Emory University Project on Children of Disturbed Parents

by Sherryl H. Goodman

Abstract

Young children (from birth to 5 years of age) of schizophrenic, depressed, and well mothers were studied to assess their intellectual, social, and neuropsychiatric functioning. The sample derived from predominantly black, low-income, single-parent families. An extensive battery of laboratory and home-based tests was administered three times, each 1 year apart, to test the stability of findings. Schizophrenic offspring, as a group, had more problems than others. They showed more deficits on social competence, had lower IQ's (the youngest children only), and were overrepresented in the group of children with multiple negative indices. However, both schizophrenic offspring and depressive offspring sometimes performed more poorly than children with well mothers (presence of symptoms of psychiatric disorder and certain categories of social behavior). In certain instances, the children of depressed mothers were worse off than either other group (small for age and showing less social competence at home). Deficits were found in the child-rearing environment provided by the disturbed mothers. Both schizophrenic and depressed mothers were rated as less affectively involved and less responsive than well mothers. Schizophrenic mothers were rated as providing the poorest overall environment: less play stimulation, fewer learning experiences, and less emotional and verbal involvement. The following possible protective factors were identified in the mothers: lesser severity of illness, older age, higher education, higher IQ, work experience, and presence of spouse, boyfriend, or other relative to help in child care.

The Emory University Project on Children of Disturbed Parents was designed (1) to provide descriptive data on the characteristics of young children (from birth to 5 years of age) of schizophrenic and depressed mothers, and (2) to test the effectiveness of a research-based model of preventive intervention. Preliminary reports on the preventive intervention are available (Goodman 1984a, 1984b) and will not be discussed here. Data included in the descriptive study were either collected before interventions or from families in control groups receiving no interventions.

Whereas most high-risk studies attempt to identify vulnerable children and the precursors of schizophrenia, the present study focused on (1) describing any unique aspects of intellectual and social functioning, both problematic and adaptive, of children with schizophrenic mothers relative to others (offspring of depressives and normals); (2) describing any unique aspects of the child-rearing environment of schizophrenic mothers; and (3) determining the linkages among parental diagnosis, other characteristics of the disturbed mother's functioning, child-rearing environment, and child functioning.

Several factors contributed to our decision to study children between birth and 5 years: (1) The emphasis of the research was on describing the children and identifying specific differences between offspring of schizophrenics and others. (2) The research was conducted as part of a primary prevention study, for which early detection and intervention at

Reprint requests should be sent to Dr. S. H. Goodman, Department of Psychology, Emory University, Atlanta, GA 30322.
the youngest possible age are major concerns. (3) A major interest was in environmental variables, which might be delineated more clearly from constitutional factors in the early years. (4) The young age range was selected in recognition of the relative lack of knowledge about the offspring of schizophrenics in infancy and early childhood.

We also studied children of severely depressed mothers as a comparison sample. Thus, we had the opportunity to identify aspects of child functioning, parent functioning, or the qualities of the environment that might be unique to children of either schizophrenics or depressives. Also, the children of depressed mothers are interesting in their own right. Aspects of the child’s rearing by a severely emotionally disturbed mother (e.g., exposure to psychotic behavior and separations) may be equally relevant to both groups. Further, the mother’s depressed mood, low energy, and low self-esteem are likely to affect the child’s opportunity for healthy development. Finally, evidence for genetic transmission of affective disorders has been accumulating (Cantwell 1983; Gershon 1983).

The third decision was to study a mostly black sample that was living in poverty. The decision was partly based on pragmatics: schizophrenics are overly represented in the population of low-income blacks (Kohn 1968). In addition, low income and minority group status are often considered to be additional risk factors, and the dual risk of poverty and schizophrenic parentage may increase the likelihood of problems in child development. Previous researchers have indicated poorer outcomes for lower socioeconomic status (SES) risk groups and for blacks compared to whites when poverty was also a factor (Samooff et al. 1984).

**Characteristics of the Sample**

**Diagnostic Criteria for Parents.** Subjects were recruited for the two risk samples and the control group. Sample selection began in 1981, so *DSM-III* (American Psychiatric Association 1980) diagnostic criteria were already in use. The schizophrenic sample met diagnostic criteria for any of the schizophrenic disorders (but not schizoaffective or schizophreniform disorder). The depressed mothers met the criteria for major depressive disorder or a dysthyemic disorder that persisted after recovery from a major depressive episode. The well control group comprised mothers with no history of mental illness in themselves, their first-degree relatives, or the target child’s father.

The referral agencies consisted of community mental health centers and psychiatric clinics of Grady Memorial Hospital, which serves the indigent population in Atlanta, Georgia. The sample was predominantly black (98 percent), low-income (mean yearly income <$5,000), single-parent mothers (90 percent) and their children under 5 years of age.

In all, 115 disturbed women with young children were referred to the project: 71 had a diagnosis of schizophrenia, 36 were depressed, and 8 did not have diagnoses available at the time of referral. The control group consisted of 38 well women and their children. All three groups were equivalent on race, age, marital status, and SES. More well women had completed high school relative to schizophrenic or depressed women (p < .002). The target child was the youngest child in the family.

