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Psychological Inquiry, Vol. 9, No. 1. (1998), pp. 1-28.

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TARGET ARTICLE

The Contours of Positive Human Health

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The primary objectives of this article are (a) to put forth an explicit operational formulation of positive human health that goes beyond prevailing “absence of illness” criteria; (b) to clarify that positive human health does not derive from extant medical considerations, which are not about wellness, but necessarily require a base in philosophical accounts of the “goods” in life; (c) to provoke a change of emphasis from strong tendencies to construe human health as exclusively about the mind or the body toward an integrated and positive spiral of mind–body influences; (d) to delineate possible physiological substrates of human flourishing and offer future directions for understanding the biology of positive health; and (e) to discuss implications of positive health for diverse scientific agendas (e.g., stress, class and health, work and family life) and for practice in health fields (e.g., training, health examinations, psychotherapy, and wellness intervention programs).

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The refrain that positive health is “more than the absence of illness” has long been heard. Nearly 50 years ago, the World Health Organization (WHO, 1948) defined *health* as a “state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (p. 28). A decade later, Jahoda (1958) argued against the absence of mental disease as a criterion for mental health and proposed instead mul-

iple criteria of positive mental health. Regrettably, there has been no discernible progress in carrying these views to the scientific or practice realms. Thus it remains the case that typical indices of health status in the Western world focus on “disease, illness, and negative concepts” (Bowling, 1991, p. 2) and that fundamental conceptions of epidemiology (from *epidemios*, meaning “among the people”) continue to address rates of

mortality and morbidity in human populations (Lilienfeld & Lilienfeld, 1980), not rates of wellness and positive functioning. Illustrative of this entrenched tradition is the definition of health given by the National Center for Health Statistics (1974), which encompasses acute conditions, chronic conditions, chronic activity limitations, chronic mobility limitations, physical impairments, physiological measurements, and psychological measurements.

Explicit efforts to move beyond medical and disease models of health, such as attempts to measure multidimensional aspects of functioning (physical, mental, and social; Engel, 1977; Machenbach, Van Den Bos, Joung, Van De Mheen, & Stronks, 1994; Stewart & Ware, 1992; Ware, 1986) and quality of life (Bowling, 1991), provide important steps in the direction of construing health as states of well-being rather than ill-being. But even these initiatives suffer from a continued focus on primarily negative outcomes. That is, assessment instruments are notably weighted on the side of physical problems (e.g., mobility, pain, fatigue, sleep disorders, symptoms), mental problems (e.g., cognitive confusion, distress, depression, anger, anxiety), social problems (role limitations, marital problems, sexual dysfunction), and deal with only the most limited features of daily human activities (e.g., eating, bathing, dressing, toilet activities). Moreover, the rare excursions into positive realms, such as life satisfaction, morale, happiness, and self-esteem, reveal weakly articulated conceptual and philosophical formulations of well-being.

Three principles underlie the formulation of human health presented herein. A first is that positive health is not, in the final analysis, a medical question but rather is fundamentally a philosophical issue that requires articulation of the meaning of the good life. More than anything, it is the chronic neglect of philosophical perspectives on "the goods" in life that has handicapped efforts, including well-intentioned efforts, to understand positive health, and has produced instead deeply impoverished conceptions of human functioning. A second principle is that human wellness is at once about the mind and the body and their interconnections. Thus, a comprehensive assessment of positive health must include both mental and physical components, and the ways in which they influence each other. It is in fact the physiological substrates of "positive states of mind" that constitute key future directions for explication of mechanisms that underlie positive human health. Third, positive human health is best construed as a multidimensional dynamic process rather than a discrete end state. That is, human well-being is ultimately an issue of engagement in living, involving expression of a broad range of human potentialities: intellectual, social, emotional, and physical.

In the following sections, we review philosophical perspectives on the meaning of a life that is well-lived and use these as a framework to reconceptualize the contours of positive human health. Along the way, we examine the cultural specificity versus universality of proposed "goods" in life. Key components of positive health, which address essential features of engagement in living, are then delineated, and prior empirical research related to them is reviewed. We note that these core components of quality living have minimal presence in efforts to understand biological well-being. However, consistent with our view of health as the presence of the positive in the mind as well as the body, we examine the physiological substrates of these elements of well-being and consider their protective role in resistance to and recovery from illness. In the final section we examine implications of the proposed formulation of positive health for a wide range of scientific agendas and for practice in human health fields.

Beyond Repair Shops and the Return to Neutral: Insights From Philosophy

It is curious that historically, long-standing emphasis in human health has been on illness rather wellness, given that philosophers through the ages have never wanted for formulations of optimal human functioning. Aristotle's notion of *eudaimonia*, for example, described the highest of all human goods as the realization of one's true potential. John Stuart Mill distinguished between the happy pig and the unhappy Socrates in an effort to define more noble features of human existence than simply feeling good. The missing interplay between philosophical accounts of how to live well and how human health has been construed probably originates in the scientific revolution wherein health was relegated to the biological disciplines. Thus ensued an ever-widening separation of health from philosophy and the humanities, resulting in conceptualizations of health that were primarily about the body. Since Descartes proposed it in 1637, the mind-body dualism dominated scientific thinking:

Back then, dualism made the body, as a ghost-free machine of mere meat, a permissible object of empirical investigation at a time when the Inquisition was dangerous to scientists, as shown by the contemporaneous trial of Galileo. In modern times, it reinforced the biomedical avoidance of studying emotions as factors in health and disease. (Melnychuk, 1988, p. 183)

Medical technology further escalated the divorce of mind and spirit from the body in basic constructions of health. Having left behind philosophical realms that

gave enduring attention to the nature of human wellness, it became possible, indeed inevitable, that health would be defined negatively as the absence of physical illness. The central objective of the medical model thus became that of returning the body from states of negative functioning back to neutral. *Positive health* has minimal presence in this realm. In fact, the WHO definition has been decried as giving rise to a "variety of evils" (Callahan, 1973, p. 78), including the tendency to define all social problems as medical problems, blurring of the lines of responsibility between the medical profession and the political order, and expecting modern medicine to be the "final magic-healer of human misery" (p. 81). There is merit to recognizing the purview of the medical field (i.e., diagnosis and treatment of illness and disease). Unfortunately, the medical profession and the culture that supports it has equated the task of treating human infirmity with the goal of fostering health. Governed by a focus on the negative, orthodox medicine is poorly equipped to advance the positive health agenda.

Philosophy, we argue, has long been concerned with the nature of human thriving and flourishing. What then are the insights from this realm for understanding health? We begin by endorsing a pluralist rather than a unitary conception of the good life, believing that the goods realizable in a human life "are genuinely diverse, that is, not reducible to a single species" (Becker, 1992, p. 18). Such plurality underscores the importance assigned to a focus on "whole lives," in contrast to particular features of existence. Second, although contemporary accounts may equate the good life with "something like a good vacation, or a good house, or a good meal—at best a long stretch of happiness" (Becker, 1992, p. 16), we posit that a judicious formulation of positive human health is grounded in more than momentary pleasures. The whole life that is well-lived is a many-splendored thing, with some splendors having greater import for soundness of mind and body than others. We propose, following from our philosophical analysis, that the key goods in life central to positive human health are, primarily, having purpose in life and quality connections to others; and secondarily, possessing self-regard and mastery.

Defining the "Goods"

Becker (1992) offered a comprehensive review of prior philosophical efforts to sculpt the good life. From these, he generated a list of "criterial goods" that embody lives well-lived. These begin with fundamentals, such as the material conditions necessary to sustain life, or to have basic states of consciousness and understanding, but then move upward to more complex as-

pects of selfhood: *self-command* (the ability to resolve states of consciousness into acts of will) and *self-love* (the self-esteem required to avoid self-destructive acts, and self-respect required to defend one's liberty and integrity). Qualities of connection to others are also emphasized, such as *mutual love* (reciprocal desire, affection, empathy, and conviviality) and *sexuality* (expression of the sexual aspect of human nature in erotic love, sexual behavior, and reproduction), along with elements of social responsibility like *benevolence* (concern for the well-being of others), and *rectitude* (morally right conduct). Reflecting enduring philosophical themes, Becker discussed the *harmonization of reason, desire, and will* (the unification of multiple and often conflicting elements of action); *life as an aesthetic object* (the life that is beautiful, sublime, a work of art); and exemplification of *goodness-of-a-kind* (capturing Aristotelian accounts of excellence—the perfection of a thing, be it an individual, a human community, or a tradition).

Especially pertinent to positive human health are the criterial goods of *meaningful opportunity* (autonomy to choose and pursue projects that give value to one's whole life—"autonomous lives have a dignity that is immeasurable, incommensurable, infinite, beyond price;" p. 20); *meaningful activity* (active pursuit of projects that make one's life valuable—"We may think of Socrates, here, for whom doing philosophy was apparently both necessary and sufficient for the good life, and perhaps also of Camus's rebel, in perpetual, creative revolt against the absurdity of the human quest for meaning in an indifferent universe;" p. 21); and *achievement* (life of productive activity). Such qualities underscore the view that the good life includes active engagement in living, the selection and pursuit of projects that give meaning and dignity to one's existence. These qualities further convey that human well-being is a dynamic process, not an achieved state.

Some philosophical systems elevate one of among the above array to posit "unitary" accounts of the good life, such as *inner unity* (harmony, integrity, or wholeness, particularly with respect to reason, passion, and will), *human excellence* (Aristotelian accounts of human flourishing), or *personal fulfillment* (degree to which one's needs and desires are satisfied). Certain of these monistic accounts can, however, be rejected as insupportable for defining the good life—"a moral monster can have inner unity," stated Becker (p. 24), and human excellence can be dangerous, for "if we are by nature more selfish than righteous, then perfection of that nature will lead to injustice" (p. 24). Personal fulfillment, which includes hedonism and epicureanism, is particularly problematic as a unitary account, because

it is not hard to see how figures like Sardanopolis, Lucrezia Borgia, Catherine the Great, or de Sade (without the difficulties they encountered) might have had lives characterized by a high level of personal well-being, and yet had lives which, as a whole, were so unjust, ugly, or pointless as to preclude our describing them as good. And from that standpoint it is not hard to see how Joan of Arc, Kirkegaard, Virginia Woolf, or Albert Schweitzer might have had lives so desolate as not to qualify as ones of personal well-being, and yet had lives which, on the whole, were so noble, profoundly creative, courageous, or self-sacrificial that we are compelled to describe them as good. (Becker, 1992, p. 26)

In addition to Becker's review of prior philosophical accounts, there are other treatments of the "goods" in life, such as Griffin's description of well-being (1986), listing five "prudential values" for being well: accomplishment, agency, understanding, enjoyment, and deep personal relations; Norton's *Personal Destinies* (1976), in which he elaborated the eudaemonistic account of ethics and the good life; and Nozick's *The Examined Life* (1989), which provides philosophical meditations on creativity, love, wisdom, happiness, and the holiness of everyday life (for other accounts, cf. Rawls, 1971; Ruddick & Rachels, 1989; Sumner, 1992). We return to these diverse formulations when we distill recurrent philosophical themes that bear on positive human health. Before that, we examine one other, particularly lucid philosophical account about the good life.

Russell's Conquest of Happiness

Bertrand Russell (1930/1958) examined the causes of unhappiness and happiness, not as an exercise for philosophical highbrows, but for those concerned with practical problems of living. His formulation is relevant for its wisdom and spirited style, but also because it underscores parallels between scholarly and prosaic accounts of how to live. In his view, people are unhappy for a variety of reasons: having nothing to live for (Byronic unhappiness), competition, boredom, fatigue, envy, the sense of sin, persecution mania, and fear of public opinion. It is, however, his articulation of the causes of happiness that speaks to the task of defining positive human health.

