An Ecocultural Perspective on Risk and Protective Factors in Children's Development: Implications for Learning Disabilities

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An ecocultural perspective on the development of at-risk children and their families is proposed. In this approach we have identified both risk and protective factors as contributors to at-risk children's educational and personal–social outcomes. Four predictive models of risk are proposed: (a) main effect, (b) additive, (c) multiplicative, and (d) compensatory. Preliminary findings suggest that the models differ in predictive power, with correlational results favoring the compensatory and additive models. Generalizations to date include: Aggregated data are more valid predictors than single indicators or main-effect models; risk and protective factors have their locus in the child, family, and social context; both risk and protective factors must be taken into account in diagnosis and intervention planning.

The well-documented high rates of school failure and the number of children needing special educational services argue for the need for early and effective programs of recognition, prevention, and intervention for high-risk children, including children with learning disabilities (LDs). A consequence of the interest in early risk has been an increase in the number of predictive studies, and in efforts to specify particular risk conditions or variables of importance. Findings to date allow several generalizations which may serve as guides to research and to program development:

1. Prediction is more accurate for groups than for individuals within groups.
2. The power of specific risk indicators varies relative to ecological and cultural context.
3. Risk conditions may be mediated by the presence of protective factors.

4. Outcome status varies according to the time and content of assessment.

Our ongoing research at the University of California, Los Angeles, is guided by these generalizations, and is an attempt to further the understanding of risk by testing various models for combining risk and protective indicators. As part of a project using extant longitudinal data sets we are examining the predictive power of different risk models within an ecological and cultural framework. We have proposed four models for aggregating information about at-risk children and their families: (a) main effect, (b) additive, (c) multiplicative, and (d) compensatory. Preliminary findings, based on child and family data, suggest the differing predictive power of the models and underscore the importance of considering a range of influences when assessing risk, particularly the culturally mediated beliefs of parents regarding the nature of risk and protection. Our purposes in this article are to provide an overview of an ecocultural perspective on risk and development, to summarize findings from preliminary research on the risk models, and to propose some implications for intervention planning with at-risk children and their families.

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AN ECOCULTURAL FRAMEWORK

Ecocultural theories offer a principled basis for identifying child and family circumstances representing risk or protective influences. As articulated by Weisner (1984) and by Weisner and Gallimore (1985), an ecocultural approach views the environment as a complex set of cultural–environmental conditions or domains that influence families and their children's development. These domains can be ranked according to their influence on children's everyday experiences and activities, and thus on children's development and achievement. Within this approach, the ecocultural characteristics of the environment, as well as the parents' perceptions or constructions of their circumstances, are considered when defining and understanding risk and protection. Indeed, the determination of risk and protection is, in part at least, a function of the parents' constructions and interpretations, based on the context of their everyday lives. Our earlier example of single mothers illustrates that mothers' beliefs about their family arrangements influence the educational outcomes of the children.

The ecocultural context also influences expectancies and requirements for children's competencies and for the childrearing practices thought to lead to competence. In horticultural societies dependent on subsistence crops and livestock, compliance to family subsistence needs, responsibility for domestic chores, and assistance in child care are expected of children. In societies dependent on literacy and numeracy skills, however, early signs of verbal responsiveness, environmental exploration, and learning written and spoken text are signs of competence and of appropriate development (Weisner, 1987). The ecocultural context also shapes perceptions and responses to child characteristics. For example, individual differences in children's temperaments or behavioral styles may become risky or protective as children interact with adults and peers (Keogh, 1989a; Keogh & Burstein, 1988). In societies and families in which motoric precocity and high activity are signs of good development and future competence, high-active, high-energy, and high-persistence children are considered to have positive and "easy" temperaments. Yet, in societies like the contemporary United States, in which sleeping through the night, adaptability and malleability in the face of often tight, time-driven family schedules is important, such high-energy children are frequently viewed as having "difficult" temperaments (Super & Harkness, 1982).

