Translating Social Ecological Theory into Guidelines for Community Health Promotion

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Abstract

Health promotion programs often lack a clearly specified theoretical foundation or are based on narrowly conceived conceptual models. For example, lifestyle modification programs typically emphasize individually focused behavior change strategies, while neglecting the environmental underpinnings of health and illness. This article compares three distinct, yet complementary, theoretical perspectives on health promotion: behavioral change, environmental enhancement, and social ecological models. Key strengths and limitations of each perspective are examined, and one principle of social ecological theory is used to derive practical guidelines for designing and evaluating community health promotion programs. Directions for future health promotion research are discussed, including studies examining the role of informalists (e.g., corporate decision-makers, legislators) in promoting the wellbeing of others, and those evaluating the duration and scope of intervention outcomes. (Am J Health Promot. 1996;10(4):282-98.)

OVERVIEW

The past 15 years have witnessed a tremendous growth in health promotion research and practice. This quantitative growth in research and intervention programs has been accompanied by a qualitative shift in emphasis from individually oriented analyses of health behavior to those that encompass environmentally based, as well as behaviorally focused strategies of health promotion. Whereas the 1979 Surgeon General's Report on Health Promotion and Disease Prevention emphasized the modification of individuals' health habits and lifestyles, more recent conceptualizations have stressed the importance of linking behavioral strategies of health promotion with efforts to strengthen environmental supports within the broader community that are conducive to personal and collective well-being. The shift from person-focused to environmentally based and community-oriented health promotion is evident in several streams of research, including the development of cultural change strategies to foster socially supportive norms and healthful environments within work organizations, community-wide efforts to facilitate community participation in the development and implementation of health promotion programs, and the Healthy Cities Movement, which has evolved from sustained international collaboration in the design and delivery of community health promotion programs. These areas of research reflect the increasingly ecological orientation of the health promotion field. The increased popularity of the ecological orientation stems from a growing...
recognition that most public health challenges (e.g., encouraging people to exercise regularly, improve their diet, and refrain from smoking) are too complex to be understood adequately from single levels of analysis and, instead, require more comprehensive approaches that integrate psychological, organizational, cultural, community planning, and regulatory perspectives.179

This article examines the core assumptions and principles inherent in the social ecological approach to health promotion. Social ecology is viewed as an overarching framework, or set of theoretical principles, for understanding the interrelations among diverse personal and environmental factors in human health and illness. The article also considers some of the ways in which social ecological theory can be used to develop practical guidelines for designing, implementing, and evaluating community health promotion programs. The assumption here is that social ecological theory offers a variety of conceptual and methodological tools for organizing and evaluating health promotion interventions.

I begin with an overview of the core assumptions and distinguishing features of three alternative, yet complementary, perspectives on health promotion:

• Behavioral change and lifestyle modification
• Environmental enhancement and restructuring
• Social ecological analyses of health promotion

In many respects, the social ecological approach integrates person-focused efforts to modify persons' health behavior with environment-focused interventions to enhance their physical and social surroundings. Yet the social ecological approach goes beyond behavioral and environmental change strategies by offering a theoretical framework for understanding the dynamic interplay among persons, groups, and their sociopolitical milieu. Thus the latter portions of this article emphasize the translation of social ecological theory into practical guidelines for community health promotion.

BEHAVIORAL, ENVIRONMENTAL, AND SOCIAL ECOLOGICAL APPROACHES TO HEALTH PROMOTION

The 1979 Surgeon General's Report on Health Promotion and Disease Prevention1 was instrumental in alerting the American public to the impact of unhealthy behaviors, such as smoking and substance abuse, on personal and community wellbeing. As clinical evidence for the links between smoking, lung cancer, and cardiovascular disease mounted during the 1970s and 1980s, the prevailing view of health as merely the "absence of illness"2 and the corresponding emphasis on medical interventions to remediate disease began to be challenged by broader conceptions of health as "complete physical, emotional, and social well-being"3 and supplemented by preventive strategies for modifying unhealthy behavior and lifestyles before the onset of illness symptoms.4

Whereas earlier approaches to health enhancement had focused almost exclusively on the medical treatment of disease, the 1970s and 1980s saw a growing interest in disease prevention, health protection, and health promotion programs. The terms disease prevention and health protection have been used to describe various medical and public health strategies aimed at preventing the onset of physical and mental illness (e.g., inoculation against infectious diseases, enhanced community sanitation services, reduction of workplace hazards, and governmental regulation of food and drug safety). The concept of health promotion, however, differs from the disease prevention orientation in that it places greater emphasis on the role of persons, groups, and organizations as active agents in shaping health practices and policies to optimize both individual wellness and collective well-being.5,12,13 Of particular relevance to this discussion is community health promotion, which emphasizes collaborative efforts among various public and private sectors to enhance the well-being of a population within a geographically defined area.23 Behavioral Change Strategies of Disease Prevention and Health Promotion

The behavioral change approach to disease prevention and health promotion focuses on the modification of persons' health-related behaviors. Examples of these behaviors are dietary and exercise regimens, smoking and alcohol consumption, safe or unsafe sexual practices, and personal actions that either decrease or increase the likelihood of bodily injury (e.g., vehicle safety belt and bicycle helmet usage, firearm purchases, substance abuse). During the 1970s, several studies documented the empirical links between persons' routine health practices, stressful patterns of living, and their susceptibility to disease and premature death.34 These research programs further suggested that personal vulnerability to disease increases in proportion to the number and regularity of unhealthy behaviors performed by individuals.

