

An Innovation Adoption Approach to the Dissemination of Health Information to Consumers

Christine Moorman, Ph.D.
Assistant Professor of Marketing
Graduate School of Business
University of Wisconsin—Madison

This chapter views health information programs as attempts to diffuse health innovations among consumers. The proposed framework draws on previous theory and research in the diffusion of innovations and social marketing to develop a framework that delineates the conceptual, material, and behavioral components of health innovations and that conceptualizes and manages their interrelationships to promote adoption.

To begin, the current state of the health information marketplace and consumers' responses are described. An innovation adoption approach to the design of health information programs is then suggested and literature describing characteristics of health innovations and consumers that influence adoption of health innovations is reviewed. A general framework for managing health information programs is then proposed and specific strategies are overviewed. Finally, data from a recent study are used to generate several example applications of the proposed framework. The implications of this approach are then discussed.

The Status of the Health Information Marketplace

Health information is defined as *knowledge relevant to physical or mental well-being*. This definition suggests that health information is more than mere data; it is information that has a more intelligent nature—it has been processed, codified, and formatted and its implications have been delineated. Three fundamental changes in the health information marketplace have dramatically influenced the intelligence of currently available health information.

First, we have witnessed an explosion in the amount of health information available to consumers. Second, this explosion has been accompanied by an increase in the technical quality of health information. Indeed, Naisbett's (1984) idea that "we are drowning in information, but starved for knowledge" is a reality in the area of health information for many consumers. Finally, health information reaches a wider group of consumers and does so more quickly than in the past. This is the case because consumers often bypass medi-

cal authorities in the gathering of information; because consumers are exposed to health information on labels, in product inserts, and through product advertising; and because the media bring the results of medical studies to consumers more quickly than in the past (even, perhaps, before the results have been subject to replication or to the scrutiny of the larger scientific community).

These changes have resulted in consumers becoming increasingly skeptical and confused about how and whether to use health information ("The great American health pitch," 1989). The challenge, then, is not to make more information available but to create and disseminate information that consumers can *use* in their decisionmaking. A focus on utilization brings a customer orientation to the design and dissemination of health information, an orientation that many critics of health information programs contend is currently lacking. This orientation, adopted in this chapter and depicted in Figure 1, suggests that health information programs be designed and disseminated in such a way as to maximize consumers' utilization of health information.

An Innovation Adoption Approach to Increasing Health Information Utilization

An *innovation* is an idea, material artifact, or practice perceived as new by the target adopter (Rogers and Shoemaker, 1971; Zaltman and Lin, 1971). Using health information nearly always involves innovative activities for consumers because although the health information itself may not be perceived as new, consumers' involvement, thoughts, or behaviors with regard to the information typically are perceived as new. For example, consumers may be aware of nutrition labels, but using nutrition information in decisionmaking may be a new activity for them. Given this distinction, health information programs may be conceived of as involving health innovations.¹

¹ The terms *health information program* and *health innovation* are used interchangeably in the remainder of this chapter.

term (e.g., maintenance and upgrading of equipment) (Fliegal and Kivlin, 1966).

Time or inconvenience is an important cost that consumers incur (Peter and Olson, 1990; Rothschild, 1979). If consumers have to expend a great deal of time adopting an innovation, they are less likely to adopt it. For example, Third World immunization programs that travel to towns and villages in addition to larger cities decrease the time costs associated with immunization.

Costs may also come in the form of effort. Russo, Staelin, Nolan, and others (1986) referred to three types of effort that represent important costs in the utilization of nutrition information: collection effort (acquiring information), computation effort (combining collected information), and comprehension effort (inferring and categorizing meanings associated with information). Likewise, Zaltman and Lin (1971) described the effort necessary to align beliefs, values, and behaviors with the adoption of an innovation (see also Peter and Olson, 1990). Incompatibilities between the change and existing ways of thinking and behaving (Gatignon and Robertson, 1985) may also cause effort to be expended. Ram and Sheth (1989) referred to use behaviors as one type of incompatibility, describing tofu as a product that suffered because its use ran counter to existing food preparation behaviors and consumers were required to make an effort to learn correct use patterns.

Effort may also be created by the perceived complexity of the change. Complexity refers to the sophistication and number of behaviors and the skills required to adopt a change. A low-cholesterol diet is an example of a complex change. It entails adapting food preparation practices, identifying high-saturated fat foods, and modifying consumption patterns. Finally, effort may arise because of the frequency of the adoption. Frequency refers to how often behaviors must be enacted to achieve valued outcomes. For example, improving cardiovascular health requires frequent behaviors—engaging in daily exercise, for instance, and consuming a low-fat diet—whereas an influenza immunization is required only once a year.

Two special types of costs that are unrealized at the time of adoption but that threaten adoption are the risk of loss and the uncertainty associated with both gains and losses. Ram and Sheth (1989) described four types of risk: physical (bodily harm), economic (financial loss), functional (reliability of the product), and social (social disapproval). A variety of factors affect perceptions of risk and uncertainty. One such factor is permanency, which reflects the trialability of the change irrespective of the frequency with which it is performed during that time. Trialability is the degree to which a behavior innovation may be tried on a limited basis (Zaltman and Lin, 1971). For example, the valued outcome of a trim figure can be achieved by a permanent change (plastic surgery) or by a nonpermanent change (diet and exercise). As discussed in the next section, some consumer characteristics also affect perceptions of risk.

Strategies that decrease the cost of adopting the innovation (e.g., strategies that decrease effort, risk, and time) increase adoption. For example, decreasing the financial cost, complexity, and permanency of an innovation makes a health innovation more likely to be adopted. Furthermore, increasing the trialability or compatibility of a health innovation makes its adoption easier for the consumer because it re-

Table 1. A classification of innovation characteristics affecting adoption.

Benefits of innovations

Generic benefits

- Social approval
- Avoidance of discomfort
- Time savings
- Ease of use
- Higher yield
- Self-esteem

Health-related benefits

- Fitness
- Longevity
- Weight control
- Control over life
- Safety from health threats

Costs of innovations

Generic costs

- Financial
- Time
- Effort
- Incompatibilities between innovation and beliefs or behaviors
- Complexity
- Frequency
- Risk and uncertainty
- Permanency
- Observability

Health-related costs

- Learning new behavioral routines
 - Giving up unhealthy behavioral routines
 - Purchasing products and services
 - Collecting, computing, and comprehending health information
 - Changing attitudes and values regarding health
-

quires no change in thinking or practice and because the innovation may be discarded at any time (Zaltman and Duncan, 1977).

Consumer Characteristics Affecting Adoption

Health-related cognitions and motives. *Health value* refers to the extent to which health is a fundamental end state that consumers want to achieve in life (Peter and Olson, 1990; Rokeach, 1973). When health is valued relative to other end states, consumers should enact high levels of health behaviors. This is the case because values represent a central component of consumers' knowledge about themselves (Kihlstrom and Cantor, 1984; Markus, 1977); hence, their fulfillment motivates the acquisition and consumption of information, products, and services. Moreover, when health is valued, no effort is required to change beliefs and values.

Health motivation refers to the extent to which consumers have goal-directed arousal toward health-related activities (Park and Mittal, 1985). Kotler and Roberto (1989) refer to consumers' willingness to learn as a critical factor affecting the adoption of innovations. This willingness can be more broadly interpreted as a motivation, in this case for the consumption of health-related information, products, or services. Consumers can have *enduring* levels of health-related motivation, because they value health or such end states as attractiveness and longevity. Alternatively, consumers can have a *situation-induced* or *stimulus-induced* level of health-related motivation that has been created by the social environment (a need to fit into a group that is health conscious), the information environment (new nutrition information at the point of sale), or the general physical environment (healthy food "giveaways") (see Houston and Rothschild, 1978; Celsi and Olson, 1988).

Health knowledge refers to the extent to which consumers have health-related cognitive structures that assist in information processing. High knowledge levels, in general, have been theorized to reduce consumers' motivation to acquire (collect) more information (Bettman and Park, 1980; E.J. Johnson and Russo, 1984), despite the fact that high knowledge levels also facilitate consumers' ability to process information (Alba and Hutchinson, 1986; Brucks, 1985; E.J. Johnson and Russo, 1984). Knowledge has also been found to improve the quality of decisionmaking (Sproles, Geistfeld, and Badenhop, 1978, 1980) and the performance of various health innovation behaviors, including practicing safe sex (Manning, Barenberg, Gallese, and Rice, 1989), changing dietary practices (Speers, Niemcryk, Morter, and others, 1990), exercising (Avis, McKinlay, and Smith, 1990), and performing sun-protection behaviors (Keesling and Friedman, 1987). Other research has found no such linkage between health knowledge and increased health behaviors, including practicing safe sex (Ottomanelli, Kramer, Bihari, and others, 1990) and performing sun-protection behaviors (Hill, Rassaby, and Gardner, 1984).

Health-risk orientation also affects the adoption of health innovations. Assuming that health is valued, a consumer who is averse to risk may be less inclined to adopt a risky health innovation. A risk-taking consumer, on the other hand, would be more likely to make a risky adoption. Risk takers, who may be associated with such characteristics as the need for variety, excitement, or novelty, will be more inclined to try new behaviors, products, or information sources than will consumers who do not have this need (McAlister and Pessemier, 1982).

Perceived health status refers to consumers' perceived physical and mental well-being. Research suggests that perceived health status may inhibit the adoption of health behaviors because consumers who perceive themselves to be unhealthy do not perceive the benefits associated with health or are uncertain about their ability to achieve a healthy state (Closser, Wallace, Pomrehn, and others, 1990). Other research, however, has found that perceived poor health is associated with higher levels of counseling in hospitals (Pineault, Champagne, Maheux, and others, 1989), medical service utilization, and health-enhancing behaviors (Mechanic, 1982). Therefore, the effect of health status remains equivocal.

Preventive orientation refers to the extent to which consumers believe they should manage their health *prior* to a

health problem's appearance (Dabbs and Kirscht, 1971). *Curative orientation* refers to the extent to which consumers believe their health problems should be managed *after* symptoms appear (Moorman, 1990). Research has found that a preventive orientation increases health behaviors, whereas a curative orientation decreases health behaviors (Zweig, LeFevre, and Kruse, 1988).

Finally, many health innovations provide gratification only long after adoption has occurred, and often if results do occur, they may not be detectable by the adopter, as in the case of many cardiovascular improvements. Hence, consumers who are *able to defer gratification* or who have a *long-term orientation* will be more likely to adopt such health innovations.

Demographic characteristics. Research indicates that age inhibits the processing of information, including nutrition labels, because of elderly consumers' declining cognitive and perceptual skills (see Cole and Gaeth, 1990).² Processing health information from electronic media may also be difficult, because of the presentation speed of such information. Elderly consumers are, however, likely to utilize other sources of information, such as health professionals, family, and friends, who can help them process complicated health information. In addition, the elderly are likely to adopt behavioral (not informational) health innovations, possibly because they encounter less interference (e.g., from work or family) with the enactment of health regimens and because they value their increasingly fragile health at higher levels than do younger consumers.