From our work with families and children with developmental delays, we know that parents construe their children's problems differently and have different "theories" about why the problems occur and about what to do about them (Gallimore et al., 1989; Weisner, Beizer, & Stolze, 1991). Striking differences emerge in these families' social constructions, despite similarities in the nature of the children's problems and in the social and demographic characteristics of the families. It is reasonable that our understanding of home–school disagreements about a given child's problems will also be increased if both parents and school professionals recognize that their constructions of the problem may vary, but that each perspective may have validity given its context.

PREDICTIVE MODELS

A major consideration in predictive studies relates to the ways in which information is aggregated or integrated. Ramey and MacPhee (1986) noted that in addition to reliance on deficit and actuarial models, much of the research on risk prediction has been limited by three major constraints. First, the predictions over time assume linear growth patterns and a constant magnitude of risk. Second, most studies have relied on only a small number of predictor and outcome variables, and the variables are often global, summarizing indices such as maternal education level or family social class. Third, risk factors have been defined in terms of personal or environmental characteristics, not as functional or transactional effects. Further, as noted earlier, few researchers have attempted to assess what parents themselves view as risky or protective; thus, the parents' social constructions of risk and their developmental goals for the child and family are in general unstudied. It is increasingly clear that understanding the consequences of risk over time involves aggregating or integrating information from several sources. At issue is how to accomplish this given the limitations already outlined.

MODELS FOR THE STUDY OF RISK

Based on a review of the existing literature (Keogh, 1989b), we describe four basic models. Within each model, specific risk and protective factors can be organized, allowing comparative test of the predictive power of each.

Main-Effect Model

The most direct and perhaps simplest model of risk assumes a direct linear effect of risk condition on development. The model is rooted in the medical tradition. Clinical implementation of this model has focused on biological variables, as exemplified in the idea of a "continuum of reproductive casualty" (Pasamanick & Knobloch, 1961). Broad psychological and educational applications of the model have been developed on the assumption that particular in-child conditions lead to predictable behavioral, adaptive, and learning problems (e.g., brain damage leads to perceptual disturbances). It is often assumed, too, that the consequences are relatively fixed and that the underlying condition(s) lead to long-term and irreversible outcomes.

Additive Model

A somewhat expanded approach to the study of risk is based on the assumption that risk is determined not just by *what* but by *how many* risk determinants are present. The additive models have been proposed in part because of the recognition that single factors predict only a limited number of (usually severe) problem conditions. Several investigators have proposed that it is the number of risks, rather than the specific risk conditions, that effects outcome (Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987). Most additive models contain a range of social–environ-

mental risk signs in addition to child conditions. For example, Werner (1986) identified family factors (e.g., number of children, number and type of alternative caretakers) as risk indicators. Rutter (1978) also implicated a number of risk signs, including severe marital discord, overcrowding or large family size, and paternal criminality. Sameroff et al. (1987) proposed 10 risk variables, which included maternal mental health, family size, and ethnic status, as contributors to intellectual outcome. Based on their longitudinal research they found that children's intellectual performance was best predicted by a "combination of multiple variables" (p. 347) rather than by any single variable. The additive model, thus, suggests that it is necessary to consider a number of individual and environmental variables and that outcome is a function of the aggregate or sum of risk conditions.

Multiplicative Model

It is reasonable that the aggregate of risk indicators is more powerful than any single factor, yet the additive model may not capture the interactive nature of individual variables. Rutter (1987) suggested the possibility that the relation among risk variables may be multiplicative rather than additive. That is, a more powerful prediction may be derived from viewing risk as the product rather than as the sum of individual indicators. We proposed earlier that some risk or protective factors may enhance other factors, so that the cumulative effect is geometric rather than arithmetic. For example, a child or family with five risk indicators would have an additive risk score of 5 ($1 + 1 + 1 + 1 + 1$) but would have a multiplicative risk score of 120 ($1 \times 2 \times 3 \times 4 \times 5$). An alternative method for computing a multiplicative score is to assign a value of 2 to each risk or protective factor and multiply by the total number of conditions present (E. Zigler, personal communication, May 1992). A child with five risk factors would have a multiplication score of 10. Clearly, the quantitative index of risk differs depending on the model used for aggregation. It is possible, however, that the enhancing effects of multiple influences may be more powerfully captured in a multiplicative rather than in an additive model.