While children were accepted into the program if they were anywhere in the age range from birth to 5 years, the actual referrals tended toward the youngest children: 46 percent between the ages of birth and 1 year, 21 percent between 1 and 2 years, 14 percent between 2 and 3 years, 9 percent between 3 and 4 years, and 10 percent between 4 and 5 years.

The mothers’ records were reviewed to confirm the current diagnosis. In addition, for 48 randomly selected cases, the records were independently reviewed by two clinical psychologists. The two psychologists agreed with each other and with the original diagnosis on 43 (90 percent) of the cases.

**Dimensions of Assessment.** Three measures were included in an attempt to delineate variations in maternal functioning that might be related to outcome in the offspring: (1) The Global Assessment Scale (GAS) (Endicott et al. 1976) was used to measure the wide range of illness severity in both diagnostic groups; (2) the Zigler-Phillips (1962) Social Competence Index was used to reflect a constellation of factors of possible relevance to offspring outcome (mother’s age, intelligence, education, employment history, and marital status); and (3) the Role Functioning Scale (Presmanes 1978) was used to measure the mother’s level of functioning in several dimensions of daily living (homemaking, school or work, self-care, family relationships, and extended social network relationships).

The GAS scores were highly variable within each diagnostic group. Scores ranged from 20 to 90 for both schizophrenic and depressive patients and from 60 to 100 for well subjects. The mean score of the schizophrenic group (63) was signifi-
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percent) or of the study were the mother’s refusal not to differ from each other significantly (p < .001). There was a great deal of variability within each diagnostic group.

Another potentially important aspect of maternal functioning is the mother’s hospitalization history. In our sample, the schizophrenic mothers had an average of 1.58 previous hospitalizations, significantly higher than the .45 average for the depressed mothers (p < .01).

All mothers also were given the Shipley-Hartford intelligence test (Shipley 1940) and the Mother’s Child-Rearing Problem Solving Test (MOPS) (Shure and Spivack 1974). IQ score did not differ as a function of diagnosis.

Attrition. From the 153 referrals, including 38 well women, 45 families did not complete the study. There was no significant difference in mother’s diagnosis as to the number of families lost. Of those who were lost, 41 percent were schizophrenic, 25 percent were depressed, and 34 percent were well. The majority of families that were lost had completed the preliminary testing, but did not stay with the study long enough to be in the second testing session, which occurred at the end of the first year. A few families were dropped because their diagnoses could not be confirmed (i.e., the referring agency did not follow through with the necessary records). The major reasons for dropping out of the study were the mother’s refusal to participate (44 percent) or the family’s moving outside of our study area (24 percent).

Procedures for Index Offspring Assessment
Families were studied at three times 1 year apart, using predominantly the same battery of tests at each time. Each round of testing consisted of several home visits and one visit to our project office. In the year between testing times 1 and 2, subjects were either participants in the preventive intervention study (55 of the schizophrenic mother families and 24 depressed mother families) or were in no-intervention control groups (16 schizophrenic mother families, 12 depressed mother families, and all well mother families). Subjects in the control groups were telephoned or briefly visited once a month to maintain contact. The same minimal contact was made with all subjects between testing times 2 and 3.

The three testing times allowed us to study the degree of continuity in children’s functioning. One expectation was that the children of schizophrenics would show declines in functioning with increased years of exposure to poor parenting. An alternative expectation was that a subgroup would already be performing poorly in infancy whereas the others would demonstrate adequate functioning throughout the age range.

Child Outcome Variables

Individual Intelligence Testing. All children less than 30 months old were administered the Bayley Scales and were scored on the Mental Development Index (MDI), the Psychomotor Development Index (PDI), and the five Kohen-Raz (1968) subscales. All Bayley scores were corrected for prematurity. Older children were administered the McCarthy Scales and received scores on each of five subscales and on the General Cognitive Index (GCI), a combination of three of the subscales. To obtain a score that could be compared across the full age range of subjects, a new score (IQMD) was created by combining the MDI and the GCI scores, which have the same population mean and standard deviation.

Neuropsychiatric and Physical Health Rating. These ratings were completed by a child psychiatrist. Each child was weighed, measured, and examined for any signs of abuse or neglect. Further observation and examination were followed by the completion of a checklist of neuropsychiatric signs, a listing of any psychiatric symptoms noted, and the assignment of a psychiatric diagnosis, if warranted.

Temperament Ratings. Each mother completed a temperament questionnaire with the assistance of one of the researchers. The questionnaires were short versions of the Infant Temperament Questionnaire for birth to 12-month-olds (Carey and McDevitt 1977), the Toddler Temperament Questionnaire for 1- to 3-year-olds (Fullard et al. 1978), and the Behavioral Style Questionnaire for 3- to 7-year-olds (McDevitt and Carey 1978).

Social Competence Observation. Burton White’s (1978) observational procedure and checklist scoring system for assessing social abilities from the Harvard Preschool Project was used. The measure yields scores on five summary categories: getting an adult’s attention, using an adult as a resource, expressing affection and hostility to an adult, showing pride in product, and adult role play.
Children's Self-Concept. Children who were 3 years old or older at the time of testing were administered the Children's Self-Concept Test (Muller and Leonetti 1974). The test yields six factors (e.g., physical size, peer acceptance, and success), three domains (personal self, social self, and intellectual self), and a total score.

