

Health Promotion from the Perspective of Social Cognitive Theory

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Abstract

This chapter examines health promotion and disease prevention from the perspective of social cognitive theory. This theory posits a multifaceted causal structure in which self-efficacy beliefs operate in concert with cognized goals, outcome expectations, and perceived environmental impediments and facilitators in the regulation of human motivation, action, and well-being. Perceived self-efficacy is a key factor in the causal structure because it operates on motivation and action both directly and through its impact on the other determinants. The areas of overlap of sociocognitive determinants with some of the most widely applied psychosocial models of health are identified. Social cognitive theory addresses the sociostructural determinants of health as well as the personal determinants. A comprehensive approach to health promotion requires changing the practices of social systems that have widespread detrimental effects on health rather than solely changing the habits of individuals. Further progress in this field requires building new structures for health promotion, new systems for risk reduction and greater emphasis on health policy initiatives. People's beliefs in their collective efficacy to accomplish social change, therefore, play a key role in the policy and public health perspective to health promotion and disease prevention.

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The recent years have witnessed major changes in the conception of human health and illness from a *disease model*, to a *health model*. It is just as meaningful to speak of levels of vitality as of degrees of impairment. The health model, therefore, focuses on health promotion as well as disease prevention. Lifestyle habits exert a major impact on the quality of human health. Current health practices focus mainly on the supply side by reducing, rationing, and curtailing access to health care services to contain health costs. The social cognitive approach works on the demand side by helping people to stay healthy through good self-management of health habits. By exercising control over several health habits people can live longer, healthier, and slow the process of biological aging (Bandura, 1997; Bortz, 1982; Fries, et al., 1993; Fries, 1997). As health economists amply document, medical care cannot substitute for healthful habits and environmental conditions (Fuchs, 1974; Lindsay, 1980). Self-management of habits that enhance health and reduction of those that impair it is good medicine. Indeed, if the huge benefits of a few key lifestyle habits were put into a pill, it would be declared a spectacular breakthrough in the field of medicine.

Research guided by various psychosocial theories of health behavior have added to our understanding of how cognitive and social factors contribute to human health and disease. Among these various approaches are the health belief model (Becker, 1974; Rosenstock, 1974), social cognitive theory (Bandura, 1986, 1997), the theories of reasoned action (Ajzen & Fishbein, 1980), planned behavior (Ajzen, 1991) and protection motivation (Rogers, 1983).

Proliferation of conceptual models of health behavior tends to spawn cafeteria style research. Constructs are picked from various theories and strung together in the name of theoretical integration. This practice multiplies predictors needlessly in several ways. Similar factors, but given different names, are included in new conglomerates as though they were entirely different determinants. Facets of a higher-order construct are split into seemingly different determinants, as when different forms of anticipated outcomes of behavioral change are included as different constructs under the names of attitudes, normative influences, and outcome expectations. Following the timeless dictum that, the more the better, some researchers overload their studies with a host of factors that contribute only trivially to health habits because of redundancy. There is a marked difference between expanding the scope of an integrative theory and creating conglomerates from different theories with problems of redundancy and fractionation of predictors and theoretical disconnectedness.

The present article examines health promotion and disease prevention from the perspective of social cognitive theory. This theory posits a multifaceted causal structure in which self-efficacy beliefs operate in concert with cognized goals, outcome expectations, and perceived environmental impediments and facilitators in the regulation of human motivation, action, and well-being. This approach addresses the sociostructural determinants of health as well as the personal determinants. The factors singled out in the various theories overlap with subsets of determinants in social cognitive theory. Figure 1 presents the areas of overlap of the main set of sociocognitive determinants with those of some of the widely applied psychosocial theories of health behavior. It is acknowledged that these theories differ in their specified range of application. However, they are applied to a variety of health behaviors and will be considered briefly in relation to such applications. Social cognitive theory in its totality specifies factors governing the acquisition of competencies that can profoundly affect physical and emotional well-being as well as the self-regulation of health habits.

 Insert Figure 1 about here

Sociocognitive Causal Structure

If people lack awareness of how their lifestyle habits affect their health, they have little reason to put themselves through the misery of changing the bad habits they enjoy. They are lectured more than they want to hear about their unhealthy practices. Applications of theories of health behavior have tended to assume adequate knowledge of health risks. It is usually high. Knowledge creates the precondition for change. But additional self-influences are needed to overcome the impediments to adopting new lifestyle habits and maintaining them.

Beliefs of personal efficacy occupy a pivotal regulative role in the causal structure of social cognitive theory (Bandura, 1997). Perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given levels of attainments. Although a sense of personal efficacy is concerned with perceived capabilities to produce effects, the events over which personal influence is exercised varies widely. It may entail regulating of one's own motivation, thought processes, affective states and behavior patterns, or changing environmental conditions, depending on which aspects of life one seeks to manage.

Efficacy belief is a major basis of action. Unless people believe they can produce desired effects by their actions, they have little incentive to act or to persevere in the face of difficulties and setbacks. Whatever else may serve as motivators, they must be founded on the belief that one has the power to produce desired changes by one's actions.

Exercise of control requires not only skills, but a strong sense of efficacy to use them effectively and consistently under difficult circumstances. Efficacy beliefs not only operate in their own right. They act on other determinants in the regulation of behavior (Bandura, 1997). Beliefs in one's learning efficacy and efficient deployment of effort enhance acquisition of knowledge and skills for managing the demands of everyday life. Efficacy beliefs also regulate motivation by determining the goals people set for themselves, the strength of commitment to them and the outcomes they expect for their efforts. Belief in the power to produce effects determines how long people will persevere in the face of obstacles and failure experiences, their resilience to adversity, whether their thought patterns are self-hindering or self-aiding, and how much stress and depression they experience in coping with taxing environmental demands. The beliefs that people hold about their capabilities, therefore, affect whether they make good or poor use of the skills they possess. Self-doubts can easily overrule the best of skills.

People's beliefs in their personal efficacy can be developed by four main sources of influence. The most effective way of creating a strong sense of efficacy is through mastery experiences. Successes build a robust belief in one's personal efficacy. Failures undermine it, especially if failures occur before some sense of self-assurance has been established. If people experience only easy successes they come to expect quick results and are easily discouraged by failure. A resilient sense of efficacy requires experience in overcoming obstacles through perseverant effort.

The second way of creating and strengthening self-beliefs of efficacy is through the vicarious experiences provided by social models. Seeing people similar to oneself succeed by sustained effort raises observers' beliefs that they too possess the capabilities master comparable

activities to succeed. Modeling influences do more than provide a social standard against which to judge one's own capabilities. Through their behavior and expressed ways of thinking, competent models transmit knowledge and teach observers effective skills and strategies for managing environmental demands.

Social persuasion is a third way of strengthening people's beliefs that they have what it takes to succeed. People who are persuaded verbally that they possess the capabilities to master given activities are likely to mobilize greater effort and sustain it than if they harbor self-doubts and dwell on personal deficiencies when problems arise. Successful efficacy builders do more than convey positive appraisals of capabilities, however, they structure situations for people in ways that bring success and avoid placing them in situations prematurely where they are likely to fail often. They encourage people to measure success in terms of self-improvement.

People also rely partly on their somatic and emotional states in judging their capabilities. They interpret their stress reactions and tension as signs of inefficacy. In activities involving strength and stamina, people judge their fatigue, aches and pains as signs of physical debility. Mood also affects judgments of their personal efficacy. Positive mood enhances perceived self-efficacy, despondent mood diminishes it. The fourth way of modifying self-beliefs of efficacy is to reduce people's stress reactions, alter their negative emotional proclivities and correct misinterpretations of their physical states.

Most models of health behavior now include an efficacy determinant (see Figure 1). Those that do not, sacrifice explanatory and predictive power. For example, when added to the variables in the theory of reasoned action, a sense of efficacy to exercise control promotes health behavior both directly and by its influence on intention (Ajzen & Madden, 1986; deVries & Backbier, 1994; deVries, Dijkstra, & Kuhlman, 1988; Dzewaltowski, Noble, & Shaw, 1990; Kok, deVries, Mudde, & Strecher, 1991; Van Ryn, Lytte, & Kirscht, 1996; Schwarzer, 1992). Attitudes are usually predictive, especially of intention, but normative influences vary widely in their contribution across different types of health behavior. Efficacy beliefs are consistently predictive.

