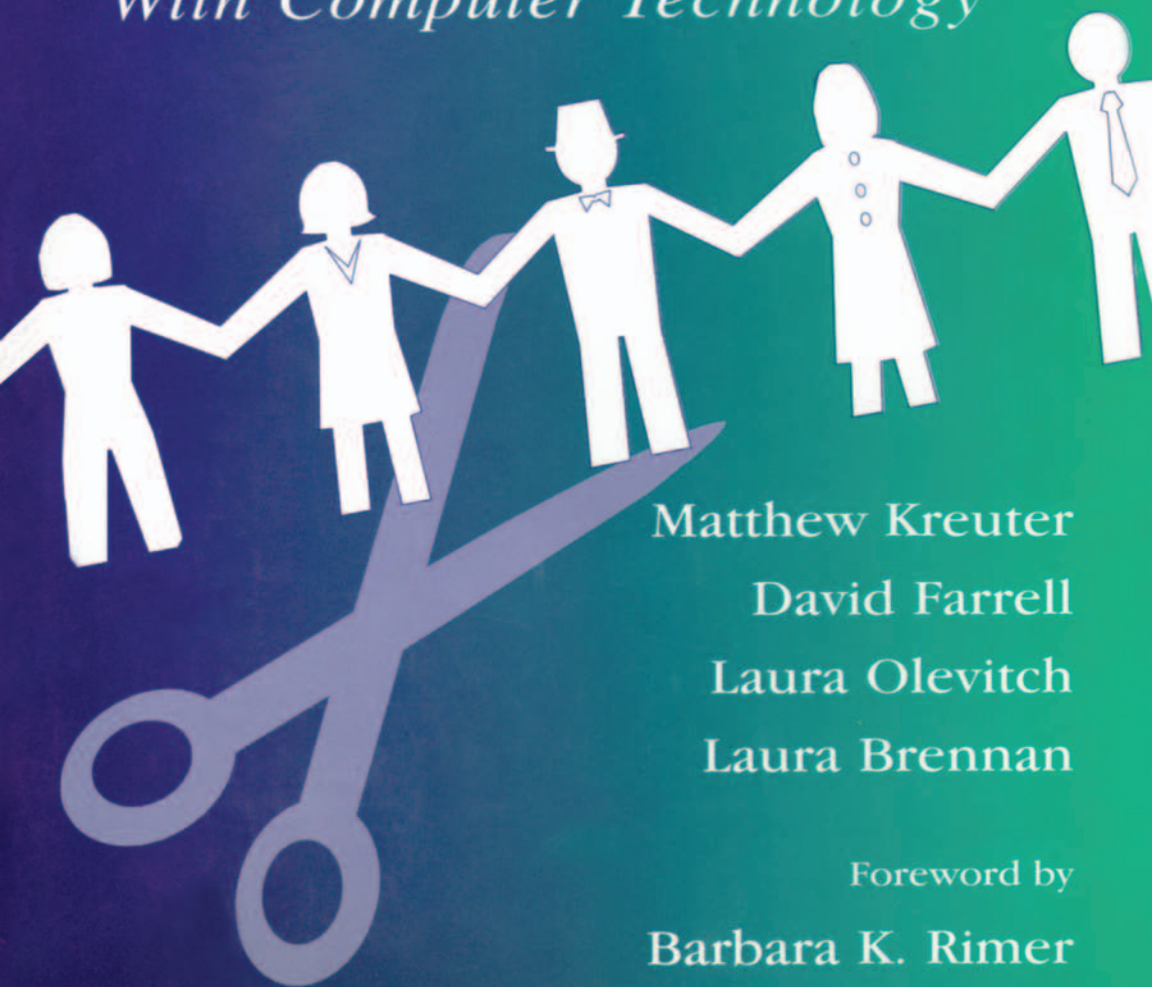


TAILORING HEALTH MESSAGES

*Customizing Communication
With Computer Technology*



Matthew Kreuter

David Farrell

Laura Olevitch

Laura Brennan

Foreword by

Barbara K. Rimer

TAILORING HEALTH MESSAGES

CUSTOMIZING COMMUNICATION
WITH COMPUTER TECHNOLOGY

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CUSTOMIZING COMMUNICATION WITH COMPUTER TECHNOLOGY

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Foreword

It is more than a pleasure, it is an honor to write the Foreword for *Tailoring Health Messages*. It has been obvious for some time that there is a great hunger among researchers, clinicians, and other health practitioners to learn about tailored health communications and to acquire the skills needed to produce them. But until now, the tools to enable greater dissemination have been lacking. *Tailoring Health Messages* fills an important void by providing a scholarly how-to resource that will be as valuable to researchers as it will be to practitioners. The book is incredibly readable. In fact, I was so fascinated that I read it in one sitting.