Preschool Interpersonal Problem-Solving Scale. Children 4 years old or older were administered the PIPS (Shure and Spivack 1974), which consists of the child's responses to resolving a series of interpersonal (peer and parent-child) conflicts posed by the examiner through cut-out dolls and incomplete stories. The child's solutions are then categorized using a standard scheme and summarized as the number of each of 12 types of relevant solutions used, the number involving force, and the number of nonsolutions posed.

In addition, the birth record on each child was obtained, thus providing information on birth weight, gestational age, and any abnormalities in birth or perinatal status.

Mother-Child Relationship Variables. The mother and child were observed and videotaped during a 5-minute semistructured play session at the project office. A predetermined set of toys was provided, varying with the age of the child. Mothers were encouraged to play with their children as they would at home. The videotaped interactions were then rated with the 53-item Mothers' Project Rating Scale of Mother-Child Interaction (Clark et al. 1980). The ratings were completed by two trained observers who had periodic reliability checks. The two raters' scores were averaged to obtain one score for each child on each item.

Child-Rearing Environment Variables. The child-rearing environment was measured with the HOME Inventory (Caldwell and Bradley 1973), completed by a trained research assistant in the subject's home during a semistructured interview and observation session. Two versions of the instrument were used: a 45-item inventory for birth to 3-year-olds and a 55-item inventory for older children. Information was also obtained on the household composition, and the availability and characteristics of the secondary caregiver. Social and community resources were assessed with a questionnaire on the number and type of resources available for helping with family problems.

Developmental Problems in Assessment. Even before completion of initial testing, it was apparent that some tests would prove more useful than others. The young age of the sample placed major restrictions on the assessments. For example, the self-concept and PIPS were limited, in that only the older children in the sample were eligible for those measures. In addition, variables are not always relevant across the whole age range studied, and for some variables, the appropriate measure changes with the child's age. Moreover, the use of different instruments makes it difficult to make longitudinal and cross-age comparisons.

Another limitation is obtaining accurate self-report data from emotionally disturbed mothers. For example, the mothers' responses on the temperament measure seemed to be more a reflection of their own disturbance than an accurate perception of their children's behavior. Because of this, the temperament data are being given further consideration and will be presented in a later report. Overall, the most valuable child measures were the intelligence tests, the social competence observations (home and lab), and the neuropsychiatric and health ratings.

Design of the Analyses. The first step was to identify the children who received psychiatric diagnoses and note whether any characteristics could be identified that distinguished them from those who remained psychiatrically well. Second, we examined the outcome for the children on other aspects of functioning: perinatal status, physical development, social competence, and intellectual functioning. For the latter analyses, we excluded data collected after the onset of interventions for those families who were participants. Third, we looked at the data on a case-study basis to see whether a child's psychiatric status and his/her relative standing on the other aspects of functioning were congruent. Throughout the three sets of analyses, data were examined for any indication of either predictors of vulnerability or protective factors.

Psychiatric Outcome for Index Offspring

At the first testing, 124 of the children were interviewed to determine their eligibility for a DSM-III diagnosis. From that group, five children (4 percent) met the criteria for a psychiatric diagnosis. At the second testing, 1 year later, two (2 percent) of the 99 children evaluated met the criteria for a diagnosis. At the third testing, another year later, 10 (10 percent) of the 98 children evaluated met criteria for a diagnosis (table 1). Given the young age of the children,
Table 1. Diagnoses of children at each of 3 testing times

<table>
<thead>
<tr>
<th>Subject number</th>
<th>Testing time</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>201S</td>
<td>Developmental disorder</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>205S</td>
<td>Developmental disorder</td>
<td></td>
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</tr>
<tr>
<td>226D</td>
<td>Attention deficit-hyperactivity</td>
<td></td>
<td>Attention deficit-hyperactivity</td>
<td>Attention deficit-hyperactivity</td>
</tr>
<tr>
<td>304S</td>
<td>Anxiety disorder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>309D</td>
<td>Attention deficit-hyperactivity</td>
<td></td>
<td></td>
<td>Adjustment disorder</td>
</tr>
<tr>
<td>204S</td>
<td>Anxiety disorder</td>
<td></td>
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<tr>
<td>227S</td>
<td>Anxiety disorder</td>
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<tr>
<td>107S</td>
<td>Developmental disorder</td>
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<tr>
<td>113S</td>
<td>Developmental disorder</td>
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<tr>
<td>203S</td>
<td>Developmental disorder</td>
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<tr>
<td>213S</td>
<td>Conduct disorder</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>216D</td>
<td>Developmental disorder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>402D</td>
<td>Anxiety disorder</td>
<td></td>
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<tr>
<td>424S</td>
<td>Conduct disorder</td>
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<tr>
<td>518W</td>
<td>Developmental disorder</td>
<td></td>
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<tr>
<td></td>
<td>Attention deficit-hyperactivity</td>
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</table>

1The letter at the end of each subject number refers to the diagnosis of the child's mother:
S = schizophrenic, D = depressed, W = well.