Fundamental happiness, according to Russell (1930/1958), depends "more than anything else upon what may be called a friendly interest in persons and things" (p. 155). He elaborates these ideas in chapters entitled "Zest" and "Affection." We are told that "the more things a man is interested in, the more opportunities of happiness he has and the less he is at the mercy of fate, since if he loses one thing he can fall back upon another" (p. 160). Examples of zest were described by Russell:

Sherlock Holmes, it may be remembered, picked up a hat which he happened to find lying in the street. After looking at it for a moment he remarked that its owner had come down in the world as the result of drink and that his wife was no longer so fond of him as she used to be. Life could never be boring to a man to whom casual objects offered such a wealth of interest. (p. 162)

One man, in the course of a long train journey, will fail entirely to observe any of his fellow travelers, while another will have summed them all up, analyzed their characters, made a shrewd guess at their circumstances, and perhaps even ascertained the most secret histories of several of them. (p. 162)

Zest, in Russell's (1930/1958) view, was deeply linked to the second major cause of happiness, affection: "One of the chief causes of lack of zest is the feeling that one is unloved, whereas conversely the feeling of being loved promotes zest more than anything else does" (p. 176). He argued that the unloved sink into despair relieved only by occasional "gleams of envy and malice" (p. 177). General self-confidence toward life, he argued, comes more than anything else from receiving as much of the right sort of affection one has need for. Moreover, "the best type of affection is reciprocally life-giving: each receives affection with joy and gives it without effort, and each finds the whole world more interesting in consequence of the existence of this reciprocal happiness" (p. 184).

Much of Russell's (1930/1958) discussion about affection addressed feelings of parents for children, but he had a good deal to say about affection between adults and, more directly, about love. Love, he claimed, is to be valued, first because it is in itself a source of delight, and its absence is a source of pain. Second, "it enhances all the best pleasures, such as music, and sunrise in mountains, and the sea under the full moon. A man who has never enjoyed beautiful things in the company of a woman whom he loved has not experienced to the full the magic power of which such things are capable" (p. 39). Russell contrasted the experience of love, which "is able to break down the hard shell of the ego" (p. 39), with more solitary philosophies, such as the Stoics or the early Christians, or others who believed power or personal pleasure were the aim of life. The latter have in common the belief that the highest good of which human life is capable is to be realized by means of one's own will. Russell's response is that "all such views, to my mind, are false, and not only in ethical theory but as expressions of the better part of our instincts" (p. 39). It is our connections to others that become the means for achieving the highest goods in life. In this regard, Russell's everyday account of how to live coincides with extensive philosophical treatments that emphasize

mutual love, sexuality, and deep personal relations. The theme of quality relationships with others repeatedly recurs as a defining feature of the life that is well-lived.

Other sources of happiness described by Russell include work, which is important because it is a preventive of boredom and gives chances of success and continuity of purpose; and impersonal interests that provide relief from nervous strain and fatigue, and help one retain a sense of proportion. "Even in the most fortunate lives there are times when things go wrong. ... At such times a capacity to become interested in something outside the cause of anxiety is an immense boon" (p. 228). Russell concluded with the observation that happiness is something for which one must strive and work hard—"Happiness is not, except in very rare cases, something that drops into the mouth, like a ripe fruit, by the mere operation of fortunate circumstances" (p. 232)—it is rather a struggle, hence his title *The Conquest of Happiness*.

Finally, to achieve happiness, Russell argued that one's passions and interests must be directed outward, not inward—it was important to avoid self-centered passions. In this regard, his ideas echo another philosopher of happiness, John Stuart Mill, who stated that he never wavered in his conviction that happiness is the test of all rules of conduct, and the end of life. However, he cautioned that this end was to be attained only by not making it an end:

Those only are happy, I thought, who have their minds fixed on some object other than their own happiness, on the happiness of others, on the improvement of mankind, even on some art or pursuit, followed not as a means, but as itself an ideal end. Aiming thus at something else, they find happiness by the way. (Mill, 1893/1989, p. 117)

Seen in this light, happiness is not, despite its prominence in philosophical and everyday discourse, the main message—it is the by-product of a life that is well-lived. Despite these philosophical distinctions, happiness remains at center stage in most social scientific efforts to monitor subjective well-being (e.g., Myers & Diener, 1995).

Are the Goods Universal?

The accounts provided thus far convey Western formulations of the criterial goods of life. Culture and context are, we realize, powerful influences in efforts to characterize the positive side of human experience. Of late, much discussion has revolved around distinctions between individualist versus collectivist, or independent versus interdependent, constructions of self and society (Markus & Kitayama, 1991; Shweder,

1993; Triandis, 1989). For our purposes, it is important to ask whether the formulations just sketched reflect largely individualist models of the good life. Full analysis of this question goes beyond the scope of this article. However, not wishing to ignore the cultural debate, we consider the meaning of the life well-lived and of ultimate goals in life as seen from a traditional African perspective. We select Africa because of prior efforts to understand health in that context (Hielscher & Sommerfeld, 1985; Konmare, 1983; Singer, 1989) and because of the stark cultural contrasts between much of sub-Saharan Africa and the United States.

Hierarchical patterns characterize all traditional African relationships from the realm of the spirits through the royal court to all social institutions, including the family. In each sphere, harmony of relationships constitutes the nature of the good that is desired by all. Harmony within hierarchy is achieved by each actor knowing his or her status, functions, and responsibilities, above all taking care to avoid insubordination. Moreover, "those of higher rank are obligated to protect their subordinates and the duty of the latter is to acknowledge their dependency by always seeking the good will and blessing of the former" (Paris, 1995, p. 43). Unquestioned loyalty and obedience to legitimate authority are moral virtues that are taken for granted. From kingship to sibling rivalry, many checks and balances are designed to ensure justice and prevent injustice. The major deterrent to injustice is the knowledge that one's wrong acts can anger the spirits and thereby bring disaster not only to oneself but to the entire community.

Ethical systems of Africans define bilateral, reciprocal obligations in human relationships. Among the Yoruba,

it is believed that to be trusted by a friend, to be bosom friends, to eat together, or to be received hospitably as a guest, is to enter into a covenant which involves moral obligations. A covenant between two parties means, *negatively*, that they must think or do no evil against each other's body or estate, and *positively*, that they must cooperate in active good deeds towards each other in every way. (Idowu, 1962, pp. 149–150, italics added)

Underscoring strongly collectivist thinking, Africans have no conception of the person apart from the community. In order of moral importance, the corporate community always assumes priority over individual members. The highest moral good is thus that of serving the common good with one's material and spiritual resources. However, because the person is an essential part of family and the larger community, each significant event in the individual's life is at one and the same time an important occasion in the life of the whole

community. The unfolding drama of an individual's life and times of happiness and grief are invariably shared by the community. Consequently, it is rare for Africans to experience loneliness. These essentials are summarized as follows:

In traditional life, the individual does not and cannot exist alone except corporately. He owes his existence to other people, including those past generations and his contemporaries. He is simply part of the whole. The community must therefore make, create or produce the individual. ...

Only in terms of other people does the individual become conscious of his own being, his own duties, his privileges and responsibilities towards himself and other people. When he suffers, he does not suffer alone but with the corporate group; when he rejoices, he rejoices not alone but with his kinsmen, his neighbors and his relatives whether dead or living. (Mbiti, 1970, p. 141)

For Africans, the ultimate goal of life, the attainment of which marks the person's full growth, is thus the preservation and promotion of community. In this context, the moral virtues are as follows.

1. Beneficence, in which an individual's disposition is so shaped by the ultimate goal of community that he or she finds contentment in facilitating the well-being of others. The converse of beneficence is the vice of meanness, synonymous with small-mindedness, self-centeredness, and selfishness.

2. Forbearance.

3. Practical wisdom: excellence of thought that guides good action. The training of children develops practical wisdom by example.

4. Improvisation: This virtue reaches its zenith in musical, oratorical, and ceremonial performance. Because poverty constitutes a basic condition for many improvisational practices, African peoples bestow much praise on the authors of invention because, more often than not, their product represents the creation of something new out of virtually nothing. One of the most significant spheres of creativity in Africa is the ability to speak in and understand proverbs.

5. Forgiveness: the commitment to the goal of community implies that the goal of life is to build relationships rather than prohibit them. Africans shun hatred by cultivating the virtue of forgiveness through the habitual exercise of kindness. Forgiveness is structurally essential for the ongoing life of the community.

6. Justice: the sum of all prior virtues. The goal of justice is the good of the community. This does not imply any form of absolute egalitarianism, because the hierarchical ordering of African societies insists on many levels of inequality based on moral and political

distinctions with respect to the contributions each makes to the community.

Taken together, these characterizations of traditional African virtues and life goals reveal a clear elevation of community over self. The highest good is to preserve order and harmony within the community, and between the community and its spiritual protectors, the divinities and ancestors (Paris, 1995). All human activity in such a society is thus justifiable only in so far as it contributes to order and harmony. When contrasted with criterial goods emergent from Western philosophy, the African stance appears notably different. Goods such as self-command and self-love are not clearly evident in the latter. And yet, clear parallels exist regarding "social goods" as reflected in themes of benevolence, rectitude, beneficence, forbearance, and forgiveness, directing interests outward rather than inward. Meaningful activities and achievements, defined by Becker as the pursuit of projects that make one's life valuable, are well-articulated in the African context. That is, one's purposes, obligations, and reasons for living are explicitly defined by the social structure and its carefully delineated hierarchical system. Social relationships thus reign supreme in the formulation of life meaning. Marriage and parenthood become defining focal points of existence (Mbiti, 1970); they are duties in which everyone must participate, and they constitute the essential rhythms of life.

In summary, our brief consideration of culture points to marked contrasts in phenotypic manifestations of criterial goods that embody the life well-lived. The form that engaged, purposeful living takes varies dramatically from the Westerner's investment in work or intrigue with the mundane in life described by Russell, to the African elder's provision of responsible guidance needed to maintain harmony of the social order. Both nonetheless reveal a fundamental endorsement that the good life is characterized by meaningful goals, objectives, and pursuits. Similarly, quality features of social relationships are uniformly exalted in these culturally diverse formulations, although they, too, are differentially expressed via romantic love relationships, responsible parenting, or the appropriate execution of obligations to others in a well-defined hierarchy. Quality ties to others emerge as a pervasive "good" in life.¹

¹Note, we are not presenting communalism in Africa or individualism in the West as social structural *ideals*. Adverse consequences for women follow from patriarchal African societies, as may individualism contribute to the breakdown of community cohesion. Our point is that purpose in life and quality relations with others are *cultural invariants* in the midst of the very different social structural dynamics, local nuances, and values.

Core Features of Positive Human Health

In this section we distill key components of positive human health grounded in prior philosophical and ethical accounts of the good life. The objective is to describe central features of lives that are well-lived and examine how they work together to embody a fully functioning and healthy existence. We also examine existing empirical research related to these qualities to illustrate their scientific tractability.

We reiterate our view that individual lives as well as the social order are enriched by enactment of diverse aspects of wellness. Rorty (1992) argued that we are well-served, practically and morally, by diversity. Quoting from Plato, *The Statesman*, she conveyed the advantages:

Those who are careful, fair, and conservative—those of a moderate temperament—are not keen; they lack a certain sort of quick active boldness. The courageous on the other hand are far less just and cautious, but they are excellent at getting things done. A community can never function well ... unless both of these are present and active. (p. 38)

Our parallel argument is that we need communities composed of diverse types of wellness, some of which are more fully personal and individualist, others more interpersonal and relational, and still others reflecting capacities for deeply held purpose or for upholding the social order. There are, in short, multiple ways to be healthy, and individual lives bring together these key features in uniquely distinctive ways. Amid the variety, we posit superordinate categories of the essential goods that comprise engagement in living, and as such constitute core ingredients of positive human health.

