Familial Risk and Child Competence

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SAMEROFF, ARNOLD J., and SEIFER, RONALD. Familial Risk and Child Competence. CHILD DEVELOPMENT, 1983, 54, 1254-1268. Components of familial risk are examined in the context of a 4-year longitudinal study of children with mentally ill mothers. The risk factors examined are parental mental health, social status, parental perspectives, and family stress. The interactions among the risk factors were found to be complex in nature and different for child cognitive and social-emotional competence. These findings are discussed in the context of a systems approach to development in general, and to the development of children at risk in particular. Parental beliefs, attitudes, and coping abilities are hypothesized to be important mediators between environmental stress and child competencies.

The study of high-risk children has produced two major changes in what developmental psychologists do. The obvious one was the change from singular focuses on basic research to increasing involvement in applied areas. The less obvious parallel change was from a primary interest in the processes of development (e.g., learning and perception) to a greater interest in the context of development (e.g., caregivers and cultures). The definition of a high-risk child is one who is at a greater than average risk for later deviancies in behavior because of membership in some identifiable population. Initially, the source of that risk was sought exclusively in the medical condition of the newborn infant (Lilienfeld & Parkhurst, 1951). The continuum of reproductive casualty (Pasamanick & Knobloch, 1961) was hypothesized to be a range of conditions that arose from the birth process, that were intrinsic to the child, and that were directly correlated with later outcomes. A major insult would produce a major defect such as cerebral palsy, while a minor insult would produce a minor defect such as a learning disability. The central theme of this initial view of risk was that the deviation was a characteristic of the child independent of context.

The reproductive risk concept arose in a medical framework where a disease model was thought to underlie all disorders. According to Engel (1977) the current dominant model of disease within psychiatry is still biomedical, leaving little room for social and psychological conceptions of illness. The biomedical model is reductionist in that all behavioral aberrations are explained on the basis of disordered somatic structure and function. The biomedical model was a major advance over prior attributions of deviant behavior to demonology; the view of maladaptation as disease marked an advance to empiricism. Draguns and Phillips (1971) describe the change from "unthinking condemnation of conspicuously disturbed people to serious and well-meaning attempts to observe them in order to understand and help" (p. 2). In the disease model, individuals are not seen as integrated systems of biological, psychological, and social functioning, but rather as divided into a biological self and a behavioral self. Individuals who exhibit symptoms are thought to be affected by a germ or other aberrant process that works internally. Removal of the germ would not alter the makeup of the individual, but would only eliminate symptoms of illness. Thus, if the disease is to be cured, it

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must be understood in terms of an etiological process hidden from view. It is of little value for purposes of prevention or treatment to study behavioral disturbances such as intellectual or emotional problems because these are only surface characteristics of a deeper somatic disturbance. The behavioral symptoms may be relevant for diagnosis but not for treatment.

The contribution of the concept of reproductive casualty was to focus attention on the birth process as a source of developmental disabilities. However, the unexpected consequence of this attention was that major revisions were found to be necessary in the underlying biomedical model. Sameroff and Chandler (1975) had attempted to find the etiological links hypothesized between reproductive factors and later psychological symptoms. In an extensive review of longitudinal studies of the consequences of birth complications, they were unable to discover deviant developmental consequences that could be linearly related to biological risk factors:

Retrospective studies often gave the impression of having established clear relationships between pregnancy and delivery complications and later deviance. Prospective studies of the same variables have, however, not succeeded in demonstrating the predictive efficiency of these supposed risk factors. Most infants who suffer perinatal problems have proven to have normal developmental outcomes....

The large role given to socioeconomic and familial factors in producing emotional difficulties and intellectual retardation [in children] tends to overshadow the effects of early perinatal difficulties. The environment appears to have the potential of minimizing or maximizing such early developmental difficulties. High socioeconomic status dissipates the effects of such perinatal complications as anoxia or low birthweight. Poor social environmental conditions tend to amplify the effects of such early complications. Since the caretaking environment plays such a major role in determining developmental outcomes, a “continuum of caretaking casualty” [is] hypothesized to describe the range of deviant outcomes which would be attributed to poor parenting. [P. 236]

The implications for models of developmental risk were that the characteristics of the child could not be given sole status as causative factors in deviancy, especially the biomedical characteristics. The focus on “caretaking casualty” was the result of an emphasis on deviant outcomes for children. However, for the vast majority of children who suffer reproductive problems, behavioral outcomes are normal. To understand this discontinuity between biological and behavioral functioning, one must study the compensating aspects of caretaking, the environmental characteristics that move children from abnormal biological states to normal behavioral ones.