Income continues to represent access to health behaviors, despite such programs as Medicaid and Medicare (Liem and Liem, 1978; McLeod and Kessler, 1990). High-income consumers, for example, use physicians more often than do low-income consumers (Rosner, Namazi, and Wykle, 1988; Williams, 1990). In addition, low income often coincides with feelings of alienation and psychological distance from mainstream societal norms (Mirowsky and Ross, 1986; Myers, Lindenthal, and Pepper, 1975). Hence, low-income consumers may not enjoy access to communication about social norms involving health or, when exposed to such communication, may not perceive themselves as part of the social system holding such norms. Low-income consumers may, however, rely on family and friends, who are less costly and more convenient than professional or label sources.

Research is mixed on the topic of *gender*; however, results generally indicate that women exhibit more health behaviors than do men (Verbrugge, 1985) and engage in fewer direct-risk behaviors, such as smoking and drinking (Antonucci, Akiyama, and Adelman, 1990; Dean, 1989; Kristiansen, 1990). Women also exhibit more risk-avoidance behaviors (e.g., checking the home for safety hazards), daily health routines (e.g., taking vitamins and eating high-fiber foods), and preventive measures (Hickey, Rakowski, and Julius, 1988; Spilman, 1988).

Psychological control characteristics. *Health locus of control (HLC) beliefs* refer to the extent to which consumers believe they control health outcomes (Rotter, 1966). Lau (1982, 1988; Lau and Ware, 1981) suggested that HLC beliefs are multidimensional, including beliefs in self-

² These skills include, for example, a decreased ability to bring very close objects into visual focus (Kline and Scheiber, 1985), a reduced sensitivity to low levels of light, and a decreased ability to recover from glare (Carter, 1982; Pitts, 1982).

control, provider-control, chance-control, and the existence of general health threats. Consistency between these health beliefs and health-innovation behaviors should emerge because consumers have a need for cognitive consistency (Heider, 1946), they learn via a hierarchical process (Lavidge and Steiner, 1961; Ray, 1973), and their beliefs can be used to predict behaviors (Fishbein and Ajzen, 1975).

Behavioral control beliefs are described as a sense of personal efficacy, or the "conviction that one can successfully execute the behavior required to produce certain outcomes" (Bandura, 1977, p. 193). As consumers' sense of behavioral control increases, so will their initiation, persistence, and maintenance of various health innovation behaviors (Ajzen and Madden, 1986). This is the case because the performance of most health behaviors is achieved only through high costs; therefore, consumers are unlikely to attempt behaviors unless they believe they will be effective (Bagozzi and Warshaw, 1990).

A Framework for the Strategic Management of Health Innovations

This section describes a framework and a process for designing, managing, and evaluating health information programs. Each component of the framework is described, two general design principles are noted, and strategies for ensuring adherence to these principles are suggested. Examples are provided that indicate the effect on adoption. Finally, rec-

ommendations for evaluating the effectiveness of health information programs designed using the proposed framework are provided. A summary of the process is contained in Table 2.

The Components of Health Information Programs

Figure 2 illustrates the proposed framework for conceptualizing the components of health information programs. These include the target adopters' characteristics, the change objective, the concept innovation, the behavior innovation, and the material innovation.

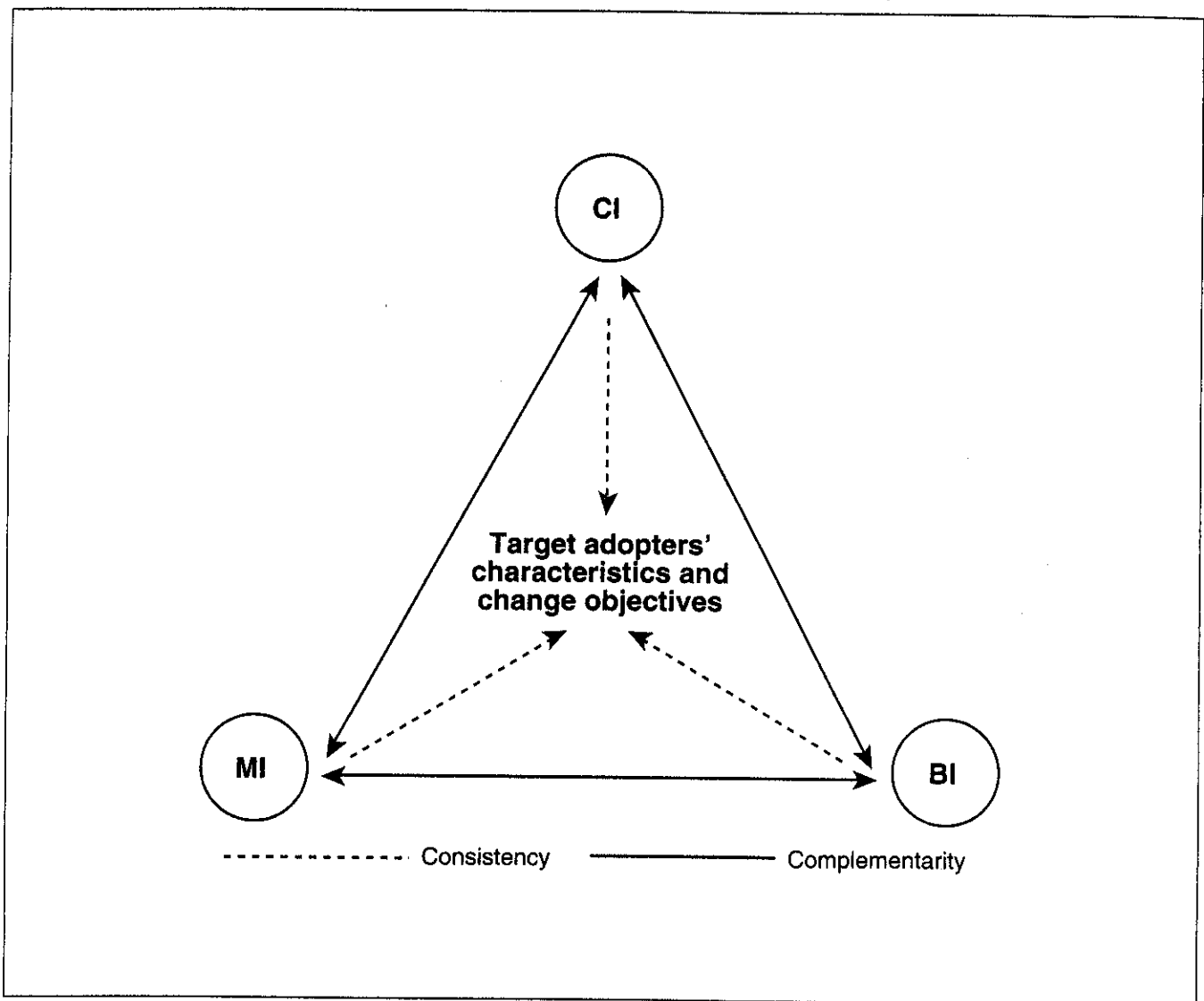
Target adopters' characteristics. The term *target adopters' characteristics* refers to any characteristic relevant to the adoption of health innovations. It may include any of the consumer characteristics reviewed earlier or other relevant characteristics. One way to easily conceptualize the large number of characteristics that are likely to emerge in such an analysis is to classify them into one or more of the overarching categories that have been recommended for consideration in the design of change programs: values, abilities, motivations, and context (Davis, 1973; Davis and Salasin, 1975; K.W. Johnson, 1989; MacInnis, Moorman, and Jaworski, 1991).³ These four categories are not mutu-

³ The general factors are drawn from the A VICTORY model (Davis, 1973; Davis and Salasin, 1975). Each letter in the acronym A VICTORY describes an important precondition for change. Factors not relevant to the framework are not discussed.

Table 2. Summary of process for managing health information programs.

Step
1. Place health information in the broad context of how consumers will use it. Identify the specific information acquisition, information processing, decisionmaking, implementation, and confirmation behaviors to be encouraged or discouraged.
2. Identify potential consumers. Research their key characteristics, focusing on abilities, motivations, values, and context, among other critical characteristics that might affect adoption. Research the extent to which consumers value various concept innovations that may be used. These might include some of the benefits noted in Table 1.
3. Select a target market(s) for the program on the basis of criteria determined to be important.
4. Select a change objective from among health information utilization outcomes for the target market. This objective should reflect important health goals for target adopters while accounting for their unique characteristics and the ability to achieve the objective via health information programs.
5. Design a number of potential concept innovations, behavior innovations, and material innovations that are consistent with target adopters' manifest or latent characteristics and with the achievement of the change objective.
6. Reduce the set of consistent program components to those that mutually reinforce one another. Specifically: (1) choose material innovation(s) and behavior innovation(s) that consumers believe, or can be persuaded to believe, lead to the achievement of concept innovation(s); (2) choose material innovation(s) that are easy to acquire and understand and behavior innovation(s) that are easy to enact.
7. Implement health information program.
8. Evaluate health information program.

Figure 2. The proposed structure of programs designed to increase the adoption of health innovations.



Abbreviations: CI = concept innovation; BI = behavior innovation; MI = material innovation.

ally exclusive and many consumer characteristics that increase one factor may decrease another. For example, the presence of health knowledge may reflect an increase in consumers' abilities but may work to decrease their motivation to acquire and process more health information. Each general category of factors will now be briefly reviewed.

Ideas, practices, and products consistent with consumers' values are more readily adopted (Davis and Salasin, 1975; Rogers and Shoemaker, 1971; Zaltman and Lin, 1971). For example, Dholakia (1984) described how family planning efforts in India met with slow success because of the value placed on large families and the negative attitudes toward birth control. Moreover, health psychology research has shown that unless individuals value their health, attempts to change their disease prevention activities prove largely ineffective (Lau, Hartman, and Ware, 1986).

Abilities include consumers' resources, knowledge, and skills, including factors that affect these abilities, such as

education, age, income, and psychological-control belief levels. Change agents must consider target adopters' abilities when designing health information programs because abilities influence the extent to which consumers can acquire and process information and evaluate, implement, and sustain a change (Glaser, Abelson, and Garrison, 1983). For example, Moorman (1990) found that recommended daily allowance (RDA) information dramatically increased comprehension accuracy levels over milligram information for consumers with some graduate education (+17 years); it also increased comprehension accuracy among university-level consumers, but less dramatically. However, RDA information rather than milligram information slightly reduced the comprehension accuracy of consumers with a high school education.

The goal-directed arousal of motivation (Park and Mittal, 1985) could be focused on consumers' processing of health information or on their enactment of health behaviors, such as exercise or diet restriction. Zaltman and Duncan (1977)

argued that motivation arises when there exists a significant discrepancy between actual and desired well-being in the area of the change. This discrepancy may be the result of consumers' health-risk aversiveness, perceived health status, age, gender, psychological-control beliefs, preventive or curative orientation, the value of health, or knowledge regarding possible health achievement levels. Evidence suggests that introducing change when there is a felt need increases the chance of a program's success (Glaser, Abelson, and Garrison, 1983). Other research suggests that felt needs can be fostered by change agents (Zaltman and Duncan, 1977).

Context refers to those environmental conditions surrounding consumers. These conditions, which may be enduring or temporary in nature, include geographic location, family size, cultural norms, and exposure to communications. For example, Rogers and Shoemaker (1971) found that Peruvians rejected the idea of purifying water by boiling it because doing so ran contrary to their superstitions. Likewise, cultural norms regarding cigarette and alcohol consumption have radically changed consumption patterns over the last decade ("Youthful Sobriety," 1990). Change agents who understand these contextual factors can use them to design change strategies.

