

**ECOLOGY OF CHILD WELL-BEING:
ADVANCING THE SCIENCE AND THE
SCIENCE-PRACTICE LINK**

Ecology Working Group¹

¹Enabled by support provided by the Center for Child Well-Being (CCW), this report was developed over a period of several months as a group of 18 scientists became engaged in discussions facilitated by computer technology and face-to-face meetings. The goal of the group was to (1) specify the features of individual development, environments, social relationships, and services that promote and sustain well-being; and (2) recommend priorities for science and practice that advance child well-being. The group, labeled the Ecology Working Group (EWG), was composed of: Arlene Andrews; Asher Ben-Arieh; Maya Carlson; William Damon; Carol Dweck; Felton Earls (Chair); Cynthia Garcia Coll; Robert Gold; Neal Halfon; Roger Hart; Richard M. Lerner; Bruce McEwen; Michael Meaney; Dan Offord; Donald Patrick; Madga Peck; Barbara Trickett; Thomas Weisner; and Barry Zuckerman. The writing team associated with this report was composed of Earls, Carlson, Peck, Trickett, and Lerner.

EXECUTIVE SUMMARY

The concept of child well-being spans multiple disciplines and professions. The concept connotes healthy and successful individual functioning, positive social relationships, and a social ecology that provides safety, human and civil rights, social justice, and participation in civil society. These dimensions of child well-being vary developmentally, culturally, and historically and, within the United States, across socioeconomic status, class, ethnicity, and religion.

Discussion of child well-being may be directed to delineating its specific attributes and/or to analyzing the basic physiological, psychological, social, and broader ecological (e.g., economic, public policy, historical) processes involved in the development and regulation of child well-being. The Ecology Working Group (EWG) took as its goal an attempt to make progress in regard to understanding the nature of and the systemic relationships among these basic processes. Given this goal, a key question becomes “What are the features of individual development, environments, relationships, and services that foster and sustain child well-being?”

To address this scientific challenge, the EWG pursued its tasks (and has organized this report) around four foci: 1. Issues related to theory and methodology from an ecological perspective; 2. Key areas of remaining scholarly controversy and practical constraint as they relate to advancing the science and practice, respectively, of child well-being; 3. Exemplary programs that reflect in varying ways the principles of best practice derived from good science; and 4. Recommendations for science development and for the possible role of the CCW in such development. Appendix 1 presents brief biographical profiles of members of the EWG.

In regard theory and method, the EWG concluded that the understanding and enhancement of child well-being involves understanding of the multiple levels of organization involved in the ecology of human development and how these levels are dynamically, reciprocally related. The integrated action of these multiple levels of influence may be understood through the use of models associated with dynamic, developmental systems theory. The status of and changes in the complex, reciprocal relationships involved in child well-being may be framed by instances of such theory, for example, by the life course health development model.

In regard to physiological contributions to child well-being, the Report discusses the presence of nature-nurture interactions throughout life, the protective and damaging effects of stress mediators, the effects of stress and life style on well-being, and the concept of resilience. This discussion underscores the association between biological and contextual processes, points to the relevance of this dynamism for both research and application, and emphasizes the role of the individual’s own actions in linking biology and context within the developmental system. As such, the discussion of physiological contributions to well-being is linked conceptually and empirically to an appraisal of the

ways in which individual action is involved in the dynamic interactions within the developmental system.

The discussion of individual action involves a consideration of the links between motivation and child well-being and, as well, between the prototypic patterns of behavior children manifest (for example, in regard to routines, habits, and culturally-mediated behaviors involving mores and customs). In turn, the Report discusses the association between individual behavior and the spatial, physical, and social ecology of child well-being and, as such, between levels or organization involving cultural, historical, and physical ecological influences on the positive development of children.

If the developmental systems perspective is to be used to frame the advancement and integration of science and practice pertinent to child well-being, then scholars and practitioners will need to collaboratively act to bridge gaps between knowledge and practice, practice and policy making, and data and policy making. To span these bridges, scholar-practitioner partnerships must promote the shared ownership of research and evaluation data, must build shared capacity for the effective use of data, and must assure that local communities have the resources to be, and are responsible for being, accountable for child well-being. Critically, if social justice and civil society are to be promoted in America, then these collaborations must involve the diverse individuals and families of the nation.

Numerous exemplary programs illustrate the ideas of science and application forward in this report. Several of these programs are described. These examples illustrate the broad-based, community coalitions that, from a developmental systems perspective are seen as essential for program and policy actions to be effective in enhancing child well-being. In addition, the presentation of these examples of “best practice,” community-based actions, and the discussion of the theory and research associated with the developmental systems model within which these programs are presented, enable several key points about child well-being to be summarized:

- Most generally, scientists need to develop further the conceptual and empirical bases of dynamic, developmental systems models pertinent to child well-being, such as the life course health development model.
- To further the understanding and use for application of such models, scientists need to investigate further the physiological processes underlying child well-being; the connection between animal models of well-being and intervention models for human infants, children, and adolescents; and the physiological bases and sequelae of interventions into child well-being.
- Critical here, and in respect to all scientific and practice ideas forwarded by the EWG, is the need to develop measures that are appropriate to index change (1) at all of the levels of organization comprising the developmental system and, as well, (2) sensitive to variation across age, race, ethnicity, socioeconomic status, religious, cultural, and historical categories.

- At the individual levels of organization, greater understanding is needed of child motivation and of strategies for action used by young people. For example, how are goals selected and what means are used to pursue these goals? How do children compensate for failure to reach goals?
- Actions involving ecologically prototypic behaviors (routines, habits, mores, and customs) are important to understand in order to appreciate the normative patterns of functioning that may moderate well-being.
- The physical and geographical place of development plays an important role in cognitive, emotional, and personal development. Accordingly, the natural and designed physical ecology needs to be better understood, both as a context within which behaviors associated with well-being are enacted and as a dynamic relational influence on well-being.
- More longitudinal research is needed to understand how the social ecology as well as the physical ecology promote child well-being. The Project on Human Development in Chicago Neighborhoods is an exemplary instance of such research because it underscores the efficacy of the social collective in promoting positive child and adolescent well-being.
- Child participation in culturally important activities imbues young people with senses of belonging to, and having the capacity to engage positively, their social ecology. Study of such engaged children supplements understanding of the bases and implications for well-being of children's prototypic behavior patterns and use of time more generally.
- From a developmental systems perspective it is necessary, in order to appropriately integrate science and practice pertinent to the promotion of collaborative research/evaluation and application activities, to collaboratively involve scholars, practitioners, policy makers, and child, adolescent, and adult community members. Such partnerships should help bridge gaps between knowledge and practice and, as well, between practice and the formulation of policy.
- Such collaborations will have this integrative function by giving all partners shared ownership of data. Moreover, through the collaborative involvement of researchers in the design and implementation of research and evaluation, these partnerships will inculcate a greater capacity for all partners to understand and use the data associated with these collaborations.
- In addition, child, parent, and participation in such collaborations will enhance the likelihood of local responsibility and accountability.

- In order for social justice and civil society to exist in America, it is crucial that these research-application collaborations include the breadth of the diverse children, families, and communities in the nation.
- Exemplary programs may involve innovative means of enhancing the development of features of child well-being. For instance, such programs may involve a group of professionals (e.g., pediatricians) in the development of outcomes (e.g., literacy) not ordinarily associated with their practice. In turn, such programs may involve devising a “youth charter” to engage a community in promoting child participation in athletics in a manner that stresses both the health and the social collaborative aspects of sports. In turn, such programs may involve working with municipal leaders to identify and marshal community capacity to deliver the individual and ecological assets needed to enhance child well-being. In addition, such programs may involve building community coalitions to improve the early life development of children.
- Innovative collaborations such as those noted above involve partnerships across disciplines and professions, and underscore the point that the developmental systems approach to programs and policies involve integrations across sectors of youth-serving community. Contributions from all stakeholders in the lives of children need to be integrated to design, implement, bring to scale, and sustain programs effective in enhancing child well-being.
- Given the strengths that universities and their faculties can bring to these collaborations—for example, in regard to research/evaluation-application partnerships, it is important to promote engagement by higher education in child well-being.

Given the potential power of the perspective embraced by the EWG, represented by the above points, group members believe that several actions are appropriate for the CCW to consider. These recommendations for action are:

1. Devote resources to the continued development of the conceptual and empirical bases of dynamic, developmental systems models pertinent to child well-being.
2. Conduct further investigations of the physiological processes underlying child well-being; the connection between animal models of well-being and intervention models for human infants, children, and adolescents; and the physiological bases and sequelae of interventions into child well-being.
3. Devote resources to the development of measures that are appropriate to index change (1) at all of the levels of organization comprising the developmental system and, as well, (2) sensitive to variation across age, race, ethnicity, socioeconomic status, religious, cultural, and historical categories. For instance, establish indicators of well-being that promote understanding at the community level and, as well, that can be used at state and national levels to promote effective policies and programs and new norms about children in their natural social networks.

4. Facilitate research that addresses child motivation, child strategies for action, and the identification of how children select goals, devise means to pursue these goals, and compensate for failure to reach goals.
5. Facilitate research that appraises the actions of children involving ecologically prototypic behaviors (routines, habits, mores, and customs) and their link to child well-being.
6. Facilitate research that assesses the natural and designed physical ecology. Determine how these settings serve as contexts within which behaviors associated with well-being are enacted and as dynamic relational influences on well-being.
7. Encourage more longitudinal research about the social ecology as well as the physical ecology promote child well-being. Use the Project on Human Development in Chicago Neighborhoods as a template for facilitating new research.
8. Given the significance for child well-being of child participation in culturally important activities, facilitate research that assesses such engaged children.
9. Given the need to integrate science and practice pertinent to the promotion of collaborative research/evaluation and application activities, promote the involvement of scholars, practitioners, policy makers, and child, adolescent, and adult community members in partnerships that help the bridge gaps between knowledge and practice and practice and the formulation of policy.
10. To pursue this goal, seek collaborations with other national, state, and local organizations that work to marshal the strengths, or assets, of communities in the service of the promotion of positive youth development. For instance, given the comparable national agenda of Search Institute (SI) and CCW for building community collaboration around developmental assets pertinent to child well-being, CCW should explore establishing a collaboration with that advances each organization's goals in regard to the enhancement of well-being among children and adolescents in America. Similar collaborations might be explored with the American branch of the International Youth Foundation and with the newly organized Society for the Study of Human Development.
11. Insure that these research-application collaborations reflect the breadth of the diverse children, families, and communities in the nation.
12. Given the exemplars that exist of innovative programs promoting child well-being, and that such programs involve building broad-based community coalitions, develop and catalyze a model of community collaboration that assures contributions from all stakeholders in the lives of children in regard to the design, implementation, bringing to scale, and sustaining of programs effective in enhancing child well-being.

13. Given the strengths that universities and their faculties can bring to these collaborations, promote engagement by higher education in child well-being. Consistent with the ideas forwarded above by the EWG, the group believes that there are several ideas for action that should be considered by the CCW. These ideas have scientific, practice-oriented, and community-collaborative features.

CONCLUSIONS

Using these recommendations as a frame for integrated research, evaluation, and dissemination efforts, CCW could catalyze an historically unprecedented collaboration among scholars, practitioners, and policy makers. This collaboration would function to apply developmental science in a manner that will invaluablely extend the ability of our nation to understand the bases of child well-being across the diversity of our nation, *and* to use this understanding in community-based programs and in policies to enhance these bases. In contributing to building a ubiquitous community basis for the positive development of America's youth through these and other instances of the application of developmental science, the integrated basic and applied scholarship promoted by the CCW would help create in America a sustained process for the enhancement of child and adolescent development and, as a result, civil society in our nation.

INTRODUCTION

The concept of child well-being is inherently one that spans multiple disciplines and professions. The concept connotes healthy and successful individual functioning (involving physiological, psychological, and behavioral levels of organization), positive social relationships (with family members, peers, adult caregivers, and community and societal institutions, for instance, schools and faith and civic organizations), and a social ecology that provides safety (e.g., freedom from interpersonal violence, war, and crime), human and civil rights, social justice, and participation in civil society. These dimensions of child well-being vary developmentally, culturally, and historically and, within the United States, across socioeconomic status, class, ethnicity, and religion.