Sameroff and Chandler suggested that the self-righting tendencies that operated biologically in the embryological system to produce a physically normal infant (Waddington, 1966) might operate postnatally through social systems to produce a psychologically normal child. The biological self-righting tendencies are coded in a genetic system that monitors biochemically the status of the developing embryo and introduces regulatory processes to maintain a normative condition. Sameroff (1982) suggested that similar self-righting tendencies are located in the caregiving environment organized around behavioral norms and coded into social institutions and cultural heritages. In any society that endures over several generations there must be a codified system of child rearing and socialization into appropriate roles to assure the continuity of that society.

In defining the developmental risk associated with any specific child, the characteristics of the child must be related to the ability of the environment to regulate the development of that child toward social norms. In extreme cases of massive biological abnormality such regulations may be ineffective. At the other extreme, disordered social environments might convert biologically normal infants into caretaking casualties.

The Kauai study of Werner and her colleagues (Werner, Bierman, & French, 1971; Werner & Smith, 1977, 1982) provides a good description of the interplay among those risk factors in the child and those in the environment. A sample of children were followed from birth through adolescence. Assessments were made of the birth condition of the children and their developmental progress at 2, 10, and 18 years of age. From the predominantly lower-SES sample, more than half had learning or emotional problems by 18 years of age. The first two books reporting this study (Werner et al., 1971; Werner & Smith, 1977) helped to dispel the notion that birth complications had a determining effect on behavioral outcomes. Children with severe early trauma frequently
showed no later deficits unless the problems were combined with persistently poor environmental circumstances such as chronic poverty, family instability, or maternal mental health problems.

In the third report of the Kauai study, Werner and Smith (1982) divided all the children who had been at a high clinical risk at 2 years of age into three groups: those who developed problems by 10 years of age, those who did not develop problems until 18 years of age, and those who did not develop problems at all. This latter “resilient” group was the target of analyses to determine what factors in development protected them from the disorders that characterized the children who did have problems. Most of the protective factors that were identified were not surprising: good temperament, favorable parental attitudes, low levels of family conflict, counseling and remedial assistance, small family size, and a smaller load of stressful life experiences. What was surprising was the variety of interactions among the factors and the degree of complexity of analysis needed to match the complexity of variables that affected the course of a child’s development. For example, Werner and Smith attempted to separate those factors that led to healthier outcomes both in the presence or absence of risk conditions from those that only had an interactional effect, that is, a positive impact in the presence of risk factors but no impact when risk factors were absent. These latter protective factors were not found to discriminate between positive and negative outcomes for middle-class children whose lives were relatively free of stress, but they were very important in the lives of children who were growing up in poverty and subject to a large number of negative life events.

The Kauai study is in tune with many others (Sameroff & Chandler, 1975) in targeting SES and family mental health as important moderators of child development. Both mental health and social status are summary variables that incorporate a wide range of factors that may interfere with optimal child rearing. The child could be passively affected through a withdrawn parent who is unavailable for the affective exchanges necessary for healthy emotional development or through an impoverished environment where a limited range of stimulating experiences inhibits intellectual growth. On the other hand, the child could be actively affected through disorganizing experiences with an abusive or intrusive parent or through trauma from the increased number of stressful life events associated with lower-SES existence. The following sections will explore some of the dimensions that compose mental health and SES variables.

Parental Mental Illness as a Risk Factor

Family transmission of mental illness has been a consistent finding in the psychological literature. Parents with mental illness of many kinds have children who themselves have substantially higher than normal rates of mental illness (Garmezy, 1974; Rosenthal, 1970). The area that has received the most research interest is the transmission of schizophrenia. Large numbers of children of schizophrenic parents have been found to have mental disturbances (Kallman, 1938, 1946). The proportion of relatives of schizophrenics who were given a diagnosis of schizophrenia appeared closely related to the proportion of genes shared with those relatives, for example, the concordance rate for monozygotic twins was twice as high as for dizygotic twins. While the rate of schizophrenia in the general population is about 1%, close to 10% of children with one schizophrenic parent become schizophrenic themselves (Hanson, Gottesman, & Meehl, 1977).

