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# Understanding Social Factors and Inequalities in Health: 20th Century Progress and 21st Century Prospects

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*The development of social epidemiology and medical sociology over the last half of the 20th century, in which Leo Reeder played a central role, transformed scientific and popular understanding of the nature and causes of physical health and illness. Viewed in the early 1950s as shaped almost entirely by biological processes and medical care, physical health and illness are now understood to be as much or more a function of social, psychological, and behavioral factors. Utilizing a stress and adaptation conceptual framework, social epidemiology has identified a broad range of psychosocial risk factors for health, most notably: (1) social relationships and support; (2) acute or event-based stress; (3) chronic stress in work and life; and (4) psychological dispositions such as anger/hostility, lack of self-efficacy/control, and negative affect/hopelessness/pessimism, with new risk factors continuing to be identified. However, proliferation of risk factors must be balanced by conceptual integration and causal understanding of the relationships among them, their causes, and consequences. One source of such integration and understanding has been the rediscovery of large and persistent socioeconomic and racial-ethnic disparities in health. Socioeconomic position and race/ethnicity shape individuals' exposure to and experience of virtually all known psychosocial, and well as many environmental and biomedical, risk factors, and these risk factors help to explain the size and persistence of social disparities in health. Improving the socioeconomic position of a broad range of disadvantaged socioeconomic and racial-ethnic strata constitutes a major avenue for reducing exposure to and experience of deleterious risk factors for health, and hence for improving the health of these groups and the overall population. This in turn requires better understanding of the macrosocial forces that influence the socioeconomic position of individuals.*

It is a special honor to receive the Leo G. Reeder award—for someone like myself whose career has focused on the social epidemiology of mental and especially physical

health—as Leo G. Reeder was one of the pioneer researchers and teachers in this field. He was “the first sociologist to be interested in the epidemiology of coronary heart disease” (Reeder 1989), co-editor of the first three editions of the *Handbook of Medical Sociology* (Freeman, Levine, and Reeder 1963; 1972; 1979), and co-author of the chapter on “Social Factors in the Chronic Diseases” (Graham and Reeder 1972; 1979) in the second and third editions of the *Handbook*. He modeled the kind of interdisciplinary scholarship, research, and teaching that has been the foundation of the progress made in the social epidemiology

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of physical health in the 20th century and of its prospects for the 21st century.

Using a somewhat autobiographical narrative, I trace the great positive development in the social epidemiology of physical health over the last half of the 20th century, and the exciting but formidable opportunities and challenges before us at the beginning of the 21st century. This development has moved from a broad and continuing effort to understand social factors in health toward an increasing focus on understanding social inequalities in health, both because these inequalities are of great social importance and concern and because they provide a conceptual frame for integrating our understanding of social factors in health and applying this understanding toward the improvement of population health.

To appreciate how far we have come in this area it is useful to begin with where we were in the 1950s when medical sociology first emerged as the leading edge of what has become a broad social science of health, and to then to sketch the major outlines of what has been accomplished over the past five decades in both demonstrating the role of social factors in the etiology and course of physical health and, more recently, in rediscovering the persistence of social inequalities in health despite continuing improvements in overall population health. While we have come a long way, there is much still to be done. The discussion will largely bypass parallel and related developments in the social epidemiology of mental health, except as these have importantly contributed to the social epidemiology of physical health, and the increasing recognition that health is a broad state of human functioning and well-being in which mental and physical health are inextricably intertwined. Interestingly, the story with respect to physical health is one of growing appreciation of the major, arguably even predominant, role of social, psychological and behavioral factors in what was once considered an almost entirely biological phenomenon, while in the area of mental health, we have seen increasing recognition of a major, some claim predominant, role of biological factors in what was once considered a predominantly psychosocial phenomenon.

## THE MID-TWENTIETH CENTURY HEGEMONY OF THE BIOMEDICAL PARADIGM AND INITIAL CHALLENGES TO IT

When I started graduate school in 1965 in an interdisciplinary social psychology program, I had never had a course, or barely even a thought, about the role of social factors in health beyond the idea that all people needed to be guaranteed equal access to the wonders of modern medicine. As I recall, no courses on the sociology or social science of health existed in my undergraduate institution, or at my graduate institution, highly regarded as they were and are. I came of age in the 1950s, which is often aptly described as the acme of the medical profession's dominance of the health care system and of the hegemony of a biomedical paradigm of health and illness, grounded in the doctrine of specific etiology developed as part of the great advances in bacteriology of the late 19th century (Mishler 1981; Starr 1982). The introduction of a relatively safe and effective oral polio vaccine in 1954 capped a series of triumphs in the use of vaccines, antibiotics, and prophylactic agents from antiseptics to pesticides to prevent, treat, and even virtually eradicate many forms of infectious disease.

However, human and natural forces were already beginning to challenge the dominance of the medical profession and its biomedical paradigm of human health, such that Leo Reeder could collaborate with Howard Freeman and Sol Levine in publishing the first *Handbook of Medical Sociology* in 1963. I remained blissfully unaware of any of this until some two years into my graduate programs, when I began to seek a broader conceptual framework for understanding how and why what were termed social strains, such as rapid social change, anomie, status inconsistency, and social mobility, came to produce very divergent kinds of social outcomes, from prejudice and social movement participation to deviance, mental illness, and even suicide.

I found what I was looking for in emerging theories of "stress," which were being developed and used primarily to understand how social, psychological, and environmental phenomena could produce a syndrome of physiological reactions and even serious physical ill-

ness or death. What had attracted me to social psychology and sociology was their ability to illuminate the role of social forces in shaping human behavior and social life, and what more dramatic illustration of the import of the social than its ability to shape the biological processes of life and death. I shifted my focus toward the study of stress in relation to physical health, initially heart disease. In doing so, I began to learn about several developments that were already well underway by the early 1960s and would gradually reduce the hegemony of the biomedical paradigm and professions in matters of health and illness.

### *The Rise of Chronic Disease and Risk Factor Epidemiology*

The first of these developments was a change in the nature of disease in human populations and hence in understanding of the etiology and course of disease. As human life expectancy grew with the decline of the previously epidemic infectious diseases, chronic diseases such as cardiovascular diseases and cancers became increasingly epidemic in the United States and other developed nations, and gradually also in developing countries, slowing or even halting the dramatic trajectory of improvement in life expectancy of the previous century (Omran 1971). Rather than having a single, disease-specific etiologic agent which could be countered by a “magic bullet,” the etiology of chronic diseases proved multi-factorial, with no single precursor either necessary or sufficient to produce or alleviate the disease. A new terminology—risk factors—emerged to denote the multiple contingent causal factors in chronic disease (Aronowitz 1998). At first the search for risk factors remained biomedically focused on factors such as blood pressure and cholesterol or lung function in studies such as the Framingham Heart Study (Dawber 1980).