Given the multiple levels of organization and individual and social/cultural systems of influence involved in the well-being of children, users of the term should be clear about whether they are speaking of one, several, or all portions of the system of influences on and/or the attributes of well-being. Such discussion may be directed to delineating the specific attributes of child well-being and/or to analyzing the basic physiological, psychological, social, and broader ecological (e.g., economic, public policy, historical) processes involved in the development and regulation of child well-being.

The Ecology Working Group (EWG) took as its goal an attempt to make progress in regard to understanding the nature of these basic processes. Given this goal, a key question becomes “What are the features of individual development, environments, relationships, and services that foster and sustain well-being?” The essential scientific challenge involved in this question is to increase understanding of the reciprocal influences between person and environment that support the achievement of well-being, to specify possible or existing instances of these reciprocal relationships (for example, through identifying programs that represent “best practice” in the development or regulation of well-being), and improving methods of measuring these relationships (and evaluating these programs) across time (longitudinally, historically).

To address this scientific challenge, the EWG pursued its tasks (and has organized this report) around four foci:

- 1. Issues related to theory and methodology from an ecological perspective.** Here the group considered the conceptual frameworks useful for understanding the multiple levels of organization involved in well-being and the empirical methods available or needed to elucidate the systematic interrelation of these levels. Consensus was reached in regard to the use of a developmental systems theoretical perspective, a model linking the individual reciprocally with all levels of his or her biological through sociocultural and historical context.
- 2. Key areas of remaining scholarly controversy and practical constraint as they relate to advancing the science and practice, respectively, of child well-being.** All theoretical and methodological issues pertinent to using a developmental systems model

to advance the scientific study of child well-being have not been settled. In turn, even when scientific consensus exists in regard to particular issues pertinent to theory and method, there remain challenges to translating good science into best practice. Whereas the EWG developed consensus regarding the theoretical approach that seems most useful to advance science at this point in time, the group discussed some challenges to its preferred approach and to using it as a practical frame for application.

3. Exemplary programs that reflect in varying ways the principles of best practice derived from good science. Despite the scientific challenges that remain in the scientific and applied use of a developmental systems perspective, the EWG was able to identify some programs that exemplify the link between science and practice envisioned by the group.

4. Recommendations for science development and for the possible role of the CCW in such development. The EWG drew conclusions about the status of the science, the translation of science into best practice, and the character of practice per se. In addition, the group formulated ideas for ways in which the domains of activity pertinent to child well-being could be enhanced by strengthening scientific activities. CCW may want to play a role in developing and advancing these new scientific activities.

Finally, the report also presents, in Appendix 1, brief biographical profiles of members of the EWG.

CHILD WELL-BEING:

THEORY AND METHODOLOGY FROM AN ECOLOGICAL PERSPECTIVE

The understanding and enhancement of child well-being is not the province of any one discipline or profession. We believe that the positive development of children and adolescents derives from the integrated contributions of variables and processes associated with the multiple levels of organization comprising the ecology of human development (Bronfenbrenner, 1979, in press; Bronfenbrenner & Morris, 1998). Accordingly, science and practice pertinent to child well-being must seek to integrate scholarship associated with research and application that encompasses the organization of the physical and social environment, motivation and personal efficacy, biological systems that regulate behavior, and the particular ways individuals engage themselves in their settings.

The integrated action of these multiple levels of influence may be understood through the use of models associated with dynamic, developmental systems theory (e.g., Ford & Lerner & 1992; Thelen & Smith, 1998). For instance, over childhood and adolescence development involves interdependent changes in physiological, psychological, behavioral, and social functioning; these functions are moderated by the nature of the community, economic, political, cultural, and physical ecological characteristics of the settings within which children lives. The status of and changes in these complex, reciprocal relationships may be framed by instances of such theory, for example, as

discussed below, the life course health development model. As illustrated by this model, several levels of organization must be treated to have a comprehensive and generative approach to child-well being, one that merits investments aimed at further refinement and testing.

Dynamic Developmental Systems Theory

A dynamic, developmental systems theory affords understanding of the parameters of plasticity in human development across the life span (Lerner, 1998). As illustrated by the research of several scientists who frame their work with such a theory (e.g., Baltes, Lindenberger, & Staudinger, 1998; Fischer & Bidell, 1998; Magnusson, 1999a, 1999b; Sameroff, 1983; Thelen & Smith, 1998), this approach involves testing models of person-context relations that attempt to identify the individual and ecological variables associated with the promotion of positive outcomes in human development. This approach brings together the relevant features of environments with the physiological and motivational bases of behavioral development. Exhibit 1 provides an illustration of such a developmental systems model.

In essence, then, using this theoretical and empirical work as an overall architecture for understanding human development and for applying such knowledge in order to promote positive child and adolescent development, developmental systems theorists/researchers seek to find ways to conduct developmental science in real world settings (e.g., in communities, in collaboration with community-based organizations). Their scholarship attempts to understand the character of the developmental process by testing ideas about how specific relations between young people and their ecology may promote healthy behavior and, over time, enhance their life chances.

Accordingly, from the perspective used in such scholarship, there is a blurring of the distinction between basic and applied research. If the basic process in human development involves relationships between the individual and his or her actual ecology, then by using theory to design tests of whether particular combinations of people and setting results in improved (healthier, more positive) developmental trajectories, one is both doing research on basic process and, simultaneously, evaluating applications pertinent to improving well-being (Lerner, 1995, in press-a, in press-b). When embedded in the actual ecology of human development, theoretically predicated changes in the relationships between individuals and settings represent, depending on the level of organization at which they are focused, community-based program or social policies (Lerner, in press-a). Evaluations of such programs and policies provides, then, both a test of theory and an appraisal of the efficacy of intervention. In this way, developmental science associated with a developmental systems perspective is used as a frame both for doing scholarship and for promoting positive developmental outcomes in young people (Lerner, in press-a, in press-b).

As such, the developmental systems perspective has been used to integrate the context on behalf of the promotion of positive child and adolescent development. For instance, developmental systems theory has been used as a rationale for trying to get all institutions

in the child's ecology (e.g., schools, government, faith institutions, youth organizations, social service agencies, and businesses) to integrate, to collaborate or partner, to promote positive development. If the relations in the developmental system are the bases of human development, then it may be feasible to promote positive development by having individuals and institutions within the system act integratively (collaboratively), to combine their strengths (assets) to enhance the lives of youth.

Accordingly, it is possible to simultaneously and integratively advance the science of child well-being and community-based activities designed to promote child well-being, for example, partnerships and collaborations among child- and youth-serving organizations in the service of initiating, bringing to scale, or sustaining programs and policies effective in enhancing the lives of children. A model that seeks to advance the syntheses suggested by a developmental systems perspective is the life course health development model.

Life Course Health Development Model

Proponents of the life course health development model (e.g., Halfon, Sutherland, Inkelas 1999) work to integrate information on developmental trajectories derived from biological and social science. The purpose of this integration is to advance research and policy in the direction of devising an effective strategy of investing societal resources in the well-being of children.

The "developmental trajectory" represents the growing functional capacity of the child across time. The concept of a developmental trajectory explains how risk factors that children and their families experience can affect the child's developmental course over time. It also is an explicit representation of how experiences in childhood translate into adult health status and health outcomes. The upward slope of this trajectory determines the ultimate level of adult functional status (Halfon, et al., 1999). The area under the developmental trajectory curve can be considered as "health capital" (Grossman 1972), using the analogy of a production function for human capital (Thurow, 1970).

The developmental trajectory construct is presented in Exhibit 2. This exhibit illustrates how the initial health endowment, health risk factors, and exposure to health promotion and risk reduction interventions interact to affect the developmental course in childhood. The exhibit also represents how these factors taken together affect the health "status" of an adult, and how the interactions affect risk of disease in adulthood as well as risk for, timing of, and rate of health status deterioration. A critical implication of this illustration is that the height and slope of the trajectory at any point in time is the interactive product of risk and protective factors, risk reduction interventions, health promotion interventions, and the child's initial health "endowment".

Risk factors, such as low birth weight, lead exposure in early childhood, poor parenting, and exposure to neighborhood violence can be characterized as potential sources of downward pressure on the developmental trajectory. *Risk reduction* activities help to minimize the effect of present risk factors on the health development trajectory.

Examples are the provision of home visiting nurses and other intensive prenatal interventions to reduce the likelihood of prematurity among high risk individuals, timely provision of immunizations to prevent infectious disease in young children, lead screening to detect and remove harmful environmental exposures, and community resources to support families at risk for violence and/or neglect.

A risk factor also can be conceptualized as the absence of a “*protective factor*,” such as family social support, individual resiliency, and parental attachment. *Health promotion* refers to services provided to children and families that create an upward pressure on the developmental trajectory. These include appropriate nutrition to promote optimal physical development, early literacy and language development supports to promote optimal cognitive development and educational attainment and the support of nurturing parenting styles and skills to promote optimal social-emotional development. Many other interventions are designed to optimize development and maximize developmental trajectories across the life-course.

As shown in Exhibit 2, each trajectory is associated with significantly different functional expectancies. As illustrated there are potentially varying slopes and heights of the developmental trajectory curves. Children following each of these different trajectories would need different levels and types of care, are differentially amenable to prevention and promotion strategies, and are likely to incur different levels of health care costs and to have different earning and productivity potentials over their life-course. While difficult to quantify given the complexity and range of factors, for theoretical purposes it is useful to think of the health determinants and the health interventions as influencing the probabilities of specific health outcomes and levels of functional status at later stages of the trajectory, into adolescence, and throughout adulthood.

Numerous studies support the concept of health development as a process derived from the reciprocal relations within the developmental system and provide evidence that childhood, with its great “reservoir” of biopsychosocial plasticity, presents a unique opportunity to influence the trajectory of human development and to prevent adverse health outcomes in adulthood (e.g., see Baltes, 1997; Lerner, 1984, in press-a; Magnusson, 199a, 199b). Physiological, social, and environmental factors have been found to have a lasting impact upon development during childhood (Eisenberg, 1999; Hertzman, 1994; Magnusson, 1997; Meisels & Shonkoff, 1990; Sameroff, 1990). Moreover, the links between biological, psychological, and social insults during childhood and adult disease, disability, and death are increasingly well-established (Kuh & Benschlomo, 1997; Barker, 1993). At the same time, intervention studies demonstrate the efficacy of targeted interventions in childhood for moderating certain risks and protective factors to achieve better short-term and long-term outcomes (Károly, et al., 1997; Meisels & Shonkoff, 1990).

It is worth noting that while health development occurs at the individual (child) level, the social implications extend beyond the individual. These social implications are evident from aggregating the experiences of all individuals in the population. However, the compounded and cumulative impact of individual risk and protective factors, and health

interventions, determine more than developmental trajectories of individual children and the aggregation at the population level. The combined trajectories of populations of children may also produce an environment that exerts its own influence on children's health development. This concept of a "population health developmental trajectory" has important consequences for entire cohorts of children as they make their way to adulthood.

Relevance of the developmental trajectory to health production

In general, the minimization of risk factors, taken together with health promotion, can elevate a child's developmental trajectory and thereby promote positive long-term health outcomes. This is the most important implication of the "health development" concept for how health care is organized and financed for children. As a product of risk and protective factors, interventions, and initial endowment, the developmental trajectory is the core component of a health development framework that highlights the relevance of health determinants and health care services for both child and future adult health.

This depiction of the trajectory of human development from childhood to adulthood suggests a basic approach to how clinical interventions can be used to produce better health outcomes at the individual level, and to make a difference in health status at the population level. What are the factors in the health system that determine how extensively clinical prevention and health promotion are used to influence health outcomes? By identifying these factors it is possible to identify those specific policy levers (defined broadly to include public policies, private sector policies, and financial mechanisms) that have the potential to stimulate greater production of health capital.

In sum, the life course health development model draws from multiple disciplines and multiple professions information pertinent to child well-being and integrates this knowledge in a manner that suggests potentially fruitful avenues for applied research. Given, then, the potential use of this instance of developmental systems thinking, it is important to understand more precisely the character of the several levels of organization integrated in the model. We consider first the contributions of biological systems to the dynamic ecology of child and adolescent development.

PHYSIOLOGICAL CONTRIBUTIONS TO CHILD WELL-BEING

EWG Member Bruce McEwen suggests that there are four areas of biological research that illustrate the role of physiological functioning in the developmental system promoting child well-being. They are:

Nature-nurture interactions throughout the life course

Genes are continually subject to influences of the internal and external environment over the entire life-span, and the old nature-nurture dilemma has disappeared in favor of the study of how genes are regulated. Hormones and neurotransmitters, including cytokines and chemokines of the immune system, mediate environmental influences on the

expression of genes throughout the life course. Early events can have life-long influences on later physiology. Two examples: sex differences in brain and body function; effects of maternal care and early life stress on emotionality and stress physiology.