The change objective. Health information programs can have a variety of objectives. For example, information programs can have macro or micro objectives. Micro objectives focus on changing individual consumer behaviors. Macro objectives focus on how changes at the micro level transform the entire marketplace in productive ways, such as when the choices and complaints of an informed minority of consumers influence firms or governments to alter offerings or provide information (Mazis, Staelin, Beales, and Salop, 1981; Thorelli and Engledow, 1980). This chapter focuses only on micro objectives of health information programs.

Another distinction among programs, suggested by Bettman (1975) and others, focuses on improving consumers' information-processing behaviors (i.e., processing normative objectives) or on improving the quality of consumers' decisions (i.e., behavioral normative objectives). Processing normative objectives include ensuring that consumers are exposed to information, that they attend to it, and that they comprehend its meaning. How—or even whether—consumers act on such information is considered an individual matter, however, and the system does not try to direct those decisions other than to present the information in a manner that facilitates processing. Behavioral normative objectives, on the other hand, explicitly attempt to improve the quality of consumers' decisions and behaviors. The current chapter includes both types of objectives.

The selection of the change objective should (1) reflect important health goals for the target adopters while accounting for (2) target adopters' unique characteristics and (3) the ability to achieve the objective via health information programs. The health information utilization outcomes illustrated in Figure 1 form the general set of objectives most health programs will seek to achieve. For example, the general objective of increasing health information acquisition and processing may be chosen in a context where the target adopters are teenaged women and the type of health information is information concerned with the symptoms and health effects of various eating disorders. In this case, the change objective would be to increase the acquisition and process-

ing of health information concerned with the symptoms and health effects of various eating disorders.

The concept innovation. All innovations have a conceptual element (Kotler and Zaltman, 1971). Concept innovations are usually designed to communicate an abstraction that consumers value, although adopting an innovation will often involve other conceptual costs. Therefore, concept innovations represent benefits and costs to the consumer. For example, consumers who quit smoking may believe that they will become healthier, but they may suffer temporary weight gain. Likewise, consumers who wish to be protected against the threat of catastrophic disease must risk the dangers associated with immunizations.

The behavior innovation. Behavior innovation refers to the practices associated with an innovation that have certain costs and benefits. The benefits (costs) include compatibility (incompatibility) with current attitudes and behavioral routines, the simplicity (complexity) of the practice, the low (high) frequency of the practice, and the trialability (permanency) of the practice. With regard to family planning, for example, sterilization is a far more costly approach than using condoms (Fox and Kotler, 1980).

The material innovation. Material innovation refers to the tangible attributes associated with a health innovation. These attributes may be expressed as information, a physical good, a service, or some combination of these. Material innovation elements could be, for example, attributes associated with the product, such as: size, weight, texture, smell, color, packaging, brand name, and illustrations. Change agents must manage these tangible attributes, matching their suitability to certain types of consumers. For example, when contraceptives with the brand name "F. L." or "French Letters" were introduced in India, they were viewed negatively because the name was associated with prostitution. However, when the name was changed to "Nirodh," a Sanskrit word meaning "protection," acceptance of the product improved appreciably (Fine, 1981).

Other attributes may be information related, including the content, format, source, and amount of information. Content may involve the primary message and the use of certain types of appeals (e.g., humor or fear) to influence an innovation's adoption by informing the consumer of important consequences. Format involves the way the information is structured for presentation. Research has found, for example, that consumers use nutrition information formatted in RDAs more than they use information in a milligram format (Moorman, 1990) and that they use an adjectival descriptor format more than an RDA format (Scammon, 1977), presumably because the comprehension costs are lower. The source of information also affects consumers' adoption of health innovations. For example, sources that are trusted, knowledgeable, liked, or similar to the message recipient are more persuasive than are sources that do not have these characteristics (Sternthal, Dholakia, and Leavitt, 1978). Finally, the amount of information affects adoption, because consumers view information processing as costly.

When a material innovation is a service, many of the attributes are intangible. For example, the quality of a service is a very important attribute. However, change agents need to "tangibilize" this attribute so it can be experienced and evaluated by adopters. Quality may be tangibilized into timeliness, courtesy, or honesty of health service providers, which would decrease the costs of adoption.

The Design of Health Information Programs

Two principles, *consistency* and *complementarity*, guide the creation of programs to facilitate the adoption of health innovations (Park and Zaltman, 1987).

Designing consistency. Consistency occurs when health information program components are in agreement with or reflect consumers' manifest and latent characteristics and the change objective. Research has shown that innovations that are consistent with target consumers' needs and characteristics are used to a greater degree (Glaser, Abelson, and Garrison, 1983). Moreover, when the program components reflect the program objective, it is more likely that the objective will be achieved.

In managing consistency between a health information program and target adopters' characteristics, change agents have, presumably, two alternatives: to alter the program or to alter the target adopters. Because of the framework's customer orientation, the preferred option is to modify the program's components to accommodate target adopters' characteristics except when doing so is not feasible or risks the achievement of critical change objectives.

Designing complementarity. After consistent components have been identified, change agents should make the decision to include a component on the basis of its complementarity with other potential program components. Complementarity requires that the components be mutually reinforcing or support one another's effects toward the adoption of the innovation (Park and Zaltman, 1987). Various combinations of the health-innovation components will now be examined with the objective of achieving complementarity in the combination.

Complementarity between concept innovations and behavior innovations. One way to manage complementarity between these two components is to ensure that target adopters perceive concept innovations as valued out-

comes and behavior innovations as an effective means for acquiring them. Figure 3 summarizes four combinations of these states and corresponding strategies for moving target adopters toward the state in which both beliefs are held.

When the concept innovation and behavior innovation are already complementary (the yes-yes cell), a *reinforcement strategy* is recommended to reward target adopters for their beliefs. Psychological reinforcement is recommended if the behavior innovation has not been enacted. Psychological reinforcement is the directing of such intrinsic rewards as encouragement and compliments toward the belief and the reasons for the behavior (Sheth and Frazier, 1982). However, if the behavior innovation has been enacted, psychological reinforcement in conjunction with a behavioral reinforcement strategy is recommended. Behavioral reinforcement provides rewards following the behavior innovation to strengthen the probability of its recurrence (Nord and Peter, 1980).

Although the concept innovation may be valued and the behavior innovation may be believed to be an effective means for acquiring it, the proposed change may not be adopted if adopters feel that the costs involved in enacting the behavior innovation outweigh the concept innovation's benefits. Under such conditions, a *facilitation strategy* is suggested. Facilitation strategies are strategies that make the implementation of innovations by the target group easier (Zaltman and Duncan, 1977). Change agents can use these strategies either to increase the value of the concept innovation or to reduce the costs of enacting the behavior innovation. The percentage of consumers eating low-fat diets, for example, rose after the cardiovascular benefits of doing so were publicized (higher benefits) and easy-to-prepare alternatives to fatty foods were offered at convenient locations and reasonable prices (lower costs).

Three strategies are recommended when the concept innovation is valued but the behavior innovation is not believed to be an effective means for achieving it. First, an *informa-*

Figure 3. Strategies for creating complementarity between concept innovations and behavior innovations.

		Concept innovation is a valued outcome	
		Yes	No
Belief that behavior innovation is an effective way to achieve concept innovation	Yes	Reinforcement strategy Facilitation strategy	Nonintervention strategy Introduction strategy
	No	Information/education strategy Persuasion strategy Confirmation strategy	Information/education strategy Persuasion strategy Disconfirmation strategy Power strategy

tion/education strategy could be used to present factual and nonbiased information so target adopters perceive that the behavior innovation will achieve the concept innovation. Second, if factual information alone cannot convince adopters, a *persuasion strategy* that presents biased information to stress the efficacy of the behavior innovation can be used. This strategy may be accomplished via specialized appeals (e.g., "This is your brain on drugs!").

A third strategy, a *confirmation strategy*, can be used alone or in conjunction with either of the other two. This strategy attempts to illustrate directly the efficacy of the behavior innovation in leading to the concept innovation, as when adopters can directly confirm that using contraceptives prevents unplanned pregnancies. In some cases, however, the concept innovation is difficult to confirm because it is not self-evident, is somewhat abstract, or is not realizable in the short term (e.g., increasing cardiovascular fitness). In such cases, change agents must manage the confirmation process more explicitly. This explicit management may entail teaching adopters simple confirmation processes (e.g., how to detect a slower resting pulse after adopting exercise regimens) or supplying more sophisticated forms of confirmation that will give credence to changes that can not be sensed (e.g., free blood pressure and cholesterol testing at local health fairs and places of employment).

When the behavior innovation is believed to be effective in achieving valued outcomes but the designed concept innovation is not valued, two strategic options exist. The first, a *nonintervention strategy*, allows target adopters to continue to value whatever outcome they link to behavior innovations. However, if linking the behavior innovation to a different, more highly valued concept innovation would increase the likelihood of the health innovation's adoption, a second approach, an *introduction strategy*, is recommended to present the new idea. For example, following the adoption of organizational wellness programs touting the benefit of employee health, it was discovered that these programs also had positive effects on worker motivation, productivity, and health care costs. When these new outcomes were communicated to decisionmakers (via an introduction strategy), the adoption of wellness programs was reinforced in existing organizations and spread to other organizations that also valued these outcomes (Roberts and Harris, 1989). In this case, the linkage of the additional concept innovations with the wellness programs made the programs more attractive.

When the concept innovation is not valued and the behavior innovation is not believed to be helpful in achieving the concept innovation, change agents may employ various strategies to create complementarity, depending on adopters' beliefs about the relationship between the concept innovation and the behavior innovation. If adopters have no beliefs, the information/education strategy is recommended to create this linkage. If, on the other hand, target adopters' beliefs conflict with the change organization's proposed concept innovation and behavior innovation, three strategies are recommended.

First, a *persuasion strategy* to change beliefs with the purposive biasing of information may be useful. One potentially fruitful approach is personal selling, in which change agents engage in face-to-face oral presentations to build good will, demonstrate product or information use, and deliver the product or information to target adopters (Kotler, 1988). Both

Lazarsfeld and Merton (1949) and Wiebe (1951) noted that face-to-face interaction between the change agent and the target adopter increases the likelihood of change. This interaction is furthered when the target adopter trusts, likes, and believes in the expertise of the change agent. A recent program in which former drug addicts taught intravenous drug users how to sterilize needles with bleach (the behavior innovation) to decrease the spread of the acquired immunodeficiency syndrome (AIDS) (the concept innovation) demonstrates the flexibility of this strategy (Watters, Downing, Case, and others, 1990).

Whereas information/education and persuasion strategies create new beliefs, change agents can use a *disconfirmation strategy* to discredit currently held beliefs and replace them with new beliefs that support the proposed concept innovation and behavior innovation linkage. Research has shown that beliefs can change in a direction consistent with new information when that information disconfirms current beliefs that are in conflict with it (Argyris, 1982; Crocker, 1983). Thus, to use this strategy, change agents should assess target adopters' current beliefs and provide information that disconfirms these beliefs and supports new beliefs consistent with the change objective. For example, change agents interested in reducing obesity among the inner-city poor must consider that the target adopters associate being overweight with being healthy and being underweight with being addicted to drugs or being too poor to eat well (Freedman, 1990a, 1990b). Hence, inner-city residents may value being overweight. Moreover, these consumers place status on the ability to eat at fast-food restaurants, which contributes to their weight problems.⁴ A change agent using a disconfirmation strategy could provide evidence demonstrating the link between obesity and death rates, negating the link between normal or low weight and drug addiction, and illustrating how fast food contributes to obesity because of its high fat content. This information could be communicated in conjunction with guides showing normal weight levels for different heights and body types and campaigns to make vegetables and fruits status foods among inner-city consumers. In each case, new beliefs are created while old beliefs are disconfirmed.