### *Environmental and Behavioral Risk Factors*

However, the web of causation soon widened to include environmental, behavioral, and eventually psychosocial risk factors. Many chemicals, along with physical particulates

such as soot, asbestos, and coal dust, and even something seemingly as benign as sunlight, were gradually recognized as major risk factors and causal agents for cancer and a range of other diseases; and Saxon Graham and Leo Reeder (1972) showed how exposure to them was socially patterned. Though not largely a product of social science research, the U.S. Surgeon General’s (1964) report on *Smoking and Health* gave great impetus to the idea that health and illness were products of individual and social behavior as well as biological processes. The evidence that smoking was a major risk factor for morbidity and mortality spawned new and still growing fields of research on the role of a broad range of health behaviors or “lifestyles”—especially physical activity and moderate eating, weight and alcohol consumption—in promoting health and preventing disease (e.g., Berkman and Breslow 1983), though the social nature and nexus of such behaviors remains inadequately appreciated even today. Gradually the significant role of these human behaviors in health became accepted in biomedical and other scientific circles, leading over time to major public policy initiatives against cigarette smoking and later a broad range of health behaviors (DHHS 1990).

### *The Limits of Modern Medicine*

The growing evidence of non-biomedical factors in health was given further impetus by the work of McKeown (1976, 1988) and others (McKinlay and McKinlay 1977; Fogel 1991) showing that most of the dramatic advances in life expectancy of the eighteenth, nineteenth, and twentieth centuries occurred prior to either the development of the germ theory of disease or its widespread application via preventive vaccination and pharmacological treatment. Even those admiring of the achievements of modern medicine have estimated that only about five years of the almost thirty-year increase in life expectancy in the United States in the twentieth century were due to preventive or therapeutic medical practice (Bunker, Frazier, and Mosteller 1994), with the bulk of it attributable to a combination of public health and sanitation (increasingly informed by modern biomedical science) and, especially, broad patterns of socioeconomic development, with

associated improvements in nutrition, clothing, housing, and household sanitation (Preston 1977; Wilkinson 1996). In recognizing the limits of modern medicine, however, we need to be careful not to throw out the baby with the bathwater, as medicine remains a significant factor shaping levels of and inequalities in population health, if not the exclusive or even predominant factor it was once thought to be.

### *Emergent Theories of Psychosocial Factors in Health*

The 1950s and 1960s saw a confluence of new theories and methods of social science with strands of biomedical thinking of both ancient and more contemporaneous origins (cf. Dubos 1959; Rosen 1979; Renaud 1993; Bloom 2000). The product was a more thoroughly psychosocial theory of the determinants of health and illness, and a concomitant empirical social epidemiology. The precursors lay in ancient Greek notions of hygiene, involving healthful living in adaptation to a healthful environment, and the nineteenth and early twentieth century social medicine of Virchow, Grotjahn, Seydenstricker, Sigerist, and others (Rosen 1979; Bloom 2000), which lives on in some areas of the world, especially Latin America (Waitzkin 1998). The contemporaneous roots lay in several lines of research dating back to the 1920s and 1930s.

One line was theory and research on the social epidemiology of mental illness, with antecedents in the pre-World War II work of Faris and Dunham (1939), which blossomed with the post World War II work of Hollingshead and Redlich (1958), Gurin, Veroff, and Feld (1960), and Srole et al. (1962) and the growing support of the National Institute of Mental Health and some private foundations (Bloom 2000). The full social epidemiology of mental health is beyond the scope of this paper, but it was and remains important to the social epidemiology of physical health and illness in several ways.

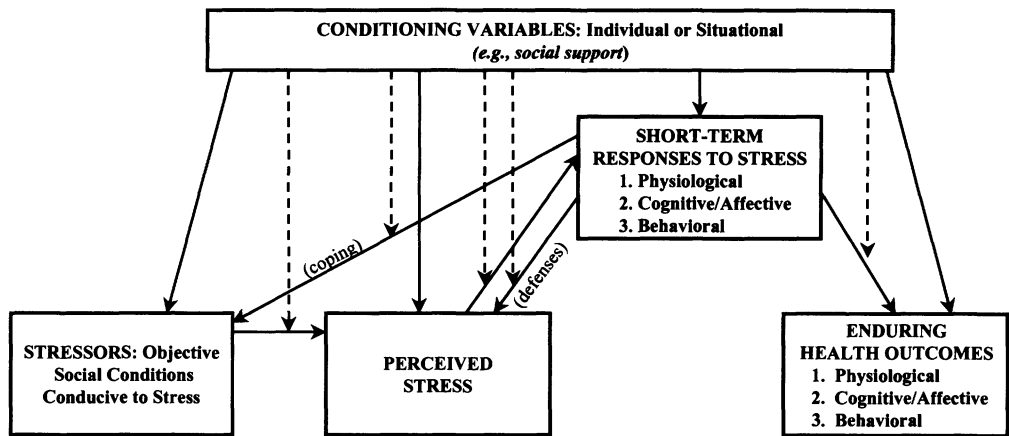
Beginning with Hollingshead, epidemiologists and social scientists of mental health have played a leading role in the development of medical sociology and the other social sciences of health (Bloom 2000; Good and Good 2000). The National Institute of Mental Health was the major supporter of social science research on social aspects of health, physical

as well as mental, at least until 1981 when its mandate was narrowed to mental health and especially illness. My own first Public Health Service grant on the relation of occupational stress to physical as well as mental health was funded by NIMH in the mid-1970s. So was the Mental Health in Industry program at the University Michigan Institute for Social Research in the 1960s, which evolved into the Social Environment and Health program in which I got my initial exposure to and training in the study of social factors in physical health. Finally, social epidemiologists of mental health have played a leading role in developing the dominant theoretical paradigm in the study of psychosocial factors in physical and mental health.

Physiologists Walter Cannon (1932) and Hans Selye (1956) laid the foundation of this paradigm by identifying a syndrome of sympathetic nervous system and the hypothalamic-pituitary-adrenal axis responses that were generated by an organism trying to fight, flee, or otherwise cope or adapt to a wide range of noxious physical or social stimuli. If extreme or prolonged, these physiological responses could lead to what Selye termed "diseases of adaptation," such as hypertension, heart disease, ulcers, and arthritis. More recent work indicates that these effects extend to the immune system, increasing susceptibility to infectious disease and even cancer (Ader, Felten, and Cohen 1991).