Compensatory Model

In the models described so far, risk and protective factors are aggregated to yield separate indices of risk or of protection. Another way to conceptualize risk, however, is to include possible positive or protective contributors to developmental outcome. In a sense, this model subsumes several characteristics of the additive and multiplicative models already described, but explicitly adds the notion of compensating conditions and attributes. Anthony (1974), Werner and Smith (1982), and Rutter (1979) all documented that some children born in risk status are well functioning and achieve solid, positive developmental and personal outcomes. Their findings suggest the need to take into account possible compensating or "protective" factors which lessen the impact of potentially negative risk conditions. The contribution of compensating conditions is well illustrated in Sameroff and Chandler's (1975) review of the potential compensating impact of social–interactive vari-

ables on risk defined as reproductive casualty (e.g., perinatal anoxia, prematurity). Similarly, Werner and Smith (1982) and Rutter (1978) identified personal attributes (e.g., positive temperament) that characterized resilient children.

The importance of possible compensating contributors to risk status has also been argued from an educational perspective (Keogh, 1971; Maughan, 1988). Many children enter school "at risk" because of personal and/or social-environmental conditions. Yet, some of these children achieve well and are successful both academically and socially. A smaller number of children enter school with specific risk conditions (e.g., limited cognitive skills, visuoperceptual problems, sensory or physical limitation). Within this group we can also expect a range of outcomes, outcomes that are not predictable exclusively from the problem condition. Thus, it is necessary to take into account other child or family attributes that appear to compensate for or minimize the effects of problem conditions on learning and behavior. In our work thus far, we have used the algebraic sum of risk and protective indicators to represent a single compensatory model score. The functional nature of the interactions among risk and compensating contributors is still unclear, yet this model holds promise for understanding and intervening in risk conditions.

Weighting of Variables

In our preliminary tests of the models, the various risk and protective factors or variables are treated as if they are of equal weight or importance. The assumption of equivalence is naive and probably inaccurate, however, as it is apparent that certain risk conditions (e.g., severe biological damage prenatally, extreme family discord) are likely to be especially powerful contributors to outcome. At the present time, the weighting of specific variables is uncertain, yet the weight or impact is important both conceptually and empirically. We expect that the impact of specific risk and protective factors may vary relative to the child's age, to the severity of the problem condition, and possibly to the child's sex. We can speculate about the relative weights of given risk and protective factors based on the existing research literature and on our clinical experiences, but we argue that the question of weighting is best addressed through both clinical and research tests. Such tests will necessarily involve taking into account differences in developmental levels and ages of at-risk individuals, as well as differences in outcome criteria, because certain variables may be especially important in particular life periods.

Aylward (1988), for example, suggested that medical–biological conditions are powerful contributors to outcomes when children are young, but that environmental conditions become increasingly important as children grow older, a finding consistent with the results of the follow-up of the Kauai sample in adulthood, as described by Werner (1991). Aylward also suggested that the same variable may have different influences on motoric or cognitive outcomes, an observation consistent with Lambert's (1988) findings that certain risk factors related to subsequent psychological or emotional outcomes, whereas others related to educational status. Thus, weighting variables will be

advantageous because it allows for multiple contributors, but takes into account possible differences in the impact of specific variables over time.