Protective and damaging effects of stress mediators

The physiological responses to acute stress are generally protective and adaptive, whereas the over-activity of these systems or their inefficient use (e.g., failure to shut off when not needed or failure to turn on when needed) leads to pathophysiology over a long time frame. This has been termed allostatic load, where allostasis, maintaining homeostasis through change, describes the active processes involved in adaptation to a challenge.

Effects of stress and lifestyle

Stress is only one aspect of life that can influence allostatic load. Lifestyle is another, and this includes choice of diet, smoking, drinking, sleep patterns and exercise.

EWG member Meaney notes also the importance of the study of stress in regard to understanding the potential richness and importance of applied developmental science activities involving the biological level of organization. In discussing stress, Meaney focuses on the concept of “challenge.” He notes that, in regard to the developmental process across life (including changes associated with aging), it is interesting to consider the degree to which challenge, that is perceived as being controllable, activates very different mechanisms from those in which conditions are considered or perceived as being uncontrollable. In such cases, it may be that challenges are perceived as being exhilarating versus overwhelming, respectively.

If one assesses the degree to which the perception of controllability influences the ultimate endocrine response, some very provocative findings emerge. One may observe what has been referred to as kind of an exercise version of stress response. One sees increases in adrenaline that are, among adults, for the most part associated with large increases in noradrenaline cortisol. In turn, when you consider the peripherally damaging or compromising effects of stress, one finds that they are largely mediated by noradrenaline and aided and abetted by cortisol.

There is no evidence to suggest that persistent activation only of adrenaline would have anything but beneficial effects on the cardiovascular system. There may be differences in the effect of adrenaline on neural activity. There are the differences in brain activation patterns associated with the challenges perceived as being “exhilarating but controllable” compared with conditions that are perceived as being “uncontrollable.” Physiological research suggests that peripheral catecholamine and peripheral steroid production are involved. Meaney suggests that it would be fascinating is to know what are the differences in the way the brain is activated. Such information would be useful in delineating the forms of stimulation that could be beneficial versus those which could be very deleterious in children’s attempts to meet the challenges and other stressors of their ecology.

The concept of resilience

Because the body adapts to acute challenges and tries to adapt to chronic challenges as well, the concept of resilience refers to its ability to adapt successfully and to minimize allostatic load. Stress-related behaviors have the potential to improve cognitive capacity and the ability to resist agents that may damage the brain. For example, voluntary exercise increases neurogenesis in the dentate gyrus of the hippocampus (van Praag et al., 1999) and increases neurotrophin production in this brain region (Neeper, et al., 1996; Russo-Neustadt et al., 1999).

Biology-Context Integration within the Developmental System: Perspectives from the Sackler Panel (1999)

McEwen points to the relevance of a 1999 Sackler Panel report in providing information that underscores the links between the biological level of organization and the other levels of the developmental system in promoting well-being. The report is especially relevant to such systems effects in relation to early life events and development:

The susceptibility of an individual to stress related disorders is likely to reflect developmental influences as well as genetic risk factors. In animal models, prenatal stress increases emotionality and stress hormone reactivity for the life of the individual; conversely, postnatal handling of neonates leads to reduced emotionality and reduced stress hormone reactivity for a lifetime. In animal models, brain aging is increased by elevated stress reactivity, and reduced by lowered stress reactivity. There are also data for an animal model that increased stress reactivity increases propensity for substance abuse, and this finding needs to be studied for its implications and relevance to human drug abuse.

For instance, as shown in several non-human primate and rodent models, early environmental exposures can alter the activity of these stress mediators that are involved in allostatic load and can do so in permanent ways. Early life experiences play a powerful role in determining allostatic load over a lifetime in experimental animals, and these animal models provide an attractive model for understanding some environmental and developmental influences upon individual differences in human stress reactivity. Neonatal handling of newborn rats (removing pups from the mother for 10 hours per day for the first 14 days of postnatal life) results in animals that have lower stress hormone reactivity and slower rates of brain aging, measured in terms of loss of cognitive function, whereas prenatal or postnatal stress is suspected of causing increased hypothalamo-pituitary-adrenal (HPA) reactivity over a lifetime and leading to increased rates of brain aging. A likely mediator of the handling effects is maternal behavior towards the young in the form of licking and grooming, since these behaviors are intensified in mothers after the return of the young, and the pups showing the greatest handling effects are from the litters where the mothers show the most intense and prolonged licking and grooming behavior. The finding that early maternal care influences HPA reactivity in rodents

provides a basis for individual differences in rodent brain aging and lifelong patterns of HPA activity.

There are also individual differences in human brain aging related to elevated cortisol levels, although their connection to early life events is unknown. There is more information about phenomena such as low birthweight and indications that this condition and various types of early life trauma may influence stress hormone responsiveness over a lifetime. Moreover, experiences in childhood have other, deleterious consequences: e.g., a history of sexual and physical abuse in childhood is a risk factor not only for post-traumatic stress disorder but also for hippocampal atrophy and cognitive impairment in adulthood.

As noted above, in clinical studies, new evidence for the consequences of child abuse and dysfunction of the family in early life points to substantial increases in substance abuse, depression and suicide, as well as sexual promiscuity and increased incidence of heart disease, cancer, chronic lung disease, extreme obesity, skeletal fractures and liver disease. Abuse and neglect during early childhood also links to the neurochemical imbalances that are associated with low serotonin and risk for hostility, aggression, substance abuse and suicide. Studies in infrahuman primates have shown that early maternal deprivation reduces brain serotonin levels and increases alcohol preference and aggressive behavior and decreases affiliative behaviors, thus increasing the risk for elevated allostatic load.

Evidence from human studies indicates similar patterns of altered physiological regulation in children exposed to 'risky families' (i.e., families characterized by aggression, lack of warmth or over/under-regulation). In these latter studies, children from such families exhibit dysregulated HPA axis activity, characterized primarily by higher levels of activity (see Repetti, Taylor and Seeman for review). There is also evidence suggesting dysregulation of serotonergic function, especially among children exposed to abuse and to deficient nurturing. To the extent that such dysregulation is experienced chronically by these children, they would be hypothesized to contribute to more rapid cumulation of allostatic load and its resulting health risks.

In general, the health effects of trauma and other childhood adversities are very broad and do not appear specific for any one type of psychiatric or other disorder. The character of these effects has important implications for the design of interventions.

It is known that the effects of prenatal stress to increase HPA reactivity and emotionality in rats can be reduced or prevented by neonatal handling. As noted above, the neonatal handling effect appears to be mediated by maternal licking and grooming of pups returned to the mother after a brief separation. It is not possible at this point in time to extrapolate to human infants the data derived from this rodent model to human infants. It is the case, however, that rather simple interventions early in a child's life may have a beneficial effect on later antisocial behavior and cognitive scores. Nevertheless, it is unknown whether the chemical mediators in humans corresponds to these involved in rodents.

The interventions with human infants consisted of a series of home visits during pregnancy and after birth in order to provide the mother with support and education about child care in the hope of improving the quality of child care and reducing the incidence of abuse and neglect. Even prenatal visitations showed some beneficial effects. Given the apparent efficacy of these interventions and the still unsolved issue of mediating chemical mechanisms, this is clearly an area where both physiological studies and large-scale community-based interventions need to be carried out.

In sum, discussion of the biological level of organization within the developmental system underscores the bidirectional association between biological and contextual processes, points to the relevance of this dynamism for both research and application, and emphasizes the role of the individual's own actions in linking biology and context within the developmental system. It is useful, then, to consider some key ways in which individual action is involved in the dynamic interactions within the developmental system.

Individual Motivation and Child Well-being

Across the life span, individuals' actions are increasingly predicated on their goals and intentions. Accordingly, in trying to understand the role in the development of well-being of individual action within the developmental system, it is crucial to consider children's motivation. Accordingly, the research of EWG member Carol Dweck is central to appreciating the contribution of the individual level of organization to the function of the developmental system. Her work is aimed at understanding the beliefs and goals that allow some children to thrive and fulfill their potential and lead others to self-limiting, self-defeating patterns of behavior.

She has shown that it is a belief in fixed, limited ability that turns children away from activities that help them learn and grow. When children believe that their intelligence is a fixed trait, they become over-concerned with how much of it they have, and begin to shy away from risks or challenges that might reveal inadequacies--even when these hold valuable learning opportunities. When they do hit setbacks, they often see the difficulty as indicating low ability, lose interest in the area, and lose the will or the ability to perform well. Dweck and her colleagues have seen this happen repeatedly to students as they hit challenging school transitions. In contrast, children who believe that their intelligence is a potentiality that can be developed seek out activities that will stretch their minds and expand their skills. Challenges are opportunities not threats, and mistakes or obstacles are information about their strategies or effort, not condemnations of their abilities. Moreover, as they confront obstacles, their enjoyment of the activity often grows and their strategies become increasingly effective. These children were observed to accomplish many things that seemed beyond their abilities.

Can children be taught the "malleable" view of intelligence? Dweck's research supports the response, Yes, indeed. She and her colleagues have found that this view can readily be taught to students of all ages, from early grade school through college. Students can be taught that their intellectual skills are things that can be cultivated --through their hard

work, reading, education, confronting of challenges, etc. And when they are taught this, they seem naturally to become more eager for challenges, harder working, and more able to cope with obstacles. Researchers (for example, Joshua Aronson of the University of Texas) have even shown that students' grade point averages go up appreciably when they are taught that their intelligence can be developed. It is interesting that these beliefs about intelligence seem to be fairly stable individual differences when left to themselves. But they also can be changed fairly readily when students are confronted with the alternative view in an explicit and compelling way.

How are these views typically communicated to kids? In a recent series of studies, Dweck and her colleagues showed how some well-meant and common practices might be teaching the fixed view, with its attendant issues. They were aware of the widespread belief that praising students' intelligence would help them feel smart and fulfill their potential. Yet, it struck them that praising intelligence could actually do harm by putting the spotlight on intelligence and conveying to students that it is a deep-seated quality can be measured from their performance.

Dweck and Claudia Mueller set out to test this notion by conducting six studies, all with powerful results. In these studies, late grade school students worked on a task, succeeded nicely on the first set of problems, and received praise. Some received praise for their intelligence, while others received praise for their effort. It turned out that praising students' intelligence, even after truly admirable performance, made them feel good in the short run, but it had many, many negative effects. In contrast, praising students' effort had many positive effects.

First, when students were praised for their intelligence, they became so invested in looking smart that they became afraid of challenge. Most of them preferred a sure-fire success over a challenging opportunity to learn something important. When students were praised for their effort, ninety per cent of them wanted the challenging learning opportunity.

Second, when students then experienced a second, difficult set of problems, those who had been praised for their intelligence now told us they felt dumb. In other words, if the success meant they were smart, the failure meant to them that they were dumb. Any self-esteem that had been promoted by the praise was very, very fragile. In contrast, the students who had been praised for their effort, saw the setback, not as a condemnation of their intellect, but as simply a signal for more effort. They realized that a harder task meant harder work.

Third, the students who were praised for their intelligence told us that they no longer enjoyed the task, and no longer wished to take problems home to practice. A feeling of failure made them turn away from a chance to practice their skills and improve. In contrast, the ones were praised for their effort enjoyed the task just as much as before and were just as eager to take problems home to practice. In fact, some of them liked the task even better when it got hard and were more determined to master it.

Fourth, Dweck and her associates gave the students a third set of problems, similar to the first set (the one on which they had succeeded). How did they do on these problems? The students who were praised for their intelligence now did significantly worse than they had initially, whereas the students who were praised for their effort did significantly better than they had done before. This means that two groups of students, who had started off with similar performance, were now very far apart.

Fifth, when given a chance to write to a student in another school about the task, 40% of the students who received intelligence praise lied about their score. They revised it upward. Very few effort-praised students did so. This suggests that when students are praised for their intelligence, they become so over-identified with their performance, so personally humiliated by setbacks, that they can't tell the truth even to an anonymous peer they will never meet.