People who regularly engage in multiple health-threatening behaviors—for example, by smoking cigarettes, consuming excessive amounts of alcohol and saturated fat, adopting irregular sleep and exercise patterns, and experiencing chronically high levels of interpersonal stress—are described as having unhealthy lifestyles.34 Behavioral change interventions to prevent disease can focus on modifying single patterns of unhealthy behavior (e.g., smoking cessation programs), or on the replacement of unhealthy lifestyles (characterized by interrelated clusters of behavioral risk factors for disease) with healthier ones.39

Efforts to modify individuals' unhealthy behaviors and lifestyles have been guided by several distinct theories of social influence. Social influence is the alteration of a person's thoughts, attitudes, and behavior in response to the actions or feelings of others.34 A substantial amount of psychological research has focused on three basic forms of social influence: cognitive changes involving the alteration of a person's beliefs and opinions; affective changes reflecting a shift in one's evaluation of some entity; and behavioral modification involving changes in a
person's overt actions toward him or her surroundings. Theoretical and clinical perspectives on modifying persons' health relevant actions reflect varying degrees of emphasis on cognitive, affective, and behavioral processes. For example, behavioral therapies based on operant and classical conditioning principles emphasize the manipulation of nonsymbolic reinforcers contingencies as the primary strategy for changing personal health behaviors. After manipulating these contingencies, the health belief model and stories of social learning are used to enhance self-efficacy, self-reasoned action, and planned behavior. These advances in attention to the role of cognitive and symbolic processes in mediating personal behavior change. The affective and motivational underpinnings of people's health beliefs and behavior, on the other hand, are explicitly emphasized in theories of risk perception, fear arousal, and self-protective behavior. Several lines of research have demonstrated the effectiveness of cognitive and behavioral modification programs and educational and mass media campaigns in diminishing health-threatening actions and personal vulnerabilities, such as the coronary-prone behavior pattern. At the same time, however, certain large-scale behavior change programs, such as the Multiple Risk Factor Intervention Trials (MRFIT) and the Minnesota Heart Health Program to reduce cardiovascular disease, have had a modest or negligible impact on persons' health practices and health status. The modest impact of these interventions reveals some potential limitations that are inherent in behavior change models of health promotion. First, persons' efforts to modify their health practices are often impeded by economic, social, and cultural constraints. Low educational status, lack of time, money, and energy, chronic exposure to neighbor-hood violence, and proximity to friends and family members who frequently exhibit health-threatening behavior are some of the situational factors that can derail people's best efforts and intentions to improve their health practices. On the other hand, efforts to persuade a person to adopt improved health practices may go unheeded if that person is already engaged in the suggested behaviors. And even when persons do manage to adopt new and improved health practices, the efficacy of their behavioral changes can be undermined by their exposure to environmental toxins and safety hazards. In recent years, increasing attention has been paid to the role of environmental factors in human wellbeing, as the result of growing public concerns about the health impacts of indoor and outdoor air pollution, soil and water contamination, lead poisoning in children, ultraviolet and electromagnetic radiation, dysfunctional environmental design, global warming, and ozone depletion. Health promotion efforts focused on environmental enhancement strategies are a crucial adjunct to individually focused lifestyle modification programs. We turn now to a consideration of environmentally oriented models of health promotion.

Environmental Change Strategies of Health Promotion

Earlier discussions of health policy in the United States have subsumed environmental strategies of health enhancement under the rubric of health protection—that is, those changes in the physical environment that are undertaken to eliminate or reduce toxic, pathogenic, or injurious conditions. The analysis presented in this paper, however, construes the environments of persons and whole communities as multidimensional, encompassing social and cultural as well as physical (e.g., geographic, architectural, and technological) components. Moreover, the environmental assessment is assumed to function not only as a potential source of pathways, toxins, and safety hazards, but also as a provider of health-promotive information and social support that can enable people to achieve higher levels of well-being than are implied by the term health protection (in the presence of unhealthy or unsafe environmental conditions). This discussion, therefore, the broader concept of health promotion is used to refer to the full array of environmentally based strategies of health enhancement. Recent evidence for the health impacts of global environmental change underscores the importance of developing environmentally based strategies of health promotion in conjunction with behavioral change and lifestyle modification programs. Environmental enhancement interventions can be considered in relation to at least five "environmentic," or health-influencing, functions of the physical and social environment: • The physical and social environment can serve as a medium of disease transmission, exemplified by waterborne and airborne diseases and the spread of contagious illnesses through interpersonal contact. • The environment can operate as a stressor, exerting disruptive effects on people's mood, performance, and physiology as the result of exposure to uncontrollable demands such as noise, political upheaval, or interpersonal conflict. • The environment can function as a source of safety or danger (e.g., residing in areas that are chemically contaminated, geographically isolated, unsafe, or socially violent). • The environment can serve as an enabler of health behavior, exemplified by the influence of safety devices in motor vehicles, proximity of physical fitness facilities to one's home or workplace, and exposure to interpersonal modelling or cultural practices that foster health-promoting behaviors. • The environment can serve as a provider of health-related resources such as effective community sanitation systems, public health services, and legislation ensuring citizens' access to health insurance and primary care.

Environmental enhancement strategies have emphasized these health-related functions of the
environment to varying degrees, depending on the theoretical or disciplinary bases of the intervention program. For example, the role of the environment in transmitting disease and as a source of safety or danger has been emphasized in the fields of industrial hygiene, occupational epidemiology, injury control, and environmental health science. 17-22 and environmental psychology. 23,24 The stress-inducing and stress-buffering qualities of environments have been examined in studies of social support, environmental stressors, and well-being. 25-28 and in the fields of ergonomics and human factors. 29,30 The role of the environment as an enabler of health behavior and as a provider of health resources, on the other hand, has received more attention in studies of organizational development. 6-8 and in fields such as architecture, facility management, geography, sociology, and urban planning. 15,16,18

An important advantage of environmental enhancement models of health promotion is that they provide a more complete understanding of the situational factors that can facilitate or hinder persons’ efforts to improve their health practices and well-being. Moreover, environmental analyses reveal the direct and often imperceptible effects of people’s physical and social surroundings on their well-being, which can undermine the benefits of favorable health practices or exacerbate the negative outcomes associated with unhealthy and injurious behavior.