Both schizophrenic mothers and depressed mothers were equally likely to have their children receive a diagnosis. At the first testing, 5.7 percent of the schizophrenic offspring and 5.9 percent of the depressed offspring received diagnoses, compared to 4.3 and 3.8 percent at the second testing and 14.3 and 10.3 percent at the third. One child of a well mother received a diagnosis of attention deficit disorder with hyperactivity at the third testing.

Children's age and sex were also examined to see whether any patterns distinguished those who received diagnoses. As expected, diagnoses tended to be assigned to the older children. The youngest child to receive a diagnosis was a 21-month-old boy who was described as having attention deficit disorder with hyperactivity and who received the same diagnosis both 12 and 24 months later. Of all the children who were diagnosed, the mean age at first diagnosis was 31 months, even though the majority of children in the study (67 percent) were less than 24 months old. Boys were more likely to be diagnosed than girls. Of the 15 children who received a diagnosis at any time, 10 were boys and 5 were girls. The finding that several children's diagnostic status was not replicated 1 or 2 years later probably reflects developmental fluctuations in symptoms but may indicate low reliability of efforts to diagnose young children.

Predictors of Vulnerability

Perinatal Status. We were able to examine the birth records of 61 schizophrenic mother-child pairs (57 mothers), 33 depressive mother-child pairs (28 mothers), and 33 well mother-child pairs (31 mothers). Sixty-one of the offspring were males, and 66 were females. The birth records included information on gestational age, birth weight and weight for age, APGAR at 1 and 5 minutes, pregnancy complications, concurrent illnesses, complications of labor, method of delivery, and status of the infant. Also included was information on the month of pregnancy in which prenatal care began, the total number of prenatal visits, and the total number of previous live and stillborn births to this mother. A total obstetrical complications score (OCS) was tabulated using Littman and Parmelee's (1978) procedure. The total OCS score is the number of 41 pregnancy variables indicating absence of complications.

All of the birth variables were tested for the effect of child’s sex. Since none were significant, boys’ and girls’ data were combined for all of the remaining analyses.
Comparisons were conducted with either one-way analysis of variance (ANOVA) or χ² analyses on each of the birth-record indices to determine whether the groups could be differentiated by course of pregnancy, delivery process, or infant's perinatal status. Only on the month in which prenatal care began and birth weight did the mother's diagnosis differentiate the pregnancy, labor, delivery, or physical status of the neonate. Schizophrenic women began their prenatal care significantly later in the pregnancy (mean = end of month 4) than did either the depressed (mean = beginning of month 3) or well women (mean = end of month 2; p < .01). The results also indicated that children of depressed women were significantly smaller (mean = 2763 g) than those of schizophrenic (mean = 3000 g) or well women (mean = 3211 g) (p < .006). However, an analysis of covariance (ANCOVA) indicated that differences in mother's education across diagnostic groups accounted for more of the differences in birth weight than did mother's diagnosis.

Next, the data were analyzed for the degree of severity of the psychopathology within the schizophrenic and depressed groups. The GAS score was used as a covariate in separate one-way ANOVAs of the effect of mother's diagnosis on pregnancy and birth complications. The GAS score was a significant covariate in the effect of diagnosis on the overall OCS score (p < .02), but not on any of the individual pregnancy or birth variables.

Finally, data were analyzed to test directly whether mother's age, IQ, SES, family composition, or premorbid social competence were related to the incidence of pregnancy and birth complications. Correlational analyses were conducted to test the degree of relationship between the above factors and pregnancy and birth complications.

Mother's age was significantly correlated with her infant's birth weight (r = .18, p < .03), APGAR at 5 minutes (r = .21, p < .04), number of pregnancy complications (r = -.16, p < .05), and number of congenital anomalies (r = .18, p < .03). Mother's IQ was significantly correlated with her infant's gestational age (r = .19, p < .04) and birth weight (r = .22, p < .01). Lower IQ mothers also began prenatal care later in pregnancy (r = -.26, p < .009) and had fewer prenatal medical visits overall (r = .33, p < .002). Single mothers were more likely to give birth to babies with lower APGAR scores at 1 (r = -.24, p = .02) and 5 minutes (r = -.23, p = .02).

Women with lower premorbid social competence began prenatal care later (r = -.30, p < .003) and had babies who were born earlier (r = .29, p < .01) and smaller (r = .22, p < .01). And the more severely disturbed women had babies who were born earlier (r = .16, p < .05) and smaller (r = .18, p < .03), had more concurrent illnesses with pregnancy (r = -.17, p = .03), and had higher total OCS scores (r = .22, p < .01).

To investigate the factors that predict the infants with most complications, an outlier analysis was conducted. Outliers were defined as those scoring in the lower quartile on OCS (OCS < 99). Outlier analyses indicated that mother's diagnosis, social competence, and SES were not significant factors in discriminating between births with the lowest OCS scores and others. Infants with the lowest OCS scores were, however, born to mothers who were more disturbed (i.e., lower GAS ratings, p < .03), scored lower on the IQ measure (p < .05), and were single parents (p < .04). There also was a tendency for the lowest OCS births to be to younger women (p < .09).

