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Social Ecology and Behavioral Medicine: Implications for Training, Practice, and Policy

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Social ecology offers a conceptual framework for understanding the etiology of multiple health problems and a basis for designing broad-gauge educational, therapeutic, and policy interventions to enhance personal and community well-being. Implications of social ecology for behavioral medicine are considered in relation to the development of diagnostic and therapeutic practices, professional training programs, and health policies implemented at municipal, state, and national levels. By influencing the training and practices of healthcare professionals and the decisions of corporate and community leaders, behavioral medicine can expand the scope and impact of future interventions beyond the health gains achievable through provision of direct services to patient populations. Potential barriers to establishing ecologically based health programs and policies and directions for research at the interface of behavioral medicine, social ecology, and public health are discussed.

Index Terms: *behavioral medicine, social ecology*

Our focus on social ecology and behavioral medicine in this series differs in some important respects from earlier triptychs published in *Behavioral Medicine*. Unlike many of the topics covered in previous triptychs (eg, smoking cessation, disability in older adults, behavioral management of chronic pain), social ecology is not limited to a particular health issue or illness. Instead, it encompasses a broad, multidisciplinary perspective on the relations between people and their environments.[1-3]

Social ecology as a framework for health research and practice can be understood better in terms of its overarching conceptual and methodological principles rather than as a search for a clearly defined body of research organized around a particular topic. The core themes of social ecology (highlighting the dynamic relations between people and their surroundings) can be used to explain the etiology of a number of health problems (eg, cardiovascular disease, cancer, occupational injuries, smoking, substance abuse, com-

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munity violence, environmental pollution). Social ecology can serve as a basis for developing broad-gauge educational, therapeutic, and policy interventions to enhance personal and community well-being.[4-6]

Social ecological analyses of health and illness are characterized by their broad contextual scope. That is, they examine health problems encountered by individuals and groups in relation to the etiologic circumstances present in their day-to-day physical and social environments (eg, exposure to secondary tobacco smoke, interpersonal strains at the workplace). Social ecological analyses can also be useful in examining health problems in the context of life span developmental, sociodemographic, and societal circumstances that influence susceptibility to disease.

The spatial, temporal, and sociocultural scope of ecological analyses generally is broader than the contextual frame of analysis reflected in many behavioral medicine studies, which typically focus on the psychological and social circumstances faced by individual patients coping with particular health problems.[4,6,7] For instance, although the biopsychosocial model,[8,9] which is endorsed by many researchers

in behavioral medicine, recognizes the substantial influence of the social environment on well-being, it places considerably less emphasis on the links between people's physical surroundings and their health. Social ecological analyses, on the other hand, explicitly consider factors in the physical environment that affect health status (eg, the synergistic effects of workplace exposure to asbestos and chronic cigarette smoking on susceptibility to lung cancer,[10] environmental design features of neighborhoods that promote or constrain opportunities for engaging in physical activity[11]).

The broad scope of ecological research on health is evident in the preceding articles by Grzywacz and Fuqua (see pps 101–115)[12] and Dooley and Catalano (pps 116–128).[13] Grzywacz and Fuqua, applying the Bronfenbrenner[7] ecological model of life span development, review several studies demonstrating the joint influence of multiple life domains and settings (eg, home, neighborhood, school, workplace) on individuals' well-being. By examining the interface (or mesosystem links) between a child's home and school environments or between a parent's family and work domains, the spatial scope of the research is expanded beyond a focus on the health effects of a single setting or microsystem. Accordingly, some studies have documented the adverse health consequences of "work-family conflict," whereas others have shown the positive effects of spouse support in buffering work-related stress.[12,14,15]

The analytic breadth of ecological research is further reflected in Dooley and Catalano's typology of health policies and programs, organized in relation to both micro and macro scales of intervention (spatial scope), ranging from individuals and groups in local settings to populations situated within larger communities and regions. The breadth of the field is also reflected in its consideration of the timing of preventive and therapeutic regimens (temporal scope), ranging from proactive and reactive primary prevention prior to the onset of illness to postsymptom secondary and tertiary therapeutic strategies.[16,17] In addition, the broad sociocultural scope of ecological health research is evident in Grzywacz and Fuqua's, and Dooley and Catalano's discussions of various sociodemographic and cultural factors that moderate health status (eg, individual and neighborhood socioeconomic status[18,19] and income inequality[20]).