There are two levels at which a sense of personal efficacy plays an influential role in human health (Bandura, 1992a, 1997). At the more basic level, people's beliefs in their capability to cope with stressors activate biological systems that mediate health and disease. Social cognitive theory views stress reactions in terms of perceived inefficacy to exercise control over threats and taxing environmental demands. If people believe they can deal effectively with potential stressors they are not perturbed by them. But if they believe they cannot control aversive events they distress themselves and impair their level of functioning. The impact of beliefs of coping efficacy on biological stress reactions is verified in experimental studies in which people are exposed to stressors under perceived inefficacy and after their beliefs of coping efficacy are raised to high levels through guided mastery experiences (Bandura, 1992; O'Leary & Brown, 1995). Exposure to stressors without perceived efficacy to control them activates autonomic, catecholamine and endogenous opioid systems. After people's perceived coping efficacy is strengthened they manage the same stressors without experiencing any distress, visceral agitation or activation of stress-related hormones. The types of biochemical reactions that have been shown to accompany a weak sense of coping efficacy are involved in the regulation of the immune system. Hence, exposure to uncontrollable stressors tends to impair the function of the immune system in ways that can increase susceptibility to illness (Herbert & Cohen, 1993).

Most human stress is activated while learning how to exercise control over environmental demands and during the process of developing and expanding competencies. Stress aroused while gaining coping mastery over threatening situations can enhance different components of the immune system (Wiedenfled, et al., 1990). Providing people with the means for managing acute and chronic stressors increases immunologic functioning (Antoni, et al., 1990; Gruber, Hall, Hersh, & Dubois, 1988; Kiecolt-Glaser, et al., 1986). The field of health has been heavily preoccupied with the physiologically debilitating effects of stressors. Self-efficacy theory also acknowledges the physiologically strengthening effects of mastery over stressors. A growing number of studies are providing empirical support for physiological toughening by successful coping (Dienstbier, 1989).

Depression is another affective pathway through which perceived self-efficacy can affect health functioning. Depression has been shown to reduce immune function, and to heighten susceptibility to disease. The more severe the depression, the greater the reduction in immunity (Herbert & Cohen, 1993). A low sense of efficacy to exercise control over things one values highly produces depression in several ways. One route is through unfulfilled aspirations. People who impose on themselves standards of self-worth they judge they cannot attain drive themselves to bouts of depression (Bandura, 1991, Kanfer & Zeiss, 1983).

A second route to depression is through a low sense of social efficacy to develop social relationships that bring satisfaction to one's life, and cushion the adverse effects of chronic stressors. Social support reduces vulnerability to stress, depression, and physical illness. But social support is not a self-forming entity waiting around to buffer harried people against stressors. People have to go out and find, and create, supportive relationships for themselves. This requires a strong sense of social efficacy. The Holahan's have shown that a low sense of social efficacy contributes to depression both directly, and by curtailing development of social supports (Holahan & Holahan, 1987a, b). Perceived self-efficacy and social support strengthen each other bidirectionally. Perceived social efficacy builds supportive relationships and social support enhances personal efficacy. Mediation analyses show that social support alleviates depression and physical dysfunction and fosters health-promoting behavior only indirectly to the extent that it raises perceived coping efficacy (Cutrona & Troutman, 1986; Duncan & McAuley, 1993; Major, Mueller, & Hildebrandt, 1985).

The second level at which beliefs of personal efficacy affect health is concerned with direct control over health habits and over the progression of biological aging. People's beliefs in their efficacy to regulate their own motivation and behavior affect every phase of personal change. They determine whether people even consider changing their health habits; whether they enlist the motivation and perseverance needed to succeed, should they choose to do so; how well they maintain the habit changes they have achieved; their vulnerability to relapse; and their success in restoring control after a setback.

A vast body of evidence reveals that belief in one's efficacy to exercise control over health-related behavior plays an influential role in health status and functioning. The self-efficacy belief system operates as a common mechanism through which diverse modes of interventions affect different types of health outcomes. The stronger the instilled perceived self-efficacy, the more likely are people to enlist and sustain the effort needed to adopt and maintain health-promoting behavior. These beneficial effects have been shown in such diverse areas of health as level of postcoronary recovery (Ewart, Taylor, Reese, & DeBusk, 1983; Schröder, Schwarzer, & Endler, 1997; Taylor, Bandura, Ewart, Miller, & DeBusk, 1985); recovery from coronary artery surgery (Allen, Becker, & Swant, 1990; Bastone & Kerns, 1995; Jensen et al.,

1993; Mahler & Kulik, 1998; Oka, Gortner, Stotts, & Haskell, 1996; Sullivan, Andrea, LaCroix, Russo, & Katon, 1998); coping with cancer (Beckham et al., 1997; Cunningham, Lockwood, & Cunningham, 1991; Merluzzi & Sanchez, 1997) and end-stage renal disease (Devins, et al., 1982); adherence to immunosuppressive medication in renal transplantation and other prescribed medications (Brus, vandeLaar, Taal, Rasker, & Wiegman; DeGeest, et al., 1995); coping with oral surgery (Litt, Nye, & Shafer, 1995) and gastrointestinal endoscopy (Gattuso, Litt, & Fitzgerald, 1992); enhancing pulmonary function in patients suffering from chronic pulmonary disease (Kaplan, Atkins, & Reinsch, 1984); countering the debilitating and distressing effects of chronic fatigue syndrome (Findley, Kerns, Weinberg, & Rosenberg, 1998); decreasing the risk of osteoporosis through physical activity and calcium intake (Haran, Kim, Gendler, Froman, & Patel, 1998); reducing pain and dysfunction in rheumatoid arthritis (Holman & Lorig, 1992; Schiaffino, Revenson, & Gibofsky, 1991); reducing the pain of childbirth and electing vaginal over repeat cesarean delivery (Dilles & Beal, 1997; Manning & Wright, 1983); eliminating tension headaches (Holroyd et al., 1984; Martin, Holroyd, & Rokicki, 1993); managing chronic low back, neck and leg pain and impairment (Council, Ahern, Follick, & Kline, 1988; Dolce, 1987; Kaivanto, Estlander, Moneta, & Vanharanta, 1995); modifying eating habits and disorders (Desmond & Price, 1988; Glynn & Ruderman, 1986; Love, Ollendick, Johnson, & Schlezinger, 1985; Schneider, O'Leary, & Agras, 1987); reducing cholesterol through dietary means (McCann, et al., 1995); adhering to prescribed rehabilitative activities (Ewart et al., 1986); adopting and adhering to programs of physical exercise (Desharnais, Bouillon, & Godin, 1986; McAuley, 1992; Sallis et al., 1986); self-management of diabetes (Grossman, Brink, & Hauser, 1987; Hurley & Shea, 1992); exercise of control over sexual coercion and sexual practices that pose high risk for transmission of AIDS (Bengel, Beltz-Merk, & Farin, 1996; McKusick, Coates, & Morin, 1989; Walsh & Foshee, 1998; Witte, 1992); and controlling alcohol and drug abuse that impair health (DiClemente, Fairhurst & Piotrowski, 1995; Marlatt, Baer & Quigley, 1995; Stevens, Wertz, & Roffman, 1995).

That self-efficacy beliefs yield functional dividends in other spheres of adaptation and change is verified by meta-analytic studies (Holden, Moncher, Schinke, & Barker, 1990; Stajkovic & Luthans, 1998). Meta-analyses similarly confirm the influential role of self-efficacy beliefs across diverse domains of health functioning (Gilles, 1993; Holden, 1991). In studies applying multiple controls, efficacy beliefs retain their predictiveness after the influence of baseline function, sociodemographic characteristics, affective states, and other relevant factors are removed.