Finally, a *power strategy* also may be appropriate when target adopters have beliefs that conflict with the proposed concept innovation and behavior innovation linkage. This strategy describes an array of strategies that are mandated by law or that exploit one party's dependence on another for desired resources (see Zaltman and Duncan, 1977, and Zaltman, Duncan, and Holbek, 1973, for greater detail). Although change agents should use these strategies sparingly and only after trying to move target adopters to another cell by using the strategies noted previously, there may be health problems that cannot be solved in any other manner. Attempts to influence the prenatal care of young, inner-city mothers reflect this difficulty. Mandating that such women make prenatal visits to local clinics prior to receiving assistance from Government support programs may be one way to overcome

⁴ The problem is actually more systemic in that groceries and restaurants do not carry more healthful alternatives for inner-city poor consumers to select. It is not clear, however, whether consumers' choices have created this stock-out situation or the stock-out situation has increased inner-city consumers' demand for fast food.

the fact that many of these women do not see the value of such visits, see the behavior as costly, or are unaware of the need for such services.

Complementarity between material innovations and concept innovations. Complementarity between concept innovations and material innovations ensures that target adopters perceive concept innovations as valued outcomes and material innovations as an effective means for achieving them. Figure 4 summarizes four combinations of these states and corresponding strategies.

Once again, the yes-yes cell (when concept innovations are valued by target adopters and material innovations are believed to be an effective means for acquiring them) indicates that a *reinforcement strategy* can be used to reward target adopters for their beliefs. For example, the product, package, or label could reiterate the linkage between the material innovation and the concept innovation, reinforce the logic or morality of believing in this linkage, or provide subtle or overt forms of reinforcement. In one study using a reinforcement strategy, more trash was disposed in trash cans that flashed "THANKS" than in trash cans that did not (O'Neill, Blanck, and Jayner, 1980). Although the word "THANKS" is not the benefit adopters seek when depositing trash, it does provide an immediate reward that reinforces their ecologic behaviors.

When the concept innovation is valued and the material innovation is believed to be an effective means for acquiring it but adoption is resisted because consumers perceive that the costs of acquiring and understanding the material innovation exceed the concept innovation's benefits, a *facilitation strategy* is proposed. As described in the previous section, users of this strategy attempt either to increase the perceived benefits of the concept innovation or to decrease the acquisition costs of the material innovation. Decreasing the material innovation's costs could involve change agents changing the format of the information so that it can be pro-

cessed more efficiently. For example, Levy, Matthews, Stephenson, and others (1985) found that consumers processed significantly more nutrition information in a supermarket when it was placed on point-of-sale shelf markers (next to the product) than when the information was displayed on sectional posters (Russo, Staelin, Nolan, and others, 1986).

When concept innovations are valued outcomes but material innovations are not believed to be an effective means for achieving them, an *association strategy* may link the material innovation to the concept innovation in target adopters' minds, in much the same way as traditional products and services are linked to abstract qualities and benefits (e.g., Waterford crystal with prestige and exclusivity). Association strategies can be used in one of two ways in health information programs.

First, a conditioning approach can be used to pair a previously neutral stimulus (material innovation) with a conditioned stimulus (concept innovation) so that the neutral stimulus comes to elicit reactions similar to those elicited by the conditioned stimulus (Nord and Peter, 1980). Just as Campbell's soup (neutral stimulus) evokes the concept of being nurtured (conditioned stimulus), nutrition information (conditioned stimulus) could evoke the concept of food expertise (conditioned stimulus), cigarettes (neutral stimulus) could evoke the concept of death (conditioned stimulus), and drug treatment centers (conditioned stimulus) could evoke the concept of loving recovery (conditioned stimulus). Change agents may also use promotional tools to associate the product and concept by using visual and auditory cues that exemplify the concept innovation. In the case of cigarettes and death, consistently showing a skull and crossbones in conjunction with cigarettes would condition the product. Likewise, pairing the term "smart shopper" and nutrition labels via appropriate cues could link the two.

Second, a product modification approach can be used to associate the material innovation with achievement of the

Figure 4. Strategies for creating complementarity between concept innovations and material innovations.

		Concept innovation is a valued outcome	
		Yes	No
Belief that material innovation is an effective way to achieve concept innovation	Yes	Reinforcement strategy Facilitation strategy	Nonintervention strategy Introduction strategy
	No	Association strategy Conditioning approach Product modification approach	Information/education strategy Persuasion strategy Disconfirmation strategy Power strategy

concept innovation. One method is for change agents to choose product attributes that communicate the concept innovation. For example, oral contraceptives have been successfully linked to the benefit of convenient birth control because they are sold in easy-to-store-and-carry packages with numbered slots to help users keep track of their consumption each day of the month. Thus, although taking a pill every day may require more effort than using a condom periodically, oral contraceptives are perceived as a more convenient form of birth control. A material innovation's *service* attributes can also be linked to the concept innovation. For example, if middle-aged women value educational and hassle-free services, the design of a breast cancer detection clinic might include presentation of a videotape that introduces equipment and procedures prior to the actual examination. Thus, the material innovation (in this case, a service) would reinforce the concept innovation.

When material innovations are believed to be effective means for attaining concept innovations but concept innovations are not valued outcomes, *nonintervention* or *introduction strategies* similar to those described previously are appropriate. The use of a nonintervention strategy involves allowing adopters to continue in their beliefs even though they may be acquiring products for reasons other than the target reason. For example, consumers are allowed to continue valuing low-fat foods for their effects on attractiveness even though the organization desiring the adoption values low-fat foods because their use decreases medical costs. However, if linking the material innovation to a different concept innovation will facilitate adoption, change agents could introduce the additional benefit of decreased medical costs.

Finally, when adopters have no beliefs about the concept innovation and the material innovation, an *information/education strategy* should be used to create the necessary beliefs about their relationship. For example, prior to C. Everett Koop's statement suggesting that condoms were the best

weapon against the transmission of AIDS, the public was generally unaware of the linkage. Public information campaigns have continued to communicate this message to educate consumers, with great success. However, if target adopters have negative beliefs about this linkage, *persuasion* or *disconfirmation strategies* similar to those described in the previous section should be used. In extreme cases, *power strategies* may also be necessary when negative beliefs are held about this linkage. In these situations, laws may be developed to ensure that products or services have certain qualities linking them to valued outcomes, as illustrated by various regulations governing the nutritional value of school lunch programs. In other cases, voluntary industry codes exist so that products will facilitate certain outcomes. For example, the breakfast cereal industry volunteered nutrition information before it was required by law. Finally, a power strategy that involves a fat and cholesterol tax on meat, eggs, and junk food may be used to solve the problem of fatty diets ("Odds and Ends," 1991).

Complementarity between material innovations and behavior innovations. Change agents can achieve complementarity between material innovations and behavior innovations by managing the extent to which target adopters believe material innovations are easily acquired and understood and behavior innovations are easily enacted. Figure 5 summarizes four combinations of these states and corresponding strategies.

When material innovations are believed to be easily acquired and understood and behavior innovations are easily enacted, two different strategies are recommended, depending on whether the behavior innovation is being enacted. If it is, a *reinforcement strategy* should be used to reward the adopters for their behaviors as well as to reiterate that the innovation is easy to acquire, understand, and enact. If the behavior innovation is not being enacted, change agents should direct their efforts at linking the behavior and mate-

Figure 5. Strategies for creating complementarity between behavior innovations and material innovations.

		Belief that behavior innovation is easily enacted	
		Yes	No
Belief that material innovation is easily acquired and processed	Yes	Reinforcement strategy Introduction strategy	Product modification strategy Experimentation strategy Information/education strategy
	No	Accessibility strategy	Persuasion strategy Information/education strategy Power strategy

rial innovations to valued and confirmable concept innovations using an *introduction strategy*.

When the material innovation is not believed to be easily acquired and understood but the behavior innovation is easily enacted, an *accessibility strategy* is recommended to attain complementarity by lowering the costs of the material innovation. For example, the complexity of the material innovation can be reduced so that there are lower information processing costs. Likewise, the financial cost (price) of the innovation can be reduced to facilitate its adoption. An information/education strategy could also be used to increase consumers' abilities to handle such complexity, hence making the innovation more accessible to them. For example, in nutrition programs, recommended daily levels of fiber, sodium, and fat might be communicated to consumers so they could enact diet restriction behaviors.

When material innovations are easily acquired and understood but behavior innovations are not easily enacted, three strategies are available. First, a *product modification strategy* alters the material innovation to reduce any real or imagined costs of the behavior innovation. When, for instance, the American Cancer Society began distributing Hemocult kits for self-screening of colorectal cancer, the behavior innovation required patients to carry their stool smears to a hospital lab. Conceivably, this psychic cost⁵ could have been reduced if the organization had included a special receptacle for the specimen and a discreet carrying case. Moreover, had the organization included information telling consumers how to obtain the specimen easily or acknowledging the difficulty of obtaining the specimen, costs might also have been reduced.

A second general strategy for increasing the ease of enacting the behavior innovation is an *experimentation strategy*. In this strategy, change agents redesign the behavior innovation or the material innovation to minimize the risks perceived by target adopters. Two characteristics that can be redesigned to minimize these risks or costs are the innovation's trialability and observability. When adopters perceive the behavior innovation as costly to enact, increasing its trialability (i.e., the extent to which it can be used on a limited basis) can lessen resistance because adopters can reverse their behavior if results do not meet their expectations. Allowing shoppers to taste foods made with fat substitutes before purchasing them promotes trialability and behavior innovation experimentation.

Observability is the degree to which the behavior innovation can be viewed by others. Target adopters may perceive conspicuous behavior innovations as easier to enact when the innovations are socially desirable. Conversely, they may perceive inconspicuous behavior innovations as easier to enact when the behavior is socially undesirable or stigmatized. When observability decreases as the social undesirability of the behavior increases, complementarity in this linkage increases and adoption barriers are minimized. For example, companies with employee substance abuse programs have found them to be more effective when they are moved to off-site locations where employees can use the service inconspicuously (Marshall, 1989).

Third, an *information/education strategy* can teach target adopters how to enact the behavior innovation and hence re-

duce the perception that it is difficult to enact. Promotions can illustrate the behavior innovation (e.g., how to cook tofu) in displays or through cooking demonstrations where target adopters acquire the product. Personal sources can describe and demonstrate the behavior innovation, clarify concerns, and correct wrong-use behaviors. For example, the Red Cross teaches cardiopulmonary resuscitation at local workshops to reduce the perception that the behavior innovation is difficult to enact.

When target adopters believe material innovations are not easily acquired or processed and behavior innovations are not easily enacted, persuasion, information/education, and power, or some combination of these strategies, are recommended. For example, neighborhood bulletins focusing on the benefits to unborn fetuses of pregnant women not drinking alcohol (the behavior innovation-concept innovation linkage) might also direct the women to alcohol treatment centers, provide hotline numbers to call, publish times and locations of Alcoholics Anonymous meetings, and offer encouragement and support for these women (the material innovation-behavior innovation linkage). If the concept innovation is not valued and the material innovation and behavior innovation appear costly compared with this outcome, a power strategy may be appropriate. Such is the case of the power strategy that enforces product availability (e.g., nonsmoking sections in restaurants or seatbelts in cars) or the use of certain products in the performance of certain behaviors (e.g., requiring parents to place their newborn in a restraint system before leaving the hospital).