These developments in the social epidemiology of mental health and in the psychophysiology of what Selye termed "stress" converged in the 1960s to spawn a broad model of the "stress" or "stress and adaptation" process (see Figure 1). This framework indicated how and why social or other environmental conditions come to be perceived or appraised as threatening or stressful, and hence to generate behavioral, psychological, and physiological responses which may modify or alleviate the environmental stressor or the appraisal of it as stressful, or, failing that, may lead, if extreme or prolonged, to chronic deleterious health behaviors (e.g., smoking, drinking, drug use), serious mental or physical morbidity, or even death (cf. French, Kahn, and Mann 1962; Lazarus 1966; McGrath 1970; Levine and Scotch 1970). Whether and how a given potential environmental stressor is appraised as stressful and responded to is conditioned or moderated by other social, psychological, or



**FIGURE 1. A Paradigm of Stress Research (from House 1981: p 36)**

*Note:* Solid arrows between boxes indicate presumed casual relationships among variables. Dotted arrows from the box labeled “conditioning variables” intersect solid arrows, indicating an interaction between the conditioning variables in the box at the beginning of the solid arrow in predicting variables in the box at the head of the solid arrow. Figure redrawn from one published in House (1981:36).

physical-chemical-biological characteristics of individuals or of their situational context and environments (House 1974; 1981).

Implicitly at first, and increasingly explicitly, this framework came to undergird research programs and resulting publication on the role of social factors in health, as it has my own work for over 30 years. For the most part these research programs did not develop within traditional disciplinary departments of sociology, psychology, or anthropology, but rather in interdisciplinary research centers or professional schools such as the University of Michigan Institute for Social Research, the Duke University Center for the Study of Aging and Human Development, and Schools of Public Health such as those at Columbia University, Johns Hopkins University, the University of North Carolina at Chapel Hill, and the University of California campuses at Berkeley and Los Angeles, in the last of which Leo Reeder became a leading figure. Similar centers began to develop in countries like Sweden, England, and Germany. I had the good fortune to happen into the developing Social Environment and Health program at Michigan in 1968, and then to spend my formative years at Duke University collaborating both with colleagues in the Duke Aging Center and in the University of North Carolina School of Public Health. All of these contexts were populated not only by gifted social scientists,

but also by pioneering physician-epidemiologists such as Sidney Cobb, John Cassel, and Ewald Busse, who recognized that health and illness over the life course could only be understood by a combination of social science and biomedical science perspectives (cf. Bloom 1990; Straus 1999).

#### THE PROMISE AND PROBLEMS OF RISK FACTOR EPIDEMIOLOGY: SOCIAL AND OTHERWISE

By the 1970s, biomedical risk factor epidemiology was a going concern, providing increasingly strong evidence that physiological and behavioral variables such as blood pressure; cholesterol; smoking; immoderate eating, weight and obesity; lung function; EKG abnormalities; some aspects of diet; and exposure to a variety of physical, chemical, and biological substances significantly increased the risk of morbidity and mortality from cardiovascular disease, cancer, diabetes, and chronic obstructive pulmonary disease. Much of the research had begun in the late 1940s or 1950s, and so had many years of follow-up on individuals and cohorts.

Social epidemiology began later, largely from a base of cross-sectional studies and short-term longitudinal or quasi-experimental studies, sometimes including biomedical mea-

tures such as blood pressure or blood serum. By the late 1960s these data already suggested the potential importance of a variety of psychosocial factors such as chronic and acute stress, social relationships, and psychological or "personality" characteristics (cf. Graham and Reeder 1972; House 1974). Toward the end of the 1960s, spurred in part by a seminal conference organized by Leo Reeder and Leonard Syme (1967), conventional biomedical prospective studies such as those in Framingham, Tecumseh, and Evans County began to incorporate psychosocial measures, and even social scientists, into their data collection and analyses. The data for my dissertation (House 1972) on work motivations, occupational stress, and coronary heart disease risk were collected from a sub-sample of the Tecumseh Community Health Study.

### *The Type A Behavior Pattern*

What was lacking, however, was clear evidence from prospective or longitudinal studies, comparable to that for established biomedical risk factors, that psychosocial variables had medium-to-long-term effects on hard endpoints such as disease incidence or mortality. Interestingly, the first evidence of that type came not from social scientists but rather from two psychosocially oriented San Francisco Bay area cardiologists—Meyer Friedman and Ray Rosenman. Friedman and Rosenman (1974) thought they discerned in their patients a pattern of behaviors that they characterized as hard-driving, impatient, time urgent, highly job-involved, and tending toward explosive, interruptive speech in social interactions. They believed that they or other trained interviewers could code individuals as having these traits (Type A) or not (Type B) on the basis of clinical interviews, and they predicted that Type As would have a higher incidence of coronary heart disease (CHD) morbidity and mortality. To test this, they organized a prospective study: the Western Collaborative Group Study. The results of their study and others showed that Type As had 1.5–6.5 times the risk of CHD incidence and mortality as Type Bs (Jenkins 1971); and in 1981, a blue-ribbon panel of the National Heart, Lung, and Blood Institute certified the Type A behavior pattern as a risk factor for coronary heart disease like smoking, blood pressure, and cholesterol (Review Panel

on Coronary-Prone Behavior and Heart Disease 1981). Subsequent research by social and biomedical scientists suggested that Type A increased the risk of other diseases, and that the original results were not always replicable, especially in patient populations. At this point the Type A research industry is in decline as increasing evidence suggests that the toxic portion of the Type A pattern is dispositional anger and hostility, especially cynical hostility (Smith 2001). Nevertheless, the work on Type A established that psychosocial risk factors could be as valid, reliable, and potent as more conventional biomedical ones.

### *Factors From Social Science Theory*

Working largely within the broad stress and adaptation framework of Figure 1, and drawing on broader social science theory, social scientists and psychosocially oriented biomedical scientists posited a much wider range of social and psychological constructs as potential risk factors for health, both as direct or additive effects on health and as moderating or interactive factors. These have fallen into five main categories: (1) social relationships and supports, (2) "acute" or event-based stress, (3) chronic stress, (4) psychological or personality dispositions, and (5) other social behaviors, activities, or relationships. The evidence is substantial in all cases, but variable in nature and quality across these categories.