An advantage of ecological analyses, relative to more narrow-gauged biomedical and behavioral studies, is that they afford an integrative and comprehensive understanding of the ways in which biological, psychological, sociocultural, and physical environmental factors jointly affect well-being. Thus, important political, economic, and environmental determinants of health that were neglected in earlier behavioral medicine studies have been targeted in more recent

ecological research.[12,13,21] At the same time, because ecological studies combine multiple disciplinary perspectives and levels of analysis, they are not well suited to providing parsimonious explanations of health phenomena. It is understandable, then, that behavioral medicine professionals (many of whom work directly with patients in local healthcare settings) might question whether the principles of social ecology can serve as a useful framework for addressing their immediate therapeutic and research concerns.

The remaining sections of this article address the following question: What are the implications of social ecology for behavioral medicine training, practice, and health policy? This discussion assumes that social ecology theory and research have important implications for behavioral medicine. At the same time, it suggests that the utility of social ecology as a basis for developing training programs, therapeutic regimens, and community interventions can be greatest when certain guidelines are followed in analyzing health issues from an ecological perspective. First, researchers and practitioners should identify and give top priority to high-leverage variables or those that exert the greatest influence on well-being across multiple levels of analysis (eg, at behavioral, interpersonal, organizational, and community levels).[4,12] Second, behavioral medicine training, practice, and intervention programs should target health problems that are most prevalent and severe within a community and should be directed toward highly vulnerable subgroups in the population. These leveraging and targeting strategies can be used to enhance the social validity (or societal value) of health-promotion programs,[22,23] as well as their cost-effectiveness.[24,25]

Designing Ecologically Based Training Programs, Practices, and Policies

In the following section, I examine the implications of social ecology for behavioral medicine in relation to a continuum of interventions, ranging from the micro- to meso- and macrolevels. Microinterventions include the diagnostic and therapeutic practices of behavioral medicine professionals who work directly with patient populations. Meso-interventions encompass the training and wellness programs developed by healthcare and community professionals working collaboratively across multiple organizations and settings.[26,27] Macrointerventions include municipal, state, and national policies that are implemented to improve public health. As Dooley and Catalano[13] noted, microlevel and macrolevel interventions are often designed and implemented separately from each other because of the different treatment and preventive concerns of medical, behavioral, and public health specialists. Occasionally, opportunities arise

for designing multilevel interventions that can be implemented in a coordinated fashion through the collaboration of professionals representing diverse community organizations and disciplines.[4,6,21,26,27]

Creating High Leverage Behavioral Medicine Practices and Training Programs

Ecological analyses suggest that certain behaviors, social roles, and environmental conditions within an individual's life situation can exert a disproportionate influence on his or her well-being. These influential behaviors, roles, and environmental settings can be viewed as high-impact "leverage points" for enhancing one's well-being.[4,12] For instance, a person's lifestyle may include several unhealthy behaviors and situations, such as smoking, alcohol consumption, lack of physical exercise, a high-stress job, and a lengthy commute between home and work.

Considering all of these factors together, the individual's workplace might emerge as the pivotal life domain or setting posing the greatest threat to health. It poses threats to well-being because it prompts inappropriate coping strategies to alleviate stress (eg, smoking and alcohol consumption), requires a long commute between home and work, and decreases available leisure time for engaging in physical exercise. In that case, lifestyle-change programs aimed at reducing or eliminating smoking and promoting physical activity probably would remain ineffective unless the person was able to restructure his or her current job or shift to one that is less demanding. Even the best efforts of individuals who are motivated and ready to change their health habits can be derailed by unyielding environmental constraints and stressors.[4,28]

The social ecological guideline of identifying pivotal behaviors and settings as leverage points for health interventions is directly applicable to behavioral medicine practice. For instance, an environmental audit or scan of the most psychologically salient settings and stressors in a person's life (eg, excessive job demands, poorly designed workplaces, peer pressure on an adolescent to take up smoking) should be conducted routinely by healthcare providers as part of taking patient histories and keeping records of their health problems. These audits of the major stressors and environmental constraints in a person's life can be quite helpful, especially when previous behavior modification programs to improve the patient's health habits have failed.