The Evaluation of Health Information Programs

Health information programs should be evaluated by assessing the degree to which the change objective has been achieved. This assessment could be accomplished by comparing preprogram and postprogram scores indicating the degree to which consumers believe that (1) the concept innovation is a valued outcome, (2) the material innovation is easily processed and acquired, (3) the behavior innovation is easily enacted, (4) the behavior innovation is an effective way to achieve the concept innovation, (5) the material innovation is an effective way to achieve the concept innovation, and (6) the material and behavior are reinforcing. An assessment of these beliefs is useful in several ways. First, these beliefs will assist in understanding the degree to which the health information program has achieved a consistent and complementary mix of components. Second, as modeled in this chapter's framework, these beliefs should be antecedents to actual adoption behaviors, including the acquisition and processing of health information, subsequent effects on consumers' decisionmaking, and the implementation and confirmation of health-related behaviors. Hence, assessing the degree to which consumers hold these beliefs about the adoption process should indicate the consumers' readiness to enact the adoption behaviors.

In addition to assessing consumers' beliefs, change agents should also measure the degree to which consumers have actually engaged in targeted behavior innovations. Again, preprogram and postprogram performance should be assessed. However, in the event that preprogram performance levels are not available, comparing the performance of

⁵ Psychic costs include the forfeit of self-esteem or pride or other losses affecting peace of mind (Fine, 1981, p. 51).

matched sites on adoption beliefs and behaviors would also provide an evaluation of the health information program.

AHCPR is developing health messages and materials that are targeted to specific ethnic groups. One such group is African Americans. Although reaching African Americans is somewhat similar to outreach for the majority population, this strategy should emphasize areas such as cultural sensitivities, lifestyle, and socioeconomic and educational levels.

Illustrative Examples

This section illustrates how the proposed framework can be applied to design programs to increase consumers' use of health information in four specific situations. The data and measures used in these examples were drawn from Moorman and Matulich's (1991) comprehensive model of consumers' health behaviors, including 11 consumer characteristics and 8 health behaviors.

Data regarding the 368 sample members' characteristics and health behaviors were cluster analyzed to create four groups that maximize within-group homogeneity and maximize between-group heterogeneity (see Table 3). In the cluster analysis, a covariance matrix was used as an input and an object-by-object factor analysis was performed to determine clusters or segments. Results of the analysis were then used to design a health information program for each segment, as illustrated in Figure 6.

Cluster 1

Members of cluster 1 are highly educated, highly knowledgeable consumers who have high incomes and are more likely to be female than male. These consumers value their health but perceive that it is poor, are preventively oriented, and believe they can control their health behaviors and affect health-related outcomes. These consumers engage in a variety of health-related activities, such as receiving medical checkups, restricting their diets, reducing stress, restricting their alcohol intake, and abstaining from tobacco products. Despite these behaviors, cluster 1 consumers do not process a great deal of health information. In fact, they use lower-than-average levels of nearly all information sources, except that they use moderate levels of nutritional labels. Perhaps this is because they are educated and feel they already know a great deal about health. Given these characteristics, cluster 1 is termed the "educated" segment.

In considering a health information program design for this segment, change agents may select a change objective that is consistent with this cluster's needs and characteristics—to ensure that these consumers continue to build knowledge regarding health. The specific behavior innovation may then be to encourage the acquisition and processing of health information from sources such as product labels and professional sources (e.g., doctors).

With regard to the other program components, assuming that cluster 1 consumers perceive the benefits associated with

Table 3. Cluster analysis results.

Characteristics	Clusters			
	Educated segment	Poor, aged segment	Worrier segment	Invincible segment
Health locus of control	M	H	L	L
Behavioral control	H	H	L	L
Perceived health status	L	M	H	L
Health knowledge	H	L	H	M
Health value	M	H	L	L
Preventive orientation	H	M	H	L
Curative orientation	L	M	L	H
Education	H	L	H	M
Income	H	L	M	H
Gender	Female	Female/male	Male	Female/male
Age	M	H	M	L
Media use	L	L	H	L
Label use	M	L	H	M
Casual source use	L	L	L	H
Professional source use	L	L	L	L
Diet restriction behaviors	H	L	M	L
Stress reduction behaviors	H	M	L	L
Checkup behaviors	H	L	L	L
Alcohol moderation behaviors	M	M	M	L
Tobacco nonuse behaviors	H	L	L	M

Abbreviations: H = high; M = moderate; L = low.

Figure 6. Illustrative examples.