*Social relationships and supports.* Social science theory, at least since Durkheim ([1897] 1951), suggests the importance of social relationships and support for health, and two physician-epidemiologists—John Cassel (1976) and Sidney Cobb (1976)—targeted the centrality of these variables in the mid-1970s. Because some basic measures of these variables (e.g., marital status, church attendance, organizational affiliation) already existed in a number of major ongoing studies designed for other purposes (e.g., Alameda County, Tecumseh, Evans County), it was possible to generate relatively early the full range of evidence regarding their relationships to health (House 1981; Cohen and Syme 1985). Most importantly, the many short- and medium-term cross-sectional, longitudinal, and experimental studies with humans and animals were capped with a series of analyses of longer-term prospective studies showing the effects of

social isolation or relative lack of social relationships on mortality from all causes and major specific causes, such as cardiovascular disease (Berkman and Syme 1979; House, Robbins, and Metzner 1982; House, Landis, and Umberson 1988; Berkman and Glass 2000). The health risk of social isolation rivals that of other major risk factors such as smoking, but it remains less clear exactly how and why social isolation is so consequential (House 2001). Lack of social support associated with isolation is one part of this, but other mechanisms involving social control of health behaviors and perhaps more direct modulation of physiological processes also appear to be involved. In any event, the work on social relationships and supports has proved to be another major accomplishment for social epidemiology.

*“Acute” or event stress.* Although the evidence has not been, and perhaps cannot be, as neatly summarized as has been done for at least some aspects of social relationships and supports, quite strong evidence from cross-sectional, retrospective, and prospective studies suggests that negative life events such as marital disruption, unemployment, life-threatening trauma, and major economic losses or set backs are risk factors for a wide range of health problems, including physical morbidity and mortality in medium to long-term longitudinal and prospective studies (e.g., Theorell 1982; Stroebe and Stroebe 1987; Lillard and Waite 1995; Kasl and Jones 2000). Although an “acute” event is the precipitating or central factor in such stress, the stress process itself is more chronic in many cases (Pearlin et al. 1981; House 1987). Since many studies are limited to a single type of event in restricted samples, more data are needed to evaluate the impact of a broad range of events in longer-term prospective studies of broad community or national populations.

*Chronic stress.* During the 1960s and 1970s, the study of stress and health was almost synonymous with the study of life events and health. During the 1980s, however, increased attention was focused on chronic stress in work and life (Mirowsky and Ross 1989; Pearlin 1989). Because chronic stress is usually measured by self-reports, and thus potentially confounded with levels of health at any point in time, longitudinal prospective studies are especially needed that measure chronic stress at several time points and use these measures to

predict subsequent morbidity and mortality, adjusting for health at and prior to the measurement of stress. The strongest evidence of this type to date comes from a long line of research in occupational stress and health, which documents significant effects of job pressures and conflicts on morbidity and mortality from all causes and multiple specific diseases (House 1974; House and Cottington 1986; House et al. 1986; Karasek and Theorell 1990; Theorell 2001). Existing theory and evidence suggest that significant and prolonged stress outside of work, such as marital, family, or financial stress, should have similar effects, as should discrimination or harassment in work or non-work life (House and Williams 2000), though this all awaits confirmation in longer-term prospective studies of general populations.

*Psychological or personality dispositions.* Drawing on traditions from psychosomatic medicine, stress and adaptation theory, the work on Type A, and broader personality theory and research, health psychologists, psychiatrists, and other psychosocial epidemiologists have investigated a wide range of psychological, or personality, dispositions that may affect health directly or condition the impact of stress or other factors on health. Many variables have been investigated, and evidence is variable across them. However, at this point several constructs show increasing evidence of significant health effects. These concepts include: (1) anger, hostility, and mistrust, flowing out of the work on Type A discussed above (Smith 2001); (2) lack of a sense of self-efficacy, mastery, or control (Bandura 1997); and (3) negative affect/hopelessness/pessimism (Carver 2001). Beyond the need for longer-term prospective studies of these and other psychosocial risk factors, there is a particular need in this area to determine the conceptual and factorial structure of the many variables being studied, usually only one concept at a time. For example, negative affect, hopelessness, and pessimism all show significant evidence of adverse effects on health, but are they distinct constructs or are they all indicators of some more unitary underlying variable?

*Other psychosocial risk factors.* As social epidemiology continues to expand, new risk factors continue to be explored. Among the most active emerging areas are: (1) research on religion and health, grounded in the repeated finding in prospective studies that regular



church attendees live longer than infrequent or non-attenders (Koenig, McCullough and Larson 2001; McCullough et al. 2000); (2) research in productive activity and health that suggests that a range of productive activities and engagements in paid work, unpaid household work and child care, or volunteer work may all promote health and longevity (Musick, Herzog, and House 1999; Glass et al. 1999); and (3) research indicating that aspects of social contexts in which people live and work, ranging from socioeconomic disadvantage to levels of ambient stress and social disorder, may affect health (Robert 1998; 1999). Evidence in all these areas remains tentative but increasingly promising.

### *The Promise and Problems of Risk Factor Epidemiology*

In sum, during the formative years of medical sociology and the broader social science of health in the 1950s, the idea that social and psychological factors played a major role in health was regarded skeptically, if at all, by most biomedical researchers and practitioners and the general public as well. Today we increasingly know that poor health behaviors (e.g., smoking, lack of exercise, and immoderate eating and drinking), lack of social relationships and supports, chronic and acute stress, and a variety of psychological dispositions (e.g., anger/hostility; lack of self-efficacy/mastery/control; and depression/hopelessness/negative affect) are significant risk factors for health, though the quality of evidence varies across these various risk factors. Moreover, new psychosocial risk factors continue to be discovered. Social and behavioral science is a part of every institute of National Institutes of Health (NIH), and has a central coordinating office within the office of the NIH director. In addition, the general public increasingly recognizes the relevance of social and behavioral factors for health. To be sure, skepticism remains among many who see the future of health research and practice in the genomic revolution, but if Leo Reeder were alive today, I think he would, like his early collaborator, Leonard Syme (2000), take considerable pride in what has been accomplished.

However, much remains to be done. Research on social, psychological, and behavioral risk factors shares many of the problems

of broader risk factor epidemiology. There is an inherent tendency to proliferate an increasingly diverse and scattered set of risk factors, each with modest to small effects, and many lacking a solid evidentiary base as to their impact on health or the degree to which they are distinct from other well-established or putative risk factors for health. An indiscriminately expanding smorgasbord of psychosocial risk factors poses significant problems for the future development of science, practice, and policy regarding the role of social factors in health.