High-risk research in schizophrenia.— Risk research in schizophrenia started from a perspective familiar to perinatal risk researchers. The concern was to establish an etiological model for schizophrenia that would relate family risk to child outcome. Previous studies of diagnosed schizophrenics that sought the causes of the disorder suffered from serious shortcomings. They were based on retrospective reports (Robbins, 1966) or objective records that were not systematic (Watt, Stolorow, Lubensky, & McClelland, 1970). Mednick and McNeil (1968) proposed that studying the development of a group of children who would later develop schizophrenia would provide data that did not suffer from such problems. Children of schizophrenics were thought to be such a group. It was clear to the first researchers using the paradigm, Mednick and Schulsinger (1968), that only a portion of the risk group would get the disorder. The central research question was to discover what factors differentiated those truly vulnerable children who became ill from those resilient children who did not. An important difference between the high-risk
studies of schizophrenia and the high-risk studies of perinatal complications was that the most accepted etiological model for schizophrenia emphasized the additive interaction between the vulnerable child and a stressful environment (Rosenthal, 1970). In obstetrical and pediatric research, etiological models that give any role to environmental factors have been quite slow in gaining acceptance.

Following Mednick and Schulsinger’s (1968) model, a series of studies were done that examined children born to schizophrenic parents. Biological risk factors that have been studied include obstetric complications (McNeil & Kaij, 1978; Mednick & Schulsinger, 1968; Sameroff, Seifer, & Zax, 1982; Sameroff & Zax, 1973), newborn neurological status (McNeil & Kaij, Note 1), newborn heart rate (Schachter, Kerr, Lachin, & Faer, 1975), and neurological status during the first 4 months (Marcus, Auerbach, Wilkinson, & Burack, 1981) and first 7 years (Rieder & Nichols, 1979; Fish, Note 2). Although studies of attention have been prominent in the literature on adults and older high-risk children, only a few studies have been done with younger children (Gamer, Gallant, Grunebaum, & Cohler, 1977; Grunebaum, Weiss, Gallant, & Cohler, 1974). Other studies have used a variety of behavioral measures. These include temperament and language assessments (Sameroff et al., 1982; McNeil & Kaij, Note 1), cognitive and psychomotor developmental tests (Gamer, Gallant, & Grunebaum, 1976; Hanson, Gottesman, & Heston, 1976; Rieder, Broman, & Rosenthal, 1977; Sameroff et al., 1982), and parent-infant interaction and attachment (Sameroff et al., 1982; Schachter, Elmer, Ragins, Wimberly, & Lachin, 1977; McNeil & Kaij, Note 1).

The surprising result of all these studies assessing a wide variety of measures was that few differences among children of parents with varying psychiatric diagnoses could be directly related to the diagnoses. Where differences were found between offspring of schizophrenics and others, they were in studies that used only children of normal women as a control group. Where other psychiatric groups were also compared in the studies, the offspring of schizophrenics did not differ.

In studies using school-age children, a similar pattern of findings was found. Where children of schizophrenics were only compared to children of healthy parents, they differed on a variety of behavioral dimensions. When children of parents with other diagnoses were included, all risk groups differed from children of healthy mothers but not among each other (e.g., Sameroff et al., 1982).

One area where there is promise of finding unique differences between school-age offspring of schizophrenics and offspring of other parents with psychiatric disturbances is in studies of attentional processes. Reports by Weintraub, Neale, and associates (Harvey, Winters, Weintraub, & Neale, 1981) indicate that some attentional measures may differentiate children of schizophrenic parents from children of parents with other forms of mental illness. Future studies of attentional processes in preschool children may help to determine if these differences are transmitted biologically through the genes or socially through the early interactions of a child with a schizophrenic parent. However, in a review of the findings of current high-risk studies of schizophrenia, Watt (1983) was led to note that even where differences have been found between offspring of schizophrenics and other children, few of these have been replicated by other research groups.

Rochester Longitudinal Study.—In the context of high-risk research described above we have been conducting a longitudinal study since 1970 that investigates the role of parental mental illness, social status, and other family cognitive and social variables that might be risk factors in the early development of children from birth through 4 years of age. The Rochester Longitudinal Study (RLS) (Sameroff et al., 1982) was one of many studies begun in the last 15 years that were explicitly concerned with the impact of parental schizophrenia on the development of children. The RLS differed from most of these other studies in three ways. First, the age range of children studied was younger; most other studies focused on school-age children, while we were concerned with infants and preschool children. Second, in addition to schizophrenics, a variety of other diagnosis groups were studied to explore issues related to mental illness in general as well as schizophrenia in particular. Most other studies had only normal controls, or only a single mental illness control group. Third, the sample was heterogeneous for many family variables, in particular SES and race. The strategy of almost all other high-risk schizophrenia studies had been to control race or social class factors out
of their designs by matching subject groups or choosing subjects from limited social status samples.

Consequences of having a schizophrenic mother.—The results of the study to date were that the offspring of women with severe and chronic mental disturbance suffered from a variety of deficits in social, emotional, and cognitive functioning. These deficiencies, however, could not be related to any specific psychiatric diagnosis, especially a schizophrenic mother.