Tailored health communication is part of the larger field of health communication. Communication is central to effective, quality health care, from primary prevention to survivorship. Communication empowers people; it can raise awareness of health problems and recommended actions, and give people the health information they need to make informed decisions. The Science Panel on Interactive Communications and Health (Henderson, 1999) has concluded that few other health-related interventions have the potential of interactive health communications to simultaneously improve health outcomes, decrease health care costs, and enhance consumer satisfaction.

The communications environment is changing so dramatically that it has been called a communications revolution. Perhaps, the best example of this is the astronomical growth of the Internet. More than 40 million people now use the Internet for a variety of purposes, ranging from e-mail access to Medline and other library retrieval services, online support and delivery of personalized, individualized services. In the future, more and more health communication programs are likely to be delivered online.

Tailoring Health Messages comes at an important point in history. The burgeoning communications revolution offers an ever-increasing array of tools for communication, including interactive CD-ROMs, the Internet, interactive kiosks, wireless pagers, and personal digital assistants. Parallel trends have made powerful computing available at the desktop. In the business world, mass customization has become a way of life. Who has not received a personalized mailing with one's name and perhaps other information emblazoned on the front of it? People have come to expect individualized communications as a consequence of the trend toward mass customization in U.S. society.

Where once health educators and other behavioral scientists relied on generic materials designed to reach as many people as possible, the growing evidence base of tailored communications shows that print and electronic communications created for individuals based on information specific to them can result in significant positive outcomes across a range of health problems and conditions. There are now more than 30 controlled studies of tailored health communications that demonstrate significant main effects or interactions on behaviors such as smoking, diet, and exercise. But tailored communications also are being used in complex areas of health behavior. These include decision making about difficult topics, such as genetic testing for susceptibility to cancer and use of hormone replacement therapy (*Annals of Behavioral Medicine*, 1999). Converging trends in business, health, and computing augur that in the future there will be even greater opportunities to deliver individualized health messages. Given the growth of the evidence base, it now is appropriate to disseminate tailored strategies more widely.

Health educators and others must be poised to develop and deliver state-of-the-science tailored health communications. This book will help them. The "how-to" aspects of this work are especially noteworthy. The focus on the nuts and bolts of tailoring is a unique part of this book. For most people, tailoring has been a black box. This book takes readers inside the black box and shows us how to create design templates to produce tailored communications, how to develop message libraries, and how to operationalize the messages by creating algorithms, and finally, how to evaluate. This information is just what people need! One of the particular values of Tailoring Health Messages is that it puts tailoring into its larger context as part of health communication. But it also takes the reader through the key steps necessary to design tailored communications.

Matt Kreuter and David Farrell were ideally suited to author the first comprehensive text on tailored health communications. Not only were they among the first practitioners of the art and science of tailoring health communications, but they have continued to advance the frontiers of tailored health communications. Laura Olevitch and Laura Brennan are important additions to the author team. Moreover, the authors and their book blend rigorous scientific methodology with a creative, even exuberant, approach to communication. *Tailoring Health Messages* is a groundbreaking contribution and should be read by all who want to communicate more effectively about health.

Barbara K. Rimer

Director

Division of Cancer Control and

Population Sciences

National Cancer Institute

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CHAPTER 1

What Is Tailored Communication?

Imagine opening your morning newspaper to find a cover story reporting the latest developments in your company's industry and providing an analysis of how those developments might affect your work environment and your paycheck. Inside the paper, the sports pages are full with in-depth stories about your favorite players and teams from across the country, and all your favorite comic strips are presented. The financial section focuses on your personal investments, and the weather forecast includes a 5-day outlook for your next business destination. The paper offers feature stories about your favorite hobbies and a review of the latest CD recorded by your favorite artist. Even the advertisements are right for you—a shoe sale at the mall and discount tires at the auto repair shop. It's as if the paper were written specifically for you!

Futuristic fantasy? Not really. Customizing the types of news and advertising a person receives is already quite common via electronic media, such as the World Wide Web, and is becoming more widespread in many forms of print media. It's easy to see how news information can be quickly customized to a specific individual. Because most news information is routinely gathered and reported by existing organizations, it can simply be partitioned for distribution and used in many different ways. But how does this process of customization apply to personal health issues?

