health communication.

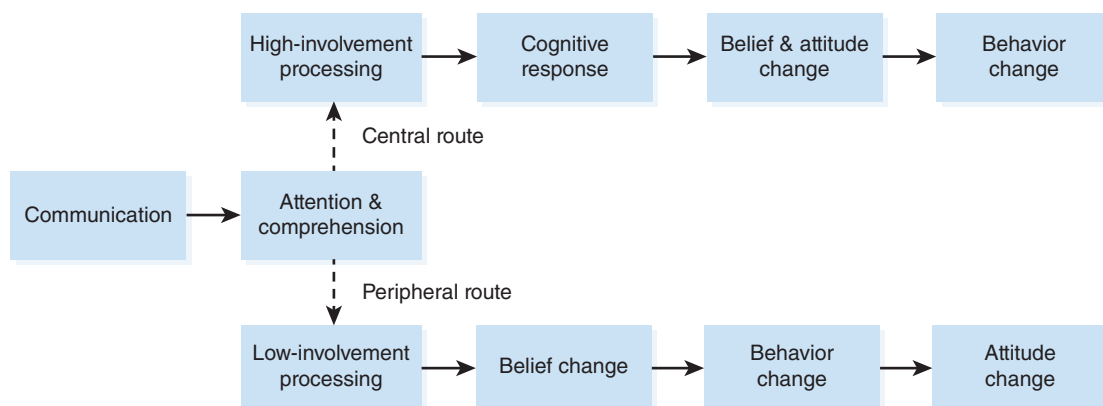


FIGURE 2-5 Elaboration likelihood model.

Modified from Petty RE, Cacioppo JT. The elaboration likelihood model of persuasion. *Adv Exp Soc Psychol*. 1986;19:123-205.

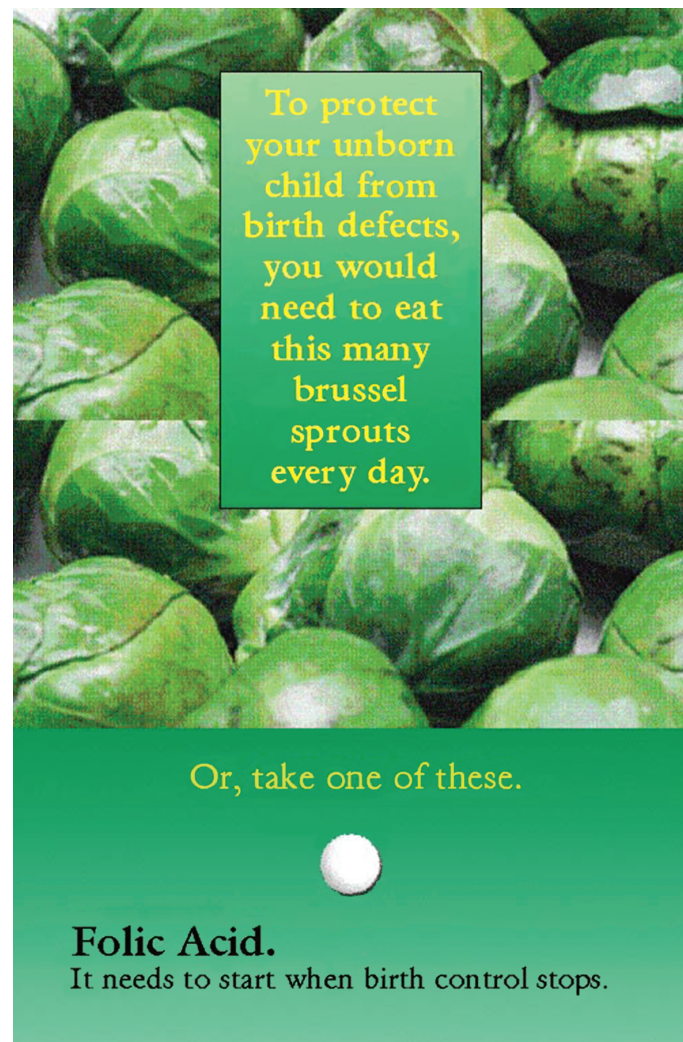
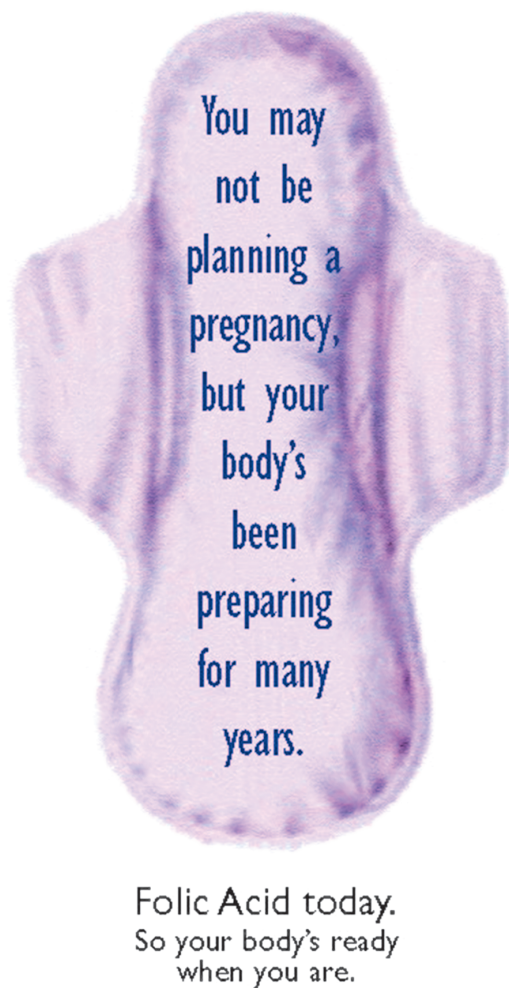