For the analyses of the effects of a schizophrenic mother on the development of her child, four groups were formed out of a larger total sample as the basis for a diagnostic comparison: (1) a schizophrenic group, (2) a neurotic-depressive group, (3) a personality-disordered group, and (4) a no-mental-illness group that was matched to the other groups on the basis of age, race, SES, number of children, education, and sex of child.

As newborns the offspring of schizophrenic women were nearly indistinguishable from the matched no-mental-illness control group on almost all evaluations of infant characteristics except birth weight. Although the schizophrenic group had the lowest birth weight, they did not differ significantly from newborns in other psychiatric groups. At 4 and 12 months the offspring of schizophrenics had slightly lower Bayley scores but showed no differences in behavior during home observations or on temperament assessments. The early Bayley differences had disappeared by the time the infants were 30 months old.

Parenthetically, if one were to seek a maternal diagnostic group where children were at most risk, it would be depression rather than schizophrenia. These infants had by far the worst obstetric status, including a number of neonatal deaths. However, even for the neurotic-depressive group, unique behavioral differences had almost all dissipated by the 30-month assessment.

When diagnostic category was ignored and comparisons made between offspring of mothers with varying degrees of mental symptoms, the demonstrable effect on the child was much clearer. Scores on general dimensions of mental illness were determined for the chronicity and severity of the mothers’ illness. The severity-of-mental-illness dimension had four categories ranging from no symptoms to many clinical symptoms that were scored from psychiatric interviews. The chronicity of mental illness also had four categories ranging from no illness to long-term hospitalization and was based on information from both the interviews and a mental health registry.

The effects of the severity and chronicity of maternal mental illness on the children were ubiquitous throughout the study. Children of severely or chronically ill mothers had lower birth weights, poorer obstetrical status, poorer performance on newborn measures, lower Bayley scores, and more difficult temperaments at 4 months of age, were less spontaneous and responsive in home and laboratory at 12 and 30 months, and had much poorer adaptive behavior scores.

From these analyses we concluded that among the mental illness measures, severity and chronicity of disturbance were better predictors than specific psychiatric diagnoses. Beyond these mental illness comparisons, we became aware that social status was a major factor in our results. Particularly striking was that the differences found between children with mentally ill mothers and normal mothers were frequently mimicked by differences between children from lower and higher social status homes. One way of separating the effects of mental illness and social status was to do a developmental analysis of the data.

A good example of the results of a longitudinal analysis can be found in the assessment of the social and adaptive competence of the children in the RLS. Seifer, Sameroff, and Jones (1981) compared groups from families that differed on mental illness and social status dimensions when the children were 30 and 48 months old. The measure used was the Rochester Adaptive Behavior Inventory (RABI), a parental interview that assesses global social-emotional competence of the child in addition to adaptive behavior on a number of specific dimensions that reflect symptomatic behavior. At 30 months children from families with mentally ill mothers differed from children from families with no parental mental illness, and children from lower social status families differed from children from higher social status families. Both groups of risk children were less cooperative, more timid, more fearful, more depressed, and engaged in more bizarre behavior than their comparison groups. However, at 48 months there was a separation between the risk-group behaviors. The children of mentally ill mothers
continued to show the same deficits they had at 30 months compared with children of healthy mothers, but many of the differences among children in different social status groups became less pronounced. The effects on preschool children's social-emotional functioning of having a parent with social-emotional problems seemed to be more pervasive and long lasting than the effects of having a low social status parent. If the children had only been assessed at one point in time, one would have reached far different conclusions than when the evaluations were made at both 30 and 48 months. The data from 30 months, when viewed alone, suggest equal impacts of mental illness and social status. On the other hand, the 48-month data alone suggest a greater role for mental illness than for social status. It was only when multiple assessments were made that developmental changes became apparent.

Another caution in the analyses of data from high-risk studies such as the RLS is that while one can attempt to separate the effects of social status and mental illness in experimental designs, the two factors are correlated in the real world. For example, the prevalence rate for schizophrenia is eight times as high in the lowest SES group as in the highest (Hollingshead & Redlich, 1958). When women were recruited as lower social status controls in the Rochester study, one-fourth of those randomly selected from an obstetric clinic showed emotional disturbance during a psychiatric interview.