Let's say you have an appointment to see your doctor about your high blood cholesterol level. In the past, your doctor has monitored your cholesterol and has lectured you about taking your medication, avoiding fatty foods, and getting more exercise. But today's visit is different. Your doctor gives you the same advice, but at the same time hands you a set of printed materials and tells you to read them. She says, "These have been created just for you and will help you make the changes we've talked about to manage your cholesterol." As you begin reading the materials,

you're amazed at how closely they relate to the specific ways *you* are working to manage your cholesterol. One section reads:

Since you're the person who usually does the grocery shopping for your family, you're in a great position to control the kinds of food that come into your home. The next time you're at the store, try to do most of your shopping on the outside aisles. That's where you'll find healthier foods like fresh fruits and vegetables, whole grain breads, skim milk, and lean cuts of meat. And remember to read the nutrition labels on foods to be sure you're choosing a low-fat option—you haven't been doing this lately.

On another page you read:

It's clear that your family members don't like the taste of lower fat foods and haven't been very supportive of your efforts to eat healthier. That's why it's important for you to try some of the new recipes listed below. They're all Mexican and Italian dishes like the ones your family enjoys, they taste great, but they have only a few grams of fat per serving.

Adjacent to the recipe cards is yet another message. It reads:

It seems like the cold weather has been keeping you from walking every day like you had hoped to in your physical activity plan. Did you know that many of the local malls open early in the winter for walkers? Crestwood Mall is the one closest to your house, and it opens for walking at 6:30 every morning. Mall walking might also help with your recent lack of motivation. You've been struggling with exercise because your walking partner moved away, and this might be a way for you to meet some new people, and not feel like you're exercising alone.

Below that is a new section that reads:

Also, the upset stomach you've been experiencing could be a side effect of the cholesterol lowering medication you're taking. Fortunately, there are several things you can do to prevent it. First, avoid taking your medication on an empty stomach. If you still feel queasy, try taking an antacid tablet before taking your pill, but most importantly, keep taking your medication. It looks like your cholesterol levels are starting to come down, and we want to make sure it stays that way.

Both of these examples—the newspaper and the cholesterol management materials—illustrate how information can be customized, or tailored, to meet the unique needs, interests, and concerns of a specific individual. Although both examples may sound innovative, the basic approach they use is not new at all. Effective teachers, physicians, real estate agents, stock brokers, salespersons, and even hair stylists identify a client's needs through observation and inquiry and use that information to customize solutions.

In the area of health promotion, individual counseling for improved nutrition, physical activity, smoking cessation, stress management,

weight control, and other health-related behaviors is also based on this approach. Counselors ask questions, patients provide answers, and the counselors use that information to determine the most appropriate course of action for that particular individual, given his or her unique life circumstances.

The interpersonal contact, interactivity, and immediate feedback that can be provided in one-on-one counseling make this approach especially desirable. However, the impact of such counseling on the health of populations is limited by cost and by the relatively small number of individuals who can be reached by an even smaller number of trained professionals. That's why tailored health communication, such as the cholesterol management materials described in the second example, are so appealing. With the use of computers, it is possible to generate highly customized health messages on a mass scale, reaching many members of a large and diverse population almost instantaneously. In a recent series of well-designed studies, such computer-generated materials tailored to the unique needs and interests of individual subjects have been shown to be more effective than conventional health communication approaches in helping some patients quit smoking (Prochaska, DiClemente, Velicer, & Rossi, 1993; Strecher et al., 1994), reduce their dietary fat intake (Brug, Steenhaus, van Assema, & de Vries, 1996; Campbell et al., 1994), increase levels of physical activity (Bull, Kreuter & Scharff, 1999; Kreuter & Strecher, 1996; Marcus et al., 1998), and get mammograms (Skinner, Strecher, & Hospers, 1994), cholesterol tests (Kreuter & Strecher, 1996), and childhood immunizations (Kreuter, Vehige, & McGuire, 1996).

The purpose of this book is to introduce the concept of tailoring health messages, present the theoretical rationale and empirical evidence that support using this approach, and describe the steps one must take to create and deliver programs that provide tailored health messages. As with any innovation in the early stages of diffusion (Rogers, 1983), tailored message programs have been used by just a handful of pioneers to date, and mostly within the context of research studies. Given the growing evidence supporting tailored interventions as a promising approach to health promotion, students, practitioners, and researchers in health science and communication disciplines should understand the approach and consider the opportunities it presents for enhancing their work.

Tailoring and Related Concepts

The distinctions between tailored, targeted, personalized, and other forms of health communication are important ones, yet the terms have

too often been used interchangeably in health communication and behavior change research literature (Davis, Cummings, Rimer, Sciandra, & Stone, 1992; Drossaert, Boer, & Seydel, 1996; Eakin et al., 1998; Morgan et al., 1996; Pasick, 1997; Rimer & Orleans, 1994). Given that research findings suggest there can be significant differences in the relative effectiveness of these approaches (Skinner, Campbell, Rimer, Curry, & Prochaska, in press), there is a clear need to standardize terminology. If apples are always compared to oranges, understanding is obscured. Furthermore, the comparative value of different health promotion programs and communication-based interventions cannot be fairly evaluated.