Finally, in two studies Dweck and her colleagues assessed the impact of the praise on the students' views of intelligence. In both studies, the intelligence-praised students now held a more fixed view of their intelligence than did the effort-praised children. This means that the intelligence praise did, in fact, tell students that what was being appraised was a deep-seated and permanent quality of the self.

In short, intelligence praise made students feel good in the moment, but it made them afraid of challenge and unable to cope with setbacks. Effort praise seemed to give students a more hardy sense of themselves as learners, a more healthy desire for challenge, and the skills to cope effectively with setbacks.

This work demonstrates that children's motivation is often more important than their initial ability in determining whether they succeed in the long run. By motivation, Dweck means not only the desire to achieve, but also the love of learning, the love of challenge, and the ability to thrive on obstacles. These are the kinds of attributes that enable children to create well-being.

In addition, this understanding of the bases of an individual's actions provides a basis for the design of environments and training of caretakers and teachers that produce high levels of personal efficacy and well-being in the daily activities of young people. Such daily, or routine, activities constitute another significant component of the individual level of organization within the developmental system.

Routine Activities and Time

Across political jurisdictions and cultures, children engage in work, play, creativity, consumption, social interactions, and other activities that are analogous to adult activities yet qualitatively different. To understand better the lives of children from a child focused perspective and to facilitate their self-fulfillment, empowerment, and life satisfaction, measures must be developed to describe their activities. An examination of children's activities and patterns of time use will highlight their participation in society, as individuals and as a group. Such information will reveal the patterns of childhood and

expose the differences between groups of children within the same society. At the same time it will raise the visibility of children as contributors to, as well as recipients of, social resources.

Although some of these activities (such as schooling) have gained much attention in terms of their outcomes or consequences, little research has been conducted regarding the patterns of children's everyday activities and the way in which different patterns of activity impact on children's well-being (Ennew, 1994, James and Prout, 1990). Thus, there is little existing knowledge on the patterns of children's activities. The few existing efforts to collect such data in different countries and in different age groups (see, for example, Plewis et al, 1990) could form a foundation for further development.

Due to the relatively innovative nature of such inquiries, it is also difficult to point out the different ways in which these patterns are related to child well being. This remains to be determined in the course of learning more about such studies and their findings. Learning more about such studies and their findings will contribute to elucidating a discussion that will in turn lead to a better understanding of the forces that contribute to shaping children's lives and the way in which these relate to their well-being, satisfaction, and development.

Asher Ben-Arieh has conducted just such research. His scholarship has identified children's everyday activities, with a special focus on the costs and benefits of such efforts. For instance, in one study he has examined the relevance and potential of time use from the perspectives of children themselves. As does the research of Dweck, this type of study will enable scholars interested in the developmental system to learn more about the role of the individual's action in and on the other systemic levels of organization comprising the ecology of human development.

Of course, framing scholarship from a developmental systems perspective requires scientists to understand the levels of organization that comprise the context in and on which the individual acts. Several members of the EWG provided information pertinent to these more macro ecological levels of organization. As described by Bronfenbrenner (1979) and Ford and Lerner (1992), these macro levels include both natural and designed physical features and, as well, social and cultural ones.

The Spatial, Physical, and Social Ecology of Child Well-being

In the conceptualization of children's well being, their relation to the physical environment, their spatial behavior, and their relatedness to places that become significant to them has been relatively weak (see, however, Elder, Modell, & Parke, 1993). More attention has been given to a consideration of social factors. This has to do with the history of the development of psychological theory and methods.

Roger Hart envisions examining these neglected domains of potential contextual influence in order to supplementing emphases in the existing literature of children's well being. Such an examination would draw on several disciplines including geography,

sociology, urban planning, environmental psychology, community psychology, developmental psychology, and the work of youth-serving professionals (e.g., community-based, 4-H agents). Hart believes that such work may be usefully structured around three interrelated topics.

1. Place and Identity Development

Dorothy's desire to return from Oz to her farm in Kansas illustrates in dramatic form that there may be a strong connection between place attachment and identity development and maintenance. How does this connection develop and what are its functions in the health and well-being of children and youth? To address these questions Hart believes that one must consider place in relation to the four principles of identity (i.e. distinctiveness, continuity, self-esteem, self-efficacy). This consideration involves appraising the comforting function of place--a sense of personal security, stimulation, care, and relaxation; the social function of place--opportunities to link with other members of the community and the development of social skills and competence; and the symbolic function--attachment to places of special personal and the symbolic value of place.

Literatures that may inform this work include those pertinent to early (childhood) memories and environmental autobiographies; environmental preference research; the way in which variation in the physical and socio-cultural characteristics of places afford for children different behavioral opportunities; and forced, involuntary and voluntary relocation and loss of place.

2. Geography of children and youth in relation to their well-being

It is important to conceptualize the qualities of the physical and spatial environment that are important in children's development. Such a consideration requires understanding of the differences in the affordances offered by the environment and in children's spatial access to resources. Several specific features of the physical environment seem relevant, including: 1. The environmental opportunities for play and recreation, including consideration of the importance of undifferentiated spaces; 2. The availability and accessibility of informal peer group gathering places; 3. The spatial dimensions of children's experiences with social and cultural diversity (including questions of residential segregation, transportation access and public space); 4. Changing time demands on children and the programming of children's time; 5. The impact of environmental safety on parental controls and the independence and autonomy of children; 6. The special environmental issues of incarcerated and hospitalized children; and 7. The spatial/environmental dimensions of well being for children with particular disabilities.

3. The physical and spatial environment of early childhood

To understand how aspects of the physical environment relate to the well-being of infants and young children, one must integrate ideas found in literatures that have not been part of the theory building in environmental psychology and geography. As

envisioned by Hart, such an integration would result in the understanding of the qualities of the physical environment, including tools and materials, for exploration and play, including space for play (variability in availability and access), the influence of spatial structure on social interaction (coherence and organization in children's physical environments and environmental considerations in special settings, such as dentist offices and hospitals). In addition, such an integration would provide an understanding of the role in child well-being of the spatial aspects of the larger social ecology, covering the consistency of caregiving in relation to the spatial ecology of the family; continuity of experiences with the physical environment (places); and the time-space activity patterns associated with different configurations of early childhood institutions.

Clearly, in such an analysis features of the local community (e.g., the quality of the housing in the neighborhood, the presence of governmental services and policies) shape the environment for very young children and, as well, influence their development. This important role of the social ecology of the local (neighborhood) physical setting on child well-being is exemplified in the research of EWG chair, Felton Earls, and his colleagues in regard to the Project on Human Development in Chicago Neighborhoods.

Social Ecology of Child Well-being

An important contribution of the Project on Human Development in Chicago Neighborhoods, which is directed by Felton Earls, is to advance understanding of how the organization of neighborhoods promote safety and child well-being. Earls and his colleagues are producing a substantial body of data for testing a theory contending that social cohesion and mutual trust among neighbors is a fundamental factor in this regard (Sampson et al., 1997, 1999). The term, **collective efficacy**, is used to describe the perception that adults are prepared to act in the best interest of neighborhood children.

The project breaks ground in its capacity to measure the property of collective efficacy with precision and accuracy. Indeed, based on this contribution, the work of Earls and his colleagues is being replicated and has been influential in strengthening policies related to community capacity building in general and community policing in particular.

Exhibit 3 is a map of different levels of collective efficacy for children across all neighborhoods in the city of Chicago. Current efforts are directed to studying the quality of home environments and out-of home child care in relationship to neighborhood social organization. The longitudinal design of this project is expanding to couple features of environments with the personal sense of efficacy and behavior of children.

The notions of dynamic systems and life course development are quite compatible to the design and methods of the Project on Human Development in Chicago Neighborhoods. As such, the work of Earls and his colleagues underscores the importance of embedding the study of child well-being in a theoretical and empirical frame encompassing all levels of the ecology of human development. Other contributions of members of the EWG underscore the importance of this embeddedness by providing information on the role of culture as a macro-level influence on the other levels of the developmental system.

The Ecological-Cultural Level

EWG Member Thomas Weisner suggest that one important individual level component of well-being is the engaged participation in activities deemed desirable by ones cultural community, and the psychological experiences produced by such engagement. Cultural communities provide activities for children and adults that are organized into developmental pathways or "cultural careers" we travel throughout life. Each family and individual participates in a daily routine, which consists of linked sets of activities. Understanding the experience of well-being then, starts with the study of how cultures and communities around the world conceive of desirable pathways and activities. What are the goals and tasks of these pathways and activities? Who are the people participating in them? What are the conventional cultural scripts and schemas for participation? What are the motives and feelings present? What resources are provided for them?

Activities are having family meals, watching TV, playing video games, visiting relatives, being in a math classroom, hanging with friends, taking care of your younger brother, bedtime rituals, playing soccer, going to Mass. They are mundane, redundant, repeated thousands of times. But they can also be unique, special events such as initiation ceremonies and birthdays, tied to a culture's social clock.. Activities are organized by and reproduce culture, and so they are gendered, divided by class, ethnicity, clans and regions.

There are many useful quality of life inventories that assess dimensions of ecology, psychology, risks and threats in the environment, and physical development. Yet we recognize that these can't easily be simply added up. There is an emergent, holistic quality of well-being over and above the particular items in these inventories. It is not that these inventories are not meaningful across cultures for many purposes. It is that they are not sufficient. The particular cultural goals, pathways and careers in life important in that community have to be included in understanding well-being.

Individuals bring their particular temperamental dispositions and common evolutionary past to their active engagement in cultural activities. An individual's well being depends on bi-directional influences and fit between personal dispositions and the activities afforded that person. Some are more "agentic," that is, capable of effective, independent action, and engage better with the activities their community provides for them. Some of us are born into the "wrong" (non-optimal) cultural community, and yearn for others once we are aware they exist! There is a growing interdependent multicultural awareness in communities around the world today, and this needs to be taken into account in studying well-being. Well-being as observed for a person in one situation, is not the only measure, therefore. Well-being as imagined, or projected, as what that person might have the capacity or fit for if following some other cultural career or pathway, should also be considered.

Cultures and communities vary in wonderful ways, in what they think are desirable activities and in how they organize activities into pathways. These world-wide variations

need to be deeply incorporated into research and policy in this field. Weisner has done cross-cultural research in Kenya and with Native Hawaiians exploring alternative conceptions of well-being and development, as well as studies in the United States with non-conventional family lifestyles and families with children with disabilities. Weisner is also currently working with economically poor families and children facing the transitions of welfare reform. In all these studies, the everyday concerns of parents and children in very different cultural circumstances, seem crucial to understanding well-being.

Ethnographic research is essential to get us closer to understanding well-being in context, but qualitative methods can and should complement other approaches. For instance, EWG member Tom Weisner has developed an Ecocultural Family Interview, a conversation with parents and children about the daily routine, what concerns family members about their routine, and what their goals are for themselves and family members.

This interview is always specifically adapted for the cultural community in which it is being used, as well as adapted for the age of children, or particular concerns of the research study. With data from such an interview, Weisner and his colleagues are able to generate data that will be useful in supplementing the sorts of individual level and physical ecological level assessments of developmental systems influences on child well-being that we have noted above have been conceptualized as significant by other EWG members. For instance, with the sorts of cultural data envisioned by Weisner, one could generate important, new information about:

1. Cross-Cultural Studies of Children's Use of Time and Daily Routines

It is important to understand what available literature depicts about the use, within and across different nations, of multiple types of assessment of children's time use, daily routines, and activities. This information would complement EWG member Asher Ben-Arieh's work, in that it would provide knowledge about cross-cultural variation, and would focus on the need for multiple measures of time use, used in a complementary fashion, as essential to adequately capture time use for children. Moreover, research on children's time is complementary with the sort of scholarship envisioned by Hart in regard to children's spatial behavior.

The rationale for this linkage is that measures of time use that truly capture the points of view of children-how they live in and experience their lives—are required. Similarly, science needs kinds of assessments that capture cultural points of view different than that of Western social science. The available methods such as time diaries, time allocation, or systematic behavior observations are valuable but do not have this feature of incorporating the experience and viewpoint of cultural actors. There are approaches that do this, such as ethnography, life histories, and ecocultural assessments. Yet these methods do not have the systematic character of the others, and do not have the comparative frame essential in this field. Accordingly, science needs to identify methods that have been or could be used in a complementary way, to more fully capture

differences around the world in children's experience of, engagement in, and systematic allocation and use of, their time in daily life.