FIGURE 2-6 CDC and March of Dimes folic acid campaign.

Reproduced from Centers for Disease Control and Prevention. CDCynergy, Micronutrients Edition, Folic Acid Case Study. <https://www.cdc.gov/healthcommunication/cdcynergy/editions.html>

BOX 2-2 Examples of Health Communication in Daily Life

- Calling your mom on the phone for advice about your sore throat
- Seeing posters in the pharmacy to get your flu shot now
- Searching for information on the internet about symptoms you are experiencing
- Reading the flyer that came with your medications about how to take them correctly
- Noticing signs in the cafeteria that show the number of calories in each dish
- Hearing emergency TV or radio broadcasts from a local public health official about what to do during a hurricane, flood, or snowstorm
- Looking at advertising in magazines that shows “responsible drinking”
- Engaging in a social media platform that discusses contraceptive choices
- Signing up for health insurance or a clinical trial
- Finding your way in a hospital or clinic to your provider’s office
- Seeing a television show or movie where someone flourishes through good health behavior or perishes due to poor health behavior choices
- Reading tweets from a celebrity about her special needs child and his progress
- Using an internet connection and camera to show your doctor the rash on your arm, from a rural location (i.e., telehealth)
- Participating in a worksite program to quit smoking
- Using a vending machine at school that offers water, low-calorie beverages, and fruit instead of junk food

Practitioners of health communication use what we know about strategic communication in its various forms to *engage* people in thinking about their health, to *inform* them about healthy choices, and to *persuade* them to adopt safe and healthy behaviors. A basic definition of health communication is “The study and use of communication strategies to inform and influence individual and community decisions that enhance health.”¹³ **BOX 2-3** offers other useful definitions of health communication from various experts.

Health communication functions on multiple levels.

- *Individual:* Effective health communication can raise an individual’s awareness of health risks and solutions, provide motivation and skills, link one to a network of support, and create or strengthen positive attitudes. Health communication varies on where we are in what is called a continuum of care relative to disease: prevention (where we hope to stay for as long as possible), but if not, then diagnosis, treatment, hopefully survivorship, but also compassionate and effective end-of-life care. Often this type of communication is done in the context of a patient/individual and a healthcare provider.
- *Group:* Increasingly, health communication takes advantage of social groupings, such as religious congregations, beauty or barber shop clientele, gyms, schools, worksites, or online or social media groups, to deliver programs. The dynamics of group message sharing and reinforcement of positive behaviors make this approach

particularly effective. Organizational partners, such as clubs or civic groups, businesses, government, or national organizations, also amplify the efforts of health communicators to reach larger numbers of people.