Traditionally, health education materials have been generic, and have aimed to provide as much information as possible within a single health communication, without considering any specific characteristics of prospective consumers (Streicher, Rimer, & Monaco, 1989). Generic materials typically aspire to be all things to all people, providing a single comprehensive set of information about a specific content area. In using generic materials, it is not necessarily assumed that all people have the same informational needs, but rather that individuals can and will sift through the parts of these materials that do not apply to them in order to find and consume those that do. Can you imagine a real estate agent saying to a prospective home buyer, "Here's a street map of our entire city. By going up and down all the streets, you're sure to find something that meets your needs"? A few motivated buyers might use this approach and find the right home, but many more would give up before then, or never start because the burden seemed too great. Alternatively, the agent could have targeted particular neighborhoods for the buyer to explore or even provided the address of one specific home that had all the qualities the buyer was looking for. Either of these alternative approaches—targeted or tailored—would greatly reduce the burden placed on the buyer.

Targeted health education materials are those materials intended to reach some specific subgroup of the general population, usually based on a set of demographic characteristics shared by its members. The use of targeted materials is based on principles of "market segmentation," which aim to find the right kinds of consumers for a particular product or service (Zimmerman et al., 1994). In health promotion, this approach might lead to creating a self-help smoking cessation manual especially for older adults (Rimer et al, 1994), or breast and cervical cancer screening materials for midlife or older women ("Pathways to Freedom," 1992). Although there is a sound public health rationale for using this approach—namely that certain health problems disproportionately affect certain populations—its effectiveness as a communication strategy is

unclear. Implicit in the use of targeted health messages is the assumption that sufficient homogeneity exists among members of a demographically defined population to justify using one common approach to communicate with all of its members. In fact, this assumption is largely unfounded for some populations (Abad, Ramos, & Boyce, 1974; Bryant, 1982; Counsel on Scientific Affairs, 1991; Furino, 1991; Novello, Wise, & Kleinman, 1991; Strecher et al., 1989; Yankauer, 1987). Targeted communication is an incremental advance over the generic one-size-fits-all approach, and there is some evidence that such materials can contribute to individual behavior change (Davis et al., 1992; Gritz & Berman, 1989; Kristeller, Merriam, Ockene, Ockene, & Goldberg, 1993; Morgan et al., 1996; Peppers & Rogers, 1993; Rimer et al., 1994). However, targeted materials cannot address naturally occurring variations between individuals on important factors that are not demographic in nature.

Still, other materials are personalized at the rather superficial level of using some common personal identifier. *Personalization*, or using a person's name to draw attention to an otherwise generic message (Raphel, 1996; Snoddy, 1996) is a commonly used approach in direct-mail marketing (e.g., "Matthew W. Kreuter, you may have already won \$2,500,000!"). This kind of nominally personalized communication is commonly used in mass mailings so that even a very low percentage of returns might generate a profit (Geller, 1997).

Both targeted and personalized communications base their messages on factors that are unique to individuals (e.g., age, race, name), but these factors alone provide little information about the cognitive and behavioral patterns that influence people's health-related decisions and actions. As a result, both approaches lack the depth of understanding that is often necessary in order to develop truly individualized strategies to address complex lifestyle behaviors. For example, which would be more useful to health educators developing a dietary change program: knowing the age, race, and sex of program participants or knowing about their specific dietary habits, cooking skills, and eating patterns? Tailoring health promotion materials allows one to build on the strengths of demographic, personal identification, and behavioral information, without being confined by the limitations inherent in using population-based demographic data alone.

Tailored health promotion materials are any combination of information and behavior change strategies intended to reach one specific person, based on characteristics that are unique to that person, related to the outcome of interest, and derived from an individual assessment (Kreuter, Lezin, Kreuter, & Green, 1998). The process of tailoring health messages is a lot like the process an actual tailor uses to make custom-fit clothing.

A tailor takes a customer's measurements, asks about preferences for fabric, color, and style, and uses this information to create a suit to fit that customer. Likewise, a tailored health communication program measures a participant's needs, interests, and concerns, and uses that information to create health messages and materials to fit that person. Like a cheap suit or a one-size-fits-all jacket, health promotion materials that aim to meet the needs of all people with a single message will seldom fit as nicely as individually tailored materials.