The goal of time use and activity research is to grasp how children engage in the everyday activities deemed desirable in their cultural communities--since such engagement may be, at the individual level of organization, a feature of well-being. This research would also be a step along the path of a program of scholarship that could assess the functional potentials of children around the world. Children can do things at all ages that amaze or disturb those in other cultural communities (e.g. care for younger children; engage in sophisticated moral reasoning; act on behalf of families in the community; do important work). The contexts and meanings of such functional activity settings need to come through in comparative studies of children's activities around the world.

2. Measurement of Home and Community

Children's use of time is an important yet understudied aspect of children's lives. There have been studies of time use in anthropology. These approaches use time allocation methods (Bernard & Killworth, 1993; Chick, 1994; Gross, 1984; Johnson 1975; 1996), behavior observations (e.g. Weisner, 1997; Whiting and Edwards, 1988) or spot observation techniques (Munroe and Munroe 1971, Rogoff 1978; Flinn, 1988a; 1988b; Weisner, Gallimore, & Tharp, 1982). In psychology and other behavioral sciences these approaches are based on time-budget diaries or surveys (Hofferth & Sandberg, 1998; Hofferth, 1999; Szalai, 1972). Another effective technique for assessing home activities is the Event Sampling Method, or Experience Sampling Methods (ESM) (Csikszentmihalyi & Larson 1987; Csikszentmihalyi, Rathunde, & Whelan, 1993).

ESM draws on immediate self reports by informants and uses beepers or programmed watches to signal informants randomly during a fixed time period. Each time the informant receives the signal he or she is expected to respond. Although directly observed behavior by fieldworkers or confederate observers might be preferred means of data collection in some circumstances, for both logistic and ethical reasons, collecting continuous observational data in the home is usually unfeasible. ESM focuses on the self-defined experiences of the participants in the study. It uses children's or others' own subjective reports given repeatedly and quickly to a familiar and trusted fieldworker who contacts them over and over, rather than on observer assessments of activities or time use done once or only a few times with more obtrusive visits. As such, ESM is a very feasible and satisfactory compromise alternative to announced or unannounced and obtrusive home visits, or to methods using family members who act as confederate recorders of family activities, or continuous video monitoring (Weisner, Ryan, et al, in press).

ESM has advantages diaries and other such procedures do not have. Family members can more freely report the activities and are not tied to fixed diary categories. Recording and recall are not routinized into time units fixed by the diary sheet, nor require literacy and other skills to fill them out completely and on a regular basis. ESM also increases the accuracy and veridicality of information compared to diaries or highly obtrusive

measures. For example, in earlier studies using children's reports of home activities in comparison to fieldworker observations, Native Hawaiian girls tended to over-report (compared to random home observations by trained observers) that they are engaged in caretaking of other children, while boys underreport (Weisner, Gallimore, & Tharp, 1982). This finding suggests that one method is not necessarily superior, but that complementary methods need to be used in this field.

A comprehensive approach using more than one method, should capture variation in individual behavior within a cultural community, as well as patterned activities part of community life. Children are not necessarily going to be consistent in behavior, and this fact requires multiple measures of behavior taken over a period of time. Nor are cultural communities going to be consistent or patterned. The extent to which there is or is not cultural patterning is something for empirical evidence to discover. Individual behavior and home activities will vary from day to day and across time periods. To map recurring patterns in activities and behavior requires observations taken at multiple points in the day, and across multiple days. Hence, we need methods that do not rely exclusively on normative accounts of typical days or generalized self-reports, in addition to methods such as surveys that do so.

Valuable as each of these approaches have been taken separately, none claims to capture the stream of behavior of children and caretakers, and capture whole events in context as ethnography does, but rather, they capture many of the elements which make up that larger context in a systematic way (Gallimore, Goldenberg, & Weisner, 1993; Weisner, 1984). Each of the ways to collect systematic time use data are more revealing when complemented with ethnography and other kinds of holistic and person-centered approaches. All of these methods of course are inherently "thin" compared to ethnography; and they are not as normed as are systematic field assessments of children's lives in context. But ethnography, normed assessments and ESM or time use methods, taken together, can give us a holistic picture which none alone can accomplish. They can also get us closer to the goal of understanding child engagement in activities promotive of well-being within specific cultural communities.

Conclusions

The EWG has found that a developmental systems perspective is a useful frame for understanding existing knowledge about how multiple levels of organization—ranging from biology through culture—are integrated in the development of healthy children. In addition, this frame has enabled EWG members to specify key next steps in research that hold the promise of substantially advancing understanding of the integrative, multilevel processes involved in child well-being.

Equally if not more important, however, the developmental systems frame has enabled EWG members to specify the possible linkages between research and application. As explained earlier in regard to the blurring of the distinction between basic and applied research, the members of the group see a seamless, reciprocal synthesis of science and practice as essential in any attempt to improve the well-being of the diverse children of

America. Accordingly, it is useful to consider the specific ideas of the EWG in regard to this synthesis.

ADVANCING THE SCIENCE AND PRACTICE OF CHILD WELL-BEING: CONTROVERSIES AND CONSTRAINTS

The EWG developed a vision of an integrated human development system providing a frame for the bases of child well-being and, as well, of this system constituting the milieu within which actions aimed at promoting positive child and adolescent development could be most successful. Nevertheless, the group recognized that there are challenges pertinent to this vision, ones involving the intellectual viability or practical feasibility of a dynamic developmental systems perspective constituting the frame for research and application. In this section we consider some key instances of these controversies and constraints.

Moving Science to Practice

Imagine for a moment that you hold in your hand, actually or virtually, the most definitive, holistic, comprehensive, integrated, science-based, state-of-the-art, knowledge base on child well-being heretofore assembled. This unparalleled knowledge base embraces an ecology of the health and well-being of children that extends from neuroscience to human rights, from Peoria to Pretoria, from the molecular level of a given child to the broadest reaches of social policy. It is rigorous enough to muster the most stringent academic scrutiny. It has been shaped by a wide range of scientists--basic, clinical and applied--who have the capacity to transcend the usual boundaries of their home disciplines, having discovered the synergy that resides at the interface between disciplines. It advances an assets-based approach which affirms children as resilient and thriving in the face of adversity. The breadth of its scope is unparalleled, its contents are intriguing, and the potential implications of its findings hold great promise. What does it take for such compelling state-of-the-art knowledge to become transformed into widespread, measurable, and sustainable improvements in the health and well-being of children, families, and communities?

One model for generating effective social policy for children's well-being suggests that three components working together can transform knowledge into action. An effective *social strategy* (or intervention), driven by a rigorous *knowledge base* (research and science), can become significant public policy when fueled by sufficient *political will* (resources) (Richmond, 1982, 1999). It assumes a dynamic, seamless interaction among its parts: What we do well (social strategy) is driven by what is known (knowledge base); what we do well attracts adequate support (political will) to be sustained; and those with resources are willing to re-invest over time in greater knowledge to yield additional successful interventions. According to EWG Member Magda Peck, this conceptual trilogy is limited in practice by a series of *gaps* at the interface between knowledge, practice, and policy which prevent the translation of data into action. Unless these

translation gaps are addressed even the best knowledge base about the well-being of children will be nothing more than incredibly interesting.

Translation Gaps in Attempts to Integrate Science and Practice to Enhance Child Well-being

There are several problems that confront applied developmental scientists when they attempt to integrate science and practice in the service of enhancing child well-being. Peck calls these problems “translation gaps,” and discuss below three key instances of these gaps.

1. The Knowledge to Practice Gap

Data, the raw by-products of research, are technically driven to assure the validity and reliability of the science they measure. Those who dwell in the house of data have little tolerance for imperfection; researchers have long sought controlled purity in academe. In applied fields such as public health which demand the translation of research to practice, the gap between data and its application in practice is filled with a chronic tension between service-driven practitioners - to whom demands for data are perceived as irrelevant distractions from honorable work - and data-driven researchers - who need valid and reliable data from the field to measure performance, outcomes, and effectiveness. Another tension comes from persistent investments in prevention intervention research, to assess the impact of controlled programmatic responses based on proven determinants of risk and adverse outcome. Investments contribute to the growing number of demonstration projects whose impacts are proven only within controlled circumstances. Critics of this approach charge that demonstration projects most often lead to more demonstration projects, but rarely to scale (Schorr, 1997).

Recently, there have been attempts to narrow the translation gap between research and practice. The Centers for Disease Control and Prevention (CDC), the nation’s health prevention and promotions agency, has described the translation of prevention research into action as a continuous improvement cycle in which the needs of public health programs help define research questions; and research findings, in turn, are translated into science-based programs (CDC, 2000). Similarly, as noted below, universities are seeking to apply their scientific expertise to promote the well-being of people participating in their developmental scholarship (Lerner, 1999). As also noted below, the movement toward “outreach scholarship,” which merges the expertise of the academy with the expertise of the community in ways that are valued by the community, is growing (Lerner & Simon, 1998). This approach is mirrored in the movement toward greater linkages between academe and public health practice to ensure the public’s health (Lasker, 1998). Greater interface between academe and practice may lead to more relevant science for prevention.

2. The Practice to Policymaking Gap

Converting science into widespread, measurable, and sustainable improvements in community health and child well-being requires elimination of the translation gap on a second front: between practice and policy-makers. The decision-makers who hold the levers of political will are likely to be removed from those on the front lines of services for children and families, and the disconnect between policy-makers and providers can lead to a chronic, mutual distrust. Policymakers may perceive requests from the field for funding as programmatic pleas for self-preservation, while practitioners righteously welded to their work grow more cynical about out-of-touch politicians. This tension escalates in an era of fiscal restraint and/or reform, in which programs and policies are destined for change.

3. The Data to Policymaking Gap

This third interface can be hampered by misconceptions and unmet needs on both sides. Policymakers demand data that are timely, simple, and preferably distilled to a single page of bullet points. They may also want to select research results which support their position. Researchers and data analysts often insist on telling the whole story, in excruciating detail, delivered in complex, technically correct terms and volumes of graphics. They are unwilling to compromise the integrity of the research in response to politicians' preferences. Amidst palpable mutual irritation, there is significant missed opportunity for research and data to strategically inform decision-making about children's well-being, and for the knowledge base, however elegant, to be relevant, responsive, and translated into action.

Narrowing the Transition Gaps: From Data to Action

There are three key actions that may be taken to foster the translation of data to action by narrowing the gaps between research, practice, and policy development for optimal child well-being in communities. These actions involve *ownership, capacity, and accountability* (Peck, 2000).

1. Promoting shared *ownership* of data

The knowledge generated by research must be responsive to the needs and interests of the populations and communities it involves. An increasing number of researchers have recommended that as is possible, research should be generated in partnership with the children and youth, families, schools, providers, government and other essential community partners who can assure that its findings are relevant, and contextually valid. They call for expanded university-community partnerships to identify what really works under real-world conditions (Jensen, Hoagwood, & Trickett, 1999). Partnership may not be enough to assure seamless translation. When participants and communities are actual shareholders in the research, they rightfully claim shared ownership of the data. Owners are more likely to demand timely and better quality data, which can lead to greater investments in the essential local infrastructure for the monitoring, assessment and dissemination of information on the well-being of their children. Owners are also more likely to use "their" data with confidence, minimizing the chronic doubts that undermine

the acceptance and championship of research findings at the community level. Earls and Carlson have introduced the concept of participatory research in their various CCW projects. It is important to develop standards to monitor the extent to which this aim is reached.

2. Building shared *capacity* for effective data use

Data on child well-being that are not and can not be *used* may be of great interest, but will have limited impact. Quantitative and qualitative data must be used purposefully, strategically, and effectively by those who influence childhood outcomes to make measurable and intended change. Individuals and organizations must have the capacity to transform in a meaningful way what they know and learn into how they do their work with and for their children. Data use capacity is best built collectively within communities. When researchers, practitioners and policy-makers learn data use skills together and in a specific context of mutual interest and priority, they are more likely to build interdependent relationships for future collaborations toward children's well-being. The effective use of data for child health and well-being has defined competencies, which when mastered by teams of research, practice and decision-makers, can foster the translation of data into practice and policy (University of Nebraska Medical Center, 2000).