Environmental enhancement strategies of health promotion also tend to be more powerful than behavioral and lifestyle modification programs, because they have the capacity to benefit all persons exposed to an environment rather than focusing narrowly on improving the health of one person at a time. For example, environmentally based health promotion programs typically emphasize passive improvements, 31 or those that simultaneously enhance the health of several people without requiring any voluntary and sustained effort on their part (e.g., the use of child-resistant caps on medicine bottles; factory installation of arthoges in all new motor vehicles). Behavioral change models, on the other hand, emphasize active interventions that require voluntary and sustained effort by persons as a prerequisite for achieving the desired health benefits (e.g., encouraging persons to give up smoking and to engage in vigorous physical exercise on a regular basis). Thus, active interventions are usually more difficult to maintain over extended periods than passive interventions.

Like behavioral-change models of health promotion, however, environmentally based interventions reflect some important limitations. First, interventions aimed at improving environmental quality typically have focused on single facets of the physical or social environment (e.g., indoor air quality, seismic hazards, or social climate within work organizations) rather than examining multiple environmental dimensions (e.g., both physical and social conditions within settings) and the relationships among them. Second, environmental analyses of health promotion give little or no attention to the varying behavioral patterns and sociodemographic characteristics of the people occupying particular places and settings. Clearly, the health-related value of environmental enhancements (e.g., designating workplaces as "smoke-free") may be diminished for those who continue to engage in unhealthy activities (e.g., smoking cigarettes at home and during lunch breaks at work), or for those groups who are more vulnerable to the negative health impacts of environmental hazards and stressors because of their restricted income, educational level, and geographic mobility. Thus, environmental approaches to health promotion often neglect individual and group differences in people’s response to their socio-physical milieu.

Having noted some of the strengths and limitations associated with behavioral change and environmental enhancement strategies of health promotion, we now consider the ecological perspective that addresses several of the limitations inherent in the behavioral and environmental approaches.

Social Ecological Models of Health Promotion

The social ecological perspective on health promotion is based, not on a singular discipline or theory, but rather on a broad, overarching paradigm that bridges several different fields of research. The term ecology refers to the study of the relationships between organisms and their environment. 32 Early ecological analyses of the relations between plant and animal populations and their natural habitats 33,34 were later extended and applied to the study of human communities and environments within the fields of sociology, psychology, and public health. 35,36 The field of social ecology, which emerged during the mid 1960s and early 1970s, gives greater attention to the social, institutional, and cultural contexts of people-environment relations than did earlier versions of human ecology, which focused primarily on biologic processes and the geographic environment. 37,38,39

The social ecological paradigm is rooted in certain core principles or themes concerning the interrelations among environmental conditions and human behavior and well-being. First, ecological analyses characterize environmental settings as having multiple physical, social, and cultural dimensions that can influence a variety of health outcomes, including physical health status, developmental matura- tion, emotional well-being, and social cohesion. 40 Accordingly, the health-promotive capacity of an environment is understood, not simply in terms of the health effects of separate environmental features (e.g., air quality, seismic safety, or social climate), but more broadly as the cumulative impact of multiple environmental conditions on occupants’ physical, emotional, and social well-being, over a specified time interval. 40

Another core theme of social ecological research is that human health is influenced not only by environmental circumstances, but also by a variety of personal attributes, including genetic heritages, psychologic dispositions, and behavioral patterns. Social ecological analyses emphasize the dynamic interplay between situational and personal

March/April 1990, Vol. 10, No. 4 285
Social ecological analyses also emphasize the interdependence of environmental conditions within particular settings and the interconnectedness between multiple settings and life domains. For instance, the physical and social facets of settings are assumed to be closely interlinked and capable of exerting independent as well as joint effects on occupants' well-being. Also, the multiple domains of human activity (e.g., one's residence, neighborhood, workplace, and surrounding community) are viewed as nested structures in which local settings and organizations are embedded within larger and more remote regions. Thus, efforts to promote human health must take into account the interdependencies that exist among immediate and more distant environments (e.g., the "spillover" of workplace and community stress to residential environments) and the influence of state and national policies on the healthfulness of occupational settings).

Finally, the social ecological perspective is inherently interdisciplinary in its approach to health research and the development of health promotion programs. Ecological analyses integrate the community-wide, preventive strategies of public health and epidemiology with the individual-level, therapeutic and curative strategies of medicine. The ecological perspective also encompasses the behavioral and social sciences' emphasis on the active role played by persons and groups in modifying their own health behaviors, the development and testing of theoretical models describing people-environment transactions; and the importance of conducting evaluative studies to assess the cost-effectiveness and social impact of health promotion programs. Thus ecologically based health research incorporates multiple levels of analysis and diverse methodologies (e.g., medical examinations, questionnaires, behavioral observations, environmental recordings, epidemiologic analyses) for assessing the healthfulness of settings and the well-being of persons and groups.

American Journal of Health Promotion
A social ecological orientation is reflected in several lines of health research. The biopsychosocial model of health, for example, emphasizes the interdependencies between psychologic dispositions, social behavior, and physiologic processes in health and illness. Similarly, studies of person-environment fit and stressful life events reveal the joint influence of personal and situational factors on persons' well-being. And cultural change models of health promotion emphasize the importance of engaging persons in active efforts to reshape their social and physical environments in ways that enhance individual and collective well-being.