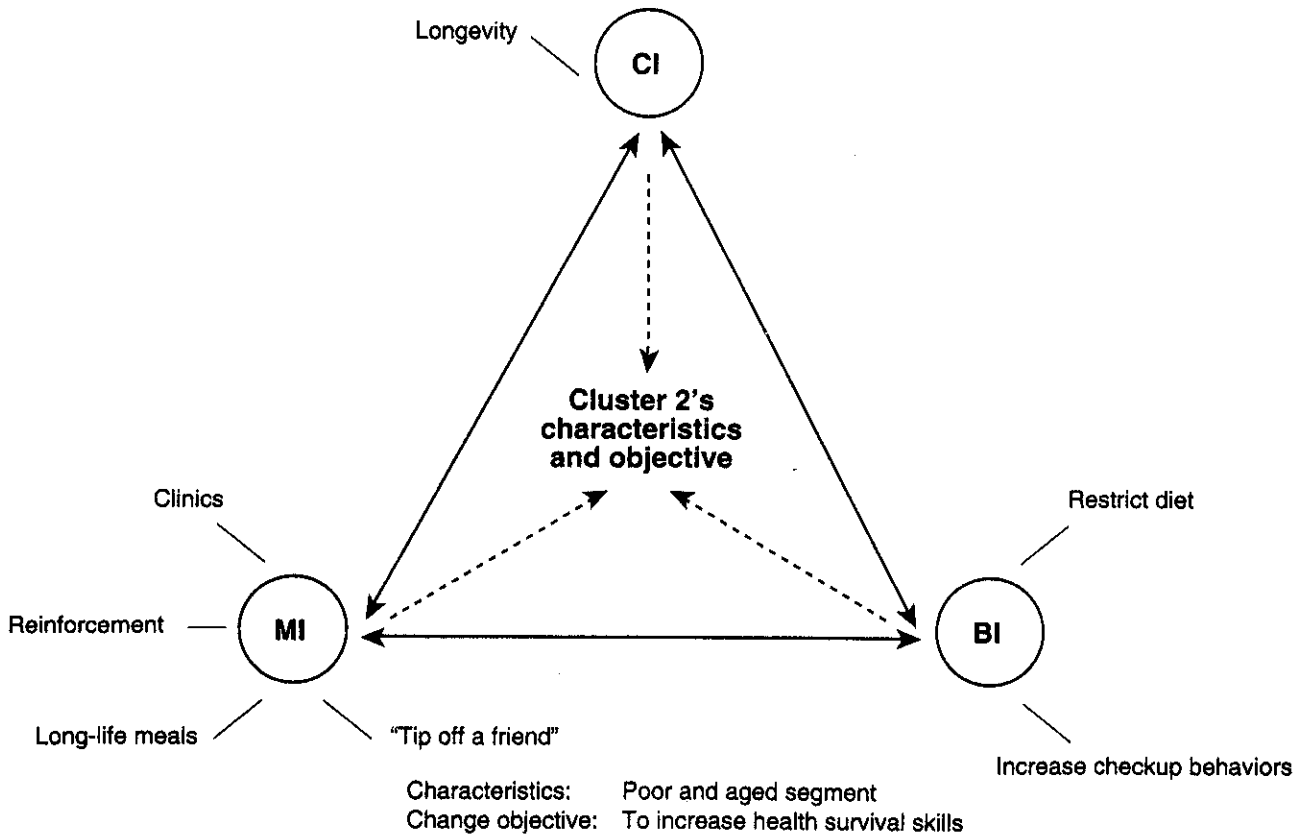
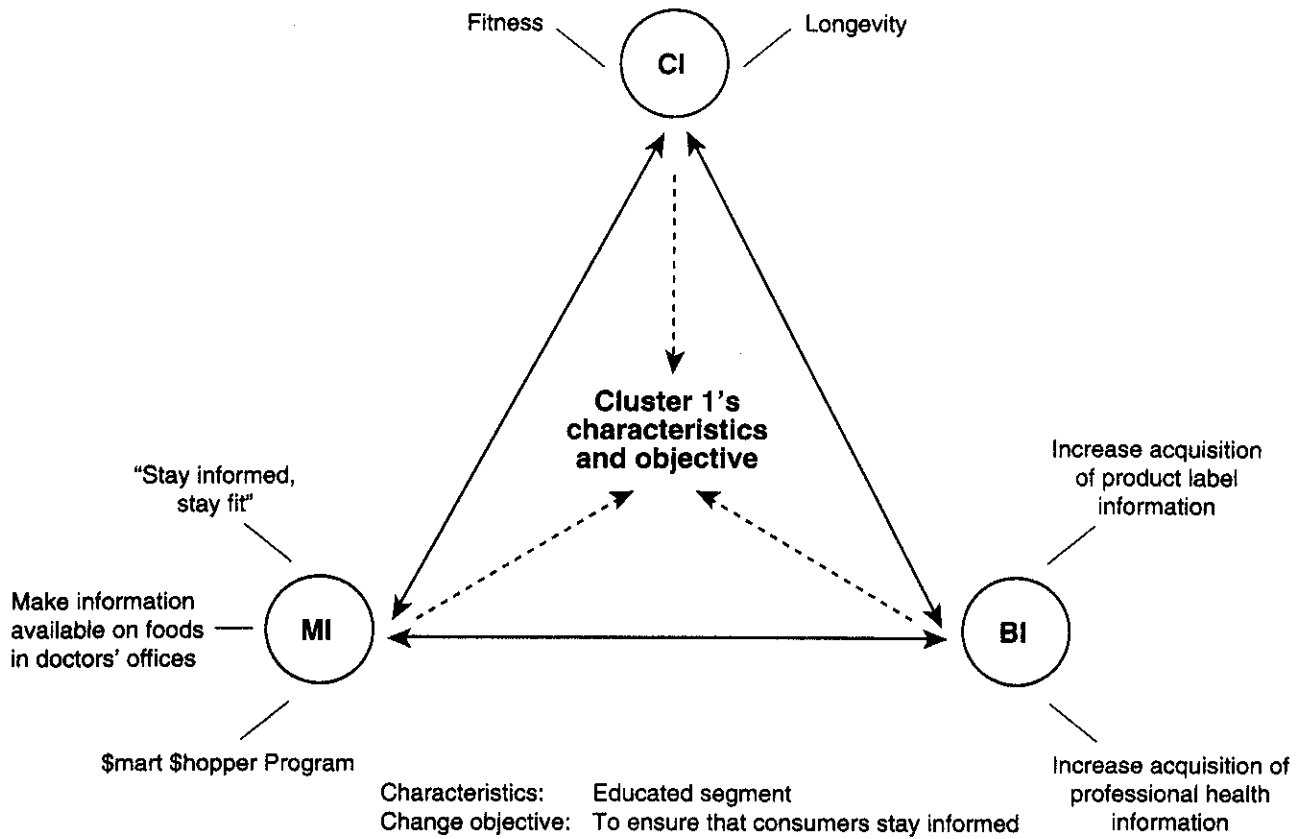
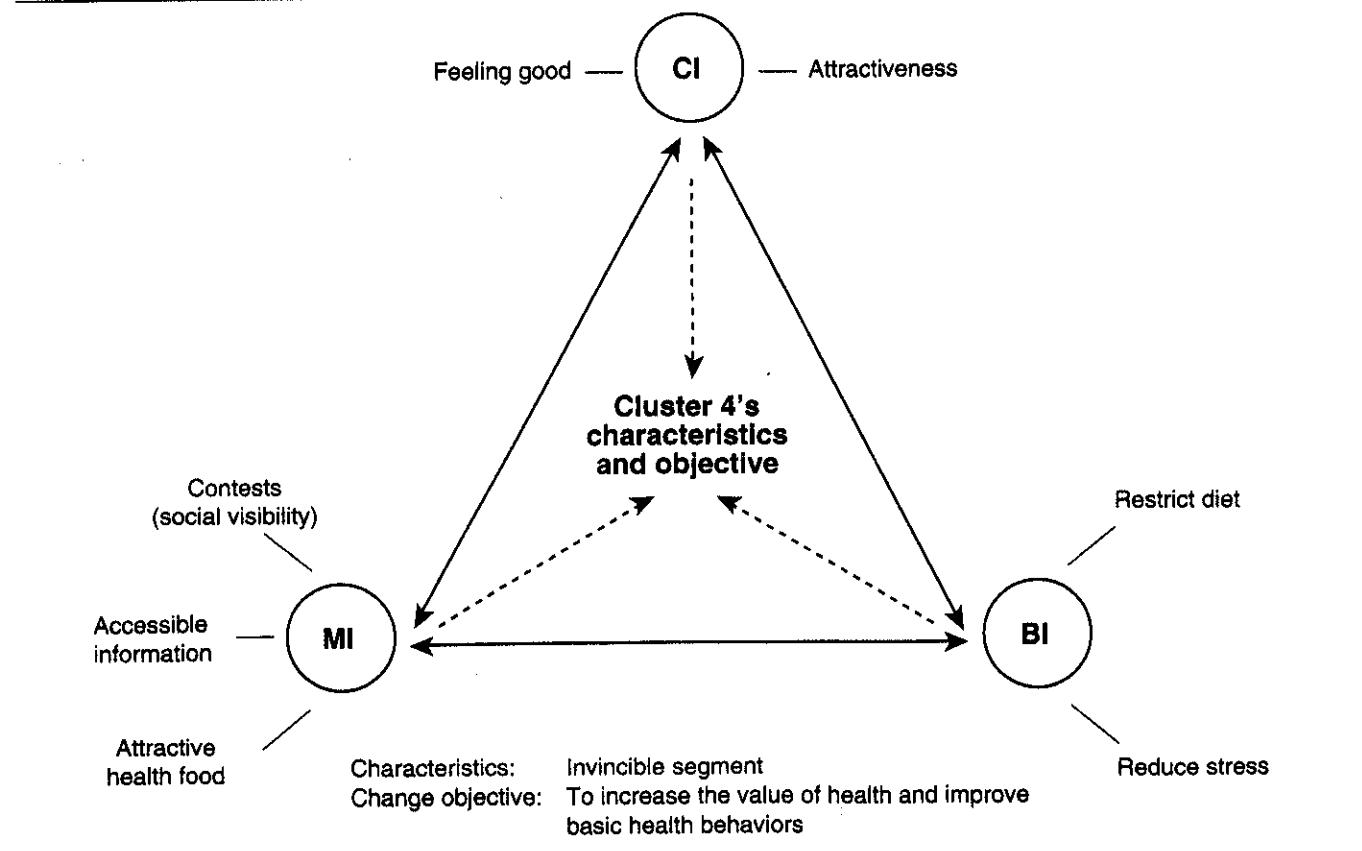
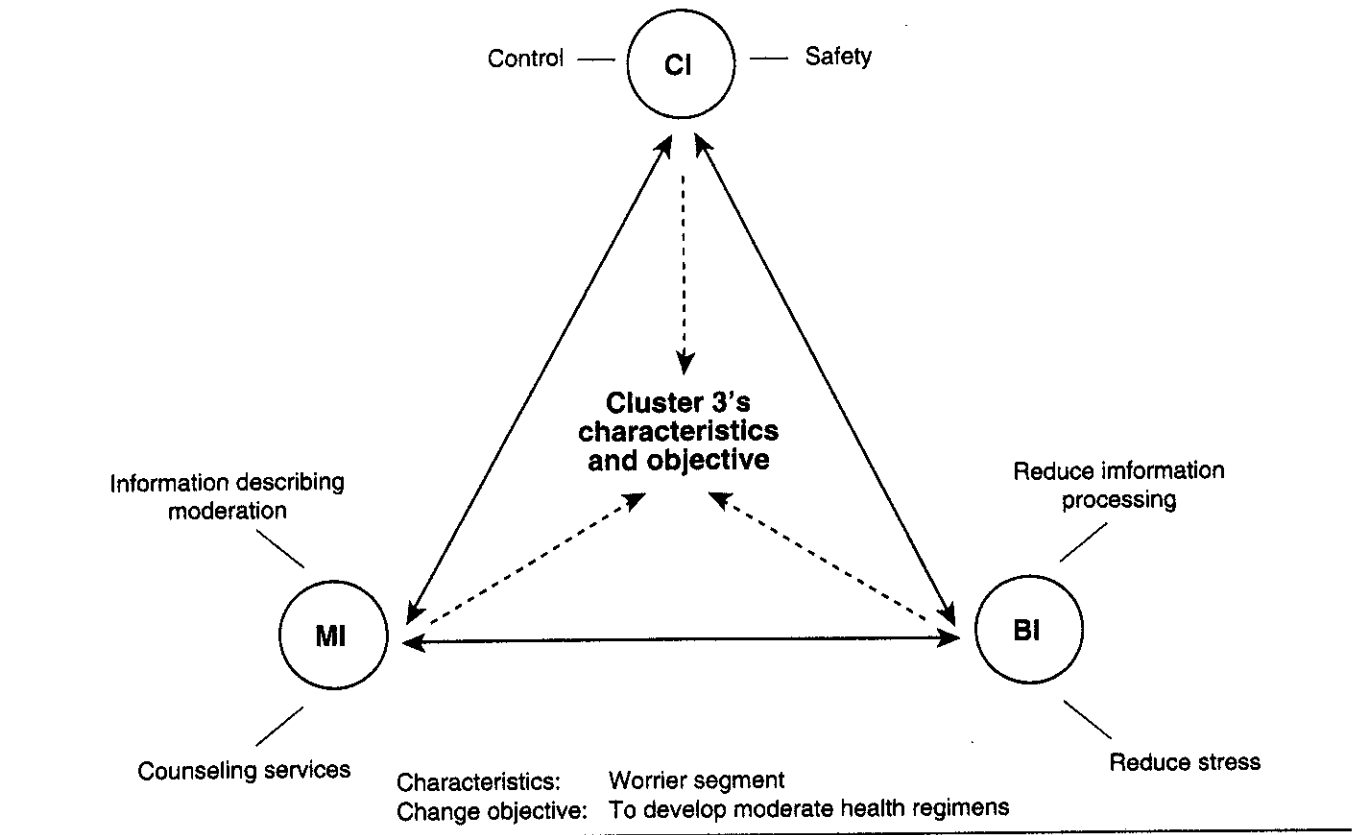


Figure 6. Illustrative examples (continued).



Abbreviations: CI = concept innovation; BI = behavior innovation; MI = material innovation.

health to be fitness and longevity, as opposed to attractiveness, the concept innovation⁶ should be formulated to reflect these benefits. To link "using health information" to "fitness and longevity," change agents should use an association strategy. An information campaign, for example, could present the material innovation with a slogan such as "Update your health quotient—be a lifelong learner" or "Stay informed, stay fit." Likewise, a facilitation strategy could be used to make health information available on products (e.g., low-fat salad dressing, fresh fruits, and vegetables) and in locations (e.g., doctors' offices) that cluster 1 consumers are currently using. This strategy may be particularly useful given that these consumers have the ability to process the information but may not want to expend the resources to acquire it. Likewise, characterizing the acquisition and processing of health information as a "smart" activity (consistent with the values of this cluster) via public service announcements may also increase the benefits associated with this activity and reduce the perception of costs. Finally, a health promotion called "Smart Shopper," in which patrons are given dollars off their grocery bills for using in-store health information, is an observable and easily tried behavior that encourages the appropriate behaviors and provides reinforcement.

Cluster 2

Members of cluster 2 are aged, poorly educated, and unknowledgeable consumers who have low incomes and are equally likely to be female or male. These consumers value their health very highly and are neither preventively nor curatively oriented, but believe they can control their health behaviors and affect health-related outcomes. These consumers do not process health information at all and are only minimally engaged in such health behaviors as reducing stress and moderating alcohol consumption. This cluster is termed the "poor, aged" segment.

Given this segment's demographic characteristics, change agents might select a change objective that involves increasing these consumers' health survival skills. This objective, when defined in terms of specific behavior innovations, may involve diet restriction and medical checkup behaviors. Moreover, a concept innovation involving the benefit of longevity may prove fruitful for this cluster. Specific strategies might include disseminating information regarding, for example, the positive link between cardiovascular disease and fat intake, or offering instruction on low-fat cooking techniques in locations where elderly consumers live, work, and play. This information should be presented simply, perhaps in a visual as opposed to a printed-material form and with large letters for easy use by elderly consumers. These strategies might be followed by a confirmation strategy to link diet restriction and longevity that involves setting up clinics to take blood pressure and blood cholesterol levels. The confirmation strategy could be used in conjunction with a reinforcement strategy that links the behavior and concept innovations by providing consumers with an estimate of how many days, months, or years their changes in diet have added to their lives. Likewise, providing reinforcement that is not as explicitly tied to the concept innovation and that rewards

consumers who come for the screening (e.g., with free fresh fruit baskets) and greatly rewards those who show signs of having restricted their diets (e.g., with monetary rewards) might encourage the behavior innovation. If, however, the behavior does not follow, change agents could switch to a power strategy by altering the composition of meals offered in free meal programs going to these consumers. These meals might be renamed "long-life" meals to associate them with longevity.

In constructing a program to encourage the use of professional sources and services by cluster 2 consumers, change agents could focus on two characteristics. The first is the high level of psychological control that causes these consumers to believe they can influence their health and health outcomes. The second characteristic is income related, but it involves the more general problem of the psychological and physical distance that low-income consumers experience in their lives. Health information programs need to reduce this distance by making health innovations more accessible without threatening the psychological control that is so critical to these consumers. One persuasion strategy using personal selling would involve elderly volunteers, traveling to elderly consumers' homes or communities to verbally disseminate health information (the program could be called "Tip off a friend about health"). This approach minimizes the adopters' costs of traveling. Moreover, the similar source is perhaps more trusted and less threatening to target adopters' sense of control than a dissimilar source might be.

Cluster 3

Members of cluster 3 are highly educated, highly knowledgeable consumers who have moderate incomes and are more likely to be male than female. These consumers do not value their health but perceive that it is good; they are preventively oriented, but they do not believe they can control their health behaviors or affect health-related outcomes. Cluster 3 consumers are heavy processors of health information, except from casual sources, but perform low-to-average levels of most health behaviors. Because this group processes a lot of information but takes little action, cluster 3 is termed the "worrier" segment.