In social cognitive theory, efficacy beliefs operate as one of many determinants that regulate motivation, affect, and behavior. Studies comparing the predictiveness of different theoretical models should, therefore, measure the full set of determinants posited by social cognitive theory rather than only the efficacy component. Outcome expectations about the effects of different lifestyle habits also contribute to health behavior. Outcome expectations can take three major forms (Figure 2). Within each form, the anticipated positive outcomes serve as incentives, the negative outcomes as disincentives. One class of outcomes includes the physical effects that accompany the behavior. They include pleasant sensory experiences and physical pleasures in the positive forms, and aversive sensory experiences, pain, and physical discomfort in the negative forms. Behavior is also partly regulated by the social reactions it evokes. The positive and negative social sanctions constitute the second class of outcomes.

Insert Figure 2 about here

People do not behave like weathervanes, constantly shifting to whatever social influences happen to impinge on them at the moment. They adopt personal standards and regulate their behavior by their self-sanctions. They do things that give them self-satisfaction and self-worth, and refrain from behaving in ways that breed self-dissatisfaction. This third class of outcomes concerns the positive and negative self-evaluative reactions to one's behavior. Evaluative self-sanction is one of the more influential regulators of human behavior but is typically ignored in models of personal change.

Most of the factors included in the different conceptual models correspond to these various types of outcome expectations. Perceived severity and susceptibility to disease in the health-belief model represents the expected negative physical outcomes (Becker, 1974). The perceived benefits of preventive action represent the positive outcome expectations.

In the theories of reasoned action and planned behavior, the intention to engage in a behavior is governed by attitudes toward the behavior and by subjective norms (Ajzen, 1991; Ajzen & Fishbein, 1980). These determinants correspond to different classes of outcome expectations. Attitude is measured in terms of perceived outcomes and the value placed on those outcomes. Norms are measured by perceived social pressures by significant others and one's motivation to comply with their expectations. Norms correspond to expected social outcomes for given styles of behavior.

In social cognitive theory, normative influences regulate actions through two control processes. These include social sanctions and self-sanctions. Norms influence behavior anticipatorily by the social consequences they provide. Behavior that fulfills social norms gains positive social reactions. Behavior that violates social norms brings social censure. In addition, social norms convey behavioral standards. Adoption of standards creates a self-regulatory system that operates through self-sanctions. In this process, people regulate their behavior by self-evaluative reactions. Some researchers report that normative pressures have little impact on health behavior (deVries, Kok, & Dykstra, 1992; Kok, et al., 1991; Lechner & deVries, 1995). This raises the question of whether normative influences are ineffectual, which seems highly unlikely, or whether they need to be measured more comprehensively as different forms of social outcome expectations.

In social cognitive theory, cognized goals, rooted in a value system, provide further self-incentives and guides to health behavior (Bandura, 1986). Goals may be distal ones that serve an orienting function, or proximal ones that regulate effort and guide action in the here and now. Intentions are essentially proximal goals. Both "*I aim to do x*" and "*I intend to do x*" refer to what a person proposes to do. Goals are an interlinked facet of a motivational mechanism, not simply a discrete predictor to be tacked on a conceptual model (Bandura, 1991). In self-motivation through goal setting, people monitor their behavior and react positively or negatively to their attainments depending on how they compare to their goal aspirations. Efficacy beliefs affect goal setting and whether substandard performances spark greater effort or are demoralizing. But goals make independent contribution to performance.

Personal change would be trivially easy if there were no impediments or barriers to surmount. Hence, perceived barriers are an important factor in the health belief model and in elaborated versions of it. Social cognitive theory distinguishes between different types of

barriers. Some of them are personal impediments that impede performance of the health behavior itself. They form an integral part of self-efficacy assessment. Efficacy beliefs must be measured against gradations of challenges or impediments to successful performance. For example, in assessing personal efficacy to stick to an exercise routine, individuals judge the strength of their efficacy to get themselves to exercise regularly when they are under pressure from work, are tired, depressed, have more interesting things to do and face foul weather. If there are no impediments to surmount, the behavior is easily performable and everyone is totally efficacious.

The regulation of behavior is not solely a personal matter. Some of the impediments to healthful living reside in health systems rather than in personal or situational impediments. Unavailability of health resources presents a second class of barriers to healthful behavior. These impediments are rooted in how health services are structured socially and economically. We shall consider the sociostructural determinants of health in a later section of this article.

Tests for Redundancy of Predictors

Figure 3 provides one example of how similar determinants bearing different labels influence health behavior through different postulated causal structures. In the top causal model, perceived self-efficacy has been severed from social cognitive theory and grafted on the theory of reasoned action. We saw earlier that it adds incremental prediction. In the bottom causal model, perceived self-efficacy remains integrated with its conceptual brethren in the causal structure of social cognitive theory. The redundancy of predictors under different names in different models of health behavior is an issue of both theoretical and empirical interest.

 Insert Figure 3 about here

Some researchers have tested whether factors in other models add incremental prediction over and above the determinants in social cognitive theory. For example, Dzewaltowski, Noble and Shaw (1990) included efficacy beliefs, expected physical health benefits and self-sanctions for healthful behavior in the sociocognitive subset. They found that efficacy beliefs and self-sanctions contribute to adherence to healthful behavior. Attitudes and perceived social pressure also account for healthful behavior. But they do not improve prediction when added to the subset of sociocognitive determinants. These findings suggest redundancy of similar determinants under different names rather than dissimilar determinants. However, the generality of construct redundancy needs to be tested further across different types of health behavior.

We seek theories of human behavior with integrative principles of broad applicability. The same set of determinants and mechanisms posited by social cognitive theory operate in markedly diverse areas of functioning as they do in health behavior (Bandura, 1997). The value of a psychological theory is judged not only by its explanatory and predictive power, but by its operational power to effect change. Most of the models of health behavior are concerned mainly with predicting health habits, but they offer little guidance on how to change them. In addition to providing a unified conceptual framework, social cognitive theory embeds its determinants in a large body of knowledge that specifies the mechanisms through which they operate and how to enlist them to enhance human health (Bandura, 1986; 1997). It provides guidelines on how to

structure goals and incentive systems to heighten motivation for personal change. It supplies a body of knowledge on how to build resilience to the demoralizing effects of difficulties and setbacks. The variables that form the prediction model are the same ones that inform the intervention model.

Stages of Change

Stage theories are undergoing a dignified burial in psychology (Flavell, 1978). Human functioning is too multifaceted and multidetermined to be shrunk to a few discrete categories. Yet many health researchers are adopting the stages-of-change notion as their guiding scheme (Prochaska & DiClemente, 1992). According to this view, in adopting new patterns of behavior people presumably move through a sequence of stages from precontemplators with no intention to change, to contemplators who intend to change, to actors who adopt the behavior but not yet regularly, and to maintainers who perform it regularly. A genuine stage theory is rooted in three basic assumptions: Qualitative transformations across discrete stages, invariant sequence of change, and nonreversibility. The stages-of-change scheme violates each of these requirements.

To begin with, the categories in the stages-of-change scheme are arbitrary pseudo-stages rather than genuine stages. In a genuine stage theory, the characteristics at one stage are transformed into qualitatively different ones at the next stage. For example, in stage progression in biological change a caterpillar gets transformed into a butterfly. In Piaget's stage progression of cognitive change, preoperational thinking is transformed into qualitatively different operational thinking. In the stages-of-change scheme, differences in degree are arbitrarily subdivided into discrete categories called "stages." The first two stages are differences in degree of intention. Noncontemplators have no intention to change. Contemplators have some intention to change. The subsequent stages are gradations of the very behavior to be explained. The action and maintenance stages are arbitrary subdivisions of degree of duration of adopted behavior rather than differences in kind. Thus, performing the behavior less than 6 months is the action stage. Doing it for more than 6 months is the maintenance stage. At the upper levels of this stage view, one can continue doing the same thing but be propelled from one stage (action) to the next one (maintenance) simply with the passage of time. This conceptual scheme creates circularity of explanation and prediction. To ask whether high stage status foretells enduring change, is to ask whether good maintainers (the maintenance stage) are good maintainers. In short, these are not stages. Sectioning behavior at 6 months into different stages is arbitrary rather than grounded in a transformational change. One can split the behavior anywhere, at 1 month, 3 months, 6 months or a year.