Scientifically, we need a renewed effort to better synthesize what we know and place it on a sounder evidentiary foundation. This requires that we somehow integrate a series of growing but also increasingly isolated subfields of research on specific risk factors, and more clearly identify those which have substantial and unique effects on consequential indicators of morbidity or mortality. To that end we need more population-based prospective and longitudinal studies, each of which measures a broad array of social and psychological risk factors for health, and relates them to relatively objective physical and mental health outcomes. Any longitudinal social science survey can now do mortality follow-up on its sample using the National Death Index, and can incorporate fairly objective self-report measures of functional status and chronic conditions. Increasingly, surveys can also incorporate direct measurement of physiological variables from samples of blood or saliva (Finch, Vaupel, and Kinsella 2001), or other biomedical measurement which can be carried out even by survey interviewers (e.g., electronic blood pressure monitoring, measurement of waist and hip ratio). Similarly, major health surveys can incorporate more psychosocial content and become increasingly longitudinal.

Beyond identifying a more parsimonious set of psychosocial risk factors, we need to better understand the causal relations among them, the "downstream" social, psychological, and physiologic processes or mechanisms through which they come to affect health, and the "upstream," more macro-social processes that tend to generate and sustain deleterious risk factors in individuals and populations. Much emphasis is currently being placed on the issue of downstream pathways and mechanisms by more psychologically and biomedically oriented researchers, in hopes of finding pharmaco-

logical or other biomedical interventions that can block these pathways. At least equal attention must be given to the broader social processes which may affect a wide array of psychosocial risk factors; and here the continuing and increased involvement of sociologists is crucial to a field in which the greatest recent growth has occurred in psychology and the biomedical sciences.

A more parsimonious, integrated, and sociologically informed science of social factors in health is also crucial to issues of application, practice, and policy. Practitioners and policymakers need priorities for action that are focused and solidly grounded in scientific research, such that they can be applied when social and political need and opportunity emerge (Kingdon 1995).

The rediscovery over the past two decades of social inequalities or disparities in health, especially by socioeconomic status and race/ethnicity, is a development which is important not only in its own right, but because it provides, conceptually and empirically, a basis for a more integrated, parsimonious, and practically effective science of social factors in health. It has certainly provided for me a framework for integrating all of my prior work on social factors in health.

## SOCIAL INEQUALITIES IN HEALTH AS AN INTEGRATIVE FOCUS FOR SOCIAL EPIDEMIOLOGY

### *Back to the Future*

The history of theory and research on social inequalities in health poses an interesting case in the sociology of knowledge, worthy of more in-depth treatment than is possible here. The problem of social inequalities in health was central to the social medicine movement of the nineteenth and early twentieth centuries. As early as 1848, Virchow saw that the factors driving infectious epidemics of typhus and other illnesses were closely tied to socioeconomic position, and hence that social and economic policy were major instruments for combating disease and promoting health, concluding that: "Medicine is a social science and politics nothing but medicine on a grand scale" (quoted in Rosen 1979:29). The social medicine perspective was attacked and eventually largely undermined in medicine and public health by propo-

nents of the germ theory of disease (Kunitz 1987). In 1893 the immunologist Emil Behring dismissed the continuing relevance of Virchow's research and writings:

While these views . . . had their merits [in 1847], now, following the procedure of Robert Koch, the study of infectious disease can be pursued unswervingly without being sidetracked by social considerations and reflections on social policy (quoted in Bloom 1990: 1-2).

The biomedical hegemony of the 1950s combined with a tendency to view poverty and class divisions as waning in an increasingly affluent post-World War II society in America and Europe. Thus, the issue of social inequalities generally and social inequalities in health were conspicuously muted in the sociology and medical sociology of the 1950s and early 1960s. Even more social welfare oriented nations in Europe and North America thought they had dealt with social inequalities in health by providing national health insurance or medical care services. Reflecting in 1972 on the first edition of the *Handbook of Medical Sociology* published in 1963, Freeman, Levine, and Reeder (1972: 501-502) noted that: ". . . remarkable as it may seem, neither the terms 'poverty' nor 'Negro,' let alone 'black' were employed frequently enough by contributors for the editors to include them in the Index!" The second edition remedied this in the index, and in a section of Graham and Reeder's (1972) chapter on chronic diseases, but no chapter focusing on socioeconomic or racial-ethnic differences in health appeared until the fifth edition in 2000, by which time *most* of the chapters on "social contexts of health and illness" focused on social inequalities in health.

The 1960s marked a re-emergence of issues of socioeconomic and racial-ethnic inequalities onto the political scene in the United States and other nations, and with it renewed attention to socioeconomic and racial-ethnic differences in health, at least in the United States, though most continued to believe that these differences were largely explainable and removable by equalizing access to health care and the marvels of modern medicine. However, the Black report of 1980 in England, brought things full circle back to Virchow. Commissioned by the Labor government of the 1970s, the report was received coldly by the new Conservative government and only a limited number of copies were printed. However,

these copies and a later commercial edition (Black et al. 1982) quickly spread its central message: A quarter century of operation of the National Health Service had not diminished occupational class differences in mortality and life expectancy, which had, if anything, increased. Subsequent research sustained these conclusions well into the 1980s for England and Wales (Marmot, Kogevinas, Elston 1987); showed that socioeconomic differences in mortality had similarly not diminished, and had perhaps even increased, in the United States between 1960 and 1986 (Pappas et al. 1993), despite increasing equalization of access to care; and indicated that fifteen years of national health insurance in Canada between 1973 and 1989 had similarly left socioeconomic differences in health undiminished (Wilkins, Adams, and Branner 1989). Thus, interest and research in documenting and understanding the bases of socioeconomic and racial-ethnic differences in health increased geometrically during the late 1980s and 1990s (Kaplan and Lynch 1997).

In a project designed in the mid-1980s to explore the role of broad ranges of psychosocial risk factors in maintaining health and effective functioning over the adult life course, I had my own epiphany on the importance of social inequalities in health, especially by socioeconomic position. When we examined variations in health by age in our representative national sample of adults aged 25+ in 1986, we found that socioeconomic position was the most powerful predictor. As shown in Figure 2 (from House et al. 1994), individuals with higher education show almost no limitations in functional health until quite late (65+) in life. However, the less educated, though little different from the more educated in early adulthood (ages 25–34) begin to decline in functional health in very early middle age, and continue to do so linearly with age, such that socioeconomic inequalities in health increase into early old age, before converging again in later old age. Thus, the less educated experience significant functional health problems in middle age that are not manifested among the more educated until they are 10–20 years older. We find similarly large differences in prospective analysis of mortality and change in health status, and similar patterns for income and education. Similar racial-ethnic disparities in health, especially between blacks and whites, are explainable in good measure by

associated differences in socioeconomic position but also reflect the effects of racially specific threats to health, such as discrimination (House and Williams 2000).