Leading a Life of Purpose

Throughout philosophical accounts repeated emphasis is given to the importance of purposeful living. Becker's (1992) comprehensive synthesis of criterial goods in diverse philosophies targeted "meaningful opportunity" and "meaningful activity," which encompassed the autonomy to choose and then actively pursue projects that give value to one's life. Russell's (1930/1958) description of zest elevated the virtues of being interested in all features of life, from the most mundane to the most high minded. Such interests protect one from weariness and boredom, and they sustain the mind. His emphasis on family, work, and impersonal interests suggested avenues for maintaining continuity

of purpose and directing one's energies outward. Griffin's (1986) prudential values emphasized accomplishment and agency as key elements of being well. Norton's (1976) eudaemonistic account of the good life involved finding and taking the self-actualizing path from one's ideal possibilities to actuality. Nozick (1989) emphasized multiple avenues for making life meaningful and purposeful (creating, parenting, loving, observing). Accounts of virtue from the African perspective offered further explicit routes for the expression of life purpose (e.g., marriage, parenthood, preservation of harmony and social order). Thus, diverse philosophical and ethical systems convey that to be lived well, lives must have purpose, embodied by projects and pursuits that give dignity and meaning to daily existence, and allow for the realization of one's potential.

Social scientific literatures underscore and operationalize these philosophical themes. In psychology, much attention has been paid to the goals and objectives that characterize people's lives, as in studies of personal projects (Little, 1989), possible selves (Markus & Nurius, 1986; Markus & Ruvolo, 1989; Ryff, 1991), personal strivings (Emmons, 1991; Omodei & Wearing, 1990), personal goals (Brandtstadter & Renner, 1990), time spent in important identities (Ogilvie, 1987), life meaning (Baumeister, 1991), purpose in life and personal growth (Ryff, 1989b; Ryff & Keyes, 1995), and goal constructs (Austin & Vancouver, 1996). However, such topics are rarely connected to human health, although it is notable that the first empirical formulations of life purpose evolved from analyses of ultimate challenges to health: survivorship in Nazi concentration camps (Frankl, 1992). Purpose in life emerged as the distinguishing feature between survivors and those who did not. Thus, in both everyday circumstances, and under massive threats to one's existence, seeing life as purposeful and meaningful emerged as a critical feature of human wellness.

On the sociological side, human development has been described as a process of self-realization (Dowd, 1990), also characterized by activities of purpose and satisfaction. Importantly, Dowd noted that opportunities for self-realization are not equally distributed across the social order, a point to which we return in discussion of the public policy implications of positive human health (e.g., the class and health agenda). A further sociological account is Antonovsky's (1987) "sense of coherence." Central to his model of *salutogenesis* (positive counterpoint to pathogenesis), sense of coherence is essentially a cognitive outlook that life is comprehensible, manageable, and meaningful. Having a sense of purpose is a key feature of the operationalization of such coherence.

Other theoretical formulations from developmental psychology and mental health literatures (e.g., Allport, 1961; Buhler & Massarik, 1968; Jahoda, 1958; Loevinger, 1976; Rogers, 1961) have similarly elevated the ultimate value of human purposefulness (for reviews, see Ryff, 1989a). Taken together, these philosophical and scientific formulations converge in their depiction of the good and healthy life as one that involves setting and pursuing goals, finding out what one is good at, exercising such talents, and hence, realizing one's potential. We posit that this is a universal feature of human wellness, not being culture or time specific, although its forms (i.e., how purpose is expressed) may be quite varied. Life purpose in traditional Africa, as noted, may well involve obligations to others and the social order. Further comparisons between midlife adults in the East (Korea) and West (United States) show that both groups give emphasis to purpose in life in evaluating personal well-being (Ryff, Lee, & Na, 1997), despite cultural differences in other aspects of self-evaluation (e.g., self-acceptance).

Purposeful living can be expressed in many contexts, an obvious one of which is work. Russell pointed to the importance of work in preventing boredom, giving chances of success, and providing continuity of purpose. We contrast these observations with the extant scientific literature, which has extensively documented the ways in which work (i.e., employment status, job conditions) affects human health, mental and physical (Jackson & Warr, 1984; Karasek, Baker, Marxer, Ahlbom, & Theorell, 1981; Link, Lennon, & Dohrenwend, 1993). The predominant emphasis has, however, been on illness; that is, how adverse work conditions or unemployment contribute to human dysfunction (for exceptions, see Kohn & Schooler, 1983; Terkel, 1972). Largely missing is a counterpoint literature on how work facilitates human purpose, meaning, self-realization, and enactment of one's unique abilities, and thereby enhances one's health. The linkage between these aspects of work and the enhancement of one's health has rarely been addressed.

The foregoing examples underscore the view that life purpose is a dynamic process—the sense that one's life is meaningful and purposeful is an ongoing, day-by-day, constantly unfolding phenomenon, not an end state that is once-and-for-all resolved. And, following Russell's observation, purpose and meaning are, not in most instances, dropped effortlessly in one's lap, but result from invested, committed living, which we construe as the essence of health and well-being.

Quality Connections to Others

Philosophical accounts of the good life give undeniable prominence to the realm of human relations.

Becker's (1992) synthesis of criterial goods emphasized the importance of mutual love (reciprocal desire, affection, empathy, and conviviality), sexuality and erotic love, benevolence (concern for the well-being of others), and rectitude (morally right conduct). Griffin's (1986) five prudential values for being well include deep personal relations. Nozick's (1989) examination of what makes life worth living included many interpersonal qualities, among them being love's bond, sexuality, and relationships between parents and children. Russell (1930/1958) argued that zest in life comes, more than anything, from feeling loved and from giving love and affection. Love, he reminded us, enhances all the best pleasures in life. Mill's (1873/1989) description of his own life included a period of crisis when he realized that his remarkable education and life pursuits had failed to cultivate a capacity for feelings. Concluding that there must be balance between "the ordering of outward circumstances" (p. 118) and the inner realm of emotion and feeling, he turned to music, poetry, and art to find the "medicine" (p. 121) for his state of mind, and importantly, developed a deeply profound relationship with a woman who became his wife and collaborator—in his words, "the most valuable friendship of my life" (p. 145). We underscore the universality of needs for deep, meaningful human connections. The interpersonal in us is a part of our evolutionary history (Trivers, 1971, 1985), beginning with our first and most immediate human relationships (Bowlby, 1969). Comparative cultural research suggests that Western cultures elevate oneness and individualism over human connection. These distinctions may be overdrawn (Ryff et al., 1997; Sampson, 1989; Spence, 1985), given that people everywhere have abiding needs for close connections to others, and that even in our own context, relations between the self and the collective are deeply rooted in cultural institutions, practices, and scripts (Markus & Kitayama, 1994). For example, in a Western study of how midlife and older adults themselves define well-being, it was found that the most frequently occurring descriptor of positive functioning, for both men and women, was that of having quality relationships with others (Ryff, 1989c). Our brief examination of life goals in the African context underscored the importance of social ties, both in terms of responsibility and obligation to others as well as the expression of good deeds that contribute to social harmony. Contentment derived from the well-being of others constitutes an especially salient aspect of quality of life in such societies where the self does not exist apart from the community. Thus, although the external manifestations of these social ties may vary, they are without doubt critical elements in any formulation of positive human health.

Again, paralleling the philosophical and ethical perspectives are numerous theories of psychological functioning that elevate the importance of warm, trusting interpersonal relations. Maslow (1955, 1968) described *self-actualizers* as having strong feelings of empathy and affection for all human beings and being capable of greater love, deeper friendship, and more complete identification with others than those who are not self-actualized. Allport (1961) included warm relations with others as a criteria of maturity, describing the mature person as capable of great intimacy in love, whether with family members or friends, and as showing compassion, respect, and appreciation of others. Jahoda (1958) considered the ability to love as a key criterion of positive mental health. Erikson's (1959) stages of development involved tasks in adulthood that were highly interpersonal, including achieving close unions with others (intimacy) and having a concern for guiding and direction of others (generativity). Birren and Renner (1980) argued that to be mentally healthy, a person of any age needs the ability to respond to other individuals, to love, to be loved, and to cope with others in give-and-take relationships. Thus, quality ties to others constitute a recurrent theme in diverse characterizations of optimal human functioning. Extensive empirical evidence, summarized by Baumeister and Leary (1995), supports the "belongingness hypothesis": that the need to belong is a fundamental human motive. Deficits in belongingness, they show, are linked with a variety of ill effects on health, adjustment, and well-being.

Similarly, much social scientific literature has probed the role of social relationships and social support in human health (Adler & Matthews, 1994; Berkman, 1985, 1986; Berkman & Breslow, 1983; Cohen, 1988; Gottman & Levenson, 1992; Helgeson & Cohen, 1996; House, Landis, & Umberson, 1988; Kaplan & Toshima, 1990; Seeman, 1996; Seeman, Berkman, Blazer, & Rowe, 1994; Thoits, 1995). At first glance, this literature appears to render our emphasis on positive human relations a mere restatement of what is already known or under study. However, as with the prior empirical work summarized herein, studies of social relationships have been biased pervasively toward negative experience. Thus, for diverse life stresses or health problems (e.g., cardiovascular disease, cancer, diabetes), researchers have examined the buffering, ameliorative effects of social integration, social network properties, and perceived support. A recent review of 81 studies, for example, revealed that social support was reliably related to aspects of the cardiovascular, endocrine, and immune systems (Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Stress-buffering models remain the primary mechanism through which social support and these physiological processes are linked.

Outside of the stress paradigm, far less is known about how quality relationships with others contribute to—indeed comprise—positive mental and physical health. Loving and being loved are fundamental ingredients of being well, offering perhaps the most powerful preventive medicine there is.

Family life has also been extensively studied for its health consequences, but again, the focus has been on the negative (i.e., how difficulties, such as divorce, widowhood, or caregiving for an ailing spouse or parent create stress and compromise mental and physical functioning; Aseltine & Kessler, 1993; Berman & Turk, 1981; Bruce & Kim, 1992; Kiecolt-Glaser, Fisher, Ogrocki, Stout, & Speicher, 1987; Kiecolt-Glaser, Glaser, Gravenstein, Malarkey, & Sheridan, 1996; Kiecolt-Glaser, Malarkey, Cacioppo, & Glaser, 1994; Umberson & Chen, 1994). On the positive side, the story of human flourishing, family life for many is a central source of meaning and purpose. Empirical studies of midlife adults show, for example, high profiles of purpose in life, environmental mastery, and self-acceptance linked to the experience of having and raising children (Ryff, Lee, Essex, & Schmutte, 1994; Ryff, Schmutte, & Lee, 1996; Ryff & Seltzer, 1996; Umberson & Gove, 1989). This work stands in contrast to the literature on the negative effects of parenthood on parents (McLanahan & Adams, 1987; Wethington & Kessler, 1989).

Finally, we emphasize that possessing rich and fulfilling bonds with others is also a dynamic process, rather than an achieved end state. Quality human connections are created and recreated each day of existence, and akin to Russell's observations, they are not handed to us finely crafted and smoothly running, but rather require continual effort and investment.