3. Assuring local accountability for monitoring child well-being

Population-based data on the health and well-being of all children is fragmented in communities, scattered among universities and governmental agencies and non-profit institutions and private sector initiatives. There is no 'home' - physical or virtual - for the guardianship of child well-being, no central repository for information that can shape programs and policies on behalf of all our children. State-of-the-art knowledge bases that are being developed for virtual, global consumption by initiatives like the CCW reach out to all within a community through enhanced technology and effective communication. Without an agreed upon locus of accountability for assuring that the information is used to continuously assess and monitor progress toward shared goals for our communities, children, parents and providers and practitioners and policymakers are likely to be just much better informed. There needs to be an agreed upon, supported, empowered, publicly owned entity, accountable to the full community, which assures that data are accessible, available, understood. This entity must also assure that data are regularly used to translate what is known about child well-being into how we do our business with, for, and about kids the very best we can. Local public health agencies used to perform this function for community well-being, with particular emphasis on the most vulnerable populations. They have long since deteriorated in their luster, declined in capacity, and eroded in their perceived value. New governance entities are emerging based on public-private partnerships to achieve results for children (Thompson, 1999). The challenge is to reinvent public health for the next generation as a vibrant, honorable, valued, effective institution that can serve as the locus of accountability for the well-being of children and families in every community.

Conclusions

What does it take for compelling state-of-the-art knowledge to become transformed into widespread, measurable, and sustainable improvements in the health and well-being of children, families, and communities? The strategic interaction between research, practice, and policymaking will mobilize data for action only if the tensions between the domains and the individuals who righteously champion them are diminished. Assuring in every community the three keys to translating of data to action--*ownership, capacity, and accountability*--will narrow the translation gaps between research, practice and policy development. Only then will what we know and what we do, collectively and purposefully over time, be in alignment for optimal child well-being.

There are several substantive instances that may be drawn of how this orientation to integrating science and application may be implemented. Given the growing racial and ethnic diversity of the child population in the United States, and the need to align the developmental system to match the specific development opportunities present within different groups of children, the EWG believes there is arguably no more important example that may be drawn than one pertinent to how science and application may be merged in regard to America's "minority" youth.

Studying Minority Children's Lives in Context in the United States

The paucity of research on so called minority populations in the United States documenting and understanding positive developmental processes and outcomes is quite striking. We have a very skewed literature: most of the high risk, deviant phenomena is studied in poor, people of color (even though most of the high risk population might actually be white); most of the "normative processes" are studied among white middle class, intact families.

This is a major problem in our literature for at least two reasons: (1) Everything we know and espouse as normative in developmental sciences is based on a very narrow, unrepresentative group of the human population and might reflect a highly culturally defined phenomena; and (2) as people of color are overrepresented in high risk groups, we know very little about what is cherished, celebrated and promoted in families who are "making it;" as we know from other research, successes within contexts can be models for preventive interventions.

How do we change this? A first consideration is the theoretical models used to study minority populations. An integrative theoretical model is necessary; this model should consider social stratification, and the use of racism to support such a social system and its role in children's lives. The EWG believes that such a model may be found among developmental systems perspectives (Lerner, 1998a). A second consideration is that multiple measures of the environment are required to assess adequately the ecology of children's lives. No one measure can adequately represent a child family, much less his or her school, peer group, or neighborhood.

Cynthia Garcia Coll provides an example of current work examining the emphases of multiculturalism in classrooms and ethnic composition of schools and how it affects children's sense of self and their engagement in school. Garcia Coll and her colleagues have multiple measures of environment: The school composition (i.e., is their group majority or minority or are they equivalent in size to other groups?), the classroom composition (in the same terms), the emphases on multicultural (i.e. positive, negative, or neutral), and the class type (regular, ESL, bilingual). She and her colleagues have also asked children about experiences of discrimination and their perceptions of different aspects of their environment (i.e. relational: are teachers fair?; perceptions of discrimination in hypothetical situations; views of their own skin color).

This experience and other research projects on minority youth development have helped to examine the variation that is clustered within the “contextual influences” category. First, Garcia Coll notes, is the confirmation of the complexity of human development and of the rich transactions that occur with the environment; the presence of these dynamic relations goes against notions of control and predictability, which come from the assumption that a scientific study of human beings will yield information sufficient to create ideal human beings [i.e. by controlling the genotype, and/or by manipulating the environments in which children were raised, in order to thereby change individuals]. Second, this research has indicated that multiple measures of multiple aspects of the environment are necessary to measure both the objective aspects of a child’s development (e.g., through the observation of classroom experiences), as well as the social constructions from all the important stakeholders in his or her development (e.g., parents, teachers, peers, and children themselves). A third insight derived from this scholarship is that, within the subjective aspects of the environment, the relational contexts are extremely important. Thus, relationships with teachers are crucial to our understanding of school experiences for both children and parents. Finally, to provide informed recommendations to policy makers and practitioners from our research, the complexity of our statistical models need to keep evolving with our understanding of human development in context.

Conclusions

To integrate science and application in the service of child well-being, the EWG believes that a true cultural integration needs to occur. This integration involves the cutting-edge application of research methods and statistical analyses in a manner that is framed by the community partners who need to use the knowledge derived from good science to take actions to promote positive child and adolescent development. As scholars listen to the voices of children, family members, teachers, practitioners, and policy makers, and act collaboratively to deploy their scholarship in manners valued by community partners, programs that enhance child well-being will be more likely to emerge.

Fortunately, this vision by the EWG is not merely hypothetical. Several excellent programs exist that reflect this integrative, collaborative approach to science and practice. We discuss several exemplary ones in the next section.

BEST PRACTICE IN THE PROMOTION OF CHILD WELL-BEING:

SOME EXEMPLARY PROGRAMS

Several members of the EWG were able to identify programs consistent with the ideas of developmental systems and with the science-practice integrations we have discussed above. Moreover, these programs are aimed at promoting positive development among minority youth. Accordingly, EWG members forward these programs as representative of the enactment of “best practice,” which, given the state of the program evaluation data base (Jacobs & Kapusik, 2000), may be operationalized as “known through available data to be effective practice.”

Programs in Medical Settings

EWG Member Barry Zuckerman notes that there exist in medical settings and, in his case, specifically pediatric settings, collaborations that involve the multidisciplinary, multiprofessional, community-collaborative, and science-practice integrative approach that we have discussed above. He describes several such programs associated with the Boston Medical Center.

Enhancing Literacy

In the past, literacy - reading, writing, language, and understanding - were viewed as separate cognitive processes, which developed in a set sequence; that is, children learn to understand and then to speak, then much later can be taught to read and then to write. This resulted in formal literacy instruction not beginning until school age when children were ready. However, early literacy, or more specifically, emergent literacy is part of a relatively new understanding of how children develop reading, writing, and language skills. Emergent literacy is a continuous developmental process that includes listening, speaking, reading and writing. It begins prior to formal instruction in reading and is best developed in real life settings for real purposes. The development of literacy skills through early experiences with books and stories is linked to children’s later success in learning to read. When children are exposed to books and reading, they develop emergent literacy skills, such as using books for fun, interpreting pictures, following the plot of a story and putting meaning to the printed word. Research on emergent literacy skills in young children suggest important links between their ability to read and their exposure to experiences prior to school. Such early experiences serve to associate books with parental affection, attention and approval.

Book sharing, and later reading out loud to children, coupled with the mutually satisfying relationship between parent and child can form the basis for future learning. Parents don’t have to teach letters to young children, but that when loving parents share books with them, children will develop an early positive attachment to books and will understand that they contain important information. Then when it is time for the child to learn how to decode the letters on the page, they are much more likely to approach reading as a positive journey and adventure.

Pediatrics has always gone beyond treating illness to trying to prevent problems, including injuries and poor nutrition. Promoting literacy is an important and natural step in the evolution of preventive pediatrics. Since pediatricians in practice reach parents and children during their early years, they are in a unique position to promote learning through early book sharing and later reading out loud. Zuckerman and his pediatric colleagues developed a program called Reach Out and Read to take advantage of this opportunity. Specifically, Reach Out and Read has the following three components:

- Volunteers read with children in the clinic waiting room, exposing children to books and modeling reading aloud and the pleasures of looking at books together for parents.
- During the well child visit, physicians and nurse practitioners advise parents about the importance of reading with young children and offer age appropriate advice.
- Children receive a new, developmentally and culturally appropriate children's book to take home and keep at every well child visit from 6 months to five years.

By giving a book to a child, pediatricians provide parents and children with a tool for reading aloud, for learning and for moments of love and attention. Giving free books breaks down economic barriers to purchasing books for families with limited incomes and demonstrates clearly to parents of infants and toddlers that their children are old enough to enjoy books.

Literacy promotion in pediatric primary care has met with an enthusiastic reception among pediatricians, particularly those who serve primarily low income children. At the present time the program has spread to more than 600 practices/clinics nationally and over 5,000 pediatricians have been trained to promote literacy and more than a million books were given to children by pediatricians last year. Separate evaluations of the program from multiple sites indicate that the program is effective in changing parental behavior; parents are reading to their children four to ten fold more than a comparison study, there are more books in the home and, in one early study, increased language skills in Latino children.

Looking at books does more than teach a child to read, it is a powerful way of promoting positive interactions between parents and children. It helps parents discover early the remarkable joys of book sharing and reading aloud to young children. When we talk to parents of a 6 month old or 1 year old, we tell them the goal is not for the child to learn the alphabet or words, but to learn that books have special information and by sharing books with the parent who they love, children will learn to love books.

The approach has special implications for parents who have limited literacy or English abilities. Children's books with comparatively few words on a page and simple sentences can offer reassuring first steps towards improved adult literacy. Parents are encouraged to look at books with their children, ask questions about the books, tell stories about the

pictures and connect the story to their everyday lives. Since the issue of literacy is discussed relative to their child, this oftentimes provides an opportunity to identify a parent who wishes to improve their own literacy skill.

Some observers may consider this approach to be “medicalizing” reading because of the relationship between the parent and clinician, but Reach Out and Read validates parents aspirations for their child to be a learner, to do well in school and in life. One mother said, “Well if the doctor is giving me books and talking about sharing books with my child, it must be important.”

In sum, through this effort as well as through other programs, the Department of Pediatrics at Boston Medical Center remains at the forefront of pediatric care by continually improving the quality of care and adapting to the changing needs of its young patients. However, other examples of medically based but systems oriented initiatives exist. The work of other EWG members provide examples.

A Proposal to Optimize Healthy Development Among Children and Adolescents with Special Needs

A developmental systems approach to child well-being emphasizes the need to integrate all components of the system within which the child lives. As noted earlier in this report, a key feature of this integration involves forging partnerships among all individual, groups, and organizations having an interest in the promotion of positive child and adolescent development. The forging of such collaborations is essential for all instances of child well-being, including clearly those pertinent to child. In short, from the perspective of developmental systems, best practice cannot occur without such collaboration.

EWG Member Dan Offord and his group at McMaster University in Hamilton, Ontario have begun to implement just such a best practice-serving collaborative effort. They are building a program that seeks to identify and enlist stakeholders into partnerships for optimizing healthy development among children and adolescents with special needs. He and his colleagues seek to develop and implement a partnership model for achieving consensus on priorities for new directions in research and practice applicable to four groups of children and adolescents with special needs: Those with autism and other pervasive developmental disorders; those exhibiting antisocial behavior; those living in poverty; and Aboriginal children and adolescents. His group seeks also to implement a plan of action for addressing the priorities identified by stakeholders, and to evaluate the effectiveness and generalizability of the partnership model for achieving consensus on priorities and initiating action to address them.

Background

Remarkable changes are taking place in approaches to setting priorities for research and practice in the health field. There is wide-spread agreement on the need for sharing this responsibility among stakeholders and, in particular, for listening to the concerns and ideas of individuals directly affected by research findings. The objectives identified in the

letter of intent issued by Health Canada for Centres of Excellence for Children's Well-Being embody this new approach. A similar direction is also being seen in national research funding agencies such as the Medical Research Council of Canada which has been recast into the Canadian Institutes for Health Research (CIHR). A specific objective of this make over is to widen the perspectives of academic researchers traditionally locked into specialist perspectives. Shifting the emphasis from specialist disciplines to more general themes is expected (a) to put a premium on interdisciplinary partnerships; (b) to broaden research foci; (c) to lead to research programs with higher relevance to the public good; and (d) to enhance the impact of the knowledge produced by emphasizing dissemination to consumers, clinicians and policy makers.