In a genuine stage theory, the stages constitute a fixed sequence that everyone must pass through. One cannot skip any of them along the way. One cannot become a butterfly without first being a caterpillar or an operational thinker by skipping the preoperational stage. For smokers who abruptly quit smoking and remain abstinent, there is no progression through stages. Most participants do not exhibit a stable progression through the postulated sequence (Sutton, 1996). Where stages differ in gradation rather than in kind, the notion of stage progression is stripped of meaning or simply acknowledges the logical necessity that a brief adoptive duration precedes a longer one. And finally genuine stage progression does not permit recycling through stages. A butterfly cannot revert to a caterpillar, nor can an operational thinker go back again to a low mode of thinking.

Even genuine stage theories lead into a thicket of problems. That is why they are being abandoned. People do not fit neatly into prefixed categories. As a result, substages or transitional ones have to be created. So, predictably, an intermediate stage of preparing for action has now been inserted to the stages-of- change scheme.

The stage view substitutes a categorical approach for a process model of human adaptation and change. Contrary to claims, shift from one descriptive category of intention to another, or from a short duration of behavior to a longer duration does not make the stage approach a "dynamic process model." Even a genuine stage theory is at best a descriptive device rather than an explanatory one. For example, categorizing individuals as "precontemplators" provides no explanation for why they do not consider making changes that could benefit them. They may be disinclined to change because they are uninformed about the risks of their current habits or the benefits of alternative habits. They may know the potential risks and benefits but are convinced they lack the efficacy to alter their health habits. Or they may have little incentive to change because they view the aversiveness of change worse than its potential benefits. These various determinants of inaction -- risk perception, efficacy belief, outcome expectations -- call for different strategies to get so-called noncontemplators to seriously consider altering their detrimental habits.

People do not recycle through discrete stages. They fluctuate in their struggle to exercise control over their health behavior. Their successes are a product of a triadic reciprocal interaction of personal factors, behavior, and environmental facilitators and impediments. In these fluctuations, which can occur over very brief periods, people are varying in their self-regulatory command not undergoing repeated transformational changes. The basic processes of personal change have been identified and their determinants extensively researched (Bandura, 1986; O'Leary & Wilson, 1987). They include: The adoption of new styles of behavior; their generalization across situational contexts, response modalities, and social conditions; relapse and recovery; and maintenance over time.

The stage scheme converts these standard change processes to descriptive categories stripped from their extensive knowledge base. This recasting is regressive rather than progressive. The stage scheme reminds us that some people have no interest in changing their health habits. Others are riper for change. But this common knowledge hardly requires the encumbrance of stage theorizing. Interventions must, of course, be tailored to the determinants governing the health habits of the individuals undergoing change and to their rate of progress.

Proponents of the stage view linked stages to sociocognitive determinants. They showed that self-regulatory efficacy and the balance of expected costs and benefits of change differentiate individuals cast into the various stages. Precontemplators believe they do not have what it takes to succeed. They expect the disadvantages of habit change to outweigh the expected benefits. In contrast, those who are confident they can effect change and expect to gain major benefits by doing so, become good adoptors and adherers to healthful habits.

The stage scheme comes with a host of interventions drawn from divergent theories on the assumption that the theories may be incompatible on etiology but compatible on behavior change. In point of fact, the behavioristic, psychodynamic and existential theories, from which this "transtheoretical" collection is forged, offer contradictory prescriptions on how to change human behavior. This menagerie of interventions is not transtheoretical, which implies an over-reaching integration of seeming diversity. It is atheoretical. For example, counterconditioning and altering faulty beliefs would be regarded as incompatible strategies by the proponents of these alternative approaches. Conditioning theorists reject beliefs as causes of behavior and,

therefore, consider it pointless to change them. Cognitivists, in turn, construe conditioning operations as a laborious way of creating outcome expectations that serve as motivators rather than as automatic implanters of responses.

The stages mainly describe behavior rather than specify determinants or operative mechanisms. Therefore, linkage of interventions to stages is rather loose and debatable rather than explicitly derivable from the stages. Effective interventions must target the constellation of determinants governing health habits in given individuals not contrived stages. For example, precontemplators forsake efforts to quit smoking because of low efficacy and negative outcome expectations. An effective intervention must persuade them of the benefits of quitting, instill beliefs that they have the capability to succeed, and enlist social supports to see them through tough times. Unlike the categorizing approach, a process model specifies the determinants and intervening mechanisms governing different facets of change. Such knowledge provides guidelines for how to structure effective interventions to initiate, generalize, and maintain habit changes. Classifying behavior by regularness or duration says nothing about its determinants that would aid selection of appropriate interventions.

Individualized interventions in general practice settings that tailor health messages to recipients' sociodemographic characteristics are more effective than uniform ones as Strecher and his colleagues have shown (Strecher, et al., 1994). Interactive computer systems can now provide personalized interventions effectively and economically to large numbers of people. However, the benefits of personalization will depend on whether weak or strong determinants are targeted. I will describe shortly one personalized system combining self-regulatory knowledge with computer assisted implementation for reducing health risk factors and promoting healthful habits. The interventions are tailored to the psychosocial determinants operating for given individuals rather than to categorical stages. The system is structured to build self-regulatory efficacy through progressive mastery experiences. Unlike the pseudo-stage approach, a self-regulatory model is a process model linked to explicit interventions.

Generational Changes in Psychosocial Interventions

The models of disease prevention and health promotion have undergone several generational changes. The initial approaches tried to scare people into health by informing them about the grave health risks of detrimental habits and the benefits of healthful habits. It did not take long to discover the limitations of information about health risks alone. However, this judgment requires qualification. Our knowledge about the changeability of health habits is seriously biased by selective focus on the habitual losers who seek help. We do not see the vast number of self-changers who succeed on their own. For example, those depressing relapse curves for smoking cessation in American samples should be superimposed on the 40 million smokers who successfully quit on their own. As the Carey's have shown longitudinally, successful self-changers have a high sense of efficacy that they can regulate their motivation and behavior (Carey & Carey, 1993; Carey, Kalra, Carey, Halperin, & Richards, 1993). They are the ones who mobilize the effort needed to succeed. Granfield and Cloud (1996) put it well when they characterized the conspicuous inattention to the vast number of successful self-changers as, "*The elephant that no one sees.*" Our theories grossly overpredict psychopathology and overstate the inability to effect personal changes because of the selective focus on hard-core cases (Bandura, 1999).

Faced with refractory cases the next approach tried to reward people into health by linking health habits to extrinsic rewards and penalties. The changes achieved by imposed incentive control were modest to begin with and usually dissipated after control was lifted. One-sided environmental determinism eventually gave way to models of interactive causation in which individuals operate as proactive agents with self-directing capabilities. Individuals continuously preside over their own behavior. Therefore, they are in the best position to exercise control over it. This next generational change focused on development of self-regulatory capabilities. People were equipped with motivational and self-management skills and resilient beliefs in their efficacy to exercise control over their health habits. Efficacy in self-management enhances adoption and maintenance of health habits (Bandura, 1997; Holroyd & Creer, 1986).

The further evolution of the health promotion model treats personal change as occurring within a network of social influences. It adds socially-oriented interventions designed to provide social supports for personal change and to alter the practices of social systems that impair health and to foster those that enhance it. A socially-oriented approach is especially important in high risk behavioral practices that are subjected to strong social influences (Bandura, 1994). Depending on their nature, social influences can aid, retard or undermine efforts at personal change. Viewed from this broad perspective, health is the product of the complex interplay of self-regulatory influence, biological endowment, and sociostructural influences.

Structure of Self-Regulatory Functions

Habit change is not achieved through an act of will. It requires development of self-regulatory skills. Self-regulation operates through a set of psychological subfunctions that must be developed and mobilized for self-directed change (Bandura, 1986). Neither intention nor desire alone has much effect if people lack the capability for exercising influence over their own motivation and behavior (Bandura & Simon, 1977). The constituent subfunctions in the exercise of self-regulation through self-reactive influence are summarized in Figure 4.