These results are consistent with McNeil and Kaij's (1978) conclusion that maternal psychiatric disturbance itself has little impact on the occurrence of pregnancy or birth complications. However, the results only moderately support previous findings that severity of the mother's disorder is related to perinatal status (Sameroff and Seifer 1980). Rather, they indicate that a general lack of competency characteristic of severely disturbed women could be the mechanism that relates mother's psychopathology to an increase in birth complications. The relevant indicators seem to be mothers with low IQ, less education, no husband or boyfriend, lowest SES, and poor social-competence status, in combination with severe disturbance.

Neurological and Physical Development Status. Neurological examinations showed very few children to have any negative signs. There was no relationship between mother's diagnosis and the presence of neurological signs in her offspring. There were no significant differences in child's height or weight percentiles based on mother's diagnosis. However, a greater proportion of depressives' offspring weighed in the lower quartile of weight per age (31–40 percent at different testing times) than either schizophrenic offspring (19–27 percent) or children of well mothers (6–14 percent). In contrast, the three diagnostic groups were about equally represented in the upper quartile of weight per age (30–45 percent of the schizophrenics, 30–38 percent of the depressives, and 27–39 percent of the well offspring). Thus, the children of depressed mothers may have a tendency to be smaller than...
others, which would be consistent with the finding that these babies were smaller at birth (at least before removing the effects of education).

The height and weight percentiles were also examined for the effect of the degree of severity of the mother's disturbance (GAS) within each of the diagnostic groups. The GAS score was used as a covariate in separate one-way ANOVAs of the effect of mother's diagnosis on child's height and weight percentiles. The GAS score was a significant covariate in the effect of diagnosis on weight percentile \((p < .05)\), but not on height. That is, more severely disturbed mothers, regardless of diagnosis, have children who are smaller.

None of the children were noted to have overt signs of abuse or neglect. From information gathered for other aspects of the project, however, we were aware that several of the mothers had been reported to Protective Services for suspected abuse or neglect. Out of 45 schizophrenic mothers for whom we had this information, 21 (47 percent) had a case worker assigned for at least part of the time they were studied. Of 23 depressed mothers on whom we had this information, six (26 percent) had a case worker assigned at some point during that mother's involvement with the project. None of the well mothers had been assigned a case worker. It should be noted that the mother may not have been considered to be abusive or neglectful with the target child. In fact, quite often a mother had had an older child removed from her custody and placed in foster care and was still considered an active case as a precaution for the younger (target) child. In addition, mothers who were noted to be severely disturbed during prenatal care or at delivery were routinely referred to Protective Services to assess their capacity to care for their babies. This probably accounts for the greater percentage of case workers for schizophrenics than for depressives.

Social Competence. In addition to the White (1978) social competence home observation ratings, we considered the 15 ratings of child behavior in the videotaped laboratory mother-child interaction to be measures of social competence.

At the initial testing, the offspring of one or both disturbed groups significantly differed from the well group on three out of five of the home-based social competence scores. Both schizophrenic and depressed offspring scored lower than well offspring on role play \((p < .03)\) and using the mother as a resource \((p < .02)\). The schizophrenic offspring, but not the depressive offspring, also scored lower on expression of affection and hostility \((p < .02)\). Differences were also noted on 3 of the 15 ratings from the mother-child interaction observations. Schizophrenic offspring scored lower on communicative competence \((p < .01)\) and on amount of expressed negative affect than either of the other two groups \((p < .02)\), and higher on activity level than children of well mothers \((p < .04)\).

At the second testing, none of the groups differed significantly from each other on any of the home-based social competence variables, but they did differ significantly on three of the ratings from the laboratory interaction observation. Schizophrenic offspring again scored significantly lower than well offspring on the amount of expressed negative affect \((p < .04)\), but the scores of the depressive offspring were just as low. Schizophrenic offspring also scored lower than well offspring on angry and hostile disposition \((p < .05)\) and on anxiety \((p < .04)\), two variables on which they had not scored lower at the first testing.

At the third testing, children of depressed mothers scored significantly lower than either of the other two groups on two of the social competence variables: showing pride in personal products \((p < .01)\) and role play \((p < .02)\). The groups did not differ significantly from each other on any of the videotaped interaction ratings.

Despite major inconsistencies over time, one pattern emerged: when differences were found in the laboratory measure, it was nearly always the schizophrenic offspring who were singled out as showing disturbed behavior. While the two sets of social competence variables (laboratory and home-based) were grouped together here for convenience, they may tap distinct dimensions of social competence.

For a better understanding of the effects of mother's diagnosis on child social competence, we also tested whether the severity of the mother's disturbance may play a role. The GAS score was a significant covariate in four out of five of the home observation variables (probabilities ranging from .003 to .05 on all but attention of the adult), but was only marginally significant as a covariate in 2 out of the 15 child variables from the laboratory interaction (apathetic, withdrawn, and communicative competence). Thus, in addition to any effects of mother's diagnosis, child's social competence (at least as observed at home) varies as a function of the degree of the mother's emotional disturbance.