- *Community:* Effective health communication can influence policymakers and public opinion to make positive changes in the physical environment, increase the availability of healthy choices in the marketplace, and improve the delivery of healthcare services.
- *Society:* By influencing individual and community values and attitudes, health communication eventually helps create new norms for behavior and standards for quality that affect populations. Laws concerning indoor smoking, child safety seat use, and littering all came about through changing norms at the individual, group, community, and eventually societal level. Global opinions about climate change and national, state, and community standards for energy conservation and recycling also demonstrate health communication at a societal level.

The overarching role of health communication is to support the translation of science into practice and connect information about problems with potential solutions. This can occur at many levels (e.g., intrapersonal, interpersonal, group or organizational, societal), across many channels (e.g., face to face, mass media, social media, written), and in diverse social contexts (e.g., homes, schools, workplaces, hospitals, community groups, population).

BOX 2-3 Definitions of Health Communication

“Health communication is the study of messages that create meaning in relation to physical, mental, and social well-being.”^{14(p9)}

“Health communication encompasses the study and use of communication strategies to inform and influence individual and community decisions that enhance health. It links the domains of communication and health and is increasingly recognized as a necessary element of efforts to improve personal and public health. Health communication can contribute to all aspects of disease prevention and health promotion and is relevant in a number of contexts, including (1) health professional–patient relations, (2) individuals’ exposure to, search for, and use of health information, (3) individuals’ adherence to clinical recommendations and regimens, (4) the construction of public health messages and campaigns, (5) the dissemination of individual and population health risk information, that is, risk communication, (6) images of health in the mass media and the culture at large, (7) the education of consumers about how to gain access to the public health and health care systems, and (8) the development of telehealth applications.”^{15(p11-3)}

“Public health communication: The scientific development, strategic dissemination, and critical evaluation of relevant, accurate, accessible, and understandable health information communicated to and from intended audiences to advance the health of the public.”¹⁶

Harrington, NG. Health communication: an introduction to theory, method and application. In: Harrington NG, ed. *Health Communication: Theory, Method and Application*. New York, NY: Routledge; 2015; U.S. Department of Health and Human Services. Health communication. In: *Healthy People 2010, Volume 1: Understanding and Improving Health*. 2nd ed. Washington DC: U.S. Government Printing Office; 2000:11.0-11.25; Healthpeople.gov website. Bernhardt JM. Communication at the core of effective public health. *Am J Public Health*. 2004;94(12):2051-2053.

Communicating About Health Using the Ecological Model

Remember that our health is affected by our physical environment, the limiting or enabling factors created by our society, as well as our own behavior and biology. Reciprocally, our physical condition and behavior affect the health and social welfare of others, and we obviously affect the physical environment. This is called the ecological model. Evidence

has shown that interventions conducted on multiple levels of the ecological model are more effective than those focusing solely on one level. A good example of this multilevel approach is how communities have addressed the problem of smoking through a combination of taxes on cigarettes, national advertising, worksite cessation and education programs, community-based interventions, and the availability of medical cessation aids (e.g., nicotine gum, patches). **TABLE 2-1** illustrates how health

TABLE 2-1 Communication Interventions in the Ecological Model

Ecological Model Level	Primary Intervention	Communication Support
State, national, global	Policies, laws, treaties, “movements,” emergencies Examples: Global tobacco and traffic safety efforts (WHO and Bloomberg Foundation), U.S. seat belt law, food fortification or enrichment regulations, smallpox or polio vaccination programs, border closing or quarantine to control epidemiologic outbreaks	Advocacy to create or maintain policy or law, national- and state-specific reinforcement advertising, incentive programs, package warnings and labels, government educational campaigns, social mobilization (e.g., national immunization days), multimedia emergency information campaign to advise and calm public
Living and working conditions	Environmental conditions, hours, policies Examples: Worker safety, time off and vacation policies, creation of walking paths, elimination of lead in gasoline and paint, availability of healthy food choices and healthcare services	Citizen or worker advocacy (multimedia) to improve conditions, awareness and promotion campaigns for improved facilities and services, state or local lead education campaigns, private-sector advertising for healthy food choices and services
Social, community, family	Social norms, elimination of social disparities, provision of community health and social services, cultural “rules” for group behavior Examples: Community Watch, day care, church ministries of health, volunteers	Social media campaigns; radio-, TV-, internet-, print-, or locale- (e.g., church, bar) based social marketing or promotional campaigns; opinion leaders and role models; public service announcements; health fairs; small media educational materials; reinforcement of norms through group processes
Individual behavior	Acquisition of beliefs, attitudes, motivation, self-efficacy, products, and services through social marketing, behavior change communications, paid advertising, or psychological counseling Examples: Individual wants to change behavior (e.g., stop smoking, lose weight) or gain knowledge about health (e.g., how to protect self from flu).	Multimedia decision aids; educational materials; guidelines; promotional advertising; reinforcement through home, healthcare providers, and the community
Individual biology, physiology	Prevention or treatment of illness Examples: Individual wants to prevent or treat illness (e.g., screening testing, visiting healthcare provider).	Behavior change communication to maintain or establish good health habits, reminders for screening, healthcare provider communication during office visits