Once high-leverage settings and health behaviors are identified, a behavioral medicine consultant can advise the patient about how to restructure or avoid stressful situations (eg, change one's job or commuting patterns) and curb illness-prone behaviors. Similarly, the therapist or consultant can make on-site visits to the patient's workplace, neighborhood, school, or recreational environment to evaluate conditions in those settings that may undermine lifestyle-change programs aimed at improving health status.

Although the leveraging strategies described above can be used to assist patients in their efforts to modify personal health behaviors, an alternative or supplemental strategy that can be adopted by behavioral medicine professionals to leverage their health-promotion efforts is to focus on changing other-directed health behavior. *Personal health behaviors* are actions taken by individuals that directly affect their own well-being.[29,30] *Other-directed health behaviors* are actions taken by individuals and groups that influence others' well-being.[4]

Rather than investing large amounts of time and resources in efforts to change the health habits of individual patients, it is sometimes more effective for behavioral medicine professionals to focus on changing the decisions and behaviors of health intermediaries—those key individuals (eg, corporate and community decision makers, healthcare workers) whose actions directly influence health outcomes among large numbers of people. The decision of a corporate manager to purchase ergonomically designed work stations for company employees can be instrumental in reducing the incidence of lower back pain and repetitive-strain injuries among several workers and also reducing the financial costs associated with those problems.[31,32] Similarly, the decision of a city council to locate a new airport far away from neighborhoods and schools can proactively prevent community health problems associated with residents' chronic exposure to aircraft noise.[33,34]

One of the most effective ways for behavioral medicine researchers to enhance other-directed health behavior is through the design of educational training programs for medical students, physicians, nurses, insurance providers, restaurant personnel, small business owners, and the managers of health maintenance organizations (HMOs). Medical students, physicians, and nurses can be trained in the "four A's" (Ask, Advise, Assist, Arrange) of smoking cessation to identify patients who smoke and to assist them in their efforts to quit smoking.[35] Healthcare workers also can be trained to provide information to patients about self-care techniques and alternative therapies as adjuncts to their regular medical care.[36-38] Behavioral medicine expertise can be incorporated into specialized training programs for medical students and physicians that enable them to provide more effective wellness information and health-risk appraisals to their patients.[39,40]

Just as some individuals may be more inclined than others to change their personal health habits, business owners,

community leaders, and insurance providers may exhibit varying degrees of readiness to enact decisions that improve their employees' and constituents' health.[28] Thus, it behooves behavioral medicine professionals to raise levels of health awareness among key decision makers in community organizations and to encourage them to take actions that enhance, rather than undermine, public health. To the extent that business owners choose to offer health insurance benefits to employees and their dependents or to comply with workplace injury and illness prevention laws, workers' health status (and that of their family members) can be significantly improved.[41-44] In the food industry, restaurant and bar owners who provide beverage-service training to their employees can help reduce alcohol-related traffic injuries and fatalities in their communities.[45] In addition, the decisions of insurance providers to subsidize routine clinical preventive services and wellness programs for their patients and to reimburse them for alternative medical therapies can contribute directly toward improving community health.[46-48]

The ecologically based training programs, therapeutic and diagnostic procedures, and organizational interventions outlined above exemplify leveraging strategies that can be used at micro- and mesolevels to improve the health outcomes of individuals and groups. These examples suggest that behavioral medicine specialists can enlarge the scope and impact of their intervention efforts beyond the health benefits they can achieve through direct services to patients by influencing the training and practices of healthcare professionals and the decisions of corporate and community leaders.

In the following section, I outline certain targeting strategies that can be used by behavioral medicine and other health professionals to develop effective multilevel interventions and policies in communities. These targeting efforts can be combined with the leveraging strategies described earlier to achieve more comprehensive and sustainable interventions spanning micro-, meso-, and macrolevels of intervention.

Targeting Pervasive Health Problems and Vulnerable Groups Through Community Interventions and Policies

A mid-decade review of progress toward meeting the *Healthy People 2000* goals in the United States found substantial reductions in smoking among adults and in alcohol-related automobile deaths.[49,50] Also noted were moderate gains in the proportion of adults who exercise regularly and eat lower fat diets and the percentage of workplaces that provide health promotion programs for employees.[49,51] At the same time, certain health threats have not abated and remain "segmented in pockets of heightened preva-

lence,"[52(159)] especially among low-income and minority groups. Examples of these complex and enduring problems include community violence, teen pregnancy, smoking, obesity, substance abuse, and financial barriers to medical and preventive services faced by unemployed and uninsured persons.[13,44,50,53-56]