This definition of tailoring highlights the two features that set it apart from other commonly used approaches to health communication. It is *assessment-based*, and as a result its messages can be individual-focused. Figure 1.1 classifies different communication strategies along these two dimensions: (1) the extent to which an individual's characteristics have been assessed in order to drive the communication; and (2) the degree of individualization in the communication itself.

In general, it is expected that as the level of assessment increases, so would the degree of individualization in the content of the communication. Obviously, the more information one has about the intended recipient of the communication, the better equipped one is to create messages and materials individualized to that person's specific needs.

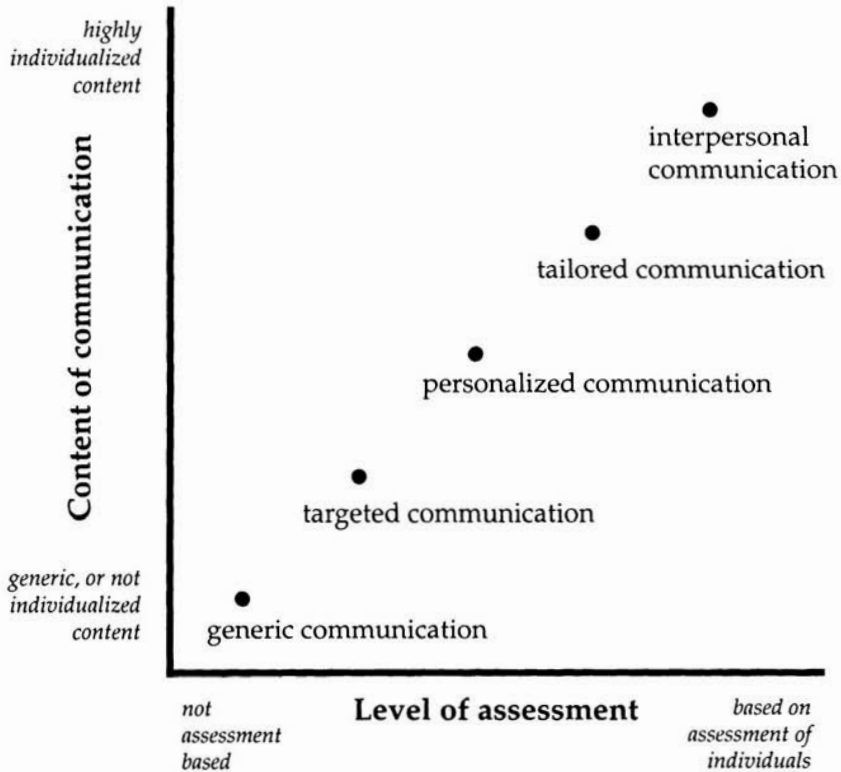
What's in a Name?

As if it's not enough to keep the differences straight among tailored, targeted, and personalized health messages, researchers and practitioners must also contend with a host of synonyms for tailoring that have recently emerged from business and industry. The term "mass customization" was coined by Stanley Davis in 1987 (Davis, 1987) to describe a more individualized approach to the production of consumer goods. This idea was more fully developed by Joseph Pine (1993) who described the opportunity and potential benefits to be gained in some industries by shifting away from systems of mass production toward *mass customization*—a more individualized process based on establishing and maintaining individual relationships with each customer. In advertising and marketing, similar approaches have been labeled "one-to-one," (Peppers & Rogers, 1993) "data-based" or "relationship" marketing, and "micromass communication" (Anonymous, 1997).

Importantly, whether creating health education materials, dress shoes, or marketing appeals, the process underlying each of these terms is fundamentally the same. It requires both an assessment of the individual

Figure 1.1

Classification of Five Approaches to Health Communication by Level of Assessment and Nature of Content.



and a customized end product. Also shared across disciplines is the recognition that this approach has the potential to reach mass populations in an individualized fashion, but there are important differences as well. Foremost among these differences are the motives and objectives for tailoring, specifically the ways in which data obtained from an individual will be used. For example, it is clear that many financial and marketing applications of tailoring principles seek to use such data to exclude or “dump” unprofitable consumers from their business planning (Peppers & Rogers, 1997). Following this kind of profit motive is not consistent with meeting public health objectives. Rather than dumping individuals who appear less likely to adopt a specific behavior change, tailored health communication seeks to identify alternative approaches that might be better suited to that person’s needs or abilities.

A Brief History of Health Communication: How Did We Arrive at Tailoring?

This section is not intended to be a comprehensive history of health communication or health education in the United States—either topic alone would easily fill a book at least the size of this one. Rather, it is meant to give readers a brief review of major changes that have occurred in the 1900s in the ways health information has been communicated to populations. The pattern of evolution described in this section includes some adaptive and some less adaptive changes and helps us to understand how tailoring has emerged as the most recent advance in the field.