Preliminary Testing of Models

We have begun initial tests of the predictive power of the models using data from two ongoing longitudinal studies of children with mild developmental delays and their families (Projects CHILD and REACH). Children and families in both studies are Euro-American, English speaking, and from poverty level to upper middle socioeconomic status (SES). Children were identified at approximately age 3 as having mild to moderate delays generally or in specific language and/or motor domains. The REACH children have been followed for over 10 years, the CHILD children for almost 5 years. Based on a comprehensive analysis of major longitudinal studies and using an ecocultural framework, we defined risk and protective characteristics and conditions relating to child, parent, family, home, neighborhood, and school, as well as interactive variables assessing family functioning and parent–child relationships and interactions. These risk and protective indicators include:

1. Economic status, ethnicity, and other demographics.
2. Child data relating to risk condition, developmental/intellectual level, educational status, language of home, and so on.
3. Family data relating to configuration, stability of location, parental employment, and so on.
4. Detailed measures of children's educational, social, emotional, and behavioral problems and competencies; their medical histories, numbers of hospitalizations, and so on.
5. Family accommodations such as parents' work load, extended family supports, availability and use of resources, and the like.

Our work to date has focused on family variables rather than child variables. As part of this work, risk and protective scores for 50 Project CHILD families were determined based on scores on each of 11 variables derived from ecocultural theory and empirically validated through statistical analyses (Nihira, Weisner, & Bernheimer, 1989). These family ecocultural variables were: SES, availability of services for delayed child, availability of help for the family, availability of help within the family, organization of home environment for child, family workload related to delayed child, quality of father's involvement, integration of child into nonhandicapped networks, integration into handicapped networks, formal and instrumental support for family, and level of information-seeking activity. Each family was categorized as *risk* or *protective* on each of the 11 ecocultural variables; thus, the range of possible risk or protective scores per family was 0 to 11.

These scores were aggregated according to the models already described, so that each family received a main-effect, additive, and multiplicative model score for risk and for protection, and also received a compensatory model score which represented the algebraically combined risk and protective additive scores. Each model score was then correlated with outcome measures tapping family accommodations to their delayed child. To illustrate, the sustainability of intervention activities is important in delayed children's development, but families differ widely in their ability to continue or to maintain intervention activities. Thus, we consider sustainability to be a useful outcome variable and have used it to test our models. In our analyses to date, the compensatory model yielded the highest association ($-.66$) followed by risk additive ($-.53$), protective additive ($.48$), risk multiplicative ($-.37$), and protective multiplicative ($.24$).

We have also pilot tested the risk models using scores derived from a subset of Project REACH children, including the initial data collected at study entrance (chronological age 30 to 36 months). The ecocultural risk and protective scores were correlated with the children's cognitive, educational, and social–behavioral data gathered when they were 10 to 12 years of age. Scores from the various risk models were significantly correlated with Binet IQs and personal/self-help skills early on, and with Binet IQs at follow-up. The strongest values of r ($.51$) were between IQ and the additive and compensatory model scores. Although preliminary and limited to only a few predictor and outcome measures, the findings to date support the ideas that the ecocultural context is an important consideration in prediction about risk conditions and that prediction is enhanced when data are aggregated.

CLINICAL AND EDUCATIONAL IMPLICATIONS

We suggest that findings from long-term studies of risk have important implications when applied to LD children and their families. One major issue concerns the diagnostic and developmental significance of particular signs or "symptoms" identified in the preschool or early school years. Some indicators may portend long-term problems, whereas others may be transitory or may be affected by maturation, by the presence of particular protective influences, or by specific intervention efforts and experiences. The predictive validity of specific indicators or constellations of indicators (e.g., equivocal neurological signs or persistent reversals of letters) requires empirical test, so that intervention efforts may be directed appropriately. Gerber (1991) noted that some conditions within a child, family, or community are alterable or modifiable, but others are more resistant to change. Predictive validity, modifiability, and the need to include multiple, aggregated information are important practical considerations in intervention planning. Two generalizations follow from the risk research to date:

1. Except in extreme conditions, identification and prediction based on aggregated data are more valid than predictions based on single indicators or on main-effect models.
2. Both risk and protective influences must be taken into account in identification and intervention planning, suggesting support for a compensatory model.

A second issue of importance for LD children has to do with the content of diagnosis and intervention planning. Rather than an exclusive focus on the individual child, there is increasing support for interventions that include the family. Indeed, rather than an Individual Educational Plan (IEP), recent legislation directs the development of an Individualized Family Service Plan (IFSP) for each child receiving special services. The IFSP must include an assessment of the strengths and needs of the family, as well as of the child, and must identify goals for families and for children. From a clinical perspective, we propose that to understand the dynamics of intervention, it is necessary to assess the ecocultural context, including the interpretations and meanings parents ascribe to the content of intervention.