Other Possible Features: Positive Self-Regard and Mastery

Philosophical lists of "criterial goods" and the social scientific accounts of well-being include numerous elements of positive functioning. From among these, we have targeted purpose in life and quality relations with others as primary features of positive human health, partly because of their pervasiveness—indeed universality—across philosophical, ethical, and social scientific formulations, but in addition, because of their capacity to engage the mind and body, a topic we address hereafter. We recognize, however, that other criterial goods might be wisely included in efforts to reconfigure the meaning of positive human health. For example, features of selfhood, such as self-love, self-esteem, self-respect, and self-acceptance (Rosenberg,

1965; Ryff, 1989a, 1989b, 1995), or the sense of efficacy, mastery, and control (Baltes & Baltes, 1986; Pearlin & Schooler, 1978; Ryff, 1989a, 1989b, 1995) are frequently a part of efforts to describe adaptive functioning or optimal living. Our assumption is that these qualities work interactively with what we see as the primary features of positive human health. That is, in the life course unfolding of well-being, it is one's sense of purposefulness and deep connection to others that likely builds and maintains positive self-regard, sense of self-realization, personal growth, and mastery, with the latter serving to enhance the pursuit of life goals and quality relations with others.

We emphasize that our primary intent is not to establish a final, definitive set of criterial goods, but rather to connect philosophical accounts of quality living to biology. That is, we begin with a circumscribed, provisional set of defining features, which are open to further refinement and expansion. Purpose in life, quality connections to others, self-esteem, and mastery, in short, provide a place to start in efforts to understand how the body functions when one is experiencing positive goods of living.

The Role of the Negative in Positive Health

To anchor positive human health in philosophical accounts of the good life can be misconstrued as a call to exclude the negative in human experience. Such a rose-colored view is, however, patently at odds with the material covered thus far. Empirical research on purpose in life had its origins, we noted, in Frankl's writings about the importance of meaning under the most adverse of life circumstances: Nazi concentration camps. Bertrand Russell further underscored the fact that happiness is not an easy pursuit but a struggle. Additionally, Becker pointed to the limits of personal fulfillment or feeling good as a sound criterial good. In short, we are not advocating a model of human flourishing that excludes negative experience or negative emotion. On the contrary, because positive health is ultimately about engagement in living, difficult experience, pain, and struggle are inevitably parts of such engagement. The negative may even contribute to the attainment of deeply felt life purpose and richly experienced relations with others. For example, recurrent clinical accounts (e.g., Allport, 1961; Maslow, 1968; Rogers, 1961) describe the gains in insight and strength that occur as individuals negotiate their way through trauma. A more recent literature (see Pennebaker, 1995) has also linked traumatic experience, emotional expression, and disclosure with human health (physical and

mental). Similarly, the effectiveness of support groups among cancer patients (Spiegel, 1993) underscores the importance of acknowledging and expressing negative emotion.

In sum, life difficulties and the emotions associated with them are clearly not banished from the positive health agenda. Rather, traumatic experience may, in some instances, be the route to achieving deeper meaning and purpose, closer ties to others, greater self-regard, and heightened mastery. In other cases, the ordeals of life may not enrich these qualities, although their presence may dramatically diminish the health tolls extracted by negative experience. How such protection occurs, a central question for the positive health agenda, is addressed in subsequent sections.

Physiological Substrates of Human Flourishing

Understanding the body during states of wellness, rather than under conditions of illness, is the essential shift in thinking about health that we advocate. It is, we argue, the physiological substrates of richly experienced purpose and human connection that constitute the most promising new directions for scientific advances in research on human health. The call to study mind-body interactions, we acknowledge, is not new. What is unique is the push to focus on positive interworkings of quality life experiences and biological function. Most prior work, as we selectively show, has been about negative influences of mind on body, or body on mind.

To explicate this view, we first revisit the place of human passions and emotions in philosophical and scientific inquiry, proposing a reinstatement of their vital role in efforts to understand human health. It is emotion, we believe, that constitutes the essential nexus between the criterial goods in life and biological functioning. That is, deeply felt life purposes and quality relations with others engage the body because they are emotionally laden. Most prior empirical work about the effects of negative, or positive, experience on human functioning has neglected this role of emotion as the bridging mechanism.

Our summary of extant research is organized separately between scientific agendas that explore the biological substrates of negative human experience, and those that focus on the positive. In sheer numbers, the former dwarf the latter. However, it is what occurs in the body when the mind is fully engaged in living and loving that most fully captures the essential meaning of positive human health. What needs scientific attention is how quality experiences in living keep the body well,

and in turn, how optimal biological functioning feeds back to quality of life. This is the fundamental agenda for understanding the physiological substrates of human flourishing.

Emotion as Nexus Between Mind and Body

Since the days of Socrates, objectivity and reason have been the designated rulers of Western philosophy, religion, and science (Solomon, 1993a, 1993b). Passions, in contrast, have been deemed intrusions and interruptions, sometimes “embarrassing if not treacherous subversions of lives that *ought* to be conceived in ‘higher’ terms” (p. xiv). Solomon challenged this view and argued instead that our passions are the very soul of our existence, the source of our interests and our purposes, restating Hume’s claim that only passion moves us. “The passions, in short, are not those primitive ragamuffins and the refuse of our psychic life that Western rationalism has always warned us against with thinly veiled repulsion; they are the high court of consciousness, to which all else, even reason, must pay tribute” (p. xvii). Russell (1930/1958) spoke as well on behalf of the good passions:

In passionate love, in parental affection, in friendship, in benevolence, in devotion to science and art, there is nothing that reason should wish to diminish. The rational man, when he feels any or all of these emotions, will be glad that he feels them and will do nothing to lessen their strength, for all these emotions are parts of the good life, the life, that is, that makes for happiness both in oneself and in others. (p. 108)

We extend these philosophical claims by arguing that passion in life purpose and in love contributes, not just to happiness, but more importantly, to positive human health.

Recent years have witnessed an explosion of scientific research on human emotion (Ekman & Davidson, 1994; Izard, 1991; Lewis & Haviland, 1993). Such work, covering the biology and neurophysiology of emotion as well as psychological and social processes related to emotion, is richly responsive to the above philosophical admonitions. Additionally, parts of this literature address interactive mind, body, and behavior processes. Unfortunately, and consistent with our summaries of other areas of empirical research, the focus has been largely on negative emotions (e.g., fear, anger, sadness, disgust), with limited attention given to the positive, which thus far has been restricted largely to happiness and surprise (Cacioppo, Klein, Berntson, & Hatfield, 1993). Zestful engagement in living and lov-

ing, à la Russell, remains primarily the purview of philosophy. Furthermore, apart from efforts to understand the role of emotion in psychological disorders (e.g., depression, anxiety), linkages between emotional experience and broader conceptions of human health have been surprisingly absent in contemporary psychological and sociological studies of emotion.

Negative Experience and Health: The Study of Stress

Physiological mechanisms. It is the animal and human literatures on stress that have made most explicit connections between life experience, emotion, and health outcomes, although indicators of all of these have been almost exclusively negative. Nonetheless, this work is invaluable to the positive health agenda because of its strides in linking mental perceptions and behavioral responses to stress with physiological and biochemical processes, and ultimately making connections with neuroendocrine and immune systems tied to disease outcomes (see Brindley & Rolland, 1989; McEwen & Stellar, 1993; Williams, 1985). The mechanisms bridging these many systems have been explicated in increasing detail. The cascade of hormone secretion in response to stress, for example, goes from the secretion of corticotropin releasing factor, driven by the hypothalamus in the brain, to the stimulation of the pituitary gland to release corticotropin, which in turn causes the adrenal glands to release cortisol into the blood (McEwen & Schmeck, 1994; Sapolsky, 1990). Activation of the sympathetic nervous system by stressors also leads to the release of catecholamines (i.e., norepinephrine and epinephrine) from the inner portion (medulla) of the adrenal gland to the blood, and immune cell function is altered by the action of these hormones and transmitters (Maier, Watkins, & Fleshner, 1994). In combination, these processes can damage regulatory feedback systems and reduce immune system capability. There are, however, considerable individual differences in the extent of hormone activation in response to stressful experiences. Further, much of the detail of pathogenesis is linked to delicate, and as yet not fully understood, communication between neuroendocrine, immune, and autonomic nervous systems.

At a more organic level of analysis, Sapolsky (1990) described how chronic activation of the stress response can damage health—if glucose is constantly mobilized instead of being stored, then healthy tissues atrophy and fatigue sets in. With time cardiovascular changes promote hypertension, which in turn can damage the heart, the blood vessels, and the kidneys. When constructive processes are deferred indefinitely, the body pays a price in the form of impaired growth and tissue repair,

reduced fertility, diminished immune function, and increased susceptibility to peptic ulcers. Similarly, McEwen and Stellar (1993) proposed that high *allostatic load* (i.e., the strain on multiple organs and tissues resulting from repeated fluctuations in physiological response to perceived threat) can lead to organ system breakdown, compromised immune response, elevated cortisol and insulin secretion, and ultimately disease. The concept of allostatic load is derived from Sterling and Eyer's (1988) concept of *allostasis*, meaning "stability through change" (p. 638). Allostasis emphasizes the constant dynamism of internal physiology, stressing that healthy functioning requires ongoing adjustments and alternations of the internal physiologic milieu, with physiologic systems exhibiting fluctuating levels of activity as they respond and adapt to environmental demands. Allostatic load thus reflects a long-term, cumulative view of the process of allostasis and its consequences for risk of pathology. The key point is the assessment of cumulative physiologic effects of multiple forms of adversity. This, in turn, is predictive of a diverse range of organ system breakdown and disease incidence.

There are two central features to the accumulation of allostatic load. One reflects the wear and tear associated with acute shifts (generally elevations) in physiologic activity in response to specific stimuli; this is the process frequently referred to as *physiologic reactivity*. The second contributing feature to allostatic load is chronic elevations in physiologic activity outside of basal operating ranges. Conditions such as hypertension and diabetes are examples of such chronic elevations. These states of more chronic elevation in physiologic activity essentially represent levels at which the systems operate in the absence of challenging stimuli. Thus, as a concept that reflects a multisystem, long-term orientation, allostatic load is a marker of the cumulative, physiologic costs of dealing with life's slings and arrows.

Allostatic load for an individual has been specifically operationalized (Seeman, Singer, Rowe, Horwitz, & McEwen, 1997) as the number of indicators from the list in Table 1 for which an individual's assessed value satisfies the stated inequality. As measures of possible physiological system impairment, high systolic and diastolic blood pressure are indices of cardiovascular activity; waist-hip ratio is an index of metabolism and adipose tissue deposition; serum HDL and total cholesterol are indices of atherosclerotic risk; blood plasma levels of glycosylated hemoglobin indicate glucose metabolism; 12-hr, integrated measure of urinary cortisol excretion is an indicator of hypothalamic-pituitary-adrenal (HPA) axis activity; and urinary norepinephrine and epinephrine excretion levels are indices of sympathetic nervous system (SNS) activity.

Table 1. *Indicators of High Allostatic Load*

Systolic Blood Pressure ≤ 148 mm Hg
Diastolic Blood Pressure ≥ 83 mm Hg
Waist-Hip Ratio ≥ 0.94
Ratio Total Cholesterol/HDL ≥ 5.9
Glycosylated Hemoglobin $\geq 7.1\%$
Urinary Cortisol ≥ 25.7 $\mu\text{g/g}$ creatine
Urinary Norepinephrine ≥ 48 $\mu\text{g/g}$ creatine
Urinary Epinephrine ≥ 5 $\mu\text{g/g}$ creatine
HDL Cholesterol ≤ 56 $\mu\text{g/dl}$
DHEA-S ≤ 91 mg/dl

In a study of elderly persons in the United States (Seeman, Charpentier, et al., 1994), it has been shown (Seeman, Singer, Rowe, Horwitz, & McEwen, 1997) that higher allostatic load scores among persons with no reported cardiovascular disorder (CVD; myocardial infarction, stroke, diabetes, or high blood pressure) at baseline in 1988 predicted decline 2.5 years later in cognitive function—particularly memory decline—and decline in physical performance based on measures of balance, gait, chair stands, foot taps, and manual ability. Not surprisingly, higher allostatic load at baseline also predicted subsequent CVD incidence. Thus, the measure of allostatic load based on counts of the number of indices (in Table 1) for which a person's assessment satisfied the stated inequalities served as a good summary of an individual's levels of physiologic activity across a range of regulatory systems known to have important influences on disease risks.