The cumulative impact of conditions within multiple settings and life domains on individual and collective well-being is examined in the fields of social epidemiology, medical sociology, community health promotion, and the ecology of human development. Similarly, the advantages of developing multilevel health promotion programs that incorporate biobehavioral, behavioral, environmental, and regulatory components are emphasized in the analyses by Winett et al. Linking the fields of public health and health psychology in social ecological models of health and illness in studies of political and regulatory processes in health promotion, and in research on healthy cities and communities.

Summary of Differences Between Behavioral Change, Environmental Enhancement, and Social Ecological Approaches

The major theoretical and research perspectives associated with behavioral change, environmental enhancement, and social ecological strategies of health promotion are summarized in Table 1. This summary of relevant theoretical and research orientations is intended to be representative rather than exclusive. Alternative but complementary classifications of theoretical perspectives associated with different strategies and levels of health promotion have been provided by McLeroy et al. and Winett. A comparison of the key emphases and differences among the behavioral, environmental, and ecological models of health promotion is presented in Table 2.

A major strength of social ecological approaches to health promotion is that they integrate strategies of behavioral change and environmental enhancement within a broad systems-theoretical framework. Social ecological theories also emphasize cross-level analyses of health problems and related intervention strategies. A key feature of ecological models is that they incorporate two or more analytic levels (e.g., personal, organizational, community) and, thereby, permit researchers and practitioners to examine both individual and aggregate manifestations of health problems and impacts of community interventions. Thus, the conceptual "blind spots" resulting from an exclusive focus on either behavioral or environmental factors at single analytical levels are avoided by giving explicit attention to the dynamic interplay among personal and situational factors in health and illness, at both individual and aggregate levels.

At the same time, however, social ecological models of health promotion reflect certain practical limitations. Most importantly, ecological interventions require the integration of knowledge from several different disciplines and close coordination among persons and groups from various sectors of the community. Moreover, the combined use of active and passive interventions for health promotion and the incorporation of multi-level, multi-method assessments of program outcomes over extended periods can be quite expensive and logically complex. Such cross-level, longitudinal studies of program effectiveness can sometimes prove to be too cumbersome and impractical to implement. These logistical complexities raise some important questions about the potential over-inclusiveness and utility of ecologically oriented health promotion programs. If ecological models are construed as all-encompassing and assumed to include every conceivable health-relevant variable, then their utility as a basis for research and intervention is substantially reduced. That is, overly inclusive models are not likely to assist researchers in targeting

Table 2

<table>
<thead>
<tr>
<th>Health Promotion Orientation</th>
<th>Key Determinants of Health and Illness</th>
<th>Focus of Health Promotive Interventions</th>
<th>Types of Interventions Emphasized</th>
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<tbody>
<tr>
<td>Behavioral Change or Lifestyle Modification</td>
<td>Individual health behavior</td>
<td>Mostly persons' health-related attitudes, beliefs, and behavior</td>
<td>Active interventions (require voluntary and sustained effort by target individuals)</td>
</tr>
<tr>
<td>Environmental Enhancement and Restructuring</td>
<td>Quality of people's physical and social environments</td>
<td>Improve environmental/hygienic safety and strengthen social supports for health</td>
<td>Passive interventions (require no effort by individuals exposed to them)</td>
</tr>
<tr>
<td>Social Ecological Approach</td>
<td>Degree of fit between people's biological, behavioral, and sociocultural needs and the environmental resources available to them</td>
<td>Integrate behavioral and environmental-level health promotion strategies</td>
<td>Combination of active and passive interventions (covering individual, organizational, and community levels)</td>
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MarchApril 1996, Vol. 10, No. 4
selected variables for study, or criticisms and policy-makers in determining what, when, and how to intervene.

In contrast to this all-encompassing view of ecological models, the present analysis suggests that social ecological strategies of health promotion, although based on "middle-range" theories of the specific circumstances (e.g., intrapersonal, physical environmental, organizational, cultural) that account for the occurrence and prevalence of particular health problems and a corresponding analysis of the contextual factors that we likely to influence the effectiveness of health-promotive interventions designed to reduce those problems,16-19 McCloy et al. refer to these complementary theoretical perspectives as "theories of the problems" and "theories of intervention."20 An important aspect of social ecological approaches to health promotion is that they integrate both problem theories and interventions.

Table 3

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<tr>
<th>Ecological Principle</th>
<th>Corresponding Procedural Guideline</th>
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<tr>
<td>Physical, mental, and social well-being are subdetermined by a variety of environmental factors.</td>
<td>Exercise the links between multiple facets of well-being and diverse conditions of the physical and social environment.</td>
</tr>
<tr>
<td>Personal characteristics and environmental conditions often are interrelated as direct effects on well-being.</td>
<td>Examine the joint influence of behavioral, dispositional, developmental, demographic factors on public's exposure and responsiveness to environmental hazards and diseases.</td>
</tr>
<tr>
<td>The degree of fit between people's biologic, behavioral, and sociocultural needs and the environmental resources available to them is a key determinant of well-being.</td>
<td>Identify sources of person-environmental and group-environmental match, and develop interventions that optimize the fit between people and their surroundings.</td>
</tr>
<tr>
<td>Within the context of structured community settings, certain behaviors and roles exert pivotal influence on well-being.</td>
<td>Identify behavioral and organizational &quot;leverage points&quot; for health promotion: consider both personal and social directed health behavior agendas for change within community interventions.</td>
</tr>
<tr>
<td>Examine links between physical and social conditions within particular settings, and the joint influence of multiple settings and life domains on personal health over extended periods.</td>
<td>Account for the modifying and mediating influences of physical and social conditions on health; design community interventions that span multiple settings and have enduring positive effects on well-being.</td>
</tr>
<tr>
<td>Interdisciplinary rapport, linking the perspectives of medicine, public health, and the behavioral and social sciences, is essential for developing comprehensive and effective health promotion programs.</td>
<td>Integrate biopsychosocial, behavioral, regulatory, and environmental interventions for health promotion; use multiple methods to evaluate the health and cost-effectiveness of community programs.</td>
</tr>
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</table>

The core themes and principles of social ecology outlined earlier provide a valuable foundation for organizing and implementing effective community interventions. The remaining portions of this article focus on the translation of social ecological theory into practical guidelines for community health promotion.