Next, we tested whether there was a relationship between each mother's social abilities and those of
her child. Results of correlational analyses indicated that mothers' problem solving (MOPS) was significantly correlated with all five of the scores on children's social competence as observed at home. This relationship was found to be true at all three testing times (correlations ranged from \( r = .20, p < .02 \) to \( r = .44, p < .001 \)). Thus, there seems to be a strong relationship between mother's style of resolving child-rearing problems and children's social competence.

We also tested whether there was a relationship between child social competence and other aspects of the mother's functioning. The degree of severity of the mother's disturbance (GAS), her role-functioning ability, and her social competence (but not the number of her previous hospitalizations) were significantly correlated with many of the child social competence variables. GAS, role functioning, and social competence were each significantly correlated with four out of five of the home-based social competence variables (correlations ranging from \( r = .21, p < .03 \) to \( r = .35, p < .001 \)). Role functioning, but none of the other mother variables, was also significantly related to 4 of the 15 child social behavior variables from the laboratory interactions (\( r = .20, p < .02 \) to \( r = .34, p < .004 \)). Mothers with poorer role functioning had children who were rated as more apathetic, withdrawn, anxious, and passive, and less hyperactive than others when they interacted with their mothers.

The final analyses of the social behavior variables were designed to test whether we could predict which children would have the poorest social behavior scores (i.e., score < 0.5 SD below the mean) from combined knowledge of mother's diagnosis, the degree of severity of the mother's disturbance, the mother's IQ, the number of times the child had been separated from the mother, and the availability of a secondary caregiver. Since only continuous variables can be used in a stepwise discriminant function analysis, the predictive power of three variables were tested in one analysis: severity of disturbance (GAS), number of separations, and mother's IQ. The predictions from mother's diagnosis and availability of a secondary caregiver were tested with separate \( \chi^2 \) analyses. To simplify the analyses further, predictions were attempted only on the five variables from the home-based observations.

The GAS score and the number of separations, usually in combination, were most frequently included in the formula predicting the child's grouping on social competence. The derived functions were able to classify an average of 44 percent of the cases correctly, with the greatest accuracy being in the prediction of those children who scored high on social competence. From the \( \chi^2 \) analyses, the three groups of mother's diagnoses were found to be distributed about equally across the groups of children with high, low, and middle social competence. A secondary caregiver was found to be more often available for children who scored high on use of the adult as a resource (\( \chi^2 = 11.87, df = 4, p < .003; \chi^2 = 12.46, df = 4, p < .002; \chi^2 = 10.94, df = 4, p < .004 \) at each testing time, respectively). Of children whose mothers had no alternative caregivers, 70–75 percent were in the lowest scoring group on using the adult as a resource.

In summary, while results are inconsistent across measures and over time, schizophrenic offspring seem to be rated as less competent than others. In addition, less competent children seem to have mothers with the most severe disturbance, fewer skills in resolving child-rearing problems, the lowest level of role functioning, and a less stable child-rearing environment (more separations and no regular secondary caregiver).

**Intellectual Competence.** The same series of analyses were conducted on the intelligence test data. Results reported here only include those using the combined IQ score, IQMD. Mother's diagnosis was found to matter for the child's IQ only at the first testing time. The children of schizophrenic mothers scored lower than both other groups on IQMD at the first testing only (\( p < .01 \)). Schizophrenic offspring scored an average of 85 (SD = 22.7), while the mean for depressive offspring was 99 (SD = 19.87), and for well children 97 (SD = 20.66). None of the groups differed significantly from the others at the second or third testing time. It was noted, however, that the scores of the depressed group dropped significantly by the third testing to a mean of 88. The degree of the mother's disturbance (GAS score) was only a marginally significant covariate in the effect of diagnosis on IQMD at pretest (\( p < .08 \)), not significant at the second testing, but was significant at the third testing (\( p < .04 \)). Thus, the degree of the mother's disturbance may be significantly related to the child's IQ even when her diagnosis makes no difference.

Mother's IQ was examined for its relationship with children's IQ scores. All mothers had been administered the Shipley-Hartford IQ test. While there were very low correlations between mother's IQ and child's IQ at both the first and sec-
ond testings, there was a significant correlation at the third testing \((r = .30, p < .02)\). Thus, the mother's intellectual level may affect the child's IQ, but only as the child gets older.

Other variables examined for their degree of relationship with child IQ were the mother's role-functioning ability, social competence, and number of previous hospitalizations. Only number of hospitalizations was significantly related to child's IQ \((r = .43, p < .006)\). Mothers who had more previous hospitalizations had children with lower IQ scores.

Finally, we attempted to identify any variables that could distinguish children who did well on the IQ test \((> 0.5 \text{ SD above the mean})\) from those who scored low \((< 0.5 \text{ SD below the mean})\) and those who scored around the average. A discriminant function analysis tested the predictive power of the degree of the mother's disturbance (GAS), the mother's IQ, the number of separations of the child from the mother, and the child's perinatal status score. Results indicated that both GAS score and perinatal status were included in a formula to predict the child's classification. The derived formula accurately predicted 45 percent of the children's classifications. Two \(\chi^2\) tests were also conducted to see whether mother's diagnosis or availability of a secondary caregiver were equally distributed across the high, middle, and low IQ groups. Mother's diagnosis, but not availability of secondary caregiver, was found to yield a significant \(\chi^2\), but only at the first testing time. Sixty-nine percent of the children in the low-scoring group had schizophrenic mothers, yet the three mothers' diagnoses were about equally represented in the high scoring group \((p < .02)\). While some offspring of schizophrenics manage to perform as well as others, they are significantly overrepresented in the group of children with the poorest intellectual performance.