Given these characteristics, change agents should select a change objective that focuses on the development of moderate health regimens. An emotional, rather than physical, concept innovation that offers cluster 3 consumers a sense of control over their health and safety from health threats is also recommended. The behavior innovations for this group might include reducing information processing to a moderate level and developing a health regimen that includes stress reduction via relaxation and exercise. Change agents can link the concept innovation to these behaviors via an introduction strategy that indicates that moderation is central to health or via a disconfirmation strategy that introduces the same notion but also disconfirms current unproductive health beliefs. This campaign would focus on moderation in life as a long-term strategy for combating health threats. This focus is meant to keep this group from being excessive in adopting new behaviors, to encourage reasonable expectations, and to help moderate the high levels of health information processing. Change agents could design campaigns using such slogans as "Everything in moderation leads to nothing but health" and could introduce the benefits of moderation in

⁶ One set of information not included in Moorman and Matulich (1991) is information regarding the consumers' concept innovations or the reasons why they perform health behaviors. This information will be inferred from the consumers' other characteristics.

conjunction with information defining the term (e.g., "Moderation in exercise is exercising three times a week for 30 minutes" or "Moderation in diet is eating fewer fatty snacks," etc.). This type of material innovation would also facilitate the behavior innovation by suggesting that it is simple, easy to implement, and trialable. These low investments should be communicated to cluster 3 consumers via informational sources they are currently using, such as health professionals and media sources, and these sources should reaffirm the importance of moderation as well as the benefits of freedom from fear and the reassurance of feeling a sense of control over one's health.

Cluster 4

Members of cluster 4 are young consumers who are moderately educated and knowledgeable. They come from households where incomes are high, and they are equally likely to be female or male. Cluster 4 consumers do not value their health and perceive that it is poor, are curatively oriented, and do not believe they can control their health behaviors or affect health-related outcomes. These consumers engage in low levels of all health behaviors, except that they use casual sources of health information a great deal. Given these characteristics, cluster 4 is termed the "invincible" segment.

Because of cluster 4's psychosocial characteristics, change agents may be less ambitious in their objectives for this group and may seek merely to increase the value of health and to improve basic health behaviors, which are defined as diet restriction and stress reduction through moderate exercise. These behaviors can easily be linked to several concept innovations which are less health based and more hedonic, involving the benefits of attractiveness and feeling good. To begin, change agents should attempt to link healthy foods to hedonic outcomes. This linkage may be accomplished by using an association strategy to make healthy foods' taste and appearance attractive to cluster 4 consumers. Creating tasty and great-looking snacks out of low-fat ingredients may be one way to create this linkage. This change in products could be accompanied by a disconfirmation strategy communicating "the new look of health food." Furthermore, the behavior innovation could be linked with the material innovation by simplifying exercise and food preparation regimens—and by providing easily accessible information guides where young people work and play, such as college campuses, school lunchrooms, bars, and so forth. These guides should stress the amount of time needed to engage in the desired behaviors, ways to simplify such behaviors, and the results of attractiveness and feeling good. It may also be productive to reduce the costs of enacting the behavior innovations by increasing their observability via contests in dorms, in sororities and fraternities, and in high school settings where participants are given fitness awards. Perhaps reinstating the Presidential Fitness Award, altered to include a healthy diet and exercise throughout the school year, might be useful for cluster 4 members. Further, given this group's reliance on casual sources, involving opinion leaders in such programs should increase the involvement of others within the social system.

Discussion

Conceiving of health information programs as systems of mutually reinforcing innovations consistent with target adopt-

ers' needs and characteristics offers a number of advantages and raises several important issues for discussion.

One advantage of this framework is that it is generic in its approach; hence, it can be applied to any health information problem. Second, the customer orientation proposed by this framework suggests that consumers' needs and characteristics drive the formulation of health information programs, which increases their probability of utilization. A third advantage of this framework is that it suggests that change agents shift their focus from a strict concentration on health information *per se* and place it on managing the entire health information utilization process. Managing this process brings us to the fourth advantage, which is a unique conceptualization of health information programs as innovations consumers adopt. These health information programs were conceptualized comprising concept innovations, material innovations, and behavior innovations whose content and relationships with one another should be explicitly managed. Previous research has not systematically related these components or noted how they support one another's effects. The present chapter provides one view of how these components could be structured to maximize health information utilization.

One of the issues raised by this approach is how to implement a customer orientation in the development of health programs. Using information regarding consumers' needs and characteristics is an important part of ensuring that health programs reflect these characteristics; however, ensuring that information regarding these characteristics is collected, analyzed, and presented to decisionmakers can become expensive and involve a radical change from current procedures. This is the case, for instance, for organizations who are focused on the development of information products without regard to whether they will be used by consumers. A customer orientation, on the other hand, requires periodic assessments of consumers' beliefs, perceived needs, and problems. These assessments involve effort and time, such as that required to conduct focus groups with consumers or to administer surveys. A customer orientation also involves sincere attempts to develop programs using collected information and gauging the acceptance of the program by exposing small groups of the target consumers to planned programs.

A second issue raised by this framework arises when consumers' varied needs mean that the same program is not suitable for all groups and there are not enough resources available to develop programs for each group. In this case, change agents might have to choose among consumer groups in targeting information campaigns. Within a traditional marketing framework, the most likely prospect for targeting would be the group whose members are most likely to alter their behaviors. However, within a traditional health care framework, targeting would be based on need, generally focusing on those who are less likely to change health behaviors on their own. More generally, the decision to target groups based on certain characteristics leaves many health care and public policy organizations concerned about the equity and appropriate distribution of benefits among society's members. Hence, change agents must consider how health care and marketing criteria will be used and to what extent equity is an important criterion for use in targeting activities.

A third issue is the question of the conditions under which a power strategy is necessary. Recall that a power strategy involves strategies that are mandated by law or that exploit

one party's dependence on another for desired resources. In general, it may be unnecessary to use power strategies, because other, less restrictive approaches can create desirable outcomes. However, there are times when consumer behavior is so harmful or consumers' beliefs and behaviors are so difficult to change that change agents are forced to use power strategies; for instance, when the actions of one consumer harm another person or adversely affect the latter person's choices (Moorman and Price, 1989). These situations may occur if (1) health information programs targeted for one consumer segment spill over to harm another segment (e.g., if RDA information increases the decision quality of educated consumers but decreases the decision quality of uneducated consumers [see Moorman, 1990]); or (2) consumer health behaviors spill over to harm others who do not choose to enact the behavior (e.g., if parents' food choices affect children's health or smokers' choices affect nonsmokers' health). The use of power strategies to ameliorate these situations raises complex issues about how to trade off benefits to some consumers against harm to others. Hence, the use of power strategies should receive considerable review from external constituencies.

References

- Ajzen, I. and Madden, T.J. (1986). Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology*, 22(September), 453-473.
- Antonucci, T.C., Akiyama, H., and Adelman, P.K. (1990). Health behaviors and social roles among mature men and women. *Journal of Aging and Health*, 2(February), 3-14.
- Argyris, C. (1982). *Reasoning, learning and action: Individual and organizational*. San Francisco: Jossey-Bass.
- Avis, N.E., McKinlay, J.B., and Smith, K.W. (1990). Is cardiovascular risk factor knowledge sufficient to influence behavior? *American Journal of Preventive Medicine*, 6(3), 137-144.
- Bagozzi, R.P. and Warshaw, P.R. (1990). Trying to consume. *Journal of Consumer Research*, 17(September), 127-140.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215.
- Bettman, J.R. (1975). Issues in designing consumer information environments. *Journal of Consumer Research*, 2(December), 169-177.
- Bettman, J.R. and Park, C.W. (1980). Effects of prior knowledge and experience and phase of the choice process on consumer decision processes: A protocol analysis. *Journal of Consumer Research*, 7(December), 234-248.
- Brucks, M. (1985). The effect of product class knowledge on information search behavior. *Journal of Consumer Research*, 12(June), 1-16.
- Carter, J.H. (1982). The effects of aging on selected visual functions: Color vision, glare sensitivity, field of vision and accommodation. In Sekuler, R., Kline, D., and Dismukes, K. (Eds.), *Aging and human visual function* (pp. 121-130). New York: Alan R. Liss.
- Celsi, R.L. and Olson, J.C. (1988). The role of involvement attention and comprehension processes. *Journal of Consumer Research*, 15(September), 210-224.
- Closher, P.L., Wallace, R.B., Pomrehn, P.R., and others (1990). Demographic and health characteristics of elderly smokers: Results from established populations for epidemiologic studies of the elderly. *American Journal of Preventive Medicine*, 6(2), 61-70.
- Cole, C.A. and Gaeth, G.J. (1990). Cognitive and age-related differences in the ability to use nutritional information in a complex environment. *Journal of Marketing Research*, 27(May), 175-184.
- Crocker, J. (1983). A schematic approach to changing consumer's beliefs. In Bagozzi, R.P. and Tybout, A.M. (Eds.), *Advances in Consumer Research* (Vol. 10, pp. 472-477). Ann Arbor, MI: Association for Consumer Research.
- Dabbs, J.M. and Kirscht, J.P. (1971). Internal control, and the taking of influenza shots. *Psychological Reports*, 28(June), 959-962.
- Davis, H.R. (1973). Change and innovation. In Feldman, S. (Ed.), *Administration and Mental Health*. New York: Charles Thomas, 232-240.
- Davis, H.R. and Salasin, S.E. (1975). *The utilization of evaluation*. Struening, E. and Guttentag, M. (Eds.) (Vol. 1, pp. 621-666). Beverly Hills, CA: Sage.
- Dean, K. (1989). Self-care components of lifestyles: The importance of gender, attitudes and the social situation. *Social Science and Medicine*, 29, 137-152.
- Dholakia, R.R. (1984, Spring). A macromarketing perspective on social marketing: The case of family planning in India. *Journal of Macromarketing*, pp. 53-61.
- Fishbein, M. and Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Fine, S.H. (1981). *The marketing of ideas and social issues*. New York: Praeger.
- Fliegal, F.C. and Kivlin, J.E. (1966). Attributes of innovations as factors in diffusion. *American Journal of Sociology*, 72(November), 235-248.
- Fox, K.F.A. and Kotler, P. (1980). The marketing of social causes: The first 10 years. *Journal of Marketing*, 44(Fall), 24-33.
- Freedman, A.M. (1990a, December 18). Amid ghetto hunger, many more suffer eating wrong foods. *The Wall Street Journal*, pp. A1, A5.
- Freedman, A.M. (1990b, December 19). Fast-food chains play central role in diet of the inner city poor. *The Wall Street Journal*, pp. A1, A5.
- Gatignon, H. and Robertson, T.S. (1985). A propositional inventory for new diffusion research. *Journal of Consumer Research*, 11(March), 849-867.
- Glaser, E., Abelson, H., and Garrison, K. (1983). *Putting knowledge to use: Facilitating the diffusion of knowledge and the implementation of planned change*. San Francisco: Jossey-Bass.
- The great American health pitch. (1989, October 9). *Business Week*, pp. 114-117.
- Heider, F. (1946). Attitudes and cognitive organization. *The Journal of Psychology*, 21, 107-112.