GUIDELINES FOR COMMUNITY HEALTH PROMOTION BASED ON SOCIAL ECOLOGICAL PRINCIPLES

This section is organized around six procedural guidelines for the design, implementation, and evaluation of community health promotion programs. These practical guidelines are based on the core concepts and principles of social ecology discussed earlier, including the following:

- The multifaceted nature of environmental influences on well-being
- The interactive effects of interpersonal and intrapersonal determinants of health and illness
- The relevance of person-environmental fit and perceived environmental controllability for individual and collective well-being
- The importance of identifying behavioral and organizational "leverage points" for health promotion, and considering both personal and social-directed health behaviors as targets for change
- The interdependencies that exist among a person's or group's major activity settings and life domains
- The value of combining biocultural,
be behavioral, educational, environmental, organizational and regulatory interventions at several community levels, and adopting an interdisciplinary, multimethod approach to evaluating the outcomes of health-promotion programs.

Table 5 summarizes the core themes of social ecological theory and their corresponding implications for the development of community health-promotion programs.

1. Examine Links Between Multiple Facets of Well-being and Diverse Conditions of the Sociophysical Environment

Social ecological theory emphasizes the importance of identifying various physical and social conditions within environments that affect occupant's physical, emotional, and social well-being. For example, architectural and interior design features of environments such as the quality of toilet and sink surfaces, ambient temperature and noise levels, and the construction of stair wals can influence a variety of physical health outcomes, including reduced risk of accidents, psychological stress and fatigue, and the likelihood of falls and other injuries.20-23

Moreover, the perceived predictability, controllability, novelty, and intrinsic value of environments can influence emotional well-being, as reflected in peoples' feelings of competence, identity, creativity, and sense of attachment to their surroundings.20,24-26 Social conditions of environments, including their economic stability, structural flexibility, and provision of opportunities for enhancement in supportive interpersonal relationships, can profoundly influence levels of cohesion, commitment, and innovation observed at organizational and community levels.20,21

Thus social ecological theory emphasizes a multivariate approach to the assessment of environmental conditions and the effects of those conditions on a variety of health outcomes. Health-relevant facets of the sociophysical environment include various geographic, architectural, technological, organizational, and social-cultural conditions that are present within a particular setting or cluster of interlinked life systems. Ecological analyses place greater emphasis on the study of health-promoting environments (or those whose physical and social conditions are linked to positive health outcomes at both individual and community levels), than on the risks of induced environmental conditions as they influence a particular criterion of well-being.21

2. Consider Joint Influence of Internal and Environmental Conditions on Individual and Community Well-being

Social ecological theory holds that human health is influenced not only by a broad array of physical and social environmental conditions, but also by a diversity of interpersonal factors including genetic heritage, personality dispositions, and health practices. These interdependent attributes can influence well-being either directly or in conjunction with a variety of environmental circumstances.

Behavioral models emphasize the direct effects of health practices (e.g., exercise, smoking) on health, whereas environmental-based analyses focus on the indirect effects of physical and social conditions on health. A unique contribution of social ecological theory is that it emphasizes the dynamic interaction of intra- and interpersonal factors in health and ill health. For example, susceptibility to respiratory disease is increased not only by personal smoking behavior, but also through passive exposure to others' cigarette smoke at the workplace. The interactive influence of environmental and behavioral factors on health is especially evident in epidemiologic data concerning lung cancer rates. Smoking is 10 times more likely to develop lung cancer than non-smokers, and persons exposed to asbestos at the workplace are 5 times more vulnerable to lung cancer than those who avoid asbestos exposure at work. However, among people who smoke and asbestos are exposed to asbestos at work, lung cancer rates are 50 times greater than among non-smokers who also avoid occupational asbestos exposure.26

Certain personal attributes, such as low socioeconomic status (SES), heighten vulnerability to a wide range of illnesses,27 and the long-observed correlation between low SES and increased morbidity and mortality is most likely attributable to the joint influence of multiple personal and environmental factors associated with lower educational and economic standing—e.g., physiologic dispositional factors, discrimination, helplessness, and perinatal externalities of control, poor nutrition, and related health practices, and disproportionate exposure to environmental hazards and stresses.28,29,30

Explicit recognition of the interactive effects of personal and environmental factors on well-being poses some important, practical implications for the design and implementation of health-promotion programs. First, whereas community interventions for health promotion are being designed, it is important to consider personal and sociodemographic characteristics that may heighten a person's or group's vulnerability to environmental health risks or reduce the beneficial effects of environmental enhancement activities or collective well-being. Community interventions that take these factors of personal and group vulnerability and perinatal exposure to environmental hazards into account should be developed and made available to those segments of the population that are in greatest need of disease prevention and health-promotion resources.25,28-30

Second, it is advisable (whenever possible) to incorporate a combination of active (behavioral) and passive (environmental) interventions within community health-promotion programs, rather than relying exclusively on one or the other.30 For instance, the health-enhancing value of behaviorally based smoking cessation programs is likely to be enhanced by organizational and policy supportive policies that mandate smoke-free workplaces, schools, restaurants, and commercial areas.31 The development of intervent-
health promotion is a logical extension of social ecological analyses that emphasize the interplay among personal and environmental factors in health and illness.