### *Understanding Socioeconomic Differences in Health*

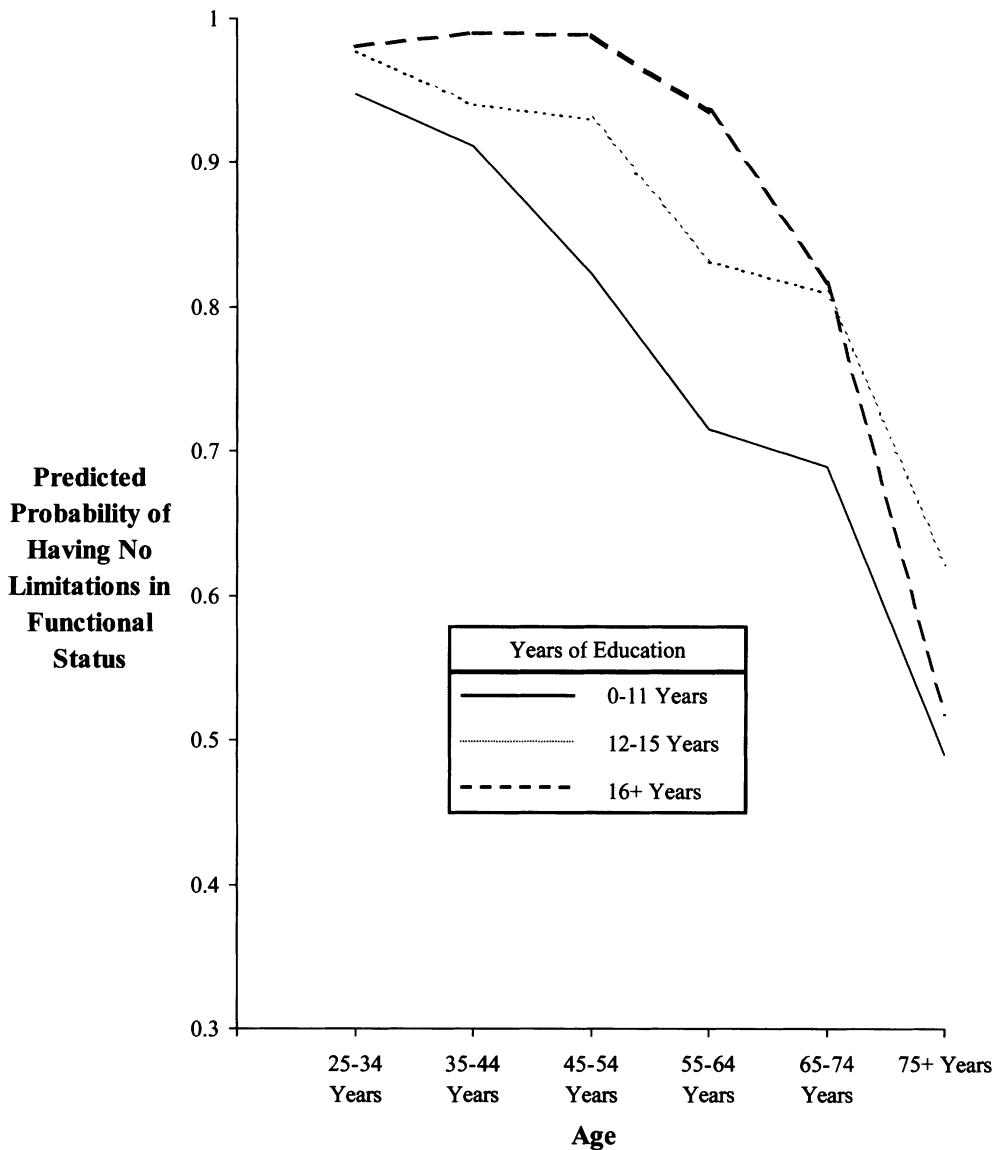
Why, then, do we have such large, persistent, and perhaps even increasing socioeconomic differences in health and the way health changes with age? As has already been noted, differences in access to medical care are not the primary explanation, though new research is increasingly documenting socioeconomic and racial-ethnic differences in the quality and appropriateness of therapeutic care, and in access to preventive care (e.g., Peterson et al. 1997).

Others have suggested that health behaviors account for most of the variation in population health (DHHS 1990) and social inequalities in health (Satel 1996). However, our and other analyses show that major health behaviors (e.g., smoking, exercise, immoderate eating and drinking) have only moderate impact on mortality and health change, and can explain at best only a modest portion (10–20%) of socioeconomic inequalities in health (Lantz et al., 1998, Lantz et al., 2001).

What we and others have discovered is that racial-ethnic and socioeconomic status are related to, and we believe influence and shape, individuals' exposure to and experience of virtually all known psychosocial, and many biomedical, risk factors for health. Thus, socioeconomic position (and race-ethnicity) are what Link and Phelan (1995) term, extending and greatly developing tentative ideas of House et al., (1990) and, originally, Lieberman (1985), "fundamental causes" that shape exposure to and experience of most diseases and risk factors for health, even as these diseases and risk factors change over time. Thus, many of the current major diseases (e.g., cardiovascular disease and AIDS) and risk factors (e.g., smoking, sedentary lifestyle, high fat diets) were once more prevalent in upper socioeconomic levels, but as their prevalence in the population and their impact on individual and population health have increased, they have become increasingly more prevalent at lower socioeconomic levels.

In our national longitudinal study,

**FIGURE 2. Age by Predicted Probability of Having No Limitations in Functional Status within Levels of Education, Controlling for Sex and Race**