 Insert Figure 4 about here

People cannot influence their own motivation and actions very well if they do not pay adequate attention to their own performances, the conditions under which they occur, and to the immediate and distal effects they produce. Therefore, success in self-regulation partly depends on the fidelity, consistency, and temporal proximity of self-monitoring. Activities vary on a number of evaluative dimensions, some of which are listed in Figure 4. Self-observation serves at least two important functions in the process of self-regulation. It provides the information needed for setting realistic goals and for evaluating one's progress toward them. In addition, paying close attention to one's thought patterns and actions in different social contexts can contribute to self-directed change. When people attend closely to their performances they are inclined to set themselves goals of progressive improvement. Goal setting enlists evaluative self-reactions that mobilize efforts toward goal attainment.

Observing one's behavior is the first step toward doing something to affect it, but, in itself, such information provides little basis for self-directed reactions. Actions give rise to regulatory self-reactions through a judgmental function that includes several subsidiary

processes. Personal standards for judging and guiding one's actions play a major role in the exercise of self-directedness. Whether a given performance is regarded favorably or negatively will depend upon the goals or personal standards against which it is evaluated.

Referential comparisons also enter into the judgment of personal attainments. In many activities people compare their performances to the achievement of others or to standard norms based on representative groups. In health behavior, self-comparison with one's prior attainments supplies the measure of adequacy. Past attainments affect self-management mainly through their effects on perceived self-efficacy and goal setting. Subgoal attainments provide markers of increasing mastery that enhance belief of self-regulatory efficacy. Hence, people generally try to surpass their past accomplishments. After a given level of performance has been attained, it is no longer challenging and people seek new self-satisfactions by striving for progressive improvements.

Another factor in the judgmental component of self-regulation concerns the valuation of activities. People do not care much how they do in activities that have little or no significance for them. They expend little effort on devalued activities. It is mainly in areas affecting their welfare and self-esteem that performance appraisals activate self-reactions. Self-reactions also vary depending on how people perceive the determinants of their behavior. They are most likely to take pride in their accomplishments when they ascribe their successes to their abilities, strategies, and efforts. But they do not derive much self-satisfaction when they view their performances as heavily dependent on external aid or special situational supports.

Performance judgments set the occasion for self-reactive influence. Self-reactions provide the mechanism by which standards regulate courses of action. The self-regulatory control is achieved by creating incentives for one's own actions and by anticipative affective reactions to one's behavior depending on how it measures up to an internal standard. When people make self-satisfaction or tangible benefits conditional upon certain accomplishments, they motivate themselves to expend the effort needed to attain the requisite performances. Both the anticipated satisfactions of desired accomplishments and the dissatisfactions with insufficient ones provide incentives for actions that increase the likelihood of performance attainments. In the case of tangible self-motivators, people get themselves to do things they would otherwise put off or avoid altogether by making tangible rewards dependent upon performance attainments. People who reward their own attainments accomplish more than those who perform the same activities without self incentives (Bandura, 1986).

Beliefs of personal efficacy partly determine how the various subfunctions of a self-regulatory system operate. Such beliefs affect the self-monitoring and cognitive processing of different aspects of one's performances and the outcomes expected to flow from them. People vary in their perceived efficacy to monitor their health-related activities consistently. Beliefs of personal efficacy influence the perceived causes of successes and failures (Bandura, 1997). Thus, people who regard themselves as highly efficacious tend to ascribe their failures to insufficient effort or deficient strategies, whereas those who regard themselves as inefficacious view the cause of their failures as stemming from low ability. Self-beliefs of efficacy also affect the goal-setting subfunction of self-regulation. The more capable people judge themselves to be, the higher the goals they set for themselves and the more firmly committed they remain to them. Whether negative discrepancies between personal standards and behavioral accomplishments are motivating or discouraging is partly determined by people's beliefs that they can attain the goals they set for themselves. Those who harbor self-doubts about their capabilities are easily

dissuaded by obstacles or failures. Those who are assured of their capabilities intensify their efforts when they fail to achieve what they seek and they persist until they succeed.

Computerized Self-Regulatory System

The social impact of our knowledge of self-regulatory mechanisms has not been fully realized because of weak models of implementation. Advances in computer interactive technologies now enable us to promote self-regulatory efficacy in a personalized way to large numbers of people efficiently and inexpensively. Health promotion and risk reduction programs are often structured in ways that are costly, cumbersome, and minimally effective. The net result is minimal prevention and costly remediation. DeBusk and his colleagues have devised an efficacy-based system combining self-regulatory principles with computerized implementation that promotes habits conducive to health and reduces those that impair it (DeBusk, et al., 1994). The system is founded on knowledge of the major subfunctions of self-regulation and their self-efficacy underpinning.

This self-regulatory system equips participants with the skills and personal efficacy to exercise self-directed change. It includes exercise programs to build cardiovascular capacity. Nutrition programs to reduce risk of heart disease and cancer. Weight reduction programs. Smoking cessation programs. One can add stress management programs to reduce the wear and tear on the body. For each risk factor, individuals are provided with detailed guides on how to achieve and maintain behavior conducive to health.

A single program implementor, assisted by the computerized system, can oversee the behavioral changes of hundreds of participants concurrently. Figure 5 portrays the structure of the self-management system. Participants monitor the behavior they seek to change. They set short-range attainable subgoals to motivate and guide their efforts. They receive detailed feedback of progress as further motivators for self-directed change. The system is structured in this way based on knowledge that self-motivation requires both goal challenges and performance feedback. Neither goals without knowing how one is doing, nor knowing how one is doing without any goals has any motivational impact.

 Insert Figure 5 about here

At selected intervals, the computer generates and mails to participants individually-tailored guides for self-directed change. These guides provide attainable subgoals for progressive change. The participants mail performance cards to the implementor on the changes they have achieved and their perceived efficacy for the next cycle of self-directed change. Efficacy ratings identify areas of vulnerability and difficulties and foretell likely relapse. The computer-generated feedback portrays graphically the progress patients are making toward each of their subgoals, their month-to-month changes, and also suggests strategies on how to surmount the identified difficulties. The program implementor maintains telephone contact with the participants, if necessary, and is available to provide them extra guidance and support should they run into difficulties. The implementor also serves as the liaison to medical personnel who are called upon when their expertise is needed.

The effectiveness of this system was initially tested in a cholesterol reduction program conducted with employees with elevated cholesterol levels drawn from work sites. One nutritionist ran the computer-assisted system for many participants. They reduced their consumption of saturated fat and lowered their serum cholesterol (Figure 6). They achieved an even larger risk reduction if their spouses took part in the dietary change program as well. The more room for change in nutritional habits, the greater the cholesterol reduction.

 Insert Figure 6 about here

Further studies attest to the efficacy of the self-management system in reducing plasma cholesterol (Clark, et al., 1997). Adding counseling by a dietitian to the self-regulatory system does not produce any further treatment gains (DeBusk, et al., 1999). The achieved cholesterol reductions are sustained. This approach can thus provide health-promoting services to large numbers of people at low cost. The self-monitoring component of the self-management system also provides an effective means for differentiating patients most likely to benefit from dietary treatment because of unhealthy eating habits, from those with hyperlipidemia despite a healthy diet, and thus require lipid-lowering drug therapy.

Application of the Self-Regulatory Model to Hypertension

People consume a lot of foods high in sodium. Sodium intake is linked to hypertension in people who are sensitive to this mineral, a sensitivity that increases with age as the body loses some of its efficiency. Left unchecked, hypertension increases risk of stroke, heart disease, and kidney failure. Sodium-reduction programs can lower blood pressure sufficiently to reduce the need for antihypertensive medication or to discontinue it altogether (Whelton, et al., 1998), especially if combined with other lifestyle changes (Reid, et al., 1994).

West and his colleagues demonstrated the effectiveness of the self-management system in helping patients with heart disease to cut back on their level of sodium intake (West, et al., 1999). Foods high in sodium content were targeted for the dietary change. As can be seen in Figure 7, training in self-management enhanced patients' perceived self-efficacy to adopt a low sodium diet. They not only reduced their sodium intake to the recommended target level, but maintained the dietary change stably over time. At each successive point in the self-change program, the stronger the perceived self-regulatory efficacy, the greater the reduction in sodium intake.