3. Develop Health Promotion Programs that Enhance the Fit Between People and Their Surroundings

The preceding guideline highlights the importance of considering the interactions among personal and environmental influences on well-being as a basis for designing health promotion programs. One way of representing the links between personal and environmental factors in health is in terms of the congruence or fit between persons' needs, on the one hand, and the structure and quality of their environments, on the other. The manifestations of fit or misfit between people and their surroundings can be quite diverse, ranging from the disinfluences and distractions of living in noisy and congested neighborhoods, and the sense of alienation that results from having insufficient input into organizational or community planning decisions, to the health, safety, and productivity costs associated with poorly designed work environments.

These diverse manifestations of people-environment misfit share a common feature—they all arise in settings where persons' opportunities for modifying or controlling their surroundings are blocked by rigid environmental constraints. Conversely, instances of people-environment fit occur in settings where participants enjoy a high degree of control over their surroundings and are free to initiate goal-directed efforts to modify the environment in accord with their preferences and plans. The processes by which persons and groups rationally guide their transactions with the environment so as to achieve successively higher levels of fit between their present (or anticipated) needs and environmental conditions are referred to as human-environment optimization.

Several lines of research suggest that uncontrolled and inflexible environments are detrimental to well-being, whereas more controllable and responsive settings are health promoters. These studies suggest that interventions to enhance the controllability, flexibility, and responsiveness of social and physical environments should be an important component of community health promotion programs. Examples of such interventions include architectural and facilities design techniques to improve the responsiveness of physical environments for disabled people, the redesign of occupational roles and job requirements to enhance employees' sense of autonomy in their work activities, urban planning strategies that insulate residential areas from high-volume automobile traffic, and a variety of other interventions that facilitate the quality of life of people who are hard-pressed for solutions to their problems.
order only those menu selections in restaurants that are labeled "heart-
healthy." Alternatively, a restaurant owner might decide to include only
healthy/hearty selections on his or her menu. The former instance is an
example of personal health behavior, whereas the latter exemplifies other-
directed behavior change. The distinction between personal and other-
directed health behavior, and some examples of each, are summarized in
Table 4.

Certain personal and other-directed behaviors exert a disproportionate
influence on well-being. For example, a woman's lifestyle may include several
unhealthy behaviors (e.g., smoking, alcohol consumption, lack of physical
exercise, high-stress job and commute between home and work), but her
involvement in a high-stress job may be the pivotal lifestyle dimension that
poses greatest risks for illness because it prompts inappropriate coping
strategies to alleviate stress (such as smoking and alcohol consumption),
requires a long and arduous commute between home and work, and reduces
available leisure time, thereby eliminat-
ing opportunities for her to engage in physical exercise. Thus, behavioral
change efforts to reduce smoking and alcohol consumption are ineffective
despite her current job to a less demanding one.

Previous research on behavioral
change strategies of health promotion
have focused primarily on modifying
domestic health behavior rather than
influencing organizational and
community decision-makers whose
actions affect the health of many other
people. Therefore, an important
challenge for the health promotion
field is to identify high-impact rules in
corporate and institutional settings
that have the capacity to influence the
health and safety of large numbers of
people. For example, the decision of urban
planners to locate elementary schools
under the flight path of large metro-
politan airports may have long-term
toxic impacts on the physical and
emotional well-being of students and
teachers at those schools. Also, the
decision of facility managers within
large corporations to purchase
ergonomically designed chairs and
work stations for their employees may
help to lower the prevalence and
financial costs of lower back and
repetitive strain injuries in those
organizations. And programs that
train beverage servers in restaurants
to recognize the signs of intoxication in
their customers and to intervene
accordingly (e.g., by offering food with
alcoholic drinks and by arranging for
others to drive intoxicated persons
home) have been implemented in
numerous states as a strategy for reducing
alcohol-related fatalities from car
crashes.

Increasingly, corporations and
government agencies are relying on
intermediaries to ensure the health
and safety of their constituents. Within
large companies, for example, medical
benefits are often administered by
health maintenance organizations
whose case managers decide whether
or not to approve payments for mental
health counseling visits, diagnostic
tests, medical treatment, and rehabilita-
tion therapy for particular employ-
ees. Also, legal initiatives to protect the
healthfulness of hospitals and commu-
nity environments generally
require public agencies and private
firms to designate a coordinator who
officially responsible for maintaining
environmental compliance with the
regulatory requirements.

The use of corporate and public
officials as intermediaries for health
promotion has several advantages.
Intermediaries can serve as advocates
for improving the quality of environ-
mental and health resources available
to organizational and community
members. They are often trained in
health-related fields and can make use
of their expertise as advocates for
environmental and health improve-
ment. Wherever persons’ efforts to
improve their own well-being are
sometimes blocked by situational
constraints, intermediaries often have
the authority to alleviate unhealthful
environmental conditions and to
encourage others to adopt improved
health practices.

At the same time, however, relying
too heavily on intermediaries to
ensure the health of their constituents
may have the disadvantage of under-
mining persons’ sense of responsibility
and personal initiatives to improve
their own well-being. Also, bureau-
cratic rigidities and an overload of
work demands within organizations
may lead to impersonal and transactional
encounters between intermediaries
and their constituents. When such
encounters result in inappropriate
or health-threatening actions by
corporate or government officials, the
well-being of many people can be
adversely affected for extended
periods.