In contrast to the declining independent contribution of social status to the social-emotional competence of the child with age, there was an increasing impact of social status on the cognitive competence of the child. Child mental development was assessed at 4, 12, 30, and 48 months of age using the Bayley Scales of Infant Development at the three early ages and the WPPSI at 4 years. Figure 1 shows the Bayley Mental Development Index (MDI) and WPPSI verbal IQ scores for three groups of subjects: whites from SES levels I, II, and III (Hollingshead, Note 3), whites from SES levels IV and V, and blacks from SES levels IV and V. At 4 and 12 months there were no differences in the group means. By 30 and 48 months there were large differences. Golden and Birns (1976) found a similar lack of differences between racial groups before the second year in both standardized and Piagetian cognitive tests with major differences thereafter. In Broman, Nichols, and Kennedy's (1975) report of the Collaborative Perinatal Project sample of over 20,000 children there were only small correlations between Bayley MDI scores and SES at 8 months of age, but at 4 years the relationships were very strong.

The data from these studies indicate that social status has an impact on the development of intellectual growth after the first year. As children grow older, those from higher-SES families are thriving more and more, while lower-SES children are becoming more stifled. McCall (1981) has chosen to interpret such findings as indicating that the regulation of development is by maturational factors during the first year of life, which is then superseded by environmental and genetic factors. We would argue that the regulation of development is always a function of the activity of the child in a context and never a function of maturation alone. During the first year of life the social context is largely irrelevant to cognitive development since nearly all infants are engaged in sensorimotor transactions with a nearly universal three-dimensional world of objects. During the second year, however, cognition and tests of cognition become increasingly language related. Language can only occur in a social environment, so that environments that are deficient in language will produce children that are deficient in language.

Parental Social Status as a Risk Factor

A continuing theme that appears in the results of risk studies in a number of areas is
that developmental outcomes are either determined or moderated by social status variables, which are of equal or greater importance than the characteristics of the child that had been used to define risk. Social variables seem to have a pervasive influence that intrudes into the analysis of every longitudinal study. Hess (1970) listed many of the factors that contribute to social class influences on socialization: “Members of the society differ with respect to the prestige of their occupations, power to influence the institutions of the community, economic resources, and the availability of educational and occupational opportunity, and that different levels of socioeconomic status offer children experiences which are both different and unequal with respect to the resources and rewards of the society” (p. 457). Hess goes on to discuss the relationships between social structure and early experience of children in terms of a number of questions: “What are the conditions of the external social and cultural world in which the child lives? What are the adaptive consequences which the adults in the environment acquire in their interaction with the system? In what specific forms do these adult orientations appear in interaction with children? What are the behavioral outcomes of these experiences in children? This outline assumes a linkage between the society, its institutions and conditions of life, and the behavior of adults who then act as socializing and teaching agents for their children” (p. 464).

An attempt to relate these issues to the role of social class in the etiology of schizophrenia was undertaken by Kohn (1973). He argued that “social class is related to schizophrenia primarily because the conditions of life built into lower social class position are conducive to that disorder” (p. 68). The conditions of most concern to Kohn are stress and conceptions of reality.

The case for stress was made by Rosenthal (1970) in his interactive model for schizophrenia where a constitutional vulnerability is potentiated by environmental stress into a psychotic illness. Biological vulnerabilities, including perinatal complications, have a higher frequency in the lower social classes (Birch & Gussow, 1970). Stress from externally induced events is also more frequent at lower social class levels (Kohn, 1973). Furthermore, for any designated level of stress, mental disturbance is found in more members of lower social class groups than higher ones (Langner & Michael, 1963).

Kohn (1973) explains this social class effect by arguing that there must be important differences in stresses and the way people from different classes deal with stress; stressful situations for lower-class individuals are less alterable by individual action than those experienced by higher social class individuals. Further, members of lower-SES groups are less able to perceive, assess, and deal with complexity and stress. Kohn hypothesizes that “the constricted conditions of life experienced by people of lower social class position foster conceptions of social reality so limited and so rigid as to impair people’s ability to deal resourcefully with the problematic and the stressful” (p. 73).

If Kohn is correct, then one way to psychologically conceptualize the differences in developmental outcomes for children is in terms of the ability of the child’s family to mediate between the child and the environment. Better conceptions of reality, or what we shall call parental perspectives, will permit the family to reduce the impact of stress on the child and also provide the child with optimal growth experiences; poorer parental perspectives will prevent the family from moderating the effects of stressful life experiences on the child or providing special experiences for children with special needs. Psychological assessments of parental beliefs, attitudes, and values have produced a variety of measures that should reflect rigidity and limited conceptions of reality. If these estimates of parental perspectives, combined with estimates of stressful life events, explain the variance in outcomes associated with social status, then one has evidence regarding the psychological consequences of a sociological variable.