The everyday routines and activities of the family within which the interventions must "fit" must also be understood. Too often, interventions and remedial programs are developed and "sent" by educators, psychologists, physicians, or other professionals, and are assumed to be "received" by a family and a community. Findings from our longitudinal studies suggest strongly, however, that homogeneity of family social constructions and ecocultural circumstances within a community cannot be assumed (Weisner, Gallimore, & Goldenberg, 1992). There may or may not be a good fit between family goals and ecocultural circumstances and professionally determined interventions. The nature of the fit may provide insight into why some interventions are sustained and others are short-lived, and why interventions are differentially effective. Intervention and change processes, as well as the calculus of what is perceived as risky or protective by parents, are influenced by culture and ecological constraints and opportunities (Weisner et al., 1992) and become fundamental data in assessment and intervention planning.

Risk and protection, in this approach, should be assessed not only at the individual child or family level, but at the level of community, subculture, social class, or other social units. Certain patterns of social investment, of inequality or discrimination, are, as aggregate social conditions, "risky" for families and children. Our approach emphasizes that the assignment of scores for risk or protection to an individual child or family should not imply that the child or family is the primary or exclusive cause or reason for the existence of risks or protections. Every society defines competencies it values, behavioral styles it prefers, physical or medical conditions it deems more or less serious. Hence, risk and protection are culturally relative. So are the protections or cures defined by societies as valuable in defending against risks. Risk from what, or protection from what?—these are socioculturally mediated issues (Super, 1987). This point of view regarding LDs reminds us that determining what is to be learned, and how, is a socially and ecologically defined practice which changes as societies change. The meaning of LDs varies widely in different cultures or circumstances; therefore, LDs must be defined relative to the cultural constraints and opportunities surrounding a child and a family.

We suggest, too, that understanding the relative weights of variables will provide insight into LD diagnosis and intervention. Some risk indicators may have powerful and long-term implications for subsequent status, whereas others may be relatively transient or may be important only in combination with other indicators or in particular contexts; some indicators may be age-specific or situation-specific. One research goal is to identify differences in predictive power among risk and protective variables and according to risk models. A second goal is to identify which indicators are amenable to change, findings that could direct assessment and intervention planning.

Finally, understanding the long-term implications of risk and protection is also important on a policy level. Recent federal legislation establishes discretionary support for the development and implementation of early intervention services for children ages 0 to 3 years and their families. A number of states have already established screening programs for the identification of preschool children with developmental or learning disabilities. Despite worthy intent, policy makers and clinicians are struggling with definitions of risk to determine eligibility for services. A practical consideration is the most efficacious use of funds in an era of ever-shrinking resources. To date, the relative power or importance of various risk and/or protective factors is unknown and their predictive validity has not been determined. Identification of risk and protective factors and their interactions, thus, provides a reasoned basis for decisions about needed services and program development.

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REFERENCES

Anthony, E. J. (1974). The syndrome of the psychologically invulnerable child. In E. J. Anthony & C. Koupernik (Eds.), *The child in his family: Vol. 3. Children at psychiatric risk* (pp. 529–544). New York: Wiley.

Aylward, G. P. (1988). Issues in prediction and developmental follow-up. *Developmental and Behavioral Pediatrics, 9,* 307–309.

Baumeister, A. A., Kupstas, F., & Klindworth, L. M. (1990). New morbidity: Implications for prevention of children's disabilities. *Exceptionality, 1,* 1–16.

Cicchetti, D., & Rizley, T. (1981). Developmental perspective on the etiology, intergenerational transmission, and sequelae of child maltreatment. In *New Directions for Child Development* (pp. 31–55). San Francisco: Jossey-Bass.