Multiple Negative Indices. As previous researchers have pointed out, only a small subgroup of the children of schizophrenic parents are expected to be deviant, and an examination of mean differences may be misleading. Therefore, we divided the children into three groups for the discriminant function and \(\chi^2\) analyses reported above. We also examined individual cases and noted the children whose scores fell in the extremes of the range on more than one measure.

We again used the cutoff of scores \(> 0.5 \text{ SD above} \) or below the mean for three of the child measures: IQMD, social competence (at least two of the five scores), and children's self-concept (total percentile). Children were also designated as having a negative index if they (1) were below the 25th percentile of weight per age, (2) had been found to have neurological or psychiatric symptoms, or (3) had been assigned a psychiatric diagnosis. Thus, a child could have from zero to six negative indices (table 2). Due to the age restrictions of several measures, not all children were administered every test, so we only include here the children who received scores on at least four of the six variables.

The majority of children received zero or few negative indices. At the first testing time, 71 children received no more than one negative index. Of those, 37 percent had schizophrenic mothers, 31 percent had depressed mothers, and 32 percent had well mothers—figures that remained roughly the same over the three testing times. Thus, offspring of schizophrenics were just as likely as the others to be in the group of children with zero or one negative index.

The percentage of children receiving more than three negative indices is quite small. In fact, only 14 children altogether received four, five, or six negative indices, of which 67 percent had schizophrenic mothers, 20 percent had depressed mothers, and 13 percent had well mothers. Accordingly, there is an overrepre-

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presentation of offspring of schizophrenics among the group of children with the most negative indices.

Child-Rearing Environment. The HOME Inventory provides a good index of the quality of the child-rearing environment. However, the age range of the children studied required the use of two separate versions of the instrument. In most cases, the sample size for each version was too small to conduct statistical analyses, but one score that can be compared across versions is the HOME total score as a percentile. In addition, five subscale percentile scores were computed by combining data on conceptually comparable subscales across the two measures. The only analyses conducted on these HOME scores were to test whether they vary as a function of mother’s diagnosis. A series of one-way ANOVAs indicated significant effects of mother’s diagnosis on the HOME total score at all three testing times \( p < .01, p < .001, \) and \( p < .04, \) respectively. Mean comparisons indicated that the child-rearing environment of the schizophrenic mothers’ group was always rated as significantly poorer than that of the well mothers. At the second testing time, the child-rearing environment of the depressed mothers’ group was also rated as poorer than that of the well mothers, although not so poor as that of the schizophrenic mothers.

Analyses of the subscale scores indicated that the poorer child-rearing environment attributed to schizophrenic mothers was predominantly due to differences on three of the subscales. First, schizophrenic mothers were perceived as being less responsive, emotionally and verbally, than the other groups of mothers \( p < .006, p < .002, \) and \( p < .03, \) at each testing time, respectively). Second, schizophrenic mothers were seen as providing less play stimulation (through toys, games, and reading materials) than the other mothers \( p < .03, p < .04, \) and \( p < .06. \) Third, there was at least a tendency to see schizophrenic mothers as providing less variety of stimulation (through both routine and special activities) than other mothers \( p < .003, p < .10, \) and \( p < .07. \) Some significant differences were also noted on the other two subscales (qualities of the physical environment and punishment and discipline), but not consistently over the three testing times.

Other analyses on the data from the HOME Inventory are underway. One unanswered question is whether scores on the child-rearing environment measure, or some of the subscales, predict the children who are the most or least competent on social and intellectual functioning.

Possible Protective Factors

Although the children of schizophrenic mothers did show more problems than the comparison groups, our single most important finding was that it is crucial to look at other factors, both as risk-increasing and as possible protective influences. Sometimes children of schizophrenic mothers and of depressed mothers seemed to be performing more poorly than children of well mothers, but more often, some factor other than the mother’s diagnosis seemed to account for the findings.

The major variable on which children of schizophrenic mothers showed some relatively greater deficit was social competence. Offspring of schizophrenics less often expressed affection, hostility, or anxiety, and they were rated lower on communicative competence and higher on activity level than either other group. On the videotaped laboratory interactions, the offspring of schizophrenics showed more disturbed behavior than the other two groups. Several of these observations were not consistently noted at each of the three testing times. On the basis of both home and laboratory observations, however, these results do suggest that the social behavior of schizophrenic offspring is beginning to diverge from others.

Children of schizophrenic mothers also scored lower on IQ, but only at the first testing. The reason is not clear. One possibility is that mother’s diagnosis matters only when children are < 1 year old. As children get older, they are more often exposed to another caregiver and may overcome an early lag. Alternatively, the shift in emphasis from perceptual-motor skills on infancy tests to more cognitive skills on early childhood tests may have facilitated the achievement of higher scores as the offspring of schizophrenics got older. However, even though the schizophrenic group scored no lower than the others at the second and third testings, they were overrepresented in the lowest scoring group at all three testings.