“Just the Facts, Ma’am”

During the first half of the 1900s, health education consisted largely of what was termed *health publicity* (Patterson & Roberts, 1951). The primary role of health educators in this era was to pass along information about health and diseases to populations at risk and to the general public. As Lemuel Shattuck had written almost a century earlier in his famous Report of the Sanitary Commission, there was a great need to:

collect and diffuse by personal intercourse, public lectures, printed work, or otherwise, information to the end that among all persons the laws of health and life may be better understood, the causes of disease known and avoided, the term of life extended, the vital force and productive power increased, the greatest possible amount of physical and sanitary happiness enjoyed.”(Patterson & Roberts, 1951, 21–22)

For the most part, this education took the form of presenting facts, dispelling myths, and giving directives for actions believed to enhance health or prevent disease (see Fig. 1.2). Implicit in this approach was the belief that changes in knowledge alone would lead to changes in behavior. As a result, information was poured on the public with the belief that more information would lead to greater changes. Much of this activity took place in school settings, where didactic teaching of health facts and recommended behaviors to school children was commonplace (see Fig. 1.3).

A Shift Toward Community

By the 1950s, increasing emphasis was being placed on working within communities to promote health and prevent disease. Health educators’ traditional role as disseminators of information was not yielding the expected behavioral results, especially when their facts and recommendations were not clearly understood by the intended recipients or when they conflicted with cultural values and beliefs. A new role for health

Figure 1.2

Fact-Based Health Education.



educators as catalysts for change emerged, with community members viewed more as active participants in the change process than empty vessels to be filled with knowledge. As Ivah Everett Deering (1942, p. 26) wrote, "Those who have had a true part in making decisions will not see those decisions lightly set aside." To make health education efforts more effective, it was necessary to better understand the needs and values of those within a community and to find ways to help them achieve whatever measures would most benefit their health. This was clearly a shift toward a more interactive and assessment-based approach to health education and health communication. However, it was still unclear whether such an approach could reach all communities in need.

Reaching the Masses

The use of mass media campaigns in the United States to reach large populations with health messages can be traced back as far as 1721, when Reverend Cotton Mather reportedly distributed thousands of pamphlets throughout the town of Boston, promoting inoculation during a city-wide smallpox epidemic (Paisley, 1989). In 1995, television was reaching 95 million homes in the United States, or 98.3% of all households (U.S. Bureau of the Census, 1997). Where once three major networks

Figure 1.3

School-Based Health Education.

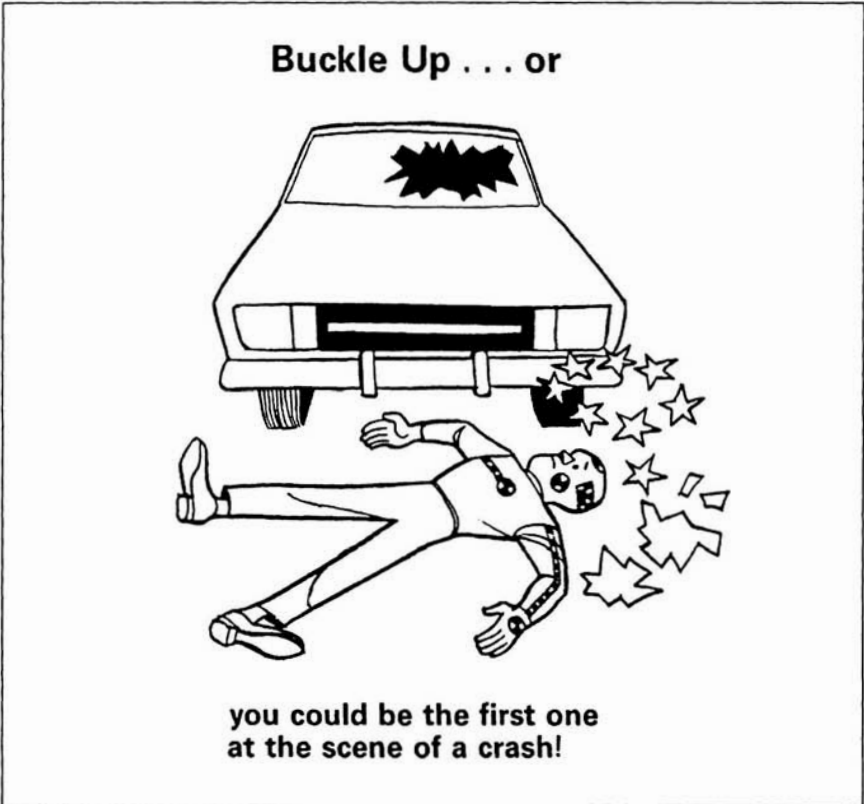


dominated television airwaves, by the late 1980s roughly three-quarters of households had access to 35 or more channels through cable television (Erickson, McKenna, & Romano, 1990). Radio and newspapers also reached large populations, but it was television that held the greatest allure for health educators.