 Insert Figure 7 about here

Some patients cannot achieve sufficient control over their blood pressure solely by dietary and other lifestyle habit changes. They require antihypertensive medication. Controlling blood pressure with drugs presents major challenges because nonadherence with prescribed medications is an endemic problem (Rudd, 1997). This is doubly so with nonsymptomatic disorders where neither the benefits of taking medication regularly, nor the detrimental health effects of nonadherence are noticeable. People are reluctant to stick to bothersome drug routines

that have no easily noticeable health benefits, but cause some unpleasant side effects. Medical nonadherence not only poses health risks, but may lead physicians to prescribe stronger medications or more drastic interventions in response to the seeming failure of the prescribed treatment.

Building adherence requires feedback systems that make unnoticeable effects observably conditional. In research in progress on compliance with antihypertension medication, participants measure their blood pressure daily at designated times at home, keep track of their pill taking with a microchip record, and receive feedback that enables them to link their blood pressure to the regularity of their self-medication. In this self-persuasory arrangement, the participants are essentially engaged in self-experimentation in the exercise of personal control. Seeing how their blood pressure covaries with level of adherence to medications provides them with evidence that it is within their power to lower their blood pressure. If enabled to do so, successes can build and strengthen self-regulatory efficacy, and positive outcome expectations can provide incentives to stick to the self-medication routine.

Self-Regulatory Impact on Coronary Artery Disease

Haskell used this self-regulatory system to promote lifestyle changes in patients suffering from coronary artery disease (Haskell, et al., 1994). The targeted risk factors included smoking, exercise, weight, nutrition and, if necessary, lipid-lowering drug treatment. At the end of four years, those receiving the usual medical care by their physicians showed no change or a worsening of their condition. In contrast, those aided in self-management of health habits achieved substantial reductions in risk factors (Figure 8). They lowered their intake of dietary fat, lost weight, lowered their bad cholesterol, and raised their good cholesterol, exercised more, and increased their cardiovascular capacity.

 Insert Figure 8 about here

The program also altered the physical progression of the disease. Those receiving the self- management program had 47% less build up of plaque on artery walls, a higher rate of reversal of arteriosclerosis, and fewer hospitalizations for coronary heart problems and cardiac deaths (Figure 9).

 Insert Figure 9 about here

The self-regulatory system combines the high individualization of the clinical approach with the large-scale applicability of the public health approach. The system is well received by patients for several reasons. It is individually tailored to their needs. It provides them with continuing personalized guidance and informative feedback that enables them to exercise considerable control over their own change. It is a home-based program that does not require any special facilities, equipment, or attendance at group meetings that usually have high drop-out rates. It is not constrained by time and place. It can serve large numbers of people simultaneously. It provides valuable health-promoting services at low cost.

In the present application the computer is used mainly as a tool to guide self-directed change through goal setting and feedback of progress. Linking the interactive aspects of this self-management model to the Internet can vastly expand its reach and availability, and boost its health promotive power by providing a ready means for enlisting social support and strategic guidance when needed. The amount and form of personalized guidance can be tailored to recipients needs. Much needed productivity gains in risk reduction and health promotion can be realized by creative coupling of self-regulatory knowledge with the disseminative and instructive power of computer-assisted implementation.

Self-Regulatory System in Post-Coronary Care

Most patients who suffer heart attacks have the bad health habits that put them at risk for another one. They receive intensive treatment in the hospital but little help following discharge in changing behavioral risk factors. The success of the self-regulatory system is being compared against the standard medical post-coronary care to reduce morbidity and mortality in post-coronary patients (DeBusk, et al., 1994). The project includes nearly 600 post-coronary patients from five hospitals. The risk factors include cholesterol, smoking and physical exercise. The differences in cardiovascular risk factors after the first year of post-coronary care are summarized in Figure 10. The self-regulatory system is more effective in reducing risk factors and increasing functional cardiovascular capacity than the standard medical care. These preventive health benefits were gained at minimal cost. A single implementor, usually a nurse with expertise in the system, provides the intensive case management to large numbers of patients concurrently.

 Insert Figure 10 about here

Self-Management of Chronic Diseases

The self-management of chronic diseases provides another example of translation of self-regulatory theory to effective implementation models. Chronic disease has become the dominant form of illness and the major cause of disability. Such diseases do not lend themselves well to biomedical approaches devised primarily for acute illness. The treatment of chronic disease must focus on self-management of physical conditions over time. The goal is to retard the biological progression of impairment to disability and to improve the quality of life of people with chronic disease. Holman and Lorig (1992) devised a prototypic model for the self-management of chronic diseases. People are taught cognitive pain control techniques, self-relaxation, and proximal goal setting combined with self incentives as motivators to increase level of activity. They are also taught problem solving and self-diagnostic skills for monitoring and interpreting changes in one's health status, skills in locating community resources and managing medication programs. The way health care systems deal with clients can alter their sense of efficacy in ways that support or undermine their restorative efforts (Bandura, in press). Clients are, therefore, taught how to take greater initiative for their health care and dealings with health personnel. These capabilities are developed through modeling of self-management skills, guided mastery practice, and informative feedback.

The effectiveness of this self-management approach was tested with patients suffering from arthritis. The program is implemented in convenient community settings in a group format by implementors who suffer similar physical impairments but surmount them. Their modeled successes in prevailing over physical debility provide participants with instructive guides and incentives for personal change. The program greatly increases patients' efficacy that they can exercise some control over their physical condition. The higher their perceived self-efficacy the less they are disabled by their arthritis, the less pain they experience, and the greater the reduction they achieve in inflammation in their joints (O'Leary, Shoor, Lorig, & Holman, 1988). Patients who believe they can do something about their physical condition are also less depressed and less stressed.

Figure 11 presents the changes in a 4-year follow-up. Arthritic patients who had the benefit of the self-management program displayed increased efficacy to manage their condition, experienced reduced pain, and a slower biological progression of their disease. They also decreased their use of medical services by 43% over the four-year period. These changes represent huge reductions in health costs with large health benefits. People's sense of efficacy at the end of the self-management program predicts the level of health benefits. In tests of alternative mediating mechanisms neither increases in knowledge nor behavioral enactments are appreciable predictors of health functioning (Lorig, Chastain, Ung, Shoor, & Holman, 1989; Lorig, Seleznick, et al., 1989).

 Insert Figure 11 about here

Different types of chronic diseases present many similar problems on how to manage pain, overcome impediments created by physical impairments, maintain self-sufficiency and exercise control over medical services to achieve the best results. The self-management approach, therefore, serves as a generic model that can be adapted to different chronic diseases. Indeed, it produces similar health benefits for people suffering from heart disease, lung disease, and stroke as well as arthritis (Lorig et al., in press). Compared to nontreated controls, those who had the benefit of the self-management program made greater use of cognitive symptom management, reported better health, less fatigue, disability, and distress over their physical condition and fewer limitations on their everyday lives and role activities. They also had fewer hospitalizations and shorter stays for those requiring hospitalization. Adding to the generic model special mastery components that address problems unique to particular chronic diseases may further enhance health benefits.

Socially-Oriented Interventions

Human agency operates within a broad network of social structural influences. Many health habits are deeply embedded in people's social lives. Social inducements and constraints strain self-regulatory capabilities. The newest generation of interventions requires an expanded social perspective to human adaptation and change. Because of individualistic bias, our knowledge base and models for effecting social change leave much to be desired. Psychological programs that increase success rates by creating social structural supports for personal change are rarely adopted despite their success. They are troublesome to create and their management

requires attention to the mundane hassles of everyday life. Unlike drug treatments, a beneficial social technology is not a merchandizable product that is readily prescribable, demands little effort, and requires repeated purchase and use to sustain its profitable production.

Self-help groups who suffer the problems are more likely to create beneficial social systems than are professional health providers. The outstanding Delancy program for hard-core drug abusers is one example (Silbert, 1984). It is built on an enablement model that provides the sociostructural means for transforming addicted criminal lives into prosocial productive ones. The substantial reductions in HIV infections in San Francisco were achieved largely by the unprecedented social and behavioral changes brought about by the self-empowering efforts of the gay community (McKusick, Coates, Morin, Pollack, Hoff, 1990). The longitudinal predictors of reduction in risky sexual practices were a strong sense of efficacy in exercising self-protective control and association with groups that adopted safer sex practices as the norm.