communication strategies can be applied at different levels of the ecological model.

An ecological approach to health communication suggests that all factors affecting a situation should be explored and that upstream factors be considered prior to efforts to change individual behavior. This applies to healthcare provider communication in clinical settings as much as to health-related media campaigns. Obviously, communication alone cannot change some systemic determinants of poor health, such as toxic waste, a poor social environment, limited healthcare resources, or poverty. Even though health communicators are not all-powerful, our responsibilities run deeper than we might think. If individuals who need critical information to protect their health are not seeking or receiving it, understanding it, or being moved to action, we can use health communication to change the situation. This can be done on multiple levels, from the clinical encounter to community-based or media-based messaging. If policymakers who determine national, state, and local laws, regulations, and public services have not received crucial information or been moved to action, we can use policy communication and advocacy to promote change.

Challenges to Effective Health Communication

Designing information to be “clear, compelling, actionable, and available to all who need it...” (personal communication, Katherine Lyon Daniel, Associate Director for Communication, CDC) is hard work! We face many challenges in being effective health communicators.

We previously mentioned several of the psychological processes that determine whether we even notice new information, as well as how quickly, or completely, we process it. Equally educated and linguistically competent individuals will still process information in their own order, speed, and time span. So, even when communicating with audiences we believe to be homogenous, we may need to create multiple versions of messages and materials, and extend the time we allow for communication activities.

There are many at-risk consumers who have limited access to relevant health information, including the elderly, immigrants, and those with low socioeconomic status, limited literacy, and disabilities. These groups may have barriers to accessing information, especially if online, or understanding information because of cognitive deficits or linguistic abilities.

Finally, we need to pay special attention to culture and belief systems. As noted earlier, communication can occur only if people share a common symbol system. If beliefs, values, and expectations are not shared, a shared

meaning of health communication messages is less likely. Many people are simply not motivated to seek out health information, deliberately ignore it when it is presented to them, and possibly negate it when forced to confront it. Some of this behavior is externally attributed, such as belonging to social groupings that demand unhealthy or risky behavior for membership. In this case, the health communicator must work at the group or community level to shift societal norms and attitudes.

A growing challenge is the multitudes of information sources, from traditional media to an almost inexhaustible amount on the internet and social media. Too many people accept individual anecdotes as “trends” and rumors as facts when they see them repeated frequently. In contrast to the flood of dubious information, healthcare providers lament the lack of time they now have available to educate patients. As one primary care physician remarked, “The days when I would have said a patient’s best source of information is their personal physician are long gone. Other healthcare providers might have more time to spend, but physicians are really on a clock these days” (Danine Fruge, MD, personal communication, September 12, 2016). So, choosing an amount of information that can be relayed during a healthcare appointment and ensuring it is appropriate to the patient’s needs also require thought.

Risk and Risk Perception

We previously laid out many of the information-processing foibles that affect communication, including the fact that most people do not consider computed probabilities and population size when thinking about risk. This has a critical bearing on health communication, both when we are trying to gain attention for prevention messages and particularly when we are dealing with presentation of risk. This is called **risk perception**. We use risk comparisons in health care for patients to evaluate the relative value of different procedures or treatments, to explain the likelihood of contracting chronic illness, and to estimate the dangers of environmental contaminants. Presenting these risks during an emergency is one of the most challenging aspects of health communication, engendering an entire field (crisis and risk communication).

Most health risk discussions concern causality (Does A [thing] cause B [disease]?) or risk (If you are exposed to A, what is your likelihood of contracting disease B?). The Environmental Protection Agency (EPA) developed a framework for distinguishing among hazard and risk, exposure, and toxicity, as shown in **BOX 2-4**.