Using the mass media as a vehicle for planned health promotion campaigns was appealing for at least three reasons. First, its broad reach promised to expose vast audiences to important health messages. From a public health perspective, even very modest rates of change in large populations can lead to meaningful reductions in disease. As Chapman (1985, 918) noted in critiquing different approaches to smoking cessation, "a 5% success rate among 10,000 people is over 33 times more efficient than the 30% success rate achieved by group work involving only 50 subjects." Second, mass media campaign planners could exercise control over which messages were shown to whom, and at what time. Third, mass media campaigns would provide high visibility for the health issues they were addressing (see Fig. 1.4), and thus help keep certain issues in the public's eye.

Figure 1.4

Mass Media Campaign.



It seems that many health educators had adopted what Larry Wallack (Wallack, Dorfman, Jernigan, & Themba, 1993) has since termed *the mass media fantasy*—the belief that all public health objectives could be achieved if we could only get the right message to the right person through the right channel at the right time. Excitement about the great potential of mass media campaigns seemed to mask some obvious limitations of this approach. For example, from a communication theory perspective, television offers only one-way communication with no feedback loop or opportunity for interaction (Warner, 1987). There were practical limitations as well, namely cost. It was expensive to produce materials of sufficiently high quality that they could stand out in what had become a busy and highly sophisticated media environment (Hammond, Freimuth, &

Morrison, 1987). Air time for campaign messages was also costly, and, as is true today, most public health agencies had limited budgets.

The alternative to paying for media coverage was to appeal to television stations and networks to air campaign messages as public service announcements (PSAs). This reduced the cost barrier to mass media health communication because radio and television stations are required to provide free air time for community and public service, even though these time slots have been increasingly filled with local promotional pieces (Dessart, 1990). Having limited resources also meant having limited control over the distribution and content of campaign messages. The good news was that one could get air time for free. The bad news was that radio and television stations would rarely fulfill this obligation during prime viewing hours because those time slots generated the most advertising revenue. As a result, most PSA campaign messages were played only sporadically and during odd hours, when far fewer listeners and viewers would be reached. Erickson and colleagues (Erickson et al., 1990) reported that only 30% to 40% of PSAs from the Office on Smoking and Health were aired between the hours of 5:00 p.m. and 11:00 p.m. Similarly, McKenna (McKenna & Romano, 1989) reported that 60% of PSAs from an anti-smoking campaign in New York were aired between midnight and 7 a.m. Finally, from an educational and behavior change perspective, it is unclear how much impact a 30-second message can have on complex lifestyle behaviors.

Right on Target

Unlike mass media campaigns that may reach a vast but undifferentiated audience, targeted communication programs seek to reach a more precisely defined population. Because many important public health problems disproportionately affect specific subgroups within the general population, we target those population subgroups for special programs or services. For example, homicide by gunshot disproportionately affects young African American males (Centers for Disease Control, 1987b). Motor vehicle crash injuries and fatalities are most common among younger drivers (U.S. Department of Transportation, 1987). Rates of screening for breast and cervical cancer are often lower among Hispanic women compared to White women (Centers for Disease Control, 1987a). Such patterns of injury and health-related behavior suggest that special efforts may be needed to address the health problems experienced by members of populations most affected. Not unlike community-focused approaches, the targeted approach to communication reflects recognition of the uniqueness of different populations. Yet although the public health rationale for targeting interventions

is clear and justifiable, its effectiveness as a communication approach may be less so. As previously described in this chapter, it is assumed that a single approach can be used to reach a group of people who hold some (usually demographic) characteristic in common.

An Individual Focus

During the 1970s, researchers' ability to quantify more precisely the impact of various behavioral risk factors on mortality rates was combined with emerging computer technology to develop individualized health risk appraisals (HRAs). To participate in an HRA program, individuals typically complete an assessment to provide information about their health-related behaviors (e.g., smoking, seat belt use), health status indicators (e.g., blood pressure, cholesterol level), and other personal characteristics related to mortality risk (e.g., age, gender, weight, present disease status). This information is fed into a computer-based risk estimation algorithm that weights each of these factors according to its relative contribution to different disease states, establishes a health profile for each participant, and then looks at population mortality rates experienced by others of the same age and sex with a similar profile.