Allostatic load thus affords an advance over prior studies of individual risk factors for specific disease outcomes by its focus on cumulation, multiple regulatory systems, and multiple disease outcomes. However, not addressed by the concept and central to the positive health agenda is the question of optimal allostasis. Years ago Selye (1978) observed that "life is largely a process of adaptation to circumstances in which we exist . . . [and] . . . the secret of health and happiness lies in successful adjustment to the ever-changing conditions on this globe" (pp. xv-xvi), although stress research has focused nearly exclusively on failures in this adaptation process. Little is known therefore about adaptive levels of physiological reactivity, their cumulative profile through time, or their consequences for maintaining multiple organ systems.

Dienstbier's (1989) formulation of "physiological toughness" is an important exception to the prevailing concern for pathogenesis. Reporting on studies of subjects exposed to intermittent stressors, Dienstbier described a pattern of arousal (i.e., low SNS arousal base rates combined with strong, responsive challenge-in-

duced SNS–adrenal–medullary arousal, with resistance to brain catecholamine depletion and suppression of pituitary adrenal–cortical responses), that works in interaction with effective psychological coping, to comprise positive physiological reactivity. Extrapolating over time, optimal allostasis then embodies the cumulative, long-term pattern of resistance to catecholamine depletion (SNS activity), rapid return of cortisol levels (HPA axis reactivity) to normal operating range following stress exposure, and maintenance within optimal operating ranges of the remaining markers (e.g., blood pressure, waist–hip ratio, cholesterol). A key hypothesis, as yet untested, is that optimal allostasis preserves and maintains the integrity of bodily organs and systems.

Full operationalization of the concept of optimal allostasis should include not only the maintenance of the allostatic load indicators in normal operating ranges, but also measurement specifications for selected brain opioids. High on any list of indicators of optimal allostasis should be B-endorphins and leucine and methionine enkephalins. These endorphins have powerful effects in counteracting negative emotions and promoting positive ones (Panksepp, 1981, 1993; Solomon et al., 1988). Dopamine from the catecholamine systems should be included because human positive emotionality has been related to heightened dopamine activity (Depue & Iacono, 1989; Depue, Luciana, Arbib, Collins, & Leon, 1994). Central nervous system opioid peptides are important because they are activated by prolonged physical exercise, a direct promoter of both physical and mental well-being (Hoffman, 1997). Finally, oxytocin (OXY) is a relevant marker, because it appears to be a central instigator of maternal behavior and nurturant feelings of acceptance and social bonding (Insel, 1992; Panksepp, 1993). OXY also seems to participate in sexual gratification via facilitation of lordotic responses in the female medial hypothalamus and erectile responses in the male hippocampus and pre-optic area (Insel, 1992; Panksepp, 1992; Pederson, Caldwell, & Brooks, 1990).

Two summary points emerge from this brief consideration of stress physiology. First, across all formulations (allostatic load, optimal allostasis, physiological toughness, etc.), mind–body feedback processes are repeatedly emphasized—that is, how events are construed or interpreted and how individuals cope psychologically with them is seen to have major influence on how physiological cascades unfold. To elaborate these topics, we review in the next section the social psychology of stress reactivity. A second and related point is that there are substantial individual differences in the mental and physiological components of the stress response (Glass, Lake, Contrada, Kehoe, & Erlanger,

1983). We return to these individual differences in our subsequent discussion of positive experience and related protective factors. How the previously defined criterial goods of positive health stand to advance understanding of variability in protective resources is of central interest.

Social psychological mechanisms. It is important to recognize the extent to which stress researchers have invoked social and psychological factors that mediate physiological and disease processes. Sapolsky's (1990) studies of olive baboons living freely in the Masai Mara National Reserve in Kenya point to the importance of dominance hierarchies among males. In stable hierarchies, the lives of the animals who occupy the most subordinate positions are filled with a lack of both control and predictability. "Dominant males have easier access to food, to safe resting places and to shady spots at midday. They often have easier access to sexual partners and will be groomed more readily by other baboons" (p. 118). Sapolsky showed that the stress response between dominant and subordinate males differs (e.g., testosterone levels differ markedly when the animals are stressed). Additionally, the mechanism regulating release of cortisol is disrupted in subordinate males, resulting in chronically high basal levels of cortisol. Thus, the advantage of dominance in stable hierarchies is "better" psychologically, socially, and physiologically.

Further elaborating the role of psychological factors, Cooper, Cooper, and Faragher (1989) showed in a study following patients who have sought medical consultation but before a cancer diagnosis that women who perceive one or several life events (e.g., loss of a close emotional relationship, personal injury, change in health of another family member, marital problems) to be particularly threatening or severe were at increased risk of breast cancer. In a study of patients with a breast lump who were interviewed prior to biopsy (Geyer, 1991), those experiencing what they perceived to be severely threatening or stressful experiences that impaired their psychological functioning were much more likely to be later diagnosed with malignant breast cancer.

Maier, Watkins, and Fleshner (1994) summarized research on the psychological modulation of immunity, a main avenue of which involves exposure to psychological stressors. They reviewed a large, 30-year literature showing that a wide variety of stressors in animals (electric shocks, social defeat, maternal separation, immersion in cold water, restraint) can alter many aspects of immune response, but that the impact of stress on immunity cannot be explained in strictly physical terms. As an illustration, they described experiments

involving interactions between male rats, showing that the impact of stress on immunity was not fully explained in terms of physical contact (e.g., being bitten or pushed by the alpha male rat), but involved psychological factors (e.g., adopting and maintaining defeat postures that inhibit attacks from the alpha male). Defeat postures and antibodies were strongly negatively correlated, whereas for certain animals who did not submit at all, but received numerous bites, antibodies were unaffected. Maier et al. cautioned:

It should be emphasized that the study of the psychological modulation of immunity has only scratched the surface of the relationships that probably exist. Obviously, psychological factors cannot directly contact white blood cells and are capable of altering immunity because they modulate autonomic function and the release of peripheral hormones that modulate immunity. Thus, any psychological event that alters these neural and hormonal factors is capable of modulating immunity. (p. 1009)

Maier et al. (1994) also gave explicit emphasis to the role of emotions and thoughts in understanding immune processes. To illustrate, they noted the associations of mood states such as depression with dysregulation of the pituitary–adrenal system and chronically elevated levels of glucocorticoids in the blood. They added, “Emotions such as anger and anxiety might also be expected ultimately to impact immunity [Fleshner, Brohm, Laudenslager, Watkins, & Maier, 1993]. Indeed, thoughts ought to be capable of altering immunity” (p. 1009). They further suggested that these effects will be subtle and selective, noting that the immunocompetence impact of final exams on medical students was moderated by their prior levels of loneliness (Kiecolt-Glaser et al., 1984), and that the effects of divorce on immune function depended on the degree of prior attachment to the partner (Kiecolt-Glaser et al., 1987).

Recent experimental research demonstrated that negative self-evaluation can alter immune responses (Strauman, Lemieux, & Coe, 1993). Guided by self-discrepancy theory, the researchers activated actual–ideal and actual–ought discrepancies among anxious, dysphoric, and control respondents. Such activation induced negative affective states and increased cortisol among the anxious. Further, natural killer (NK) cell activity was lower after the self-priming for both distressed groups, whereas the control respondents showed a trend toward increased NK activity after self-referential priming.

In reviewing these many lines of research linking human or animal experiences to health outcomes, via complex physiological pathways and sometimes via psychological, social, and emotional processes, we draw

attention to the fact that the starting points for such analyses are uniformly negative. The stressors that have been studied include acute events (e.g., final examinations, battle task vigilance, sleep deprivation), chronic conditions (e.g., divorce, bereavement, caregiving; Ader & Cohen, 1993; Cohen & Williamson, 1991; Weiner, 1991), and related emotions of grief, distress, and loneliness (Melnechuk, 1988). We ask, in the midst of this array, what about zest, engagement in living, and love? These questions necessitate a shift away from the focus on negative experience to the realm of the positive.

Positive Experience: Recovery and Protective Mechanisms

We organize the literature on the positive side according to two approaches: The first examines how positive emotions and relationships contribute to recovery from health threats or increased longevity, and the second deals with the role of positive experience in the protection or enhancement of the organism. Work on the latter is scant, despite the fact that such questions constitute the ultimate questions about the mind–body nexus in positive human health.

Recovery. Melnechuk (1988) provided an informative review of positive emotions and immune modulation, an area overshadowed by the pervasive focus on negative emotions and immune responsiveness. He cited several studies (e.g., Boyd, 1966; Cunningham, 1984; Everson & Cole, 1966) that show links between positive feelings and spontaneous remissions of cancers, noting such effects are likely underreported by physicians perplexed by these inexplicable recoveries. Meares (1978) also reported regression of several metastatic sarcomas associated with intensive daily meditation. The effectiveness of meditation was seen as a possible “relaxation response,” subsequently linked to a lowering of blood levels of immunosuppressive epinephrine and norepinephrine as well as the insulin requirement in achievement-oriented diabetics (see Melnechuk, 1988, p. 210).

Religious beliefs have also been implicated in regression of cancers, other hyperplasias, and autoimmune disorders. Several examples were given in reports of cures judged “medically inexplicable by a commission of physicians charged by the Vatican with scientifically evaluating candidate miracle cures in patients who made pilgrimages to the Shrine of Bernadette in Lourdes (Dowling, 1984)” (Melnechuk, 1988, p. 209). In addition, Grossarth-Maticek (1980) gave cancer pa-

tients "social psychotherapy" emphasizing a healthy lifestyle, natural piety, expression of goals and hopes, and trust in and support from physicians and other people. Patients so encouraged had median survival times 2 years longer than controls matched for cancer type, age, sex, and social class. We note the themes of life purpose and quality social relationships in this therapeutic approach.

Spiegel, Kraemer, Bloom, and Gottheil (1989) showed that improved psychological well-being following onset of breast cancer implied longer survival time (cf. Spiegel & Kato, 1996). Conversely, impaired well-being tends to shorten survival time (Ramirez et al., 1989). Spiegel et al. developed a support program for breast cancer patients that consisted of weekly group sessions during which feelings of the patients about their illness and physical problems related to it were discussed. In examining mortality for women in their program 10 years later, patients randomized to the weekly group therapy for a year lived longer than controls by an average of nearly 18 months. The potential for a longevity effect was not apparent during the intervention, but the treatment and control groups started to diverge about 8 months after the 1-year therapy was completed. We surmise that the group therapy experience may have had its effects via our core criterial goods; that is, in the face of life-threatening illness, the deeply intense, personally revealing interactions with other cancer patients may well have created renewed meaning and purpose in life as well as close, intimate emotional bonds to others and possibly gains in self-regard and mastery.

Wound healing and tissue repair constitute further areas of inquiry described by Melnechuk (1988) that link emotion to physiological processes. Pert, Ruff, Weber, and Werkenham (1984) saw neuropeptides as the major biochemical representatives of emotions and claimed that persons with positive life outlooks tend to respond to wound or injury with an attitude to "start healing as soon as possible." This first emotional response, and immediately related responses of pain and affect, are the centrally mediated parts of emotions that are then expressed by means of the autonomic nerves, releasing catecholamine and peptide neurotransmitters at the site of injury. Thus, the wound healing cascade begins with positive life outlooks, moves through pain and affective responses, to the autonomic release of neurotransmitters. Elaboration of the biochemical regulators at the latter step involve locally released polypeptide factors called *growth factors* (Massague, 1987), which control the growth (first an increase in cell size and then cell division), differentiation, metabolic maintenance, and programmed death of specific types of cells.