Some of the potential advantages
and disadvantages of using intermedi-
aries to promote others’ well-being are
summarized in Table 4. It is essential
that these issues be carefully consid-
ered in the design of health promote-
tive interventions, particularly as legisla-
tive and health-community interventions
come to rely increasingly on certain
rules and persons as leverage points
for enhancing personal and collective
wellbeing.

5. Design Health Promotion Programs That Address Interdependencies Between the Physical and Social Environments Multiple Settings and Life Domains

A core principle of social ecology is that the environmental context of
human activity function as dynamic systems. This systemic quality of
settings is reflected in interdependencies between physical and social
conditions within particular environ-
ments and in the nested structure of
multiple settings and life domains. A person’s residential and occupational
environments, for example, are
embedded within broader geographic
and governmental regions. These local
and more remote environments jointly
affect the person’s well-being, as when
state and federal regulations improve
the healthfulness and safety of work
places located within those jurisdic-
tions.

Environmentally based health
promotion programs that target
isolated conditions within a setting
(e.g., the air quality or noise levels
within a workplace) often neglect
important links between the physical
and social aspects of environments and
the joint influence of multiple settings
on participants’ well-being. Two types

March/April 1986, Vol. 10, No. 4
of linkages between the physical and social features of occupational settings are illustrated in Figure 1 and 2. In Figure 1, the effects of physical conditions within a workplace on employee well-being are mediated by social processes that develop in response to the precipitating physical conditions. Specifically, high levels of ambient noise can lead to personal feelings of annoyance, which in turn create conflicts and hassles among coworkers more likely. These interpersonal experiences can, in turn, lead to elevated levels of emotional and physiologic stress. Similarly, the physical separation of team members caused by poor space plans and adjacencies in offices can reduce informal social contacts and communications among co-workers and thereby create personal and group strains resulting from poor coordination and lack of cohesion.

Figure 2 depicts a different kind of interdependence between the physical and social features of a workplace. In this illustration, the effects of the physical environment on employee injury rates and corporate health costs are moderated by a prevailing climate of social conflict among workers and management. Despite adequate levels of workplace hygiene and injury-resistant facility design, a disproportionately large number of workers' compensation claims may occur within conflict-prone organizations. The potential role of social factors in moderating the healthfulness and financial costs of work facilities should be carefully considered in the design of workplace health promotion programs, especially in view of the increasing rates of stress-related workers' compensation claims in many regions of the United States and the tremendous economic costs associated with these employee health insurance claims.

Therefore, of course, several other ways in which the physical and social conditions within a setting can jointly influence personal and group well-being. For example, the health consequences of social conditions at the workplace can be mediated by physical environmental resources, as when managers' concerns about their employees' well-being prompts a substantial corporate investment in workplace amenities (e.g., the purchase of ergonomically designed furniture for all employees). The provision of these amenities, in turn, improves workers' comfort and morale while reducing their stress and health problems. Alternatively, the health consequences of a nonsupportive social environment may be moderated by the availability of certain physical resources (e.g., the availability of private workspace and onsite fitness facilities), which enable employees to cope more effectively with interpersonal strains at work (e.g., by avoiding stressful interactions and maintaining a regular exercise regimen). These examples further illustrate the variety of ways in which social and physical conditions within settings can mutually influence well-being. As understanding of the structure and dynamics of the sociophysical environment is an important prerequisite for developing effective health promotion programs at organizational and community levels.

Social ecological theory emphasizes not only the interrelatedness of conditions within single settings but also the links between multiple settings and life domains within the broader community. Personal activity patterns are organized in relation to their major life domains—for example, their residential, educational, occupational, recreational, religious, and health-care environments. These environments have a cumulative and combined influence on well-being, as shown by the substantial health benefits that accrue from one's involvement in social support networks across a variety of life domains. Therefore, health promotion programs that recognize the influence of multiple settings on well-being.
incorporate multi-channel interventions, and establish collaborative conditions spanning several different sectors of the community, should be more effective than those restricted to single-domains.\cite{24,25} For example, smoking prevention programs that combine school-based education campaigns with regulatory initiatives to ban smoking in public places\cite{15} are expected to have more pervasive and sustained effects in the community than those focusing only on educational settings.

A potentially useful criterion for judging the success of health promotion programs is the ecological depth of intervention outcomes. Ecological depth increases to the extent that positive intervention effects occur over extended periods and across multiple levels of a community. Table 5 illustrates the varying duration and levels of intervention outcomes associated with Los Angeles’ Regulation XV to promote corporate ridesharing.\cite{26} This law requires all public and private employers having 100 or more employees at any worksite to implement a plan to increase “average vehicle rideship” (AVR), or the number of employees reporting to work during rush-hour divided by the number of vehicles driven to and from work.

In this case, a legal initiative to promote corporate ridesharing may yield immediate health benefits by reducing persons’ commuting stress from solo driving during rush hour traffic. Other community-level benefits of ridesharing programs, such as improved air quality in urban areas and reduced incidence of smog-related respiratory disease, may become apparent over longer time intervals. Finally, ridesharing programs may also have longer-term, global benefits by curtailing the production of “greenhouse gases” from fossil fuel consumption, thereby reducing global warming and its concomitant health impacts.\cite{27}

Intervention outcomes should be evaluated in terms not only of their scope and duration, but also their positive or negative implications for well-being. Improvements in building insulation techniques during the 1970's, for example, resulted in increased energy efficiency and lower air-conditioning costs. Yet these same advances in construction technologies also led to poorer levels of indoor air quality and more frequent health complaints among building occupants, sometimes referred to as the “sick building syndrome.”\cite{28} Thus, community interventions should be designed so as to avoid unintended, negative side effects, while promoting long-term and pervasive health benefits within a broad segment of the population.