HRA is probably the most widely used health education tool for promoting individual behavior change (Becker & Janz, 1987; DeFries & Fielding, 1990). By 1986, as many as 15 million Americans had participated in HRA or HRA-like programs in worksites, universities, community wellness programs, health fairs, and health care organizations (Schoenbach, 1987). A random sample survey of U.S. worksites showed that, in the late 1980s, HRA activities took place at nearly one third of all worksites (Fielding, 1989). HRA feedback appealed to individual users because its quantification of personal risk status was novel and interesting (see Fig. 1.5). That, in turn, appealed to employers and health care institutions, because it could provide a thumbnail sketch of the risk status and health promotion priorities, in aggregate, for members of a defined population. For some HRA users—though perhaps only the most highly motivated—this individualized feedback may have provided a “cue to action” (Becker, 1974) to reduce their risks.

The use of computers to batch process large amounts of HRA data and provide individualized feedback was a clear precursor of modern tailored communication. However, the designers of most HRA feedback apparently failed to consider some of the important lessons learned from past health education efforts. For example, risk information alone is seldom sufficient to help people change complex lifestyle behaviors. Although HRA feedback may have provided some new information to users initially,

Figure 1.5

HRA Feedback.

Example1
Female Age 48
Mon Jun 17 1991
Version 4.0

YOUR RISK AGE: 68.40 years

NOW TARGET 60.25 years

<-- Risks are elevated due to diabetes and family breast cancer.

THIS REPORT CONTAINS ESTIMATES DUE TO MISSING ITEMS, INCLUDING THE FOLLOWING:
Beer, Wine Coolers, Liquor

Many serious injuries and health problems can be prevented. Your Health Risk Appraisal lists factors you can change to lower your risk. For causes of death that are not directly computable, the report uses the average risk for persons of your age and sex. More technical detail about the report is on page 2.

MOST COMMON CAUSES OF DEATH	NUMBER OF DEATHS IN NEXT 10 YEARS FOR 1000 WOMEN AGE 48			MODIFIABLE RISK FACTORS
	YOUR GROUP	TARGET	POPULATION AVERAGE	
Heart Attack	104	22	6	Avoid Tobacco Use, Blood Pressure, HDL Level, Weight A Low-Fat Diet and Regular Exams Might Reduce Risk Avoid Tobacco Use, Blood Pressure Control Your Weight and Follow Your Doctor's Advice Avoid Tobacco Use
Breast Cancer	43	43	6	
Stroke	19	5	2	
Diabetes Mellitus	18	18	1	
Lung Cancer	12	7	5	Avoid Tobacco Use Avoid Tobacco Use A High-Fiber and Low-Fat Diet Might Reduce Risk Get Regular Exams Avoid Tobacco Use Avoid Tobacco Use Continue to Avoid Heavy Drinking
Kidney Failure	2	2	<1	
Emphysema/Bronchitis	2	<1	1	
Colon Cancer	2*	2*	2	
Ovary Cancer	1*	1*	1	Avoid Tobacco Use Avoid Tobacco Use Avoid Tobacco Use Continue to Avoid Heavy Drinking
Esophagus Cancer	1	<1	<1	
Pancreas Cancer	1	<1	1	
Cirrhosis of Liver	1	1	1	
All Other	21	19	22	
* = Average Value Used				
TOTAL:	227	121	47	Deaths in Next 10 Years Per 1,000 WOMEN, Age 48

For Height 5'7" and Large Frame, 175 pounds is about 20% Overweight. Desirable Weight Range: 139-153

GOOD HABITS
 + Regular pap tests
 + Safe driving speed
 + You don't use smokeless tobacco

TO IMPROVE YOUR RISK PROFILE:
 - Quit smoking
 - Lower your blood pressure
 - Improve HDL level
 - Lower your cholesterol
 - Bring your weight to desirable range
 - Always wear your seat belts

RISK YEARS GAINED
 2.09
 1.84
 1.38
 1.17
 0.20
 0.02

its contents (i.e., showing the link between disease and a person's risk factors like smoking, diet, cholesterol, and blood pressure) have become so mainstream in the health-conscious media that its recommendations are likely to be more obvious than informative to most users today.

Despite HRA's pervasiveness, reviews of the research literature have found little evidence for HRA's efficacy in changing individual behavior (Beery et al., 1986; Schoenbach, 1987; Wagner, Beery, Schoenbach, & Graham, 1982). One explanation for this apparent failure has been that HRA does not provide individuals with sufficient information about how to make the behavior changes it recommends. As described in Chapter 14, there is considerable potential for creating a second generation