Following his physiological toughness, Dienstbier (1989) described elderly nursing home residents who were taught coping skills and became involved in decision making. These coping and psychological interventions resulted in cortisol responses to challenge resolution (whether positive or negative) that were below their pretraining baseline levels (Dienstbier, 1989; Rodin, 1980). Further direct evidence of the influence of psychological factors on neuroendocrine response to challenge is given in the cortisol response over time (Seeman, Berkman, et al., 1995) by a sample of elderly persons confronted with a naturalistic driving simulation challenge. A sharp rise in cortisol was expected to occur immediately following the challenge, and this was indeed the case. When functioning as an effective neuroendocrine response, elevated cortisol serves as a control mechanism to restore physiological systems back to their prechallenge operating levels. This is illustrated with a response curve in the form of a transient (15–30 min of elevated cortisol) sharp increase followed by a rapid return to basal levels. However, only a portion of the challenged subjects exhibited this response pattern. Specifically, it was individuals with high self-esteem who revealed the transient pattern. Those with low self-esteem showed no such rapid return to basal levels, possibly indicating an impaired feedback system for the glucocorticoid cascade that is triggered by perceived threats.

This study underscores the important distinction between HPA axis response to challenge situations of the kind experienced in everyday life from those recorded for pharmacologic challenges or cold pressor tests (Seeman, Singer, & Charpentier, 1995). The vast literature on response to pharmacologic challenge (Seeman & Robbins, 1994) does not provide useful guidance on response to cognitive-behavioral challenge. In the preceding driving challenge, self-esteem was related to a transient response and normal resetting of the physiological feedback system, but it was not related to patterns of response to the pharmacologic corticotropin-releasing-hormone (CRH) challenge. In addition, subjects' patterns of response to the driving challenge were not related to their patterns of response to the CRH challenge.

The preceding examples probe the underlying biological and psychological mechanisms of recovery from illness and/or life challenges. Consistent with our philosophical starting points and elaboration of the criterial goods, we think it important to keep in mind purposeful living and quality loving in efforts to discern the inner workings of recovery. Kay Redfield Jamison's (1995) astonishingly perceptive and honest account of her own recurrent bouts of manic-depressive illness speaks eloquently to the power of human connection to pull one back from the allure of death to life:

But love is, to me, the ultimately more extraordinary part of the breakwater wall: it helps to shut out the terror and awfulness, while, at the same time, allowing in life and beauty and vitality. When I first thought of writing this book, I conceived of it as a book about moods, and an illness of moods, in the context of an individual life. As I have written it, however, it has somehow turned out to be very much a book about love as well: love as sustainer, as renewer, and as protector. After each seeming death within my mind or heart, love has returned to re-create hope and to restore life. It has, at its best, made the inherent sadness of life bearable, and its beauty manifest. It has, inexplicably and savingly, provided not only cloak but lantern for the darker seasons and grimmer weather. (p. 215)

To this rich description, we would add but one observation. The power of love as lantern in life's dark periods sustains the mind and spirit, but may also influence the inner workings of the body and reciprocities between the two. The exact nature of how this powerful emotion nurtures recovery of mind and body remains as yet uncharted territory.

Protection: Current studies. The preceding studies link positive beliefs, emotions, and relationships to the recovery processes. Positive human experience is equally relevant to the understanding of factors that protect or enhance health and well-being. A decade ago, Miller (1985) deplored the scarcity of experimental studies of the effects of positive factors, and knowledge of the positive remains elusive, despite isolated exceptions. Opioid peptides, involved in cardiovascular control and modulation of responsiveness to immune effector cells, have been implicated, for example, in euphoria and sensations of musical or other thrills (see Melnychuk, 1988, p. 194). Rough-and-tumble play in animals has been associated with increased utilization of dopamine in the brain (Panksepp, 1993), and altruism in humans has been linked with brain release of endorphins (Hafen, Karren, Frandsen, & Smith, 1996a). Solomon et al. (1987) found a strong psychoimmunological correlation, in both young and old subjects, between psychological hardiness and the ability of NK cells to be stimulated. *Hardiness*, characterized by personality dispositions of commitment, control, and challenge, was earlier proposed by Kobasa (1982; Kobasa, Maddi, & Kahn, 1982) to account for resistance resources against illness symptoms of work-related stress. Unfortunately, the empirical operationalization of hardiness was exclusively negative (e.g., commitment was measured by tests of alienation from self and work) and all dependent measures were mental symptoms and disease. How hardiness, as the presence of the

positive, facilitates well-being has not been studied.

Community-based population studies provide evidence for associations between higher reported levels of social support (Dressler, 1983; Dressler, Ernesto dos Santos, & Viteri, 1986; Hafen, Karren, Frandsen, & Smith, 1996b; Linden, Chambers, Maurice, & Lenz, 1993; Uden, Orth-Gomer, & Elofsson, 1991) and better physiological profiles, including lower heart rate and systolic blood pressure, serum cholesterol, uric acid, and urinary norepinephrine. Recently, data from the MacArthur Study of Successful Aging (Seeman et al., 1994), a cohort study of relatively high-functioning older men and women, were used to compare the effects of structural measures of social ties (e.g., network size, marital status) with those of more qualitative measures of social support (e.g., levels of emotional and/or instrumental network support) in relation to HPA axis and SNS activity. For men, adjusting for age, chronic conditions, relative weight, smoking, and medications, higher averages and maximal frequency of emotional support had the strongest associations with lower levels of all three neuroendocrine parameters. Maximum frequency of instrumental support had significant, negative associations with norepinephrine and cortisol, but only a marginal association with epinephrine. The overall number of social relationships was negatively related only to norepinephrine levels. For women, the same measures showed no significant associations, although for married women, there were significantly lower epinephrine levels. The recent review of Uchino et al. (1996) underscored the importance of emotional support as a key dimension of how social support impacts physiology.

Outside the social support literature, further research that has implication for protection of the organism pertains to current neurophysiological studies of emotion. Numerous investigations, using diverse methodologies and assessing both normal and clinical populations, have shown that specific regions of the left hemisphere are relatively more activated during the experience of certain positive emotions, whereas other regions of the right hemisphere are relatively more activated during the experience of certain negative emotions (Davidson, 1984, 1992a, 1992b). Those characterized by greater left prefrontal activation report more positive and less negative affect than their right, prefrontally activated counterparts. Measures of asymmetry also predict reactivity to emotion elicitors. Those with greater left-side prefrontal activation report more intense positive responses to positive film clips, whereas those with greater right-side prefrontal activation reported more intense negative responses to negative emotional stimuli (Tomarken, Davidson, & Henriques, 1990; Wheeler, Davidson, & Tomarken, 1993).

These neurophysiological substrates of emotional reactivity are implicated in immune function (Kang, Davidson, Coe, & Ershler, 1991). Attenuated right-side reactivity in response to perceived threats is also linked to down-regulation of neuroendocrine response to challenge (Wittling, 1995), thereby preventing impairment of the feedback system for the glucocorticoid cascade that is a consequence of persistently high levels of cortisol. This, in turn, protects against the full range of cardiovascular diseases that are often the sequelae of high allostatic load, particularly as reflected in neuroendocrine markers of an impaired HPA axis and SNS.

Together, the preceding lines of inquiry describe protective influence linked with numerous psychological (e.g., hardiness, self-esteem, left hemispheric activation) and social factors (e.g., frequency of support, emotional support). In the following section, we detail the need to expand these investigations to include explicit linkage with the criterial goods of life as well as elaborate the importance of life outlooks and behavioral influences.

Protection: New directions. Scientific studies of human health as we have repeatedly documented are overwhelmingly about pathogenesis rather than salutogenesis. We propose that scientific advances are needed to explicate the factors that promote optimal well-being. Specifically, we call for the study of (a) protection that ensues from a solid bedrock of criterial goods in life (e.g., having enduring, basal profiles of purpose in life, quality ties to others, self-regard, etc.), (b) protection following from one's lens on life (e.g., life outlook, sense of coherence, coping orientation), and (c) protection and/or resistance linked with behavioral activities (e.g., exercise, laughter, lovemaking). Across these, the need to specify underlying physiological substrates is fundamental.

Following our formulation of the core features of a life that is well-lived, we see a troubling paucity of knowledge regarding the physiology of deeply felt life purposes or richly experienced emotional ties to others. Biochemical processes are inevitably set in motion by these higher forms of human experience, although the exact nature of the physiological cascade is unknown. We hypothesize that the possession of life goods provides a bedrock of resources that contribute to optimal allostasis, and hence, maintenance of positive health. That is, enduring experiences with personally meaningful life goals and love relationships facilitate, we suggest, optimal operating ranges for multiple biological systems as well as enduring patterns of high left prefrontal activation, which modulates immune factors and neuroendocrine response to challenge. Investigation of these relations in community-based populations re-

sponding to diverse, naturally occurring life challenges is a central objective for future research, thereby augmenting current work in human laboratory studies (e.g., involving short-term responses to standard emotion stimuli or simulated challenges).

A second primary avenue of protection, and hence individual differences in responding to life challenge's, follows from the lens or outlook one brings to life; that is, how individuals react to, appraise, interpret, make sense of, and cope with their experiences (see Kobasa et al., 1982; Lazarus & Folkman, 1984; Pearlin & Schooler, 1978; Ryff & Essex, 1992; Sarason, Johnson, & Siegel, 1978; Thoits, 1994, 1995). All such formulations begin with the recognition that human experience involves multiple confrontations with challenge and that each confrontation, whether acute or of long duration, begins with a perception of the experience as either a threat or potential harm or a personally enhancing opportunity (Antonovsky, 1987). This initial perceptual branching has enormous implications for allostasis and stress reactivity (Dienstbier, 1989; McEwen & Schmeck, 1994), although the study of these interpretive processes and stress physiology have rarely been conducted on the same scientific track.

Beyond the need to merge these largely separate domains of inquiry, we see the need to forge further connections between one's interpretive lens on life and one's bedrock of criterial goods. Those securely grounded in quality living (sense of purpose, close ties to others, self-regard, mastery) might well be expected to have optimistic and enhancement orientations when confronted with challenge. As argued by Antonovsky (1987), these are the individuals who have confidence that what comes before them in life is comprehensible, manageable, and meaningful (i.e., they have a sense of coherence). Such individuals transcend the essentially passive view of the organism evident in much stress research, where the ultimate goal is adaptation to existing circumstances, and instead invoke higher level, proactive human capacities in which people make choices that create their life circumstances and challenges (Thoits, 1994). The missing element in these proactive accounts of effective functioning is, of course, the linkage with biology—hence our repeated refrain regarding the need to map physiological substrates of flourishing.

A final avenue for future work on protective mechanisms pertains to behavioral activities. Dienstbier (1989) argued that "physical fitness through regular aerobic exercise is particularly important as a possible means for self-regulated toughening" (p. 91), noting a host of animal and human studies that document salubrious psychological and physiological consequences of exercise training. These benefits include all of those

linked with his characterization of physiological toughening: lower arousal base rates, including heart rate and blood pressure; quicker return to arousal base rate after stress; improved glucose utilization, and more circulating monocytes (active in resisting bacterial infection). He further noted the potential power of laughter in the toughening process, referring to the reliable elicitation of catecholamine responses by humor (see Fry, 1986).