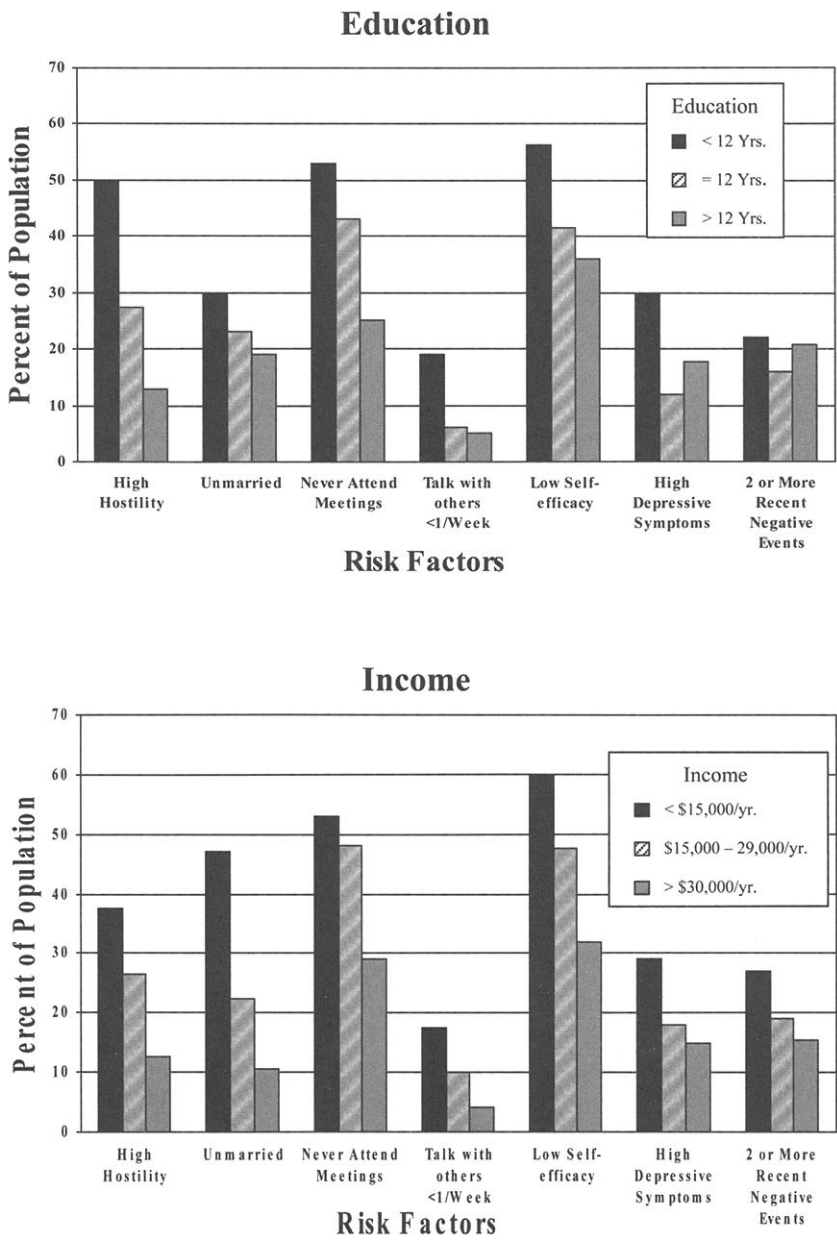


*Note:* Figure redrawn from one published in House, et al. (1994:223).

Americans' Changing Lives, we find, consistent with others, that smoking, lack of exercise, and immoderate drinking and body mass index are significantly more prevalent at lower socioeconomic levels (Lantz et al, 1998). Similarly, as shown in Figure 3 (from House and Williams 1995), almost every psychosocial risk factor for health that we thought to measure in 1986 is substantially more prevalent at lower socioeconomic levels, and others

(Williams and Williams 1993) find the same for new risk factors such as anger/hostility. Thus, it would appear that the large and persistent impact of socioeconomic position in health is explainable, at least at one level, by the degree to which exposure to and experience of major health risk factors are structured by socioeconomic position. From the point of view of social risk factor epidemiology, socioeconomic position constitutes a common cause of many diverse risk factors, and hence

FIGURE 3. Psychological Risk Factor Status in U.S. Residents, Age 45–64 by Education and Income

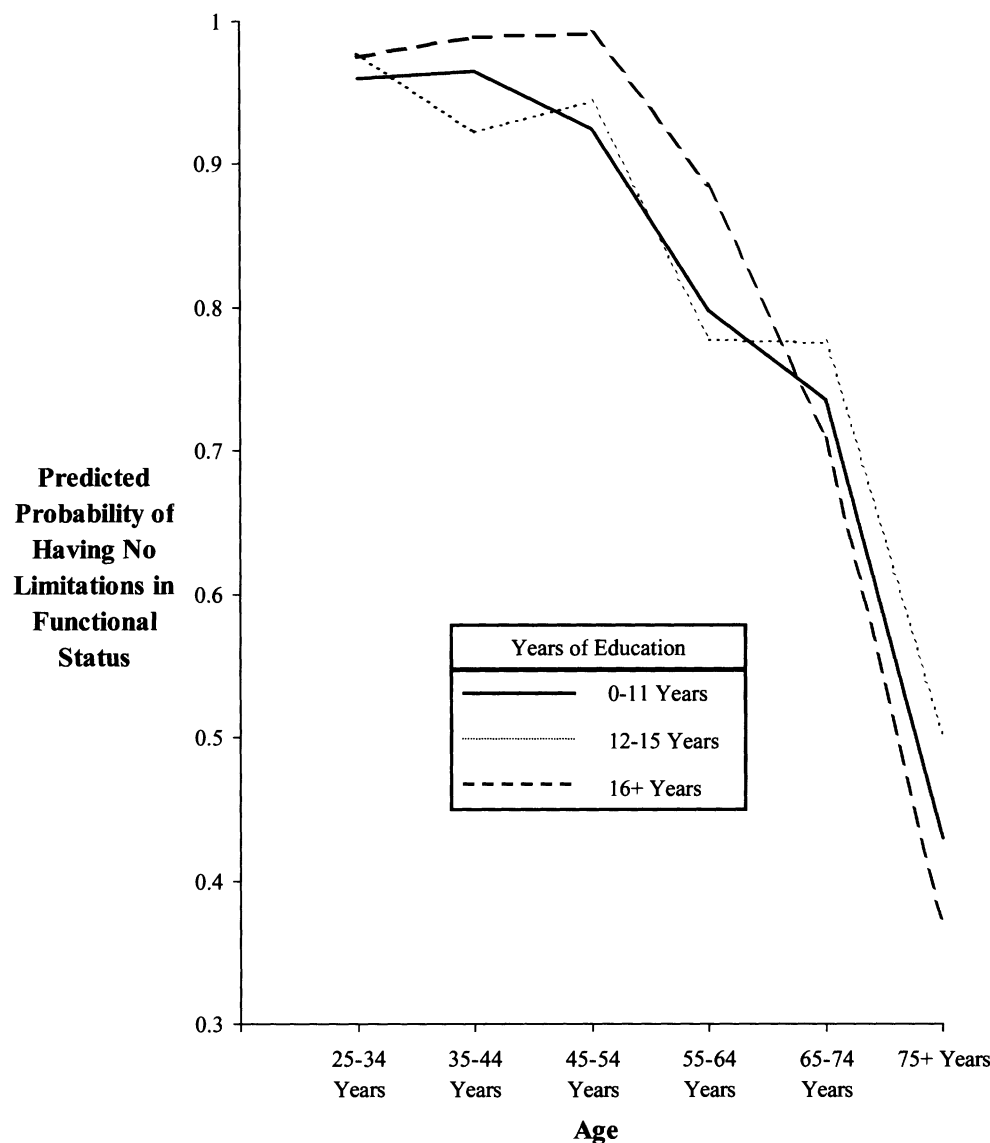


*Note:* Hostility data are taken from the 1984–85 Minnesota Multifasic Personality Inventory-II Restandardization Study. Data for other variables from the 1986 Americans’ Changing Lives Study, a national probability sample survey conducted by the University of Michigan. Figure redrawn from one published in House and Williams (1995:122).