That some illness risks have not yielded to traditional health education or behavior change programs and remain prevalent in large subgroups of the population suggests that those problems and groups should be targeted more directly in future community interventions. The epidemiologic prevalence of health problems and the severity of their impact on individuals and groups are key criteria that can be used by health professionals to decide where and how to focus their intervention efforts.[23] For instance, given the elevated prevalence of cigarette smoking among adolescents and college students, injury-related deaths among children, workplace violence in healthcare settings (eg, hospitals and clinics) and other service industries, and handgun homicides among male adolescents in low-income minority groups, behavioral medicine professionals should give greater preventive and therapeutic attention to those problems.[50,53,55-57]

Many of the most vexing and enduring health problems in this country are etiologically tied to a complex web of political, cultural, and economic conditions.[21,54] Some health researchers, for example, attribute the disproportionate exposure of low-income minority communities to environmental toxins and stressors to conditions of environmental racism. They note that legal inequities and racial prejudice target nonaffluent minority neighborhoods as dumping grounds for contaminants and as prime locations for undesirable land uses (eg, airports, waste management facilities, industrial plants, HIV treatment centers).[58] Effective efforts to resolve these economically and politically based health problems require areas of knowledge that are typically beyond the training and professional purview of behavioral medicine experts. Therefore, it is important to assess whether and in what ways behavioral medicine can contribute toward the resolution of such problems.

In the future, professionals in behavioral medicine and other health areas will need to work more collaboratively to resolve public health risks that, heretofore, have been impervious to traditional wellness programs, such as individually focused behavior change strategies. To alleviate these persistent sources of illness and injury, broader gauge strategies of health promotion will be required—those that combine behavioral, organizational, environmental, regulatory, and political inventions.[4,6,13,21] In past years, the design and implementation of macro-community interven-

tions were managed largely by public policy and regulatory experts, with little input from behavioral scientists. Future intervention efforts targeting complex health problems, however, will require greater coordination among diverse teams of health professionals, community leaders, and elected officials working across multiple disciplines and organizations.

An increasing emphasis on the value of interdisciplinary health research is evident in the recent formation of seven national "transdisciplinary tobacco use research centers" (TTURCs) through the joint efforts of the National Institutes of Health and the Robert Wood Johnson Foundation.[59] The establishment of these centers was guided by the assumption that nicotine addiction and tobacco use should be targeted through multilevel, coordinated interventions that integrate the perspectives of pharmacology, neuroscience, developmental psychology, behavioral medicine, epidemiology, urban planning, communications, decision science, and public policy. Ideally, multicomponent interventions combining educational and behavior change programs at the microlevel (eg, school-based antismoking curricula), organizational change strategies at the mesoscale (eg, establishing smoke-free work environments), and regulatory efforts at the community level (eg, raising taxes on cigarette purchases) should be implemented in a coordinated fashion to achieve greater reductions in tobacco use than would be possible using more isolated and narrow-gauged strategies.

By participating as members of ongoing transdisciplinary teams, behavioral medicine professionals can ensure that their expertise in areas such as stress management, health-risk appraisal, cognitive-behavior modification, social support, and health education is incorporated into multilevel community interventions. For example, behavior modification programs for smoking cessation can be coordinated with telephone counseling sessions to prevent relapse, no-smoking policies at the workplace, antismoking messages in recreational settings, and municipal ordinances prohibiting smoking in public environments.[60,61] Similarly, corporate or school-based programs that encourage individuals to improve their diets and exercise regimens can be augmented by community-wide media campaigns to promote heart-healthy lifestyles, regulatory interventions to enhance food quality and safety, and the provision of physical fitness and recreational facilities in work environments and residential areas.[62,63]

The following are two examples of community interventions that have incorporated behavioral science expertise: The California Violence Prevention Initiative is a multicommunity effort to reduce firearm sales and handgun violence through the combined efforts of youth counselors, political action groups, media outlets, nonprofit organizations, and government agencies.[64] The other example is the California Wellness Guide, a statewide program designed to enhance personal and community empowerment and to improve health practices in low-income families.[65] Each of these programs includes complementary behavioral and environmental components, spans multiple levels and organizations, and targets complex health problems, such as community violence and experiences of learned helplessness that are prevalent in low-income populations. Thus, greater collaboration between behavioral medicine and other health professionals in the coming years is likely to yield more integrated, synergistic, and effective community interventions designed to ameliorate complex sources of illness and improve health outcomes in vulnerable subgroups of the population.[6,66]