Isolation Among Health Stakeholders

The move towards participatory frameworks in the development and implementation of research proposals represents a concerted effort to address the disciplinary isolation of scientists engaged in health research. This problem of isolation in the health field is much deeper: health researchers work at a remove from an array of stakeholders - the public, service providers, individuals experiencing poor health, decision makers - who need information to assist them in achieving their health objectives. These stakeholders have few opportunities to influence research agendas for health, let alone identify the issues relevant to themselves and set specific priorities for addressing them. There are several reasons for this situation. One, perspectives on health have been dominated by the ascendance of scientific medicine. This has created a power imbalance that favors research experts and clinical investigators over nonacademic stakeholders. Two, the concepts and methods used by researchers are exclusionary and largely inaccessible to the public. This creates a formidable barrier to engagement. Three, the reward and accountability structures of universities, particularly the requirements to obtain peer reviewed funding and to publish in peer-reviewed journals, create a different agenda for researchers from other health stakeholders. Peer-review, for either funding or publication, is limited to like-minded scientists.

Furthermore, the content and presentation of findings in academic journals are largely inaccessible to public stakeholders. Four, perspectives on time and urgency associated with health issues are very different between researchers and other stakeholders. Scientific breakthroughs tend to be exceptional occurrences that spring from the slow accumulation of knowledge over long periods of time. Service providers, individuals experiencing poor health and decision makers have much shorter time horizons limited by the compelling need for relevant and timely solutions to immediate problems. The objectives and methods of participatory research would seem to offer a model for enhancing the public relevance and the impact of research programs by bridging the gap between health researchers and other stakeholders.

Participatory Research

Participatory research has been described as a process involving, "...(a) extensive collaboration between traditionally defined researchers and the community in each

research stage from identifying the problem to applying and disseminating results, (b) a reciprocal educational process between community and researchers, and (c) an emphasis on taking action on the issue under study...” (Green et al., 1995:3).

Offord’s model of participatory research seeks to develop partnerships among health stakeholders who have common interest in promoting the life quality of children with special needs. (Hereafter children will be used to represent children and adolescents.) There are several reasons for believing that these partnerships can be effective in achieving consensus on priorities for new directions in research and practice and for initiating action to address them. One, the partnership model offers an explicit mechanism for sharing power and accountability which traditionally resides within, not across, stakeholder groups such as researchers, service providers, decision makers and affected individuals. Two, each partnership will become an educational forum to stimulate learning among stakeholders and will have a scientific advisory group responsible for meeting its informational needs. This will provide each stakeholder with the opportunity of personal exposure to new ideas, concerns and issues. Three, each partnership will be comprised of a broad base of stakeholders. This will provide meaningful access to large constituencies beyond members of the stakeholder alliance when it comes to implementing specific action plans.

Knowledge Development and Application

The primary objective of this proposal is to develop and evaluate a partnership model (a) for achieving consensus on priorities for new directions in research and practice and (b) for initiating action to address them that will optimize healthy development among children and adolescents with special needs. Research and practice are activities in the knowledge cycle visualized below as forming an iterative loop from knowledge generation to evaluation, dissemination and use.

Obstacles and opportunities for addressing the special needs of children can exist at any point in the cycle. For example, uncertainties about the accuracy of early identification, the developmental course of children with special needs, and the effectiveness of preventive interventions focus attention on knowledge generation and evaluation. The failure of research evidence to enter public consciousness and to influence policy and practice focuses attention on knowledge dissemination and use. Finally, attempts to influence the dissemination and use of research evidence may lead to the testing of new theories and hypotheses and a new round of knowledge generation, completing the cycle. These stakeholder partnerships have two primary responsibilities: (1) to identify priorities for knowledge development and application that will improve the developmental course of groups of children with special needs; and (2) to take action that will address these priorities in a timely fashion.

In sum, in contrast to programs championed through the leadership of one community institution, such as a city hospital or medical center, there are also “best practice” efforts that may engage the breadth of the institutions and individuals within a community. EWG Member William Damon describes a new and innovative example of such a

community-wide endeavor.

Enhancing Behavior That Promotes Civil Society: The “Youth Charter”

What is required for the promotion of civil society among our nation’s young people? William Damon (1997), in his book, *The Youth Charter: How Communities Can Work Together to Raise Standards for All Our Children* (1997), has envisioned the creation in each community in our nation and world the development of a “youth charter,” a set of rules, guidelines, and plans of actions that each community can adopt in order to provide for their youth a framework for development in a healthy manner. Damon (1997) describes how youth themselves, and as well significant adults in their community (for example, parents, teachers, clergy, coaches, police, and government and business leaders), can create partnerships to pursue a common ideal of positive moral development and intellectual achievement.

For example, Damon (1997) explains how a youth charter can be developed to maximize the positive experiences and long-term desired developmental outcomes of youth in community sports activities. He notes that participation in sports is a significant part of the lives of many contemporary adolescents, and he points out that there many be important benefits of such participation. Young people enhance their physical fitness, learn athletic and physical skills and, through sports, experience lessons pertinent to the development of their character (for example, they learn about the importance of diligence, motivation, teamwork, balancing cooperation versus competition, balancing winning and losing, and the importance of fair play) (Damon, 1997). Moreover, sports can be an a context for positive parent-child relations, and such interactions can further the adolescent’s successful involvement in sports. For instance, parental support of their male and female adolescents’ participation in tennis is associated with the enjoyment of the sport by the youth and with an objective measure of their performance (Hoyle & Leff, 1997).

However, Damon (1997) notes as well that often organized and even informal opportunities for sports participation for youth, ranging from Little League, Soccer, or pick-up games in school yards, fall short of providing these benefits for young people. He points out that in modern American society sports participation is often imbued with a “win at any cost” orientation among coaches and, in turn, their young players. In addition, parents too may have this attitude. Together, a value is conveyed that winning is not only the main goal of competition, it is the only thing (Damon, 1997, p. 210).

Damon believes that this orientation to youth sports corrupts the purposes of youth participation in sports. Parents and coaches often forget that most of the young people on these teams will not make sports a life career and, even if they were to do this, they—as well as the majority of young people involved in sports--need moral modeling and guidance about sportsmanship and the significance of representing, through sports, not only physically but as well psychologically and socially healthy behaviors (Damon, 1997).

In order to enable youth sports to make these contributions to positive adolescent development, Damon (1997) proposes a “youth charter” that constitutes guidelines for the design and conduct of youth sports programs. Adherence to the principles of the charter will enable communities to realize the several assets for young people that can be provided by the participation of youth in sports. Components of the charter include the following commitments to:

1. Make youth sports a priority for public funding and other forms of community support (space, facilities, volunteer coaches);
2. Parents and coaches should emphasize standards of conduct as a primary goal of youth sports;
3. Young people should be provided opportunities to participate in individual as well as team sports;
4. Youth sports programs should encourage broad participation by ordinary players as well as stars; and
5. Sports programs for youth must be carefully coordinated with other community events for young people” (Damon, 1997, pp. 123-125).

Damon (1997) envisions that, by embedding youth in a community where service and responsible leadership are possible, the creation of community-specific youth charters can enable adolescents and adults to, together, systematically promote the positive youth development outcomes that the above-noted research indicates can be attained. In other words, the broad creation of youth charters can create opportunities to actualize valued goals for healthy development, that is, for development that serves both individual and community goals for the elimination of risk behaviors and for the promotion of the ability to contribute to high quality individual and community life. Through community “youth charters,” then, youth and adults may work together to create a system wherein civil society is maintained and perpetuated (Damon, 1997).

Using community assets to build child well-being

What, precisely, must be brought together by such charters to ensure the promotion of such positive youth development? Peter L. Benson and his colleagues at Search Institute in Minneapolis, Minnesota believe that what is needed is the application of “assets” (Benson, 1997; Benson, Leffert, Scales, & Blyth, 1998; Leffert, Benson, Scales, Sharma, Drake, & Blyth, 2000; Scales & Leffert, 1998). That is, they stress that positive youth development is furthered when actions are taken to enhance the strengths of a person (e.g., a commitment to learning, a healthy sense of identity), a family (e.g., caring attitudes toward children, rearing styles that both empower youth and set boundaries and provide expectations for positive growth), and a community (e.g., social support, programs that provide access to the resources for education, safety, and mentorship available in a community) (Benson, 1997). Accordingly, Benson and his colleagues

believe there are both internal and external attributes that comprise the developmental assets needed by youth. Through their research they have identified 40 such assets, 20 internal ones and 20 external ones.

Benson and his colleagues have found that the more developmental assets possessed by an adolescent the greater is his or her likelihood of positive, healthy development. For instance, in a study of 99,462 youth in Grades 6 through 12 in public and/or alternative schools from 213 U.S. cities and town who were assessed during the 1996-97 academic year for their possession of the 40 assets, Leffert, et al. (2000) found that the more assets present among youth the lower the likelihood of alcohol use, depression/suicide risk, and violence.

Other data by Benson and his colleagues provide direct support for this argument. Scales, Benson, Leffert, and Blyth (2000) measured a concept termed “thriving” among 6,000 youth in Grades 6 to 12, evenly divided across six ethnic groups (American Indian, African American, Asian American, Latino, European American, and Multiracial). Thriving was defined as involving seven attributes: School Success; leadership; valuing diversity; physical health; helping others; delay of gratification; and overcoming adversity. Most, if not all, of these attributes of thriving are clearly linked to the presence of prosocial behavior (e.g., helping others, delay of gratification) and to the behaviors requisite for competently contributing to civil society (e.g., valuing diversity, leadership, overcoming adversity). The greater the number of developmental assets possessed by youth the more likely they were to possess as well the attributes of thriving.

One key community-based institution that has not traditionally been part of the “solution” to community-envisioned plans for the promotion of positive youth development is the university. However, as explained by Richard M. Lerner, there is reason to believe that universities—and the academic scholars that “inhabit” them—may be at a turning point in their prototypic institutional and career trajectories, respectively. This change may involve active (and perhaps even eager) participation in the sorts of partnerships described above as being a key feature of “best practice” programs.

University-Community Partnerships

As we have just observed, one institution that has remained by and large at the periphery of providing its assets and resources to promote positive development among youth has been the university. As explained by EWG Member Richard M. Lerner, consistent with developmental systems models, however, many universities have started to work to build university-community partnerships promoting positive development. Cases in point are several of the universities within which EWG members work (e.g., Boston University, Columbia University, Harvard University, Tufts University, UCLA, University of Maryland, University of South Carolina, and University of Nebraska).

In these contexts, many universities have established centers in order to provide units through which communities can access universities and through which faculty, students, and staff can engage in outreach to communities. These efforts are aimed at building co-

learning partnerships with communities, collaborations wherein the values, the voice, and the vision of the community are equally as important as those of the scholars coming to the collaborative “table.”

To illustrate some of the university-community collaborative efforts underway at universities, we may note that partnerships exist for EWG members with the National 4-H Council to help them forge a vision of “community youth development,” of positive youth development in a community context with the International Youth Foundation, to try to build principles of best practice in youth programming within each of the 60 countries with which IYF will be working over the next four years; and with Search Institute (SI), to enhance their ability to assess, within the approximately 600 cities with which SI collaborates, the assets that exist for positive youth development. Other EWG members are involved in still other existing or proposed collaborations, several of which are discussed in somewhat greater detail below. EWG member Maya Carlson described an exciting proposed collaboration in North Carolina, involving the North Carolina “Smart Start” program.

North Carolina Smart Start

How does a community-initiated program, for instance, one focused on early learning, affect the well-being of children? How is child well-being promoted by the quality of community participation (involving, for instance, participation in decision making and in program design) in such a program? In the context of the North Carolina Smart Start program, EWG Member Maya Carlson will address these questions by ascertaining the ways in which a community and the individuals within it define goals for children, the various influences on those goals, and the ways in which the community opts to address the goals, once defined.

With the growing emphasis on the importance of young children’s early life experiences in determining later successful life outcomes, several states and communities are implementing initiatives designed to improve the lives of young children and their families. Many of these new initiatives recognize the complexity of children’s needs and offer a multi-component, comprehensive approach to addressing child well-being, rather than a more traditional, single-strategy approach such as providing teacher training alone (Knitzer & Page, 1996). For some of these initiatives, states are also ‘reinventing government’ by setting broad goals and allowing local community members to decide how best to meet those goals, instead of forcing communities to follow state-developed strategies (Osborne & Gaebler, 1992). Exactly how do communities accomplish such tasks? In an effort to answer this question, researchers at the Frank Porter Graham Child Development Center seek to learn more about the decision-making processes involved in a community-based initiative in North Carolina.