potentially a magic bullet (or analogue to John Snow’s (1965) handle on a London pump) for modifying them and improving health. Preliminary analyses by us and others suggest that if different socioeconomic strata had equivalent exposure to major psychosocial and biomedical risk factors, they would also have more nearly equal health (House et al., 1994;



**FIGURE 4. Age by Predicted Probability of Having No Limitations in Functional Status within Levels of Education, Controlling for Sex, Race, Income, Age x Income and Exposure to Psychosocial Risk Factors**



*Note:* Figure redrawn from one published in House, et al. (1994:223).

Lynch et al., 1996). Figure 4 shows how the educational differences evident in Figure 2 largely disappear after adjustment for income and about a dozen psychosocial risk factors for health. Thus, if all educational groups had the same income and psychosocial risk factors, they would all show a similar pattern of the relation of age to health and little differentiation by education in health at any age.

In theory, then, changes in socioeconomic

status in individuals and populations can produce substantial change in exposure to and experience of a wide range of risk factors in health. The improvement of health with socioeconomic development provides evidence consistent with that, as do limited data on the impact on health of experimental and non-experimental changes in socioeconomic position (House and Williams 2000). However, producing such changes requires understand-

ing of a broader set of macro-social and macroeconomic factors which influence the socioeconomic position of individuals. Figure 5 provides an integrative conceptual framework for thinking about and integrating social inequalities with psychosocial risk factors for health.

*Social Risk Factors and Inequalities in Health: Opportunities and Challenges*

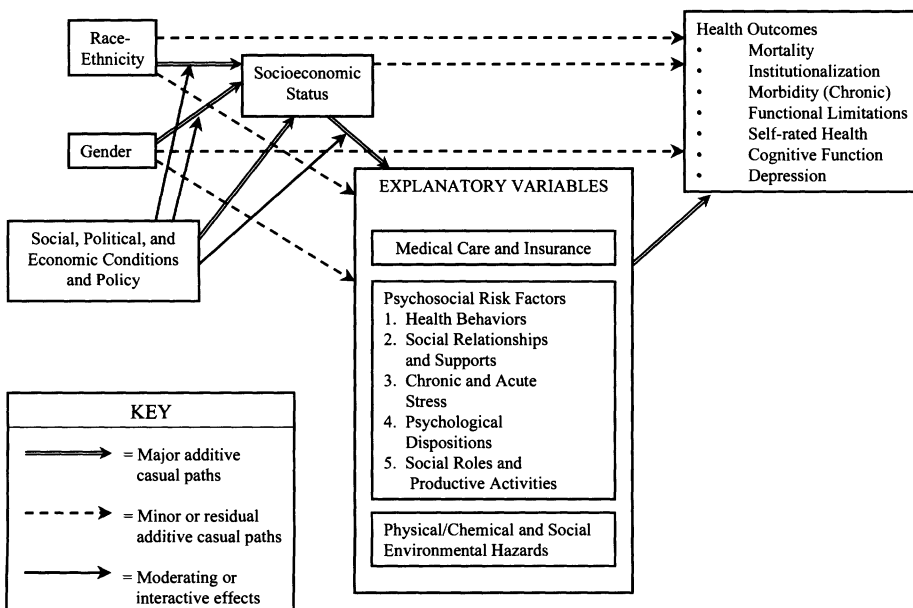
Understanding and ultimately alleviating social inequalities in health provides a major opportunity for improving population health and integrating our understanding of the broad field of social risk factor epidemiology. This is especially true in the United States where social inequalities in health are arguably responsible for our society's relatively poor standing on indexes of population health such as life expectancy and infant mortality compared to other developed nations. While the most advantaged portions of the U. S. population have levels of health that equal or exceed those anywhere in the world, the least advantaged are little better off than people in the least developed nations of the world (McCord and Freeman 1990). Since the more advantaged portions of the population of our and other societies are increasingly approaching

the current biological limits of active life expectancy, reducing social inequalities in health is the major opportunity for improving population health in the United States.

Understanding social inequalities in health is also a *sine qua non* for developing a more integrated causal framework for social risk factor epidemiology. While the study of individual psychosocial risk factors, or small sets thereof, and of potential ways of modifying them, will usefully continue, understanding and acting on the broader social and economic forces which shape individual socioeconomic position, and hence exposure to or experience of many psychosocial risk factors, provides a powerful lever for scientific understanding and social action with regard to an increasingly broad array of psychosocial and environmental risk factors for health. Virchow may have in fact already identified a "magic bullet" affecting almost all aspects of health a half century before his work was dismissed by Behring and his bacteriological colleagues.

To realize this potential, we need to confront a number of challenges to understanding social inequalities in and risk factors for health. First we need to provide more and better evidence of the extent to which socioeconomic position is really a fundamental cause of health, rather than vice versa, as economists often assume or assert (Smith 1999). This will entail better

**FIGURE 5. A Conceptual Framework for Understanding Social Inequalities in Health and Aging**



understanding of the relation over the life course among socioeconomic position, race-ethnicity, psychosocial and biomedical risk factors, and health. We also need to understand whether and how mesosocial environments such as the socioeconomic level or inequality of communities or neighborhoods both influence risk factors and health and are influenced by broader social and economic forces. Multilevel, life course, longitudinal studies will be central to all of these goals.

The last half century has established a clear and increasingly widely recognized and accepted foundation of theory and data showing that individual and population health, which were assumed to be almost purely biomedical phenomena at the middle of the 20th century, are equally or more a social or biopsychosocial problem. Leo Reeder would have been pleased at this progress, as would have been Virchow. The next fifty years provide an opportunity to truly realize Virchow's vision that health science and health policy are to a considerable degree social science and social policy.

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