The enactment of health-promotive policies at municipal, state, and national levels is an especially powerful macrolevel strategy for targeting risk factors rooted in dysfunctional societal conditions (eg, production and distribution of tobacco products, manufacture and sale of firearms, inequality of income, and poverty).[13,20,67,68] Reflecting on the power of legal interventions to enhance public health, McKinlay[69] noted that

One stroke of effective health legislation is equal to many separate health intervention endeavors and the cumulative efforts of innumerable health workers over long periods of time. . . . Greater changes will result from the continued politicization of illness than from the modification of specific individual behaviors.(p13)

Several legislative programs to promote public health, such as California's tax initiative (Proposition 99) to curtail smoking and laws mandating the use of child-safety car seats, raising the legal age for purchasing alcohol and issuing drivers' licenses, and lowering vehicle speed limits have been empirically evaluated and shown to be effective in achieving specified health promotion objectives, including reductions in smoking prevalence and traffic-related fatalities.[70-73] Other policies that remain to be evaluated for their efficacy include statewide regulations to protect environmental quality and international agreements banning the production of ozone-depleting chlorofluorocarbons (CFCs) as a means of reversing global environmental changes and their detrimental effects on health.[74-76]

The formulation and enactment of public policies is a complex, incremental process involving the combined efforts of legislative, judicial, and enforcement agencies. Behavioral medicine professionals can contribute to the development of effective health policies by serving as expert consultants at municipal, state, and national levels. For instance, they can consult with city councils on the

design of local ordinances to prohibit smoking in restaurants and other public venues.[77] They also can collaborate with state and congressional committees in advancing policies that mandate unemployment insurance and job training for workers who lose their jobs.[13] Also, once public policies have been enacted, behavioral medicine researchers can play a vital role in documenting the health impacts and cost-effectiveness of those reforms by conducting rigorous, quasi-experimental program evaluations.[70,78] The evaluation and reporting of intervention outcomes by health researchers can serve as a useful strategy for refining existing programs and policies and for designing more effective interventions for the future.

Directions for Future Research and Intervention at the Interface of Social Ecology and Behavioral Medicine

The preceding discussion suggests that behavioral medicine professionals should supplement their patient-focused interventions by targeting meso- and macrolevel sources of community health problems further "upstream."[13,21,67-70] The social ecological strategies for leveraging and targeting health problems and vulnerable groups outlined earlier offer a set of programmatic tools for expanding the reach of behavioral medicine from microlevel to mesolevel and macrolevels of intervention.

Future efforts to apply ecological strategies to public health problems will be confronted by some difficult challenges and barriers to implementation that remain to be addressed. These include (a) organizational and bureaucratic impediments to transdisciplinary collaboration in training and research; (b) the powerful economic interests and political controversies surrounding health reform efforts in the United States; (c) the difficulties entailed in designing sustainable interventions and policies that avoid unintended adverse side effects in the community at large; and (d) the methodological complexities inherent in evaluating multicomponent, cross-level interventions.

Establishing ecologically based training programs for medical service providers and multilevel community interventions will require behavioral medicine specialists to collaborate with other health professionals, organizational leaders, and government officials. Along these lines, behavioral medicine researchers and practitioners should pursue opportunities for continuing education in the fields of social marketing, media and communications strategies, and public policy.[79,80] They should also contribute their expertise in collaborative discussions with community leaders and public policy experts on topics ranging from health education and smoking cessation to stress management and program evaluation.

Although greater collaboration across disciplines is essential for the design of broad-gauge community interventions, it is important to recognize that such efforts are often impeded by bureaucratic and organizational barriers, including the "ethnocentrism of university departments"[81] and the compartmentalization of healthcare settings around particular disease categories and professional "turfs."[56,82] These impediments to cross-disciplinary and interagency collaboration must be confronted more directly in future graduate and professional training programs and in local, state, and national policymaking arenas.