The distinctions in Box 2-4 are important. Toxicity is innate to a substance, whereas hazard, risk, and exposure are situation specific. For example, chlorine

BOX 2-4 EPA Framework for Risk

Hazard: Any source of potential damage or harm or adverse outcome. For example, a substance (such as benzene), source of energy (e.g., electricity), process (e.g., crossing the street) or condition (e.g., wet floor).

Risk: The chance or probability that a person will be harmed or experience an adverse outcome if exposed to the hazard.

Exposure: Contact with a hazard. Exposure varies by the manner of exposure (breathing in, skin contact, whole body) and the quantity of time spent in an exposed condition.

Toxicity: The intrinsic ability of a substance to cause adverse health effects.

Reproduced from U.S. Environmental Protection Agency. *Risk Assessment Guidance for Superfund (RAGS)*. Washington, DC: Environmental Protection Agency; 1989.

is a gas that was used in warfare as a poison. In much smaller doses, we use it to keep our water safe and whiten our wash. Many in risk assessment use the criteria developed by Hill¹⁷ to demonstrate a causal association between environmental risks and disease, as shown in **TABLE 2-2**.

Scientists make the distinctions outlined in Table 2-2 concerning hazards and risks, and apply the criteria defined by Hill when assessing actual risk probabilities. The public, on the other hand, uses little of this thinking when considering risk. In some cases, the public greatly overestimates the risk and demands costly and difficult interventions. In other cases, the public may greatly underestimate the risk and ignore recommendations that might have a substantial impact on their health. A good example of this is the flu and getting vaccinated. Most people greatly underestimate their risk of getting the flu, or believe that if they do get it, it is not a big deal. But the CDC estimates that between 10 and 35 million people get the flu every year, 200,000 are hospitalized, and 12,000 to 56,000 die.¹⁸ Yet less than half of adults and just 60% of children get vaccinated.

We have learned a great deal about how the public at large, which has not studied statistics or probabilities, responds to risk information. To begin, people tend to believe that the members of their own community are all above average but that others are not. An example comes from a survey conducted for the Allstate insurance company. Of the 885 licensed U.S. drivers surveyed, 64% rated themselves as “excellent” or “very good” drivers. In the same survey, more than 70% admitted that “as a result of being distracted while driving, I have slammed the brakes or swerved to avoid an accident, missed a traffic signal, or actually caused an accident.”¹⁹ The clear majority of respondents (91%) did not connect that the fact they texted, listened to music with headphones, ate, put on makeup, or engaged in other distractions while driving might mean they were less than a “very good driver.” By the way, only 29% thought their friends were excellent or very good drivers. This positive self-opinion in the language of risk is called **optimism bias**.

As we described in our discussion of information-processing heuristics, we use another set of rationalizations to manage what might be an overwhelming number of potential hazards in our everyday life. The *more we know* about a risk, the *less likely* we believe it will happen to us. For example, we know now that smoking causes lung cancer, but among smokers, few believe they will get the disease. A form of cognitive dissonance, we *attenuate* or lessen the risk because this allows us to cope with the many risks and events we encounter every day.

Peter Sandman, a specialist in risk perception and risk communication, says, “The risks that kill you are not necessarily the risks that anger and frighten you.”²⁰ Fear is a basic human emotion, grounded in a biological necessity to protect ourselves from danger. What this means is that if a risk occurs that we do not know a lot about, and about which we are likely to feel “outrage,” our perception of that risk is higher because we are fearful, even if the real or actual risk is low. A good example of this is the Ebola outbreak of 2014.

Ebola is a life-threatening infection that has a high mortality rate, but before 2014, outbreaks were contained in rural locations in central Africa. However, the 2014 outbreak occurred in large urban centers in Western Africa, such as Monrovia, Liberia, and affected more than 28,000 people, killing over 11,000.²¹ In the United States, just four people were infected, all of whom contracted the virus either in West Africa or when they cared for a patient who was infected in West Africa. Despite an estimate of contracting Ebola in the United States of 1 in 13.3 million,²² a significant portion of the U.S. public viewed Ebola as a real health threat. An October 2014 Pew Research Center survey found that 41% of respondents were worried that they or someone in their family would be exposed to the virus, including 17% who said they were very worried.²³ As a result, some of the reactions included airline cleaners walking off the job for fear of contamination, parents pulling children out of school because the principal had visited Zambia (which is not located in West Africa, and had no Ebola cases), healthcare workers quarantined against their will in