Cicchetti, D., & Toth, S. L. (1987). The application of a transactional risk model to intervention with multi-risk maltreating families. *Zero to Three: Bulletin of the National Center for Clinical Infant Programs, 7*(5), 1–8.

Covello, V. T., & Johnson, B. (1987). Introduction. In B. B. Johnson & V. T. Covello (Eds.), *The social and cultural construction of risk: Essays on risk selection and perception* (pp. vii–xiii). Boston: Reidel.

Covello, V. T., Lave, L. B., Moghissi, A., & Uppulari, V. R. R. (1987). *Uncertainty in risk assessment, risk management, and decision making.* New York: Plenum.

Douglas, M., & Wildavsky, A. (1982). *Risk and culture: An essay on the selection of technical and environmental dangers.* Los Angeles: University of California Press.

Fischhoff, B., Lichtenstein, S., Slovic, P., Derby, S. L., & Keeney, R. L. (Eds). (1984). *Acceptable risk.* New York: Cambridge University Press.

Gallimore, R., Weisner, T. S., Kaufman, S., & Bernheimer, L. (1989). The social construction of ecocultural niches: Family accommodation of developmentally delayed children. *American Journal of Mental Retardation, 94,* 216–230.

Garmezy, L., Masten, A., & Tellegen, A. (1984). The study of stress and competence in children: A building block for developmental psychopathology. *Child Development, 55,* 97–111.

Gerber, P. (1991, August). *Successful adults with learning disabilities: Factors of risk, elements of resilience.* Paper presented at the Frostig Center and Borchard Foundation Meeting on Risk and Resilience in Individuals With Learning Disabilities: An International Focus on Intervention Approaches and Research, Missillac, France.

Hartzell, H. E., & Compton, C. (1984). Learning disability: A ten-year following. *Pediatrics, 74,* 1058–1064.

Horowitz, F. D. (1989, April). *The concept of risk: A re-evaluation.* Paper presented at the meeting of the Society for Research in Child Development, Kansas City, MO.

Johnson, B., & Covello, J. T. (Eds.). (1987). *The social and cultural construction of risk: Essays on risk selection and perception.* Boston: Reidel.

Kavale, K. (1988). Longitudinal studies of learning disabilities. In M. Wang, M. C. Reynolds, & H. Walberg (Eds.), *Handbook of special education research and practice* (pp. 303–344). Oxford, England: Pergamon.

Keogh, B. K. (1971). A compensatory model for psychoeducational evaluation of children with learning disorders. *Journal of Learning Disabilities, 4,* 544–548.

Keogh, B. K. (1989a). Applying temperament research to school. In G. A. Kohnstamm, J. Bates, & M. K. Rothbart (Eds.), *Temperament in childhood* (pp. 437–450). Chichester, England: Wiley.

Keogh, B. K. (1989b, March). *Models for the study of risk.* Paper presented at the meeting of the American Association for Educational Research, San Francisco.

Keogh, B. K., & Burstein, N. D. (1988). Relationship of temperament to preschoolers' interactions with peers and teachers. *Exceptional Children, 54,* 69–74.

Krasner, D. (1991). Risk and protective factors associated with school achievement of low SES children. Ongoing study, University of California, Graduate School of Education, Los Angeles.

Lambert, N. M. (1988). Adolescent outcomes for hyperactive children—Perspectives on general and specific patterns of childhood risk for adolescent educational, social, and mental health problems. *American Psychologist, 43,* 786–799.

Maughan, B. (1988). School experiences as risk/protective factors. In M. Rutter (Ed.), *Studies of psychosocial risk: The power of longitudinal data* (pp. 200–220). Cambridge, England: Cambridge University Press.

Nihira, K., Weisner, T., & Bernheimer, C. (1989, April). *Ecocultural assessment in families with DD children.* Paper presented at the meeting of the Society for Research in Child Development, Kansas City, MO.

Pasamanick, B., & Knobloch, H. (1961). Epidemiologic studies on the complications of pregnancy and the birth process. In G. Caplan (Ed.), *Prevention of mental disorders in children* (pp. 74–94). New York: Basic Books.