The benefits of an expanded perspective are further illustrated in alcoholism. In making the break from alcohol, recovering alcoholics face a bleak life stripped of their social ties and activities as they try to restructure their lives. They need a supportive environment to see them through the tough transition and help them develop a new way of life. Not surprisingly, the treatment of alcoholism yields discouraging relapse curves. Self-help groups, such as Alcoholics Anonymous, offer many supports for a new life without alcohol for those who become deeply committed members. Unfortunately, adding a referral to Alcoholics Anonymous does not seem to help many people because of the high attrition rate. Alternative supportive subcommunities are needed for rebuilding and supporting an alcohol-free life.

Azrin (1976) devised a self-governed social group for recovered alcoholics and their families to serve the supportive and enabling function. A social system that is embedded in a multifaceted treatment and tailored to the needs of the participants is likely to be used well. Indeed, it improves familial, social, occupational and recreational functioning in ways that support sobriety. Recovering alcoholics who have the benefit of such a social system achieve greater improvements in health, family life and employment than do recovering alcoholics without the supportive group (Hunt & Azrin, 1973). Despite the substantial benefits of this system, I have yet to find an adoption of it. We are incredibly slow on the uptake of needed social extensions for successful interventions. In the biological field, pharmaceutical and medical industries quickly translate new knowledge into salable products in areas that promise vast consumership. In the psychosocial field, we have few, if any, serviceable social mechanisms for diffusing effective programs.

Childhood Health Promotion Models

As noted earlier, health promotion and disease prevention has evolved into a multifaceted model that addresses the reciprocal interplay between personal and environmental determinants of health behavior. Health knowledge, incentive systems, self-regulatory capabilities and sociostructural supports all have a role to play in the successful pursuit of health. Many of the lifelong habits that jeopardize health are formed during childhood and adolescence. It is easier to prevent detrimental health habits, than to try to change them after they have become deeply entrenched as part of a lifestyle.

Health habits are rooted in familial practices. However, schools have a vital role to play in promoting the health of a nation. This is the only place where all children can be easily reached. However, beleaguered educators do not want the additional responsibilities of health

promotion and disease prevention. Nor are they equipped to do so even if they were willing to undertake this role. They have enough problems fulfilling their basic academic mission. Moreover, schools are reluctant to get embroiled in societal controversies regarding sexuality, drug use and other social morbidities that place youth at risk. Many educators rightfully argue that it is not their responsibility to remedy societies' social ills. Like other professionals, educators devote their efforts to the activities on which they are evaluated. As long as health promotion is regarded as tangential to the central mission of schools, it will continue to be slighted and resisted.

Researchers are applying promising prevention models in school settings under severe constraints well suited to undermine their effectiveness. The general conclusion is that these approaches work in the short run, but their effects dissipate over time. There are several problems with this indiscriminate verdict. Informative evaluation research requires assessment of quality of implementation. Otherwise, there is no way of knowing whether weak results reflect a deficient model or deficient application of a good one. Outcome studies of school-based programs rarely provide data on adequacy of implementation. Journal editors should insist that outcome studies include sound data on quality of implementation.

School-based applications are long on didactics but short on personal enablement. By enablement I do not mean a stock set of refusal tactics. Rather, it involves equipping children with skills and efficacy beliefs that enable them to regulate their own behavior and manage the diverse pressures in interpersonal relationships for detrimental conduct. Meta-analyses show that the more children practice exercising regulatory control, the more successful they are in resisting detrimental health habits (Bruvold, 1993; Murray, Pirie, Luepker, & Pallonen, 1989). The more intensive the program and the better the implementation the stronger the impact (Connell, Turner, & Mason, 1985). Comprehensive approaches that integrate school-based health programs with familial and community efforts are more successful in promoting health than if schools try to do it alone (Perry, Kelder, Murray, & Klepp, 1992).

Schools provide a good setting for health promotion and early intervention. But this does not mean that educators should be the standard-bearers for the health mission. Health promotion must be structured as part of a societal commitment that makes children's health a matter of high priority. A serious commitment must provide the multidisciplinary personnel and the resources needed to foster the health of its youth. This requires creating new school-based models of health promotion that operate in concert with the home, community and the society at large. The programs are in school but not of the school. The implementors must have the operational control needed to do the job well. Otherwise, promotive efforts do more to discredit psychosocial approaches through deficient implementation than to advance health.

Collective Efficacy for Policy Initiatives

The quality of health of a nation is a social matter not just a personal one. Health depends heavily on behavioral, sociostructural, and economic factors. While individuals play an important role in their own health, it is the product of the interplay of personal and sociostructural determinants. Therefore, a comprehensive approach to health promotion requires changing the practices of social systems that affect health rather than only changing the habits of individuals. It takes a great deal of united effort to dislodge entrenched detrimental practices of industries that wield sociopolitical power. People's beliefs in their collective efficacy to

accomplish social change, therefore, play a key role in the policy and public health perspective to health promotion and disease prevention.

Billions of dollars are spent annually on lobbying and advertising campaigns to promote the very products that jeopardize health. They are influential contributors to lifestyle habits. The tobacco industry is a notable example. Cigarette smoking is the single most personally preventable cause of death. About 3,000 children in the United States take up smoking each day, a third of whom will die of tobacco related diseases (Pierce, Fiore, Novotny, Hatziandreu, & Davis, 1989). Policy remedies that raise tobacco taxes, limit juvenile access to tobacco products, and ban smoking in public places and the workplace to remove the health hazard of secondhand smoke, lower the smoking rates in a society (Lynch & Bonnie, 1994). Regulating the nicotine dosage in cigarettes below addictive levels would aid those struggling to quit the smoking habit. Smoking rates are exceedingly high in many countries. This widespread habit will incur a heavy toll of deaths and staggering medical costs from smoking-related diseases. As smoking rates decline in the United States the tobacco industry seeks lucrative markets abroad, especially in Eastern Europe, Asia, and the Middle East (Perlez, 1997). Aggressive marketing tactics recruit new smokers who foreshadow a global cancer epidemic.

We do not lack sound policy prescriptions in the field of health. What is lacking is the collective efficacy to realize them. There is growing disaffection and cynicism about our centralized public institutions. All too often what is good public policy is self-jeopardizing politics for lawmakers. As a result, heavily-lobbied lawmakers block policy initiatives designed to protect human health. The tobacco industry provides an informative example of the changing social dynamics of health protection through collective social action. Despite the fact that tobacco products are the most toxic legalized substances and kill about 400,000 people annually in the United States (McGinnis & Foege, 1993), our lawmakers have exempted nicotine from any bill concerning drugs. Moreover, they federalized control with preemptive laws that ban states from regulating tobacco products and advertising. The power of tobacco money over the behavior of federal lawmakers is graphically revealed in Figure 12. The more tobacco campaign money they receive, the more likely they are to fend off legislation to regulate tobacco products. Most of the proposed legislation is killed in committee. This legislative behavior protects the reelection of lawmakers at the heavy cost of national health.

 Insert Figure 12 about here

In addition to beholden legislators, the vast supporting cast contributing to the promotion of this noxious product include executives of the tobacco industry steadfastly disputing that nicotine is addictive and that smoking is a major contributor to lung cancer despite evidence to the contrary; talented chemists discovering ammonia as a means to increase the nicotine “kick” by speeding the body’s absorption of nicotine (Meier, 1998); inventive biotech researchers genetically engineering a tobacco seed that doubles the addictive nicotine content of tobacco plants (Meier, 1998); creative advertisers with multibillion dollar budgets targeting young age groups with merchandising and advertising schemes depicting smoking as a sign of youthful hipness, modernity, freedom, and women’s liberation (Dedman, 1998; Lynch & Bonnie, 1994); ingenious officials in a subsidiary of a major tobacco company engaging in an elaborate international cigarette smuggling operation to evade excise taxes (Drew, 1998); popular movie

actors agreeing to smoke in their movies for a hefty fee; United States trade representatives threatening sanctions against countries that erect barriers against the importation of U.S. cigarettes, and even a President firing his head of the Department of Health, Education and Welfare for refusing to back off on the regulation of tobacco products. In countries where the government runs the tobacco business it has a financial stake in maintaining high tobacco consumption. Finance ministries counteract the efforts of health ministries to reduce this major public health hazard (Efron, 1997). Unless youngsters take up smoking as teenagers they rarely become smokers during adulthood. Considering the formidable sociostructural forces promoting the smoking habit, to locate the causes and remedies solely within the individual is to take a conceptually myopic view of the health problem.