Analysis of Multiple Risk Factors

Although initially the RLS centered on the issue of the etiology of schizophrenia, because of the number of assessments on a heterogeneous sample of children, more general developmental issues could be addressed as well. Of specific relevance are analyses of the relative impact of a variety of risk factors, especially the parental perspectives we believe mediate much of early child development.

In our previous analyses comparing children from various groups of mothers we demonstrated that both parental mental illness and social status factors were directly
related to child performance (Sameroff et al., 1982). As the next step in addressing the complex interplay of risk factors, we examined two additional groups of measures that might explain the effects of broad social status and mental illness factors (Seifer & Sameroff, in press). These were the cognitive capacities, attitudes, beliefs, and values of the parent, as well as the stresses that impact on the family. The measures used in these analyses are summarized below.

Mental illness.—For these analyses we used clinical and subclinical dimensions of emotional disturbance. The clinical variables were the severity and chronicity of mental illness scores described above. Subclinical variation was reflected in an anxiety score that combined three measures: the total score from the IPAT (Cattell & Scheier, 1963) administered at 30 months, the neuroticism scale from the Eysenck Personality Inventory (Eysenck & Eysenck, 1969), and the total score from the Malaise scale (Rutter, Tizard, Yule, Graham, & Whitmore, 1976), the latter two administered at 48 months.

Social status.—The social status variables included indices of occupation, education, and race. Occupation and education were reflected in the Hollingshead (Note 3) Index of Social Position. Our modification of the Hollingshead scoring combined the occupation of the head of household with the average educational level of the mother and father to produce a score in one of five SES categories.

Parental perspectives.—For this dimension we chose measures that reflected rigidity versus flexibility in attitudes, beliefs, and values that parents had regarding children. The hypothesis was that in situations that called for adaptive behavior on the part of parents, for example, stressful life changes, mental illness, or child handicap, parents limited in flexibility would be unable to buffer the child or be buffered from the child. We thought rigidity would be reflected in a combination of three measures that scored categorical interpretations of child behavior, conforming values to external norms, and an authoritarian orientation to child rearing.

The Concepts of Development Questionnaire (CODQ) (Sameroff & Feil, in press) evaluates parents' understanding of development on a scale ranging from categorical to perspectivistic. At the categorical end, child development is seen as a determined expression of single causes like constitution or environment. At the perspectivistic end, child behavior is seen as the outcome of complex, transactional processes.

The Parental Values Scale (Kohn, 1969) is a measure of the degree to which parents value conformity versus self-direction in their children. At the conformity end are items such as obedience and cleanliness, while at the self-direction end are values of self-control and curiosity.

The authoritarian-control dimension of the Parental Attitude Research Instrument (PARI) was used as the measure of rigid child-rearing attitudes (Schaefer & Bell, 1958; Zuckerman, Ribback, Monashkin, & Norton, 1958).

Family factors.—The importance of stressful life events in the relation between social status, parental cognition, and mental illness was noted above. A second family factor that is consistently related to child competence is family size (Zajonc, Markus, & Markus, 1979). These two variables are seen primarily as mediating the relationship between parent and social factors and child competence.

A stressful life events inventory was patterned after Holmes and Rahe (1967) including items such as divorce, illness, and loss of job (Rosenzweig, Seifer, & Sameroff, Note 4). The variable used in these analyses was the total number of negative events that occurred from birth until the child was 4 years of age.

Family size was a dichotomized variable based on whether or not the child was firstborn. This was the simplest to use of the variables discussed by Zajonc et al. (1979).

Child competence.—Two measures of child competence were used that indexed cognitive and social-emotional competence. The first was the verbal scale of the WPPSI IQ test (VIQ) (Wechsler, 1967). The second measure was the global rating from the Rochester Adaptive Behavior Inventory (RABI), which is derived from a 90-min parental interview that assesses child social-emotional competence in the areas of family life, social interaction, and solitary behavior (Seifer et al., 1981). The measures used in the present analyses are summarized in Table 1.

Comparing risk factors.—For the purpose of determining the sources of risk in our
sample, we compared the amount of variance explained by the sets of variables (Seifer & Sameroff, in press). A series of hierarchical multiple regression (HMR) analyses were performed (Cohen & Cohen, 1975), and the resulting regression equations were examined for each of two child-competence measures: WPPSI VIQ and RABI global rating. There were four sets of variables entered in each of the regression equations: (1) mental health—severity, chronicity, and anxiety; (2) parental perspectives; (3) family factors—life events and family size; and (4) social status—SES and race. The sets were entered in four orders so that each set was (a) entered first to determine the variance explained by that set taken alone and (b) entered last to determine if that set still explained any variance after the effects of the other three sets were partialled out. These regression equations are summarized in Tables 2 and 3.