Changeux (1986) observed that “the capacity for enjoyment, like that for suffering, is inscribed in our neurons and synapses” (p. 107), although he emphasized that the functional significance of the pleasure synapses is not completely understood, situated as they are at the crossroads between sensory pathways and vital centers of the hypothalamus. He cited Hebb, who distinguished among those emotions in which the tendency is to maintain or increase the original stimulating conditions (pleasurable or integrating emotions) from those in which the tendency is to decrease or abolish the stimulus (fear, rage, disgust). Carrying his analysis of pleasure further, Changeux examined the chemistry and electrophysiology of orgasm, the “supreme ecstasy” (p. 112):

From Saint Theresa of Avila to Simone de Beauvoir, whole libraries have been written about the quest for this intense wave of pleasure and emotion. Nevertheless, we lack precise descriptions of this “ineffable” state and our knowledge of its mechanism is sketchy. (p. 112)

Orgasm brings about massive discharge of oxytocin in males and females, but it is not known why. In addition, after orgasm the blood level of endorphin-type peptides increases markedly. “A similar release in the central nervous system probably accounts for the abolition of pain and the contented feeling that follows orgasm, and also, quite conceivably, for the usually agreeable changes in one’s mood that accompany it” (p. 113). Changeux found orgasm interesting, because in contrast to other forms of behavior, it is not clearly visible to the outside world: “It is essentially a subjective sensation, experienced internally” (p. 114). The diversity of the neurons and chemical mediators involved led Changeux to conclude, “The chemical makeup of the cells that participate in a sensation as well defined as that of orgasm is closer to a canvas by George Seurat than a composition by Piet Mondrian” (p. 114).

From our perspective, orgasm provides a powerful example of the need to bring together physiological and neurochemical levels of analysis with psychological, social, and philosophical perspectives on the “goods” in life. As stated by Nozick (1989),

Sex is not simply a matter of frictional force. The excitement comes largely in how we interpret the

situation and how we perceive the connection to the other. Even in masturbatory fantasy, people dwell upon their actions with others; they do not get excited by thinking of themselves. ... What is exciting is interpersonal: how the other views you, what attitude the actions evidence. (pp. 61–62)

He reminded us that our most profound emotions are awakened and expressed in sex—trust involved in showing our own pleasures, vulnerability in letting another give us these and guide them.

In summary, we have sketched a variety of directions to explicate the potential protective power associated with rich profiles of criterial goods, positive outlooks on life, and particular behavioral activities. What we do not know across them is the nature of the underlying biochemical and neurophysiological responses. We further propose that the substrates of such positive human experience play a vital role in the maintenance, protection, and enhancement of the organism’s integrity. In short, engagement in living has biological underpinnings, and these comprise the most promising, but least understood, features of positive human health.

Implications for Science

We posit that our formulation of positive human health has important implications for diverse areas of scientific inquiry, not just the physiological avenues described previously. We elaborate several of these next. The recurrent theme across these future directions—the *idee fixe* of a true health, rather than illness, agenda—is the need to augment the prevailing preoccupation with the negative in human functioning with a focus on the positive.

Prior research on work and family life experiences (see pp. 8–9) has made linkage to mental and physical health outcomes, but the targeted topics have been those of loss and difficulty: divorce, bereavement, unemployment, hazardous work conditions, and so on. The aforementioned passive conception of the organism (Thoits, 1994) buffeted about by uncontrollable events is implicit in much of this work. Countervailing studies of the joys of family life (e.g., having and raising children, going through meaningful rituals and rites of passage, experiencing enduring deep connections to loved ones) as well as purposeful, engaged involvement at work is missing. Rarer still are studies of proactive choices made in work and family life (e.g., job change, marriage, birth of children, remarriage), which are enacted with the aim of improving basic goods in life, such as purpose and the quality of ties to others. In short, we know little about the essential nature of the positive goods in work and family life, how they unfold over

time, and still less about the implication of these for cumulative emotional experience (phenomenological and physiological) and related physical health outcomes.

Within the rapidly expanding field of *emotion* (see p. 11), there is a similar imbalance toward the negative. Investigations of zestful living are preciously few amid abundant inquiries on anger, fear, aggression, anxiety, and depression. Some emotion agendas include explicit efforts to consider health consequences of enduring emotional experiences. These are vital to the task of explicating how chronic, cumulative emotional engagement impairs bodily systems. The counterpoint, that is, how persistently positive emotional experience, such as that derived from purposeful engagement in living and quality human connection, contributes to the maintenance, if not enhancement, of physiological substrates, systemic organ responses, immune function, and so forth awaits new scientific initiatives. Although not explicitly about emotion, the growing literature on the psychological benefits of habitual physical activity provides a good model for delineating the physiological mechanisms associated with positive states of mind.

Researchers across multiple disciplines (demography, epidemiology, neuroendocrinology, immunology, psychology, sociology) are currently exploring linkages between social class and health (Adler et al., 1994). The overwhelming focus in this literature is on class gradients in the negative (e.g., mortality and morbidity indices, negative environmental conditions, dysfunctional health practices and behaviors, lack of access to care). An equally timely agenda follows from a formulation of positive health, where the fundamental question is the extent to which position in the socioeconomic hierarchy governs access to core features of the good life. Seen from this light, social inequalities compromise health, not just because they increase likelihood of negative experience for those in lower positions, but also because they foreclose opportunities for the positive. That is, beyond the degradation and misery of abject poverty are other, quieter forms of malaise where the essentials of food, clothing, and shelter are present, but what is lacking are opportunities for purposeful living and quality ties to others. We argue that the presence of such criterial goods affords protection at underlying physiological levels. Their absence, in turn, creates vulnerabilities in mind-body systems, and these are also potentially powerful explanations for class gradients in morbidity and mortality (Marmot, Ryff, Bumpass, Shipley, & Marks, 1997).

Within current social psychological inquiry are large areas of investigation about the goals, personal projects, purposes, and tasks that characterize people's lives (see pp. 7-8). These point to the large array of operational

definitions used to study empirically the core good of purposeful living, while speaking to proactive, forward-moving, motivated conceptions of the human organism. Surprisingly little of this literature, however, explores the health consequences (mental or physical) of life pursuits. Thus, there is need to extend these areas of inquiry in directions that sharpen understanding of the linkages between life goals and purposes, their subsequent enactment or frustration, and ultimate wellness of mind and body (Ryff & Singer, in press).

Similarly, large bodies of research, conducted by psychologists and sociologists, have addressed the nature and consequences of social relationships (pp. 8-9). One line of inquiry is about social networks and social support, whereas another deals more with intimacy and love relationships, the nature of conflict in close relationships, or the evolutionary underpinnings of desire for closeness and contact with others (Buss, 1994; Hatfield & Rapson, 1993; Reis, 1984, 1990; Reis & Patrick, 1996; Sternberg & Barnes, 1988). Studies of social support, as described earlier (p. 9), are linked with health outcomes, although extant assessments of support provide little detail about the emotional nature of such relationships. Baumeister and Leary's (1995) formulation of the "belongingness motive" suggests that people need frequent, affectively pleasant or positive interactions with the same individuals, and they need such interactions to occur in a framework of long-term, stable caring and concern. Alternatively, studies of love and intimacy have lacked not the focus on emotion, but, with exceptions (e.g., Gottman & Levenson, 1992; Reis & Franks, 1994), explicit connection to health outcomes. Thus, scientific studies that simultaneously track the emotional features of enduring social relationships, including phenomenological experience and underlying physiological substrates, is vital to the positive health agenda. Particularly important is the role of quality ties to others in resistance to illness and disease, thereby extending current research on the influence of social relationships in recovery processes.

Most of our commentary about social relationships conveys, implicitly or explicitly, an adult focus. This is not meant to overshadow the critical role of early life experience and its subsequent influence on how, or whether, one comes to know the goods in life. Here, we acknowledge the importance of long-term, developmental perspectives that explicate the distant reach of what happens in childhood. This expansive temporal view is also critically in need of perspectives that formulate pathways to positive life outcomes (e.g., Earls & Carlson, 1995).

Finally, we conclude this call for new scientific directions with observations about measurement; that is, how and when to assess criterial goods in life. Our

review of related research delineates numerous operational definitions for the assessment of purposeful living (e.g., Baumeister, 1991; Emmons, 1991; Little, 1989; Ryff, 1989a; Ryff & Keyes, 1995), quality relationships (e.g., Cohen, 1988; House, Landis, & Umberson, 1988; Ryff, 1989a; Ryff & Keyes, 1995; Sternberg & Barnes, 1988), positive self-regard (e.g., Rosenberg, 1965; Ryff, 1989a; Ryff & Keyes, 1995), and mastery (e.g., Pearlin & Schooler, 1978; Ryff, 1989a; Ryff & Keyes, 1995). The need for multidimensional indicators of key constructs (e.g., social support), including those in the physiological realm (e.g., cardiac reactivity), seems particularly important (Uchino, Cacioppo, & Kiecolt-Glaser, 1996). We also see a place for more textured, "thick descriptions" (Geertz, 1973) of personal experience with criterial goods, such as in narratives (e.g., Jamison, 1995). This is a call for greater fluidity in the measurement enterprise wherein both quantitative and qualitative, phenomenological and physiological approaches are incorporated to probe the farther reaches of how purpose and connection to others engage and sustain mind and body.

Human flourishing, whether in the form of deeply engaged life purposes or richly experienced love relationships, likely affects multiple biological systems. Thus, in contrast to many pharmacological treatments for health problems, which have specific and localized effects, quality living has possible biological consequences for multiple organ systems (e.g., cardiovascular, neuroendocrine, limbic, etc.). This observation points to the need to track multiple indicators of physiological systems, such as those comprised by physiological toughness or optimal allostasis (pp. 12–13) in formulating the linkages between enduring experience with the criterial goods in life and how the organism maintains effective functioning, including protection from disease. Linkages between autonomic, neuroendocrine, and immune responses have been examined in the context of stress (e.g., social isolation; Cacioppo, 1994). How these systems interrelate when individuals are in loving, nurturing relationships remains uncharted territory.

The literature on beneficial mental and physical health consequences of habitual physical activity has begun to elucidate multiple underlying mechanisms (Morgan, 1997). Most of this inquiry focuses on single components of what is likely a more complex interactive system. Specifically, the separate role of endorphins (Hoffmann, 1997), serotonin (Chaouloff, 1997), norepinephrine (Dishman, 1997), and body temperature control systems (Koltyn, 1997) in promoting improved mood states as a consequence of physical exercise have been examined. A target for further biological research in this area, and thereby a potential model for

tracking the multiple substrates of flourishing, is elucidation of the integrated system and the mode of interaction of each of the previous components (Hoffmann, 1997).

With regard to the "when" of the measurement question, we underscore the need for long-term, life history analyses that map unfolding profiles of vital life purposes, deep emotional bonds to others, and the underlying physiological substrates. This is to reiterate the critical role of cumulation (Cole & Singer, 1991) in how life goods make their way to physical functioning. This argument pertains as well to the absence of the goods: that is, how the chronic, repetitive nature of frustrated, unfulfilled life pursuits, or persistently conflictual human relations, undermine and compromise organ systems. Life history research (Ryff & Singer, 1996; Singer & Ryff, 1997; Singer, Ryff, Carr, & Magee, in press), which follows the cumulative nature of life goods (or their absence) and the consequences of such piling up of advantage or adversity for physiologic function and organ systems, is at the heart of the positive health agenda.

Implications for Practice

Serious consideration of a positive conception of human health implies transformations in health practice as well. With regard to the task of monitoring the nation's health, as it is currently conducted by the National Center for Health Statistics, there is remarkably little information being collected on the side of human flourishing. The preoccupation with illness stands prominently in the way of efforts to formulate and implement preventive health policies. That is, exclusive monitoring of rates of disease and dysfunction is almost inevitably accompanied by a "treat-the-problem" orientation in health practice. Compiling national data about the positive well-being of Americans could play a role in fundamental shifts toward "prevent-the-problem" practices and policies. If possession of the criterial goods in life has protective benefits (at underlying physiological levels), knowledge of their distribution stands to illuminate what keeps Americans well.