- Hickey, T., Rakowski, W., and Julius, M. (1988). Preventive health practices among older men and women. *Research on Aging*, 10(September), 315-328.
- Hill, D., Rassaby, J., and Gardner, G. (1984). Determinants of intentions to take precautions against skin cancer. *Community Health Study*, 8, 33-44.
- Houston, M.J. and Rothschild, M.L. (1978). Conceptual and methodological perspectives in involvement. In Jain, S. (Ed.), *Research frontiers in marketing: Dialogues and directions* (pp. 184-187). Chicago: American Marketing Association.
- Johnson, E.J. and Russo, J.E. (1984). Product familiarity and learning new information. *Journal of Consumer Research*, 11(June), 542-550.
- Johnson, K.W. (1989). Knowledge utilization and planned change: An empirical assessment of the A VICTORY model. *Knowledge in Society*, 2(2), 57-79.
- Keesling, B. and Friedman, H.S. (1987). Psychological factors in sunbathing and sunscreen use. *Health Psychology*, 6(5), 477-493.
- Kihlstrom, J.F. and Cantor, N. (1984). Mental representations of the self. *Advances in Experimental Social Psychology*, 17, 1-47.
- Kline, D. and Scheiber, F. (1985). Vision and aging. In Birren, J.E. and Scaie, K.W. (Eds.), *Handbook of the psychology of aging* (pp. 296-331). New York: Van Nostrand Reinhold.
- Kotler, P. (1988). *Marketing management: Design, analysis, implementation, and control*. Englewood Cliffs, NJ: Prentice-Hall.
- Kotler, P. and Roberto, E.L. (1989). *Social marketing: Strategies for changing public behavior*. New York: Free Press.
- Kotler, P. and Zaltman, G. (1971). Social marketing: An approach to planned social change. *Journal of Marketing*, 35(July), 3-12.
- Kristiansen, C.M. (1990). The role of values in the relation between gender and health behaviour. *Social Behaviour*, 5(2), 127-133.
- Lau, R.R. (1982). Origins of health locus of control beliefs. *Journal of Personality and Social Psychology*, 42, 322-334.
- Lau, R.R. (1988). Beliefs about control and health behavior. In Gochman, D.S. (Ed.), *Health behaviors: Emerging research perspectives* (pp.43-63). New York: Plenum Press.
- Lau, R.R., Hartman, K.A., and Ware, J.E., Jr. (1986). Health as a value: Methodological and theoretical considerations. *Health Psychology*, 5(1), 25-43.
- Lau, R.R. and Ware, J.E., Jr. (1981). Refinements in the measurement of health-specific locus-of-control beliefs. *Medical Care*, 19, 1147-1158.
- Lavidge, R.J. and Steiner, G.A. (1961). A model for predictive measurements of advertising effectiveness. *Journal of Marketing*, 25(October), 59-62.
- Lazarsfeld, P.F. and Merton, R.K. (1949). Mass communication, popular taste, and organized social action. In Schramm, W. (Ed.), *Mass Communications* (pp. 459-480). Urbana: University of Illinois Press.
- Levy, A.S., Matthews, O., Stephenson, M., and others. (1985). The impact of a nutrition information program on food purchases. *Journal of Public Policy and Marketing*, 4, 1-13.
- Liem, R. and Liem, J. (1978). Social class and mental illness reconsidered: The role of economic stress and social support. *Journal of Health and Social Behavior*, 19(June), 139-156.
- MacInnis, D.J., Moorman, C., and Jaworski, B.J. (1991). Enhancing and measuring consumers' motivation, opportunity, and ability to process brand information from ads. *Journal of Marketing*, 55(October), 32-53.
- Manning, D.T., Barenberg, N., Gallese, L., and Rice, J.C. (1989). College students' knowledge and health beliefs about AIDS: Implications for education and prevention. *Journal of American College Health*, 37(May), 254-259.
- Markus, H. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology*, 35(1), 63-78.
- Marshall, C. (1989, May). Getting drugs out. *Business Month*, pp. 66-73.
- Mazis, M., Staelin, R., Beales, H., and Salop, S. (1981). A framework for evaluating consumer information regulation. *Journal of Marketing*, 45(Winter), 11-21.
- McAlister, L. and Pessemier, E. (1982). Variety seeking behavior: An interdisciplinary review. *Journal of Consumer Research*, 9(December), 311-322.
- McLeod, J.D. and Kessler, R.C. (1990). Socioeconomic status differences in vulnerability to undesirable life events. *Journal of Health and Social Behavior*, 31(June), 162-172.
- Mechanic, D. (Ed.). (1982). *Symptoms, illness behavior, and help-seeking*. New Brunswick, NJ: Rutgers University Press.
- Mirowsky, J. and Ross, C.E. (1986). Social patterns of distress. *Annual Review of Sociology*, 12, 23-45.
- Moorman, C. (1990). The effects of stimulus and consumer characteristics on the utilization of nutrition information. *Journal of Consumer Research*, 17(December), 362-374.
- Moorman, C. and Matulich, E. (1991). *Consumers' health behaviors: Theory and empirical test* (working paper). Madison: University of Wisconsin, Graduate School of Business.
- Moorman, C. and Price, L.L. (1989). Consumer policy remedies and consumer segment interactions. *Journal of Public Policy and Marketing*, 8, 181-203.
- Myers, J.K., Lindenthal, J.J., and Pepper, M.P. (1975). Life events, social integration and psychiatric symptomatology. *Journal of Health and Social Behavior*, 16(December), 421-427.
- Naisbett, J. (1984). *Megatrends*. New York: Warner Books.
- Nord, W.R., and Peter, J.P. (1980). A behavior modification perspective on marketing. *Journal of Marketing*, 44(Spring), 36-47.
- Odds and ends (1991, June 6). *The Wall Street Journal*, p. B1.
- O'Neill, G.W., Blanck, L.S., and Jayner, M.A. (1980). The use of stimulus control over littering in a natural setting. *Journal of Applied Behavior Analysis*, 6, 379-381.

- Olson, J.C. and Reynolds, T.J. (1983). Understanding consumers' cognitive structures: Implications for marketing strategy. In Percy, L. and Woodside, A. (Eds.), *Advertising and consumer psychology* (Vol. 1, pp. 77-90). Lexington, MA: Lexington Books.
- Ottomanelli, G., Kramer, T.H., Bihari, B., and others. (1990). AIDS-related risk behaviors among substance abusers. *International Journal of the Addictions*, 25(3), 291-299.
- Park, C.W. and Mittal, B. (1985). A theory of involvement in consumer behavior: Problems and issues. In Sheth, J.N. (Ed.), *Research in consumer behavior* (Vol. 1, pp. 201-231). Greenwich, CT: JAI Press.
- Park, C.W. and Zaltman, G. (1987). *Marketing management*. New York: Dryden Press.
- Peter, J.P. and Olson, J.C. (1990). *Consumer behavior and marketing strategy* (2d ed.). Homewood, IL: Richard D. Irwin.
- Pineault, R., Champagne, F., Maheux, B., and others (1989). Determinants of health counseling practices in hospitals: The patients' perspective. *American Journal of Preventive Medicine*, 5(5), 257-265.
- Pitts, D.G. (1982). The effects of aging on selected visual functions: Dark adaption, visual acuity, stereopsis, and brightness contrast. In Sekuler, R., Kline, D., and Dismukes, K. (Eds.), *Aging and human visual function* (pp. 131-160). New York: Alan R. Liss.
- Ram, S. and Sheth, J.N. (1989). Consumer resistance to innovations: The marketing problem and its solutions. *Journal of Consumer Marketing*, 6(Spring), 5-14.
- Ray, M.L. (1973). Marketing communication and the hierarchy of effects. In Clark, P. (Ed.), *New models for communication research* (pp. 147-176). Beverly Hills, CA: Sage.
- Roberts, M. and Harris, T.G. (1989, May). Wellness at work: How corporations help employees fight stress and stay healthy. *Psychology Today*, pp. 54-58.
- Rogers, E.M. (1983). *Diffusion of innovations*. New York: Free Press.
- Rogers, E.M. and Shoemaker, F.F. (1971). *Communication of innovations: A cross-cultural approach*. New York: Free Press.
- Rokeach, M. (1973). *The nature of human values*. New York: Free Press.
- Rosner, T.T., Namazi, K.H., and Wykle, M.L. (1988). Physician use among the old-old. *Medical Care*, 26, 982-991.
- Rothschild, M.L. (1979). Marketing communications in nonbusiness situations, or: Why it's so hard to sell brotherhood like soap. *Journal of Marketing*, 43(Spring), 11-20.
- Rotter, J.B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, 80, No. 609.
- Russo, J.E., Staelin, R., Nolan, C.A., and others. (1986). Nutrition information in the supermarket. *Journal of Consumer Research*, 13(June), 48-70.
- Scammon, D.L. (1977). Information load and consumers. *Journal of Consumer Research*, 4(December), 148-155.
- Sheth, J.N. and Frazier, G. (1982). A model of strategy mix choice for planned social change. *Journal of Marketing*, 46(Winter), 15-26.
- Speers, M.A., Niemcryk, S.J., Morter, R., and others. (1990). Spouse similarities in high blood pressure knowledge: Implications for control of high blood pressure. *American Journal of Preventive Medicine*, 6(1), 20-27.
- Spilman, M.A. (1988). Gender differences in worksite health promotion activities. *Social Science and Medicine*, 26, 525-535.
- Sproles, G., Geistfeld, L.V., and Badenhop, S.B. (1978). Information inputs as influences on efficient consumer decision-making. *Journal of Consumer Affairs*, 12(Summer), 88-103.
- Sproles, G., Geistfeld, L.V., and Badenhop, S.B. (1980). Types and amounts of information used by efficient consumers. *Journal of Consumer Affairs*, 14(Summer), 37-48.
- Sternthal, B., Dholakia, R., and Leavitt, C. (1978). The persuasive effect of source credibility: Tests of cognitive response. *Journal of Consumer Research*, 4(March) 252-260.
- Thorelli, H.B. and Engledow, J.L. (1980). Information seekers and information systems: A policy perspective. *Journal of Marketing*, 44(Spring), 9-27.
- Verbrugge, L.M. (1985). Gender and health: An update on hypotheses and evidence. *Journal of Health and Social Behavior*, 26(September), 156-182.
- Watters, J.K., Downing, M., Case, P., and others. (1990). AIDS prevention for intravenous drug users in the community: Street-based education and risk behavior. *American Journal of Community Psychology*, 18(August), 587-596.
- Wiebe, G.D. (1951). Merchandising commodities and citizenship on television. *Public Opinion Quarterly*, 15(Winter), 679-691.
- Williams, D.R. (1990). Socioeconomic differentials in health: A review and redirection. *Social Psychology Quarterly*, 53(2), 81-99.
- Youthful sobriety tests liquor firms. (1990, June 14) *The Wall Street Journal*, p. B1.
- Zaltman, G. and Duncan, R. (1977). *Strategies for planned social change*. New York: Wiley Interscience.
- Zaltman, G., Duncan, R., and Holbek, J. (1973). *Innovations and organizations*. New York: Wiley Interscience.
- Zaltman, G. and Lin, N. (1971). On the nature of innovations. *American Behavioral Scientist*, 14, 651-673.
- Zweig, S., LeFevre, M., and Kruse, J. (1988). The health belief model and attendance for prenatal care. *Family Practice Research Journal*, 8(Fall/Winter), 32-41.