TABLE 2-2 Important Considerations for Assessing Causality: Hill's Criteria		
Label	Meaning	Rules of Evidence
Strength of association	What is the magnitude of relative risk?	The probability of a causal association increases as the summary relative risk estimate increases. Hill himself was suspicious of relative risks less than two. Others have set the limits higher; however, a relative risk less than two does not rule out the possibility of causality.
Dose–response	Does a correlation exist between exposure and effect?	A regularly increasing relationship between dose and magnitude is indicative of a causal association. This works for bad things, such as the greater the exposure to radiation, the worse your symptoms (usually). It also works for things we are trying to measure in behavior change, such as if you are exposed to 10 advertisements as opposed to 1, will your behavior be any different?
Consistency of response	How many times has this effect been reported in various populations under similar conditions?	The probability of a causal association increases as the proportion of studies with similar (e.g., positive) results increases.
Temporally correct association	Does the exposure precede the effect, or does the occurrence of the disease show the appropriate latency?	Exposure to a causal factor <i>must</i> precede the effect. This is an <i>immutable requirement</i> that is often ignored.
Specificity of the association	How specific is this effect? Do many things influence the effect?	For uncommon health effects (e.g., liver cancer), this evidence can be useful. For diseases with many causes, it is of little use.
Biological plausibility	Is the mechanism of action known or reasonably postulated?	Although a mechanism of action is not a requirement for determining causality, the finding of causality should not be biologically implausible. In contrast, a plausible mechanism of action or other supportive evidence increases the probability of a causal association.
Coherence	Does the cause–effect interpretation seriously conflict with generally known facts of the natural history and biology of the disease?	See the previous entry for biological plausibility.
Experimental evidence	Do laboratory animals show a similar effect?	As in the previous two criteria, findings in laboratory animals are supportive of a causal association. However, materials such as cigarettes, benzene, and arsenic that are notably carcinogenic to humans have all tested negative in animal studies.
Analogy	Do structurally similar chemicals cause similar effects?	For some classes of compounds, such as nitrosamines, structure–activity predictions can be supportive of a causal association. In contrast, materials such as organotins do not lend themselves to cross-class extrapolations.

Data from Friis RH, Sellers TA. *Epidemiology for Public Health Practice*. Gaithersburg, MD: Aspen Publishers; 1999; U.S. Department of Health, Education, and Welfare, Public Health Service. *Smoking and Health: Report of the Advisory Committee to the Surgeon General of the Public Health Service*. PHS Publication No. 1103. Washington, DC: Government Printing Office; 1964; 1103.; Hill AB. The environment and disease: association or causation? *Proc R Soc Med*. 1965;58:295-300.

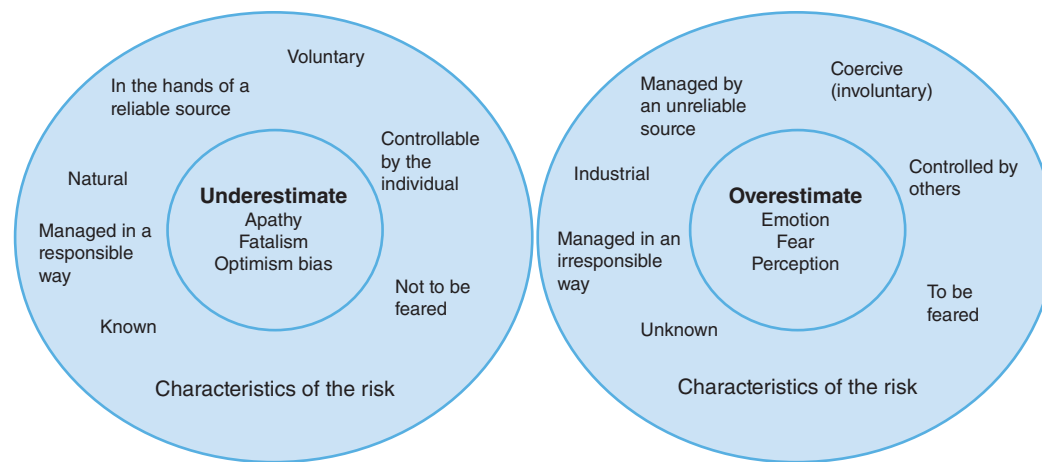


FIGURE 2-7 Public estimation of hazards and risk.