Another challenge faced by ecologically based efforts to establish more effective and comprehensive health policies is the controversial nature of proposed medical care reforms. For instance, efforts to regulate the production and distribution of tobacco products and firearms by public health agencies and political action groups have encountered stiff resistance from powerful economic interests and lobbying groups (eg, tobacco companies and handgun manufacturers).[67,68] Similarly, despite scientific evidence suggesting that patients enrolled in HMO hospitals suffer more negative medical outcomes than their non-HMO counterparts (presumably as a result of the cost-containment policies of managed care organizations),[83] proposed reforms offering greater safeguards for HMO patients (such as those recently suggested by presidential candidates) are being challenged forcefully through a national media campaign mounted by managed care and pharmaceutical companies.[84] Behavioral medicine experts interested in developing ecological interventions and working toward health reforms can expect to be confronted by strong political and economic forces. They are likely to achieve greater success in these efforts by joining community health coalitions than by working more independently.[26]

Having mentioned some of the factors that can impede progress toward developing effective health programs, I believe it is important to realize that not all intervention efforts will be thwarted by barriers to collaboration or by political and economic forces. Even under the best of circumstances, additional complexities inevitably will arise, including the challenge of designing programs and policies that are sustainable over time and also minimize the occurrence of unintended negative side effects. Altman[85] defines sustainability as

> . . . infrastructure that remains in a community after a research project ends. Sustainability includes consideration of interventions that are maintained; organizations that modify their actions as a result of participating in research; and individuals who, through the research process, gain knowledge and skills that are used in other life domains. (p527)

To be sustainable, health programs and policies should be anchored in a "theory of the intervention"[86] that facilitates grassroots participation in the formation of policies by major stakeholder groups in the community and ensures that collaborative links among key organizations and interest groups will be established and maintained.[27,87]

A key criterion for measuring the efficacy and social validity of health programs is the extent to which they minimize unintended adverse consequences among members of the target community.[22,23] Occasionally, seemingly well-conceived health interventions can lead to problems not anticipated by their creators. These include the stigmatization of illness-prone groups caused by programs that overemphasize the individual's responsibility to stay well, whereas those who condemn the individual patient neglect important social and environmental sources of disease.[88] Similarly, some public policies, such as California's Workplace Injury and Illness Prevention Law (Senate Bill 198) brought about improvements in occupational health but also triggered some unintended negative impacts on the economy—especially the relocation of many firms (and job opportunities) to neighboring states that have less stringent worksite health regulations.[43,89,90] These examples suggest that when ecologically based interventions and health policies are formulated, concerted efforts should be made to forecast and mitigate their potentially negative side effects by using broad-gauge theoretical models and policy simulation studies.[24,25,86]

Evaluating the health outcomes of ecological interventions is complicated by their incorporating several program components and spanning multiple organizations and environmental settings. Rigorous assessments of multiplex programs and policies require a combination of diverse research methods, such as qualitative and quantitative measures, formative and summative evaluation strategies, interrupted time-series and control-series designs, and hierarchical linear modeling.[78] When appropriate comparison communities are not readily available for inclusion in quasi-experimental studies of intervention effects, simulation models may be the most suitable means of evaluating program outcomes.[24]

The recent and rapid growth of the Internet suggests some new and exciting directions for future research at the interface of social ecology, behavioral medicine, and public health. The Internet era has spawned the fields of telemedicine and telewellness, whereby health services are delivered rapidly and effectively to remote underserved areas. They provide both medical information and wellness resources that are widely disseminated to large segments of the population.[91] By transcending geographic and temporal con-

straints on health communications, the Internet presents unprecedented opportunities for sharing wellness resources and coordinating disease prevention efforts on a global scale. The WHO Healthy Cities Program exemplifies the ways that electronic communications can foster international collaboration in the development of effective health policies and community interventions.[92,93]

An exciting frontier for future research at the interface of social ecology, behavioral medicine, and public health concerns the potential impacts of the Internet and World Wide Web on psychological development and community health. Notwithstanding the collaborative and educational benefits of electronic communications, it is also apparent that frequent use of digital technologies is often associated with experiences of distraction and information overload.[94] Moreover, the lack of access to desktop computers and the World Wide Web among low-income minority groups has resulted in a rapidly widening "digital divide" between affluent and nonaffluent groups in society.[95,96] This growing rift between information-rich and information-poor segments of the population has profound health implications at personal, organizational, and community levels.

Future research on the health outcomes of Internet use, as well as problems associated with a lack of access to information technologies, present novel opportunities for collaboration among behavioral medicine and public health professionals. The design and implementation of ecologically based interventions aimed at closing the digital divide should be an important goal of that research.

NOTE

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