More serious indications derive from examination of multiple negative indices. The clearest finding was that two-thirds of the children with the most negative indices were schizophrenic offspring. That is, children of schizophrenic mothers were more likely than others to (1) have symptoms of psychiatric disturbance, if not also to have been assigned a psychiatric diagnosis, (2) be small for their age, and (3) have scored in the lowest group on social competence and IQ.
Some characteristics of schizophrenic mothers and the environment they provided were also found to differ from those of the comparison groups. For example, schizophrenic mothers began prenatal care later than the other two groups of mothers. They were also more likely to be suspected of abuse and neglect; in the present study, they had had an older child removed from their custody more often than either other group. Schizophrenic mothers also were seen as having provided the poorest child-rearing environment.

Yet there were other findings that seemed to point to psychopathology as the risk factor, regardless of the specific diagnosis. Children of both schizophrenic mothers and depressed mothers seemed to exhibit similar patterns on several variables. For example, both groups were equally likely to receive a diagnosis, and both scored lower than well offspring on two categories of social competence: role play and using the mother as a resource.

On other variables, the children of depressed mothers seemed to be worse off than either other group. Offspring of depressives were smaller at birth and, while that finding may have been due to a confound with levels of education, they continued to be small for their ages throughout the study. They were never rated as performing as poorly as schizophrenic offspring on the laboratory-based social competence measure, but during at least one of the testing times they scored lower than both other groups on showing pride in their personal products and on role play in the home-based measure.

Other than the mother’s diagnosis, the degree of her disturbance seemed to be related most often to child’s outcome. The severity ratings were found to be related to perinatal status, weight per age, social competence (especially as observed at home), and IQ. Usually the children scoring lowest had mothers with the most severe illnesses, regardless of the specific diagnosis. Other factors that seemed to operate similarly, although sometimes not so powerfully or consistently, were the mother’s social competence, role-functioning ability, single-parent status, and availability of a secondary caregiver. Thus, risk-increasing factors seemed to be more severe emotional disturbance in the mother, poorer social competence (i.e., less education, younger age, lower IQ, and less work experience), poorer role-functioning ability, and absence of a spouse or other alternative child caregiver. Mothers with poorer child-rearing problem-solving ability tended to have children with lower social competence, and mothers with lower IQ tended to have children with lower IQ, at least as the children grew older. These findings may indicate a modeling effect or perhaps, with IQ, a genetically imposed restriction on the child’s potential.

The same data indicate that less severe illness, higher social competence, and so forth operate as protective factors. There was usually a relationship between children’s scores and these characteristics of the mother and the environment: the more positive scores on these characteristics were related to higher functioning for the children. Also, the groups of best-performing children were usually found to have had the advantage of a more positive child-rearing environment. For example, in the home-based social competence observation, 84 percent of the group scoring highest on use of the adult as a resource had a secondary caregiver. Use of the adult as a resource was singled out by White (1978) as one of the strongest indicators of social competence.

Unless replicated, however, these results can only be generalized to other samples of low-income, black populations. Other than mother’s diagnosis and severity of disturbance, the factors that were found to be risk-increasing or protective may be especially relevant in samples that are already experiencing hardship even without the added burden of a psychologically disturbed parent. The findings on the role of child-rearing environment are especially strong considering the restricted range from which they emerged.

The study also suffers from several limitations. First, the age of the subjects created many measurement problems. Extensive subtest data on the IQ tests remain unexamined because the number of subjects tested on each of the two IQ measures was too small to allow statistical analyses. Other measures, such as those used for social competence, are not so strong psychometrically as we would wish. The noted lack of consistency across measures and over time on social competence could be attributable to measurement problems. Since neither of the two social competence measures has been used extensively, much work remains to be done to determine their usefulness for populations of offspring of disturbed parents. Some of that work is currently underway in our laboratory.

Moreover, the study was conducted in the context of a preventive intervention program. Thus, about half of the subjects at the second and third testing times had been participants in an intervention specifically designed to improve parenting and minimize the likelihood...
of social and intellectual problems in the children. This fact, as well as the potential confound, was usually taken into account by only including the data on those families who did not receive interventions, and this contributed even further to small sample sizes. It is also likely that attrition increased because of the greater demand of intervention over and above being extensively tested and interviewed.

Implications

Our findings have two implications for preventive interventions. First, instead of attempting to provide preventive interventions to all schizophrenic offspring, a subgroup could be selected. Variables that could be used to select the high-risk subjects are the mother’s degree of disturbance, her level of functioning (including capacity for productivity at work, housekeeping, self-care, and marital status) and, possibly, the child’s perinatal status. Those families with the most limited social and material resources may also be the selected group. Second, the results provide ample evidence in support of establishing short-term goals for these interventions—namely, the prevention of declining social and intellectual competence. If such interventions also succeeded in reducing later emotional disturbance, that would be a bonus.

References


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The Author
Sherryl H. Goodman, Ph.D., is Associate Professor of Psychology, Emory University, Atlanta, GA.

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