The work proposed will take place in North Carolina, one of eight states that have developed statewide comprehensive initiatives (Knitzer & Page, 1998). The North Carolina Early Childhood Initiative - better known as Smart Start - was established by the governor in 1993 as a partnership between state government, local leaders, service

providers, businesses and families to better serve children under six. The primary goal of Smart Start, as stated in the legislation, is to ensure that all children enter school healthy and ready to learn. Progress on the following four sub-goals is expected to lead to the primary goal: (1) the quality and affordability of child care will be improved, (2) families will be more supported in their roles as the primary teachers of their children, (3) counties will make resources available to children and families, and (4) state and local agencies will engage in more collaborative decision-making concerning young children and their families. Before describing the specific research questions and methods of the work proposed, a description of Smart Start is provided below along with a brief discussion of the challenges in evaluating comprehensive community initiatives.

An Overview of Smart Start

Smart Start works like a block grant. The state allocates funds to local non-profit corporations - called partnerships - established specifically for the purpose of administering Smart Start. Each local partnership Board of Directors consist of at least 19 members representing groups mandated by the Legislature, including human services, child care, the religious community, parents of preschoolers, and others.

The local partnership boards are responsible for developing a plan to meet their own community's needs. Typically, these plans consist of improving and expanding existing programs for children and families, as well as designing and implementing new programs.

Challenges in Evaluating Smart Start

Although Smart Start and other comprehensive community-based initiatives may be an appropriate strategy for addressing complex community needs, they are challenging to evaluate. Connell, Kubisch, Schorr, and Weiss (1995, pp. 3-5) discussed six difficulties in evaluating these new community initiatives. First, the initiatives are horizontally complex. That is, they affect multiple community systems, such as schools, child care, and health agencies. Second, the initiatives are also vertically complex because they target change at multiple levels of the community, including service systems, families, and individuals. Third, it is difficult to evaluate initiatives that seek to affect a broad range of outcomes, including outcomes that are difficult to define and measure, such as collaboration among service agencies. Fourth, community initiatives are influenced by a broad range of contextual issues - such as economic and political factors - that are not controlled by its leaders. Fifth, the flexible and evolving interventions of the initiative also challenge evaluators. Because community members choose and develop the interventions themselves and may redefine the intervention at each funding cycle, the intervention is fluid rather than constant.

Finally, the absence of a comparison community or control group makes traditional random assignment designs impossible and occurs because communities typically are not randomly assigned to receive or not receive the initiative and because community initiatives are often aimed at all individuals in a community. Even if random assignment

of individuals within a community were possible, it would be difficult in many cases to determine who is and is not participating in the intervention, especially if the initiative is well-integrated into the existing service system.

Conclusions

It is clear that the frame of developmental systems used by the EWG provides a useful means to both integrate and extend current scientific information pertinent to child well-being. In addition, as illustrated by the several instance of “best practice” programs discussed above, this perspective enables the synthesis of science and practice at multiple levels of the developmental systems. Such syntheses have the potential of substantially advancing the knowledge base and the community-based skills and resources requisite to enhance child well-being across the diverse communities of America.

To understand the basis for this potential it is useful to summarize here the key points presented in this section and in the prior two ones:

- Most generally, scientists need to develop further the conceptual and empirical bases of dynamic, developmental systems models pertinent to child well-being, such as the life course health development model.
- To further the understanding and use for application of such models, scientists need to investigate further the physiological processes underlying child well-being; the connection between animal models of well-being and intervention models for human infants, children, and adolescents; and the physiological bases and sequelae of interventions into child well-being.
- Critical here, and in respect to all scientific and practice ideas forwarded by the EWG, is the need to develop measures that are appropriate to index change (1) at all of the levels of organization comprising the developmental system and, as well, (2) sensitive to variation across age, race, ethnicity, socioeconomic status, religious, cultural, and historical categories.
- At the individual levels of organization, greater understanding is needed of child motivation and of strategies for action used by young people. For example, how are goals selected and what means are used to pursue these goals? How to children compensate for failure to reach goals?
- Actions involving ecologically prototypic behaviors (routines, habits, mores, and customs) are important to understand in order to appreciate the normative patterns of functioning that may moderate well-being.
- The physical and geographical place of development plays an important role in cognitive, emotional, and personal development. Accordingly, the natural and designed physical ecology needs to be better understood, both as a context within

which behaviors associated with well-being are enacted and as a dynamic relational influence on well-being.

- More longitudinal research is needed to understand how the social ecology as well as the physical ecology promote child well-being. The Project on Human Development in Chicago Neighborhoods is an exemplary instance of such research because it underscores the efficacy of the social collective in promoting positive child and adolescent well-being.
- Child participation in culturally important activities imbues young people with senses of belonging to, and having the capacity to engage positively, their social ecology. Study of such engaged children supplements understanding of the bases and implications for well-being of children's prototypic behavior patterns and use of time more generally.
- From a developmental systems perspective it is necessary, in order to appropriately integrate science and practice pertinent to the promotion of collaborative research/evaluation and application activities, to collaboratively involve scholars, practitioners, policy makers, and child, adolescent, and adult community members. Such partnerships should help bridge gaps between knowledge and practice and, as well, between practice and the formulation of policy.
- Such collaborations will have this integrative function by giving all partners shared ownership of data. Moreover, through the collaborative involvement of researchers in the design and implementation of research and evaluation, these partnerships will inculcate a greater capacity for all partners to understand and use the data associated with these collaborations.
- In addition, community (child and parent) participation in such collaborations will enhance the likelihood of local responsibility and accountability.
- In order for social justice and civil society to exist in America, it is crucial that these research-application collaborations include the breadth of the diverse children, families, and communities in the nation.
- Exemplary programs may involve innovative means of enhancing the development of features of child well-being. For instance, such programs may involve a group of professionals (e.g., pediatricians) in the development of outcomes (e.g., literacy) not ordinarily associated with their practice. In turn, such programs may involve devising a "youth charter" to engage a community in promoting child participation in athletics in a manner that stresses both the health and the social collaborative aspects of sports. In turn, such programs may involve working with municipal leaders to identify and marshal community capacity to deliver the individual and ecological assets needed to enhance child well-being. In addition, such programs may involve building community coalitions to improve the early life development of children.

- Innovative collaborations such as those noted above involve partnerships across disciplines and professions, and underscore the point that the developmental systems approach to programs and policies involve integrations across sectors of youth-serving community. Contributions from all stakeholders in the lives of children need to be integrated to design, implement, bring to scale, and sustain programs effective in enhancing child well-being.
- Given the strengths that universities and their faculties can bring to these collaborations—for example, in regard to research/evaluation-application partnerships, it is important to promote engagement by higher education in child well-being.

Given the potential power of the perspective embraced by the EWG, represented by the above points, group members believe that several actions are appropriate for the CCW to consider. These recommendations for action are discussed below.

RECOMMENDATIONS FOR PROGRAMMATIC DEVELOPMENT

Consistent with the ideas forwarded above by the EWG, the group believes that there are several ideas for action that should be considered by the CCW. These ideas have scientific, practice-oriented, and community-collaborative features.

1. Devote resources to the continued development of the conceptual and empirical bases of dynamic, developmental systems models pertinent to child well-being.
2. Conduct further investigations of the physiological processes underlying child well-being; the connection between animal models of well-being and intervention models for human infants, children, and adolescents; and the physiological bases and sequelae of interventions into child well-being.
3. Devote resources to the development of measures that are appropriate to index change (1) at all of the levels of organization comprising the developmental system and, as well, (2) sensitive to variation across age, race, ethnicity, socioeconomic status, religious, cultural, and historical categories. For instance, establish indicators of well-being that promote understanding at the community level and, as well, that can be used at state and national levels to promote effective policies and programs and new norms about children in their natural social networks.
4. Facilitate research that addresses child motivation, child strategies for action, and the identification of how children select goals, devise means to pursue these goals, and compensate for failure to reach goals.
5. Facilitate research that appraises the actions of children involving ecologically prototypic behaviors (routines, habits, mores, and customs) and their link to child well-being.

6. Facilitate research that assesses the natural and designed physical ecology. Determine how these settings serve as contexts within which behaviors associated with well-being are enacted and as dynamic relational influences on well-being.
7. Encourage more longitudinal research about the social ecology as well as the physical ecology promote child well-being. Use the Project on Human Development in Chicago Neighborhoods as a template for facilitating new research.
8. Given the significance for child well-being of child participation in culturally important activities, facilitate research that assessed such engaged children.
9. Given the need to integrate science and practice pertinent to the promotion of collaborative research/evaluation and application activities, act to involve scholars, practitioners, policy makers, and child, adolescent, and adult community members in partnerships that help the bridge gaps between knowledge and practice and practice and the formulation of policy.
10. To pursue this goal, seek collaborations with other national, state, and local organizations that work to marshal the strengths, or assets, of communities in the service of the promotion of positive youth development. For instance, given the comparable national agenda of Search Institute (SI) and CCW for building community collaboration around developmental assets pertinent to child well-being, CCW should explore establishing a collaboration with that advances each organization's goals in regard to the enhancement of well-being among children and adolescents in America. Similar collaborations might be explored with the American branch of the International Youth Foundation and with the newly organized Society for the Study of Human Development.
11. Insure that these research-application collaborations include the breadth of the diverse children, families, and communities in the nation.
12. Given the exemplars that exist of innovative programs promoting child well-being, and that such programs involve building broad-based community coalitions, develop and catalyze a model of community collaboration that assures contributions from all stakeholders in the lives of children in regard to the design, implementation, bringing to scale, and sustaining of programs effective in enhancing child well-being.
13. Given the strengths that universities and their faculties can bring to these collaborations, promote engagement by higher education in child well-being.

CONCLUSIONS

Using these recommendations as a frame for integrated research, evaluation, and dissemination efforts, CCW could catalyze an historically unprecedented collaboration among scholars, practitioners, and policy makers. This collaboration would function to apply developmental science in a manner that will invaluablely extend the ability of our nation to understand the bases of child well-being across the diversity of our nation, *and*

to use this understanding in community-based programs and in policies to enhance these bases. In contributing to building a ubiquitous community basis for the positive development of America's youth through these and other instances of the application of developmental science, the integrated basic and applied scholarship promoted by the CCW would help create in America a sustained process for the enhancement of child and adolescent development and, as a result, civil society in our nation.

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Appendix 1

BIOGRAPHICAL PROFILES

Arlene Andrews Ph.D., LISW, is Interim Director of the Institute for Families in Society and Professor of Social Work at the University of South Carolina.

Asher Ben-Arieh is the Associate Director for Research and Development at the National Council for the Child (NCC) in Israel (an NGO which acts mainly as an advocate for children and children's issues). He heads the Center for Research and Public Education at the NCC.

Maya Carlson, is Associate Professor of Neurobiology in Psychiatry, Harvard Medical School. As a Senior Advisor to the CCW, she helped to organize the Ecology Working Group.

William Damon is a Professor of Psychology and the Director of the Center for the Study of Adolescence at Stanford University.

Carol Dweck is a Professor of Psychology at Columbia University.

Felton Earls is a Professor of Child Psychiatry at Harvard Medical School. Along with Maya Carlson, he helped organize the Ecology Working Group.

Cynthia García Coll is Professor of Education, Psychology and Pediatrics, Chair of the Education Department, and Director of the Center for the Study of Human Development at Brown University.

Robert Gold is a Professor at the University of Maryland, where he directs a laboratory on health informatics.

Neal Halfon, MD is the director of the Center for Healthier Children, Families and Communities at UCLA.

Roger Hart is a professor of Environmental and Developmental Psychology at The Graduate School, The City University of New York.

Richard M. Lerner is the Bergstrom Chair in Applied Developmental Science in the Eliot-Pearson Department of Child Development at Tufts University.

Bruce McEwen is a professor of Neuroendocrinology at Rockefeller University in New York City.

Michael Meaney is a professor of Neurobiology at Douglas Hospital in Canada

Dan Offord is a Professor of Child Psychiatry at McMaster University

Donald Patrick is a Professor of Public Health at the University of Washington

Magda G. Peck is the Associate Chair for Community Health, Department of Pediatrics and CEO/Executive Director, CityMatCH at the University of Nebraska Medical Center.

Thomas Weisner is a Professor of Medical Anthropology at UCLA.

Barry Zuckerman, MD is a Professor and Chairman of the Department of Pediatrics at Boston University School of Medicine and Chief of Pediatrics at Boston Medical Center.