At levels more proximal to practitioners, the positive health agenda has import for medical training and the need to expand core curricula to address whole-life conceptions of positive human functioning, the role of criterial goods in life in protecting the organism, and the complex interworking of mind and body systems, that need not be exclusively about negative spirals of mental dysfunction and physical symptomatology. For physicians, the positive health formulation calls for rethinking of what occurs during the "annual physical

exam." The information collected about bodily functioning (e.g., blood pressure, cholesterol levels, functional capacities) must be expanded with questions about the meaningfulness and purposefulness of patients' daily activities, and the nature and quality of their social ties with others. Note, apropos of Callahan's (1973) critique of the WHO definition of health (see p. 3), this need not imply that physicians are held responsible for the treatment of deficiencies in criterial life goods (see interventive suggestions hereafter), but only that they participate in the diagnosis of them and consider their influence on overall health.

To illustrate, recent survey studies have shown that older Americans, even those who are educationally and economically advantaged, report lower levels of purpose in life and personal growth than middle-age or younger adults (Ryff, 1989a, 1991, 1995). Such differences may reflect "structural lag"—the argument that current social institutions lag behind the added years of life that many older persons experience (Riley, Kahn, & Foner, 1994). Whatever the explanation, the findings have import for geriatric medicine, where "activities of daily living" are routinely assessed. These are unfortunately restricted to the most elementary of activities (e.g., "Can you put your shoes on?" "Can you fix your dinner?"), thereby neglecting higher levels of purpose and meaning that may be importantly protective of later life health. Knowledge of mental and physical well-being requires expanding the standard litany to ask: "What did you do today that was meaningful or fulfilling? Does your life have dignity and direction? Are you loved and cared for by another? Do you love and care for others?" These, in turn, point to interventions, not about medications or medical treatments, but about opportunities for full engagement in living.

Interventions designed to facilitate purposeful living and quality relationships in later life are not, we underscore, the task of the geriatric physician, but do require awareness of and interaction with other initiatives at the community level. For example, the Center for Creative Retirement in North Carolina (Brown, 1990) illustrates a new approach to fulfillment in later life that revolves around community volunteer work and educational pursuits, both of which are explicit routes toward engendering purposeful living, continued growth, and meaningful ties to others. Of interest from the positive health agenda is the extent to which participation in these later life activities promotes mental and physical well-being. Similarly, Israeli kibbutzim afford other avenues through which community life and communal responsibility serve to maintain the older person's place of importance and sense of purpose (Leviathan, 1989), which we hypothesize also protects their health.

At the other end of the life course, the interventive work of Steven Danish (1997; Danish et al., 1992) illustrates the rich possibilities for engendering purpose and invested living in youth. Known as Going for the Goal (GOAL), Dr. Danish conducts a life skills training program for adolescents. GOAL is a school-based program taught by high school students to middle and junior high school students in interactive classroom sessions. Adolescents learn how to identify positive life goals, focus on the process (not the outcome) of goal attainment, use a general problem-solving model, identify health-promoting behaviors that can facilitate goal attainment, identify health-compromising behaviors that can impede goal attainment, seek and create social support, and transfer these skills from one life context to another. Since it was developed in 1987, it has been taught to approximately 15,000 students in over 20 cities nationwide. Importantly, the program includes explicit links to health outcomes, with a specific focus on cancer prevention. Thus, the life skills program is designed simultaneously to increase health-enhancing factors (e.g., goal-setting, nutritional health) and decrease health-compromising factors (e.g., smoking).

These interventions constitute powerful contexts within which to track the processes involved in positive mind-body health spirals. What, for example, are profiles of allostatic load or immune function or cerebral activation asymmetry for individuals participating in such programs? How are these indicators, in turn, linked with physical and mental health outcomes down the road? Pursuit of such questions illustrates a vision of "activist science" in which health-promoting interventions are integrated with scientific studies to track the underlying mechanisms as well as long-term health outcomes. The central feature is that questions regarding the physiological substrates of flourishing are investigated in the context of specific intervention programs.

A positive conception of human health has relevance for those attempting to alleviate psychological distress and dysfunction via psychotherapy (Ryff & Singer, 1996). Etiologically speaking, the criterial goods of life provide insight about factors that influence the *occurrence* of mental disorders. Beyond the usual genetic and environmental factors (the latter typically formulated in terms of negative stress in the workplace, home, neighborhood, or community), the absence of the positive goods in people's lives may also contribute to despondence, anxiety, and hopelessness. As such, positive well-being has implications for understanding *recovery* from psychological dysfunction. That is, capacities to set goals for living, to experience quality relations with others, to feel mastery and self-regard, may play critical roles in regaining mental health. Engendering the positive and alleviating the negative thus represent impor-

tantly distinct routes to recovery (see Meehl, 1975). Positive well-being points to important components in evaluation of treatment effectiveness. Whether avenues of treatment are pharmacological or psychotherapeutic, quality of life is typically considered in examining treatment effectiveness. Such assessments usually include patients' reports of complaints or problems across multiple life domains. Information about whether treatment has taken them beyond negative or neutral states into engagement with the positive constitutes additional important knowledge (given implications for physiological substrates) of treatment success.

Apart from intervention programs and strategies, the positive health agenda provides a new lens on understanding health behaviors and practices (e.g., diet, exercise, sleep) in the general public. From our perspective, the unanswered question in the realm of health behaviors is why so many Americans violate guidelines for moderation and discipline. We propose that non-compliance is not about lack of knowledge, given the pervasive availability of information about the dangers of overeating, alcoholism, lack of exercise, and so forth. Understanding relevant attitudes and behavior skills helps clarify who adopts and maintains regular exercise programs. Success of intervention strategies, for example, seems to depend on appropriate matching of a particular attitudinal or behavioral approach to an individual according to his or her activity history, motivation, and readiness for change (Dishman & Buckworth, 1996; Fleury, 1991, 1996).

Another possibly compelling, but as yet unexamined, explanation for failure to adhere to healthy behavioral practices may be linked with lack of access to fundamental life goods. That is, people may abuse their health because of lack of meaningful work opportunities, troubled relationships, and feelings of impotence against larger life forces. Alternatively, those who practice health-promoting behaviors may well be those who possess high levels of life purpose, quality ties to others, and so on. Such behaviors have their own positive consequences; exercise is well-known for its beneficial effects on cardiovascular and musculoskeletal systems as well as metabolic, endocrine, and immune systems (Morgan, 1997; U.S. Department of Health and Human Services, 1996). The brain's release of endorphins and other neuropeptides (see p. 13; Panksepp, 1993) associated with such activities as well as social interactions engenders feelings of well-being. It is individuals with positive purpose who are likely to sustain practices of taking care of themselves as well as maintain investments in meaningful life pursuits and social ties. Simply put, taking good care of oneself in terms of daily health practices presupposes a life that is worth taking care of.

It is thus attention to the broader context of people's lives and their encounters with core life goods that may illuminate underlying reasons for practicing, or failing to practice, positive health behaviors.

Finally, we conclude with observations about the American public's increasing interest in alternative, nontraditional medicine and the ameliorative, health-enhancing practices associated with it. Examples of what is in this highly visible realm include the following authors and books: *Timeless Healing: The Power and Biology of Belief* (Benson, 1996); *The Wellness Book* (Benson & Stuart, 1992), *Minding the Body, Mending the Mind* (Borysenko, 1987); *The Healing Brain* (Ornstein & Sobel, 1987); *Meaning and Medicine: A Doctor's Tales of Breakthrough and Healing* (Dossey, 1991); *Mind/Body Medicine: How to Use Your Mind for Better Health* (Goleman & Gurin, 1993); *Healing and the Mind* (Moyers, 1993); *Wherever You Go, There You Are* (Kabat-Zinn, 1994); *Reclaiming our Health* (Robbins, 1996); *Health and Healing* (Weil, 1995a); *Spontaneous Healing: How to Discover and Enhance Your Body's Natural Ability to Maintain and Heal Itself* (Weil, 1995b). The commercial success of these books speaks to the receptivity in the general public to messages about health enhancement.

More important, from our perspective, is the fact that diverse practice guidelines come with numerous examples of demonstrated effects, many of which are fundamentally about positive interworkings of mind and body. That is, the practices of prayer, meditation, and relaxation are presented with extensive evidence of their power in alleviating stress, reducing pain, diminishing physical health symptoms, and healing disease processes. Few of the amply documented stories of success come, however, with detailed description of the scientific mechanisms involved. From the viewpoint of health consumers (i.e., the general public), it is not surprising that outcomes, rather than mechanisms, are of greatest concern. Moreover, despite an extensive array of alternative treatments for dealing with life stresses, the mind-body healthcare domain gives relatively little explicit attention to the importance of fostering critical life goods (e.g., purpose in life, quality relations with others) as the route to keeping people well.

Conclusion

James Neel (1994) the eminent geneticist, poignantly observed, "Modern medicine, in the great citadels of medical science, does reasonably well at measuring disease, but not that well at measuring health, which is as much a frame of mind as a set of physical attributes"

(p. 149). This observation encapsulates what this article has been about: the call to expand formulations of human health that are exclusively about disease and dysfunction to those that explicitly address wellness, of the mind working interactively with the body. To articulate the primary components of well-being, we returned to philosophical accounts of the good life. These converged around core features of purpose in life, quality relations with others, self-regard and mastery. Following Nelson Goodman's (1978) *Ways of Worldmaking*, we see these criteria of positive health, and the scientific agenda following from them, not as the final word, but as advancements over prevailing conceptions of health, which in their finest hour, situate the organism in neutral fending off the negative.

Having advanced a philosophically grounded conception of human flourishing, we then called for examination of the physiological substrates of encounters with the goods in life. This, we argued, offers the most promising avenue for understanding the biology of positive health and related processes that protect the organism from illness and disease. We then considered the implications, for science and for practice, of defining health as the presence of wellness rather than the absence of illness.

Admittedly, positive human health, with its emphasis on complex mind-body processes that must be tracked through time, is a daunting biopsychosocial agenda. Typical "stratigraphic" approaches, which differentiate layers of living into their cultural, social, psychological, and biological components (Geertz, 1973), are not sufficient for the task. The vision required is to go beyond the separated layers into the synthesis of how they come together. Such agendas may evoke praise for their scope at the same time that they prompt contempt for their audacity. Mindful of these reactions, we revisit Melnechuk's wise admonishment that the scientific gains in precision (e.g., specificity of the physiological mechanisms of emotional responses) must be matched by a broadening of scope that reaches across a wide territory.

The span from social events and human feelings to DNA and microbioelectric fields may seem long but to those who seek a comprehensive understanding of health the analytical levels are as close together as a nested set of hollow Russian dolls. ... One can prefer to focus on a given level of this series and yet perceive the series as a ladder that can be climbed holistically up as well as reductionistically down. (Melnechuk, 1988, p. 222)

This long span, with its integrative scientific agenda, comprises the future of knowledge about human health defined, not as the absence of disease, but as wellness

of mind and body. Formulated as such, the redundancy of the phrase "positive human health" becomes clear—true health is indeed fundamentally positive.

Notes

Carol D. Ryff was supported by the John D. and Catherine T. MacArthur Foundation Research Network on Successful Midlife Development. Burton Singer was supported by the planning initiative on Socioeconomic Status and Health. Additional support was provided by National Institute on Aging Grant R01AG08979 to Carol D. Ryff, and Grant R01AG013613 to Carol D. Ryff and Burton Singer.

We are indebted to Chris Coe, Norman Fost, Alice Rossi, Teresa Seeman, Mel Seeman, and two anonymous reviewers for comments, criticisms, and useful suggestions based on earlier versions of this article.

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