Table 5: Ecological Depth of Intervention Outcomes

<table>
<thead>
<tr>
<th>Potential Health Outcomes of Regulation XV</th>
<th>Duration and Levels of Health Outcomes</th>
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<tr>
<td></td>
<td>Short-Range/Personal</td>
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<tr>
<td></td>
<td>Reduce commuters’ stress from solo driving during rush hour traffic</td>
</tr>
</tbody>
</table>

Regulation XV requires all public and private employers having 100 or more employees at any worksite to develop and implement a plan to increase “average vehicle rideship,” or AVR, defined as the number of employees reporting to work between 6:00 and 10:00 AM, divided by the number of vehicles driven by those employees to and from work.

March/April 1996, Vol. 10, No. 4

293
wellbeing, levels of cooperation or conflict within organizations, personal or group exposure to physical environmental hazards, epidemiologic data on illness and mortality rates among specific groups in the community, and measures of employee health costs within public and private organizations. In addition to summative evaluations of program outcomes, formative evaluations of the effectiveness with which intervention components are implemented should be incorporated to assess overall program results.  

Two different criteria for evaluating the summative impacts of health promotion programs are scientific and social validity. Scientific validity refers to the methodologic rigor and theoretical adequacy of a research or intervention program. For example, internal validity is the extent to which program outcomes are attributable to treatment conditions rather than to extraneous variables, whereas external validity is the extent to which research findings can be generalized from one study or intervention site to other specified populations, environments, and time intervals. An alternative, yet complementary, criterion for evaluating research and intervention programs is social validity. Social validity refers to the societal value and practical significance of a research or intervention program. Like scientific validity, social validity encompasses several interrelated criteria. Among these are the epidemiologic prevalence of particular health problems in the community, the economic costs and sustainability of programs designed to alleviate these problems, the number of people who are likely to benefit, and the adverse or beneficial effects of the intervention program, the possible occurrence of undesirable side effects from the program, and public opinion about community health priorities. The social validity of a community health promotion program is greater to the extent that it is firmly grounded in scientific and epidemiologic research, economically feasible, likely to benefit a broad segment of the target population, unlikely to create adverse side effects, and consistent with public priorities and commitments. A major assumption underlying social ecological analyses of health promotion is that those programs designed from a multidisciplinary perspective and combining interventions implemented across several community settings are likely to achieve higher levels of scientific and social validity than programs that are more narrowly conceived.

SUMMARY AND CONCLUSIONS

The formulation and evaluation of health promotion interventions can be made more effective by clearly specifying the theoretical assumptions underlying these programs. In the preceding sections, three alternative theoretical perspectives on health promotion, including behavioral change, environmental enhancement, and social-ecological models were reviewed, and key strengths and limitations of each orientation were noted. Social ecological theory, which integrates and extends behavioral change and environmentally focused models of health promotion, was used as a basis for deriving several practical guidelines for organizing and evaluating community health promotion programs. The theoretical underpinnings of social ecology are relevant to several practical issues that arise in attempts to design effective community interventions. For example, the challenge of developing health promotion programs that have empowering positive effects on wellbeing at several community levels and avoid unintended adverse side effects is explicitly addressed in preventive medicine analyses of social validity and the ecological depth of anticipated program outcomes. Moreover, the importance of understanding the interactive influence of physical and social environmental conditions on health is highlighted by recent studies showing the differential impacts of technologic and natural disasters on wellbeing. This research reveals that the emotional and physiologic consequences of technologic disasters (e.g., those leading to the threat of toxic exposure or radioactive contamination) are more severe and prolonged than those associated with natural disasters such as hurricanes and tornados. The greater disruptiveness of technologic disasters has been attributed to the negative social processes accompanying the precipitating physical event—especially the feelings of responsibility and the ambiguities of blame that are direct toward community or corporate officials held responsible for the technologic failure. Also, the health risks associated with technologic disasters, such as potential exposure to toxic or radioactive materials, create greater emotional and physical distress because these conditions are often unpredictable (in contrast to the onset of an earthquake, flood, or tornado) and can evoke perceptions of helplessness and environmental uncontrolability that persist for prolonged periods. Thus health promotion programs and public health services for communities vulnerable to technologic and natural disasters should incorporate interventions that address the joint influence of physical and social conditions on wellbeing, the potential effects of other-directed health behavior (e.g., enacted by the managers of nuclear energy facilities) on community cohesion, and the capacity of uncontrolable and imperceptible environmental hazards to promote psychologic stress and social conflict.

The preceding discussion suggests several directions for future research and theory development within the health promotion field. First, the extent to which health promotion interventions function effectively or ineffectively in corporate and public settings may depend on situational factors, such as the quality of social climates and levels of staffing within organizational environments. The influence of these factors on the effectiveness of other-directed health behavior warrants further investigation. Also, a more detailed analysis of the ways in which physical and social environmental conditions jointly affect wellbeing within various life domains (especially work, residential, educational, and health care settings), and the identification of highimpact leverage points for health enhancement within these domains, are important directions for future study. Finally, the development of operational criteria for evaluating the scope
and duration of health promotion outcomes, and for measuring the synergistic effects of multilevel interventions undertaken at different community levels, remains as a priority for future research.

SO WHAT? Implications for Health Promotion Researchers and Practitioners

Several key issues warrant further study in health promotion research. These include the importance of (1) identifying high-impact leverage points and intermediate outcomes within organizations that can facilitate the successful implementation of health-promotive interventions; (2) combining person-focused and environment-based components within comprehensive health-promotion programs; and (3) measuring the scope and sustainability (ecological depth) of intervention outcomes over prolonged periods. At a practical level, social ecological theory offers clear implementation guidelines for maximizing the health, economic, and societal benefits (social validity) of health promotion programs.

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