Modified from Slovic P. Perception of risk. *Science*. 1987;236:280-285.

spite of negative (i.e., no exposure) test results, and the U.S. government appointing an “anti-Ebola czar” to oversee U.S.-based efforts to prevent an outbreak.²⁴ One CNN commentator called the public reaction “fear-bola.”²⁵ So why this response to something that would be so unlikely? The answer is risk perception. **FIGURE 2-7** shows how the public perceives various hazards.

People tend to *underestimate* their risk if the hazard is:

- **Voluntary/chosen:** A risk that we choose to take seems less hazardous than one imposed upon us. For example, you may be angry about people texting or looking at their cell phones while driving, but when you do it, it is “different” because you believe you do it safely and are less likely to suffer negative consequences of the action. You are choosing to text and drive, and this allows you to think it is less risky.
- **Natural:** If the hazard comes from a natural event, we think it is less likely to hurt us. Compare the radiation we are exposed to from the sun vs. radiation that we may be exposed to from a cell phone. Although the sun causes the highest number of cancer cases a year (skin), we may fear radiation from a cell phone because it seems scarier, even though there is little evidence that it causes brain cancer.
- **Known:** Risks that are known and we have experience with are less likely to be concerning to us than new or “exotic” risks, even if the known risk is more hazardous. As mentioned previously, few people worry about getting the flu, despite it causing up to 12,000 deaths a year in the United States.²⁶ Compare that to the reaction to Ebola in the United States, which caused only one death.

- **Trusted:** The more confidence we have in those who are responsible for our protection, the less we feel worried about the effect on us. As trust of government and public officials goes down, the more we feel we might be personally impacted.
- **Controlled:** The more we think that the response to the risk is being managed well and the agencies responsible are being honest, the less at-risk we feel.

On the other hand, people tend to *overestimate* risk if the risk is perceived as opposite of these characteristics. Other things that cause overestimation of risk include the following:

- **Dread:** Which idea frightens you more: being eaten by a shark or dying of heart disease? Your risk of being bitten by a shark in your lifetime is 1 in 3,748,067,²⁷ whereas your risk of dying of heart disease is 1 in 4.²⁸ Heart disease is, in fact, the number one killer of people in the United States. Despite this, often the most feared deaths are the ones that worry us the most, despite the low odds of them happening.
- **Childhood impact:** The survival of the species depends on the survival of its offspring; risks to children appear to be more serious than the same risks to adults. For example, finding asbestos in the walls of a school will cause more outrage and fear than finding asbestos in a workplace.
- **Personal impact:** Any risk can seem greater to us if we or others close to us are the victims. If a close friend has had colon cancer, we think that our risk of having colon cancer is higher, despite there being no evidence of this.
- **Previous exposure:** When we can remember a previous risk, the future risk is easier to imagine and seems greater. If we have had a fire in our house, we may fear it happening again and think our risk is higher than it is.

- **Rarity:** Unusual events, such as a nuclear accident, are perceived as riskier than more commonplace risks, such as a car accident. Such unusual events are more fear-producing than everyday occurrences, even though our chances of being in a car accident are far higher.
- **Fairness:** People who feel that they are at higher risk because of who they are or where they live may believe that things are not “fair.” For example, if a chemical plant is in a poor neighborhood, the residents may feel they are at a higher risk to

develop cancer, even if evidence does not support that fear.

► Conclusion

We have discussed what communication is, what might affect it, and how it relates to health. The evolution of the health communication field has produced numerous approaches for practitioners to engage, inform, and persuade individuals about personal-, group-, and community-level health.

Key Terms

Attribution theory

Cognitive dissonance

Elaboration likelihood model
(ELM)

Optimism bias

Perceptual process

Risk perception

Transactional model of
communication

Chapter Questions

1. Using the transactional model of communication, describe the process of message exchange among communicators.
2. Why do actual risk and risk perception tend to differ from one another?
3. What characteristics of risk affect the perception of a particular risk?
4. What is health communication, and how is it used?
5. Give an example of effective health communication for the individual and for the greater community.
6. What are the implications of failing to consider the ecological model when shaping interventions health communicators consider and choose?

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