With regard to injurious environmental conditions, some industrial and agricultural practices inject carcinogens and harmful pollutants into the air we breathe, the food we eat, and the water we drink, all of which take a heavy toll on health. Vigorous economic and political battles are fought over environmental health and where to set the limits of acceptable risk.

As people become cynical about their centralized governmental systems, they strive to regain control over practices that affect their lives by changing local circumstances over which they command some control. They got smoke-free workplaces, smoke-free restaurants, and smoke-free airliners through their own collective action not through the governmental agencies entrusted with the responsibility to protect national health. When local effort succeeds, moneyed interests move in to preempt local control. The tobacco industry helped to finance a misleading ballot measure in California to repeal all local tobacco ordinances with a less restrictive statewide law under the guise of tougher tobacco control. This effort at preemption of local control was defeated by a resounding public counteraction. With lobbyists and gridlock ruling our central systems, the social battles over health protection shift increasingly to grass-roots initiatives at local levels.

Collective Efficacy

Some writers inappropriately equate self-efficacy with individualism and pit it against collectivism. The exercise of personal efficacy gets portrayed in this jaundiced view as an act of self-indulgence. Contrary to this view, personal efficacy contributes just as importantly to group-directedness as to self-directedness (Bandura, 1997; Earley, 1993, 1994). Efficacy is valued, not because of reverence for individualism, but because a strong sense of personal efficacy is vital for success regardless of whether it is achieved individually or by people working together.

A comprehensive approach to health must provide people with the knowledge, skills and sense of collective efficacy to mount social and policy initiatives that affect human health. Such social efforts are aimed at raising public awareness of health hazards, educating and influencing policymakers, mobilizing public support for policy initiatives, and devising effective strategies for improving health conditions. Knowledge on how to develop and exercise collective efficacy can provide the guidelines for moving us further in the enhancement of human health.

We are gaining knowledge on how to frame policy issues strategically and how to use the media to enlist public support for policy changes that promote health (Bandura, 1997; Wallack, Dorfman, Jernigan, & Themba, 1993). Symbolic modeling in the broadcast media provides another means of altering detrimental normative practices and enabling people to achieve changes that have widespread societal impact. Basic research on modeling and self-regulatory mechanisms has provided guidelines for programs designed to achieve society-wide changes.

These macrosocial applications address some of the growing global problems. The burgeoning population growth is the foremost and, by far, the most urgent global problem. The world population is doubling at an accelerated rate. Unless the explosive population growth is checked, we will destroy the interdependent ecosystems that sustain life. Sabido (1981), applied sociocognitive principles creatively in developing a highly effective media format to inform, enable and motivate people to reduce their rate of childbearing and to raise the status of women in societies where they have a subservient status with little or no say about family size. These lengthy dramatic serials model family planning, women's equality, beneficial health practices and a variety of effective life skills in familial, occupational and community relations. Applications of this creative format in Africa, Asia and South America are raising people's efficacy to exercise control over their family lives, raising the status of women and lowering the rates of childbearing (Rogers, Vaughan, Swalehe, Rao, & Sood, 1996; Singhal & Rogers, 1989; Westoff & Rodriquez, 1995). These macrosocial applications are also reducing sexual practices that pose risk of infection with the AIDS virus (Rogers, et al., 1996).

Achievement of structural changes is a slow, arduous process. In the metaphoric words of John Gardner, "*Getting things done socially is no sport for the short winded.*" While concerted efforts are made to produce structural changes, people need to improve their current life circumstances over which they command some control. We need to develop sociostructural principles and implementation models on how best to enable people to work together to change their lives for the better.

The approaches that work best promote community self-help through collective enablement (Bandura, 1997). Consider, by way of example, a community effort to reduce infant mortality resulting from unsanitary conditions in poor Latino neighborhoods (McAlister, Puska, Orlandi, Bye, & Zbylot, 1991). The community was fully informed of the impact of unsanitary conditions on children's health through the local media, churches, schools and neighborhood meetings conducted by influential persons in the community. The residents were taught how to install plumbing systems, sanitary sewerage facilities and refuse storage. They were advised how to secure the financing needed from different local and governmental sources. This enabling self-help program greatly improved the community's sanitation and markedly reduced infant mortality.

There is mass migration of people from rural to urban areas. As cities swell uncontrollably, centralized urban systems, especially in poor countries, fail to provide adequate human services. Through community enablement people can work together to improve problems of sanitation, safe water, health and public safety in their localities. However, many of these pandemic problems require some material resources if collective self-help is to achieve much success. People need to be given the necessary resources and enabling guidance to help themselves. Otherwise, simply to tell people to fend for themselves with intractable problems is an evasion of societal responsibility. Unsupported prescription of local self-help can be easily used as a political subterfuge for civic neglect. Adverse changes in living conditions in poor nations—burgeoning populations, poverty, malnutrition, environmental deterioration and toxification, desertification of productive land—will present major challenges to preservation of health in the coming years (Hancock & Garrett, 1995).

If we are to contribute significantly to the betterment of human health we must broaden our perspective on health promotion and disease prevention beyond the individualistic level. This calls for a more ambitious socially-oriented agenda of research and social practice. We can

further amplify our impact on human health by making creative use of evolving technologies that enhance the scope and strength of health promotion efforts.

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Author's Note

Some sections of this article include revised and updated material from the book, *Self-Efficacy: The Exercise of Control*. Freeman, 1997.

Figure Captions

- Figure 1. Summary of the main sociocognitive determinants and their areas of overlap in different conceptual models of health behavior.
- Figure 2. Diagrammatic representation of the conditional relations between efficacy beliefs and outcome expectancies. In given domains of functioning, efficacy beliefs vary in level, strength and generality. The outcomes that flow from a given course of action can take the form of positive or negative physical, social, and self-evaluative effects.
- Figure 3. Contrasting theoretical schemes when the self-efficacy determinants is appended to the theory of reasoned action or embedded in the integrated causal structure of social cognitive theory.
- Figure 4. Structure of the system of self-regulation of motivation and action through internal standards and self-reactive influences.
- Figure 5. Computer-assisted self-regulatory system for altering health habits.
- Figure 6. Levels of reduction in plasma cholesterol achieved with the computerized self-regulation system. The panel on the left summarizes the mean cholesterol reductions achieved in applications in the workplace by participants who used the system either by themselves, along with their spouses, or did not receive the system to provide a control baseline. The right panel presents the mean cholesterol reductions achieved with the self-regulative system by patients whose daily cholesterol and fat intake was high or relatively low at the outset of the program.
- Figure 7. Enhancement of perceived self-regulatory efficacy and reduction of sodium intake through the aid of the self-management system (West, et al., 1999).
- Figure 8. Reduction in multiple risk factors by patients with coronary atherosclerosis depending on whether they received the usual care of their physical or training in self-management of health habits. Plotted from data of Haskell, et al., 1994.
- Figure 9. Differences in the number of cardiac deaths, hospitalizations for nonfatal myocardial infarction and other cardiac events who received the usual care of their physician or training in self-management of health habits. Plotted from data of Haskell, et al., 1994.
- Figure 10. Changes in coronary risk factors by patients during the first year after acute myocardial infarction depending on whether they received the usual medical care or training in self-management of health habits. Plotted from data of DeBusk, et al., 1994.
- Figure 11. Enduring healthful changes achieved by training in self-management of arthritis as revealed in a follow-up assessment four years later. The 9% biological progression of the disease is much less than the 20% disease progression one would normally expect over four years for this age group. Plotted from data of Lorig, 1990.
- Figure 12. Relationship between the amount of campaign money legislators receive from the tobacco industry and their likelihood of voting against legislation to regulate tobacco products. Public Citizen Health Research Group, 1993.