**Effects of risk factors on intelligence.**—The direct relationship between each set of risk factors and the children's

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*Note.—Table entries are change in \( R^2 \) associated with the regression step in question.

* \( p < .05. \)

** \( p < .01. \)

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** \( p < .01. \)
intellectual competence was significant (see the first column of Table 2). However, the size of the effects varied by a factor of five. The most powerful effect was for social status (almost 40% of the total IQ variance explained), the next largest effect was for parental perspectives (about 25% variance explained) followed by family factors (about 12% variance explained), and the smallest effect was for mental illness (about 8% variance explained).

When each predictor set was entered into the regression equation on the final step, that is, after partialing out the effects of the other risk factors, the situation changed in two ways (see the second column of Table 2). First, the amount of variance explained was much smaller, although the largest effect was still for social status (13% variance explained) and the smallest for mental illness (0.5% variance explained). The second change was that maternal mental illness was no longer a significant predictor of child outcome after social status, parental perspectives, and family factors were parialed out. The remaining three sets of risk variables did remain significant when the others were controlled for, though both parental perspectives and family factors accounted for less than 3% additional variance.

Although the size of some effects was large, there was no single risk factor that accounted for all of the significant variance in the IQ scores. That is, when the variance explained by the remaining risk variables was examined after partialing out any one set of risk factors, the effect was significant in all cases (see the third column of Table 2). The total amount of variance explained by all risk factors entered simultaneously was just over 45%.

Effects of risk factors on social-emotional competence.—Each of the risk factors was directly related to the RABI measure of social-emotional competence (see the first column of Table 3). While these results were similar to those for intelligence, the size of the effects for social-emotional competence were much smaller, and the relative ordering of the risk factors in terms of size of effect was different. Maternal mental illness explained the largest portion of variance in RABI scores (about 16%), followed by social status (about 10%), parental perspectives (about 7%), and family factors (about 4%).

When the risk variables were entered in the regression equations on the final step, the situation changed markedly (see the second column of Table 3). Only one of the risk factors, maternal mental illness, remained significant when all other predictors were parialed out, explaining about 8% of the variance. The total variance explained by all risk factors was 26%, little more than half that explained in the intelligence regression equations.

Context and Development

The preceding analyses have been used to demonstrate that no single factor can be identified that explains the effects of context on child development. Further, the many explanatory variables overlap in complex ways. Summary variables like social status explain large portions of variance, but they can be subdivided into component variables that interact differently with different aspects of the child's progress. Despite the fact that the way social status affects individuals is through component processes, it remains an important construct because it is an organized aspect of the environment that endures over time yet varies among different groups of people. In order for one to hypothesize the existence of self-righting tendencies that make corrections in the developmental course of children, one must also believe that the environment is organized as a dynamic system (Sameroff, 1982, 1983), much like the organized biological system used to describe embryological epigenesis.

In the developmental biological model, changes in an organism are viewed as a joint function of the previous activity of the organism and the context in which that activity occurs. The importance of context can be seen even in genetics, where despite the fact that each cell has an identical genetic structure, these genes will express themselves differently because each cell provides a unique chemical environment. Moreover, as the organism develops, these changes result in reorganizations in which higher-order coordinations come into play. The importance of reorganizations can be seen in embryology, where the initial fertilized cell begins a process of cell division that leads first to a ball of morphologically similar cells, but then through a folding process into a morphologically dissimilar organization of three cell layers that will each take a uniquely different course to form different organs of the body.

The biological model frequently has been abstracted to a more formal level by
developmental theorists. Werner (1948) derived an orthogenetic principle that he believed applied to all domains that states that "wherever development occurs it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration" (Werner, 1957, p. 126). Piaget (1971) defined functional invariants of adaptation and organization derived from biology that he felt applied to cognitive development as well. These transformational processes are presumed to result in higher levels of cognitive structure. At an even more abstracted level, von Bertalanffy (1968) developed a general systems theory based on self-organizing properties of organic models. While all three theorists addressed the transformational aspect of development, none of them used context as an important construct. Werner's theory dealt with reorganization but did not place any emphasis on the environment. Piaget and von Bertalanffy saw the environment as a necessary context for the organism's development but did not place any emphasis on the organization of that context.

Riegel (1978) criticized Piaget for being halfhearted in his constructivist approach. He argued that while Piaget saw the child as an active constructor, it was in a passive environment. Riegel believed that the environment must be seen as active as well. Development was the outcome of the relationship of an active organism to an active environment. Recent interpretations of Wernerian theory by Wapner, Kaplan, and Cohen (1973) have also emphasized this point. They discussed the complex interactions among levels of individual and social organization from a developmental perspective. Bronfenbrenner (1979) has proposed a model of environmental organization that captures much of the complexity of societal structure. He identified hierarchical systems that have differential impact on the developing child.