Ramey, C. T., & MacPhee, D. (1986). Developmental retardation: A systems theory perspective on risk and preventive intervention. In D. C. Farran & J. D. McKinney (Eds.), *Risk in intellectual and psychosocial development* (pp. 61–81). New York: Academic.

Ramey, C., Trohanis, P. L., & Hostler, C. (1982). An introduction. In C. Ramey & P. L. Trohanis (Eds.), *Risk in infancy and early childhood* (pp. 1-18). Baltimore: University Park Press.

Rutter, M. (1978). Early sources of security and competence. In J. S. Bruner & A. Garten (Eds.), *Human journal of development* (pp. 49–74). London: Clarendon.

Rutter, M. (1979). Protective factors in children's responses to stress and disadvantage. In M. W. Kent & J. E. Rolf (Eds.), *Primary prevention of psychopathology: Vol. 3. Social competence in children* (pp. 49–72). Hanover, VT: University Press of New England.

Rutter, M. (1983). Stress, coping, and development: Some issues and some questions. In N. Garmezy & M. Rutter (Eds.), *Stress, coping, and development in children* (pp. 1–41). New York: McGraw-Hill.

Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry, 57,* 316–331.

Sameroff, A., & Chandler, M. (1975). Reproductive risk and the continuum of caretaking casualty. In F. D. Horowitz (Ed.), *Review of child development research* (Vol. 4, pp. 187–244). Chicago: University of Chicago Press.

Sameroff, A. J., Seifer, R., Barocas, R., Zax, M., & Greenspan, S. (1987). Intelligence quotient scores of 4-year-old children: Social–environmental risk factors. *Pediatrics, 79,* 343–350.

Super, C. (Ed.). (1987). *The role of culture in developmental disorder.* San Diego: Harcourt Brace Jovanovich.

Super, C., & Harkness, S. (1982). The infant's niche in rural Kenya and metropolitan America. In L. L. Adler (Ed.), *Cross-cultural research at issue* (pp. 47–56). New York: Academic.

Weisner, T. S. (1984). Ecocultural niches of middle childhood: A cross-cultural perspective. In W. A. Collins (Ed.), *Development during middle childhood: The years from six to twelve* (pp. 335–369). Washington, DC: National Academy of Sciences Press.

Weisner, T. S. (1987). Socialization for parenthood in sibling caretaking societies. In J. Lancaster, A. Rossi, J. Altmann, & L. Sherrod (Eds.), *Parenting across the life span* (pp. 237–270). New York: Aldine.

Weisner, T. S., Beizer, L., & Stolze, L. (1991). Religion and the families of developmentally delayed children. *American Journal of Mental Retardation, 95,* 647–662.

Weisner, T. S., & Gallimore, R. (1985, November). *The convergence of ecocultural and activity theory.* Paper presented at the meeting of the American Anthropological Association, Washington, DC.

Weisner, T. S., Gallimore, R., & Goldenberg, C. (1992, January). *Families, intervention and literacy: An ecocultural perspective.* Paper presented at the National Institutes of Health conference on New Research on School Readiness, Washington, DC.

Weisner, T. S., & Garnier, H. (1992). Nonconventional family styles and school achievement: A 12-year longitudinal study. *American Educational Research Journal, 29*(3), 605–632.

Werner, E. E. (1986). The concept of risk from a developmental perspective. In B. K. Keogh (Ed.), *Advances in special education: Vol. 5. Developmental problems in infancy and the preschool years* (pp. 1–23). Greenwich, CT: JAI.

Werner, E. E. (1991, August). *The long-term prognosis for learning disabled children: Lessons from the Kauai longitudinal study.* Paper presented at the Frostig Center and Borchard Foundation Meeting on Risk and Resilience in Individuals With Learning Disabilities: An International Focus on Intervention Approaches and Research, Missillac, France.

Werner, E. E., & Smith, R. (1982). *Vulnerable but invincible: A longitudinal study of resilient children and youth.* New York: McGraw-Hill.