The active-environment view was adapted to the area of high-risk research by Sameroff and Chandler (1975) when they postulated the transactional model. However, that model was not formulated at the time the Rochester longitudinal study was designed. As a consequence, tests of transactions in the RLS have been post hoc using many environmental measures assessed during the preschool period and not during infancy. Recent studies have been more explicit about examining transactions, incorporating into the designs not only environmental assessments, but also environmental manipulation.

Zeskind and Ramey (1978, 1981) tested a transactional model in their exploration of the effects of fetal malnutrition on later intelligence. In a lower-SES sample, half of whom were in an educational intervention program, they were able to examine the impact of an underweight (i.e., low ponderal index) infant on the developmental system. As a group, the infants without educational intervention declined in DQ from 3 to 18 months of age and continued to score lower on tests at 36 months of age. However, within that group the low ponderal index babies showed a much greater decline into the retarded range. These lower DQs were associated with lower levels of maternal involvement. In contrast, in the group of families that received educational intervention, the malnourished infants who had scored significantly lower than the rest of the group at 3 months were by 18 months doing as well as the others. Zeskind and Ramey concluded that the educational program had interrupted the negative transaction found in the control group. Where low social status mothers would usually be put off by the characteristics of a fetally malnourished infant, contributing to a worsening developmental outcome, intervention fostered the relationship between mother and child, thereby leading to an above-average outcome.

In the transactional model both the child and the environment are seen as actively engaged with each other, changing and being changed by their interactions. While models of cognitive development granted structure to the child, it now became important to pay attention to the structure of the environment with its norms, values, and institutions. Sameroff (1982, 1983) argues that sociological constructs have to be added to biological ones to understand psychological development. The environment of the developing fetus is biologically structured in the genetic system. Changes in each cell's environment are keyed to changes in each cell's adaptation to that environment. Similarly, the environment of the developing child is structured so that the social and cognitive complexity to which each child is exposed is keyed to the characteristics of the child at each point in development.

Environmental analysis.—The thrust of the findings that risk for children was more a
consequence of environmental factors than characteristics of the child has led to more sophisticated analyses of the developmental context.

In a series of studies, the Home Observation of the Environment (HOME) scale, designed by Bradley and Caldwell (1977), has been used to differentiate environments on dimensions of organization and stimulation of child development within different social status levels (Bradley & Caldwell, 1976; Bradley, Caldwell, & Elardo, 1979). Most early work was with lower-SES samples. However, environmental analyses have been applied recently to middle-class samples and comparisons between middle- and lower-SES groups.

Gottfried and Gottfried (1983), using a predominantly middle-class sample, found social and physical home-environment variables that related to mental development independently of mother’s intelligence, attendance at nursery school, or SES. The children with the best outcomes had mothers who “knowledgeably” provided more stimulating home environments.

In a longitudinal study of a more heterogeneous social status sample, Bee, Barnard, Eyres, Gray, Hammond, Spietz, Snyder, and Clark (1982) found that mother-infant interaction and general environmental quality were among the best predictors of intellectual and language development during the first 4 years of life for the sample as a whole. On the other hand, measures of family ecology, including level of stress and social supports, related to outcomes only in a low-education subsample. Mothers with more than a high school education did not show this pattern of predictive relationships. These investigators suggest that mothers with less education may be less able to “buffer” the child when there are high levels of stressful life events and low levels of social support.

In these studies, observable aspects of the environment, for example, maternal interaction and stimulation patterns, make an explicit contribution to child outcomes. However, there appears to be also an implicit contribution of parents’ knowledgability, for example, attitudes, understandings, and buffering abilities. Parents’ intentions and capacities to mediate the impact of the environment and to encourage child development are components of what we have called parental perspectives. In statistical analyses, such as the ones described for the RLS above, these factors have been shown to make an independent contribution to the development of child competencies.

The task for risk research in the future is to continue this advancement in conceptualizing the complexity of relationships between a dynamically organized child and a dynamically organized context. It is not enough simply to assert that many variables are related to eventual child status. One must directly examine the relationships and interactions among variables, as well as the uniqueness that the many risk factors contribute to the developing organismic system. Where the mutual regulation of individual and context succeeds, a healthy, happy child develops; where the system regulation fails, deviancy appears. It is the identification of the sources of failure in system-regulatory functions that will provide the clearest path to understanding how to insure optimal outcomes for children at risk.

Reference Notes


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