Today the prevailing view in child psychiatry is the biopsychosocial model of child development, but this was not always the case. Prior to World War II, and even in the post-war period, the environment was considered the major determinant of the child's development; the role of the child's constitutional characteristics was overlooked. The theory of temperament, formulated by the author and her colleagues, holds that these constitutional characteristics are important in the child's development and interact with the environment. We tested the theory of temperament through a major longitudinal study, which required innovative approaches to data collection and analysis. Data obtained from the 133 children and accumulated over the past 35 years have been described in earlier publications. This paper traces the evolution of our methodology from the original concept to qualitative data collection and quantitative measurement. The methodological and theoretical dilemmas encountered in our research and some of the implications of our findings are also discussed.

INTRODUCTION

A "Brainless Psychiatry"

For several decades, many developmental psychiatrists and psychologists believed that even major mental illnesses, such as schizophrenia, manic-depression, and autism—as well as less severe behavioral disturbances—were caused by some type of unhealthy intrafamilial and/or extrafamilial influence. The crystallization of normal personality traits as the child grew older was also viewed as the outcome of environmental factors. In addition, the early years of life were considered all-important in determining the future course of an individual's psychological development.

There were vigorous debates as to the exact mechanisms by which individual personality differences were shaped by early environmental influences. The two most influential theoretical schools, psychoanalysis and behaviorism, took very different approaches, and within each group there were many shades and even sharp divergences of views. Nevertheless, the debate occurred within the context of agreement that the environment was the major determinant of future development.

As to the influence of the brain, apart from the obvious organic disorders, its functioning was not considered relevant by many psychiatrists and developmental psychologists. For many in the field, the study of the brain was left to the neurochemists, neurophysiologists, and neurologists. This period was, as Eisenberg [1] has phrased it, the era of a "brainless psychiatry."

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The psychologic view of mental health and illness that emerged from psychoanalysis did represent an enormous step forward in the development of a scientific psychiatry. It substituted dynamic insights into the child's early life experience for the determinism that dominated the nineteenth century. These sterile and mechanistic concepts proclaimed that constitution and heredity foretold the child's personality and potential. Thus this new outlook was truly a more hopeful approach and led to the formulation of psychotherapeutic techniques that have relieved the suffering and functional disturbances of many. These new ideas and clinical approaches did not, however, bring the utopian dynamic psychiatry envisioned by many psychiatrists of the 1940s and 1950s. Several major problems became increasingly evident.

First, it was clear that very young children showed substantial individual differences in behavior, even in the first few weeks of life. Experienced mothers, pediatricians, infant nurses, and students of child development noted differences in the regularity of sleep and hunger, the levels of motor activity, the intensity of laughter and crying, and reactions to novel stimuli [2]. Second, clinical experience failed to verify that parental attitudes and practices controlled the child's psychologic development. There were too many instances in which psychopathology occurred in children with good parents. In other cases, the child's development pursued a consistently healthy direction, even into adult life, despite severe parental disturbance and environmental adversity.

Third, if a child's disturbance was due to events in early life, then the primary caretaker, usually the mother, had to be the culprit. Circular reasoning made this conclusion a closed system. If the mother was anxious, depressed, or insecure, this fact proved the point, but if the mother appeared to be psychologically stable, self-assured, and handled the baby with loving care, this fact "proved" that her disturbances were unconscious. The "evidence" for this conclusion was the child's disturbance. Blaming the mother in this way created enormous guilt and anxiety in a host of mothers whose children had only minor behavioral deviations [3]. The possibility that the mother's anxiety might be the result rather than the cause of the child's disturbance was apparently not considered.

These impressions led us to review the scientific literature, which revealed considerable doubt concerning the validity of an exclusively environmental view of child development [4,5].

The Temperament Hypothesis

Out of these considerations, we formulated the hypothesis that the young child's behavioral style, or temperament, might play a significant role in both normal and deviant development. As indicated above, such a hypothesis had been suggested by others, but a systematic and comprehensive study was needed to test its validity. The need for such a study prompted the initiation of the New York Longitudinal Study (NYLS) in 1956.

Temperament represents the how, or style of behavior, in contrast to the why, or the motivations of behavior, and the what, which are the perceptions and talents of the individual. Two children may dress themselves or ride a bicycle with the same dexterity and have similar motives for engaging in these activities. Two adolescents may display similar learning ability and intellectual interests, and their academic performances may coincide. These actions reflect their motivations and abilities. Yet these two children or adolescents may differ significantly with regard to the quickness with which they move, the ease with which they enter a new social situation, and the effort required
by others to distract them from their chosen activity. These variations reflect differences in temperament. Others had suggested that behavior could be analyzed by consideration of \textit{how, why, and what} [6], but investigation into the nature and significance of temperament, as well as its relationship to motivation, was lacking.

**METHODOLOGY**

The study of temperament meant the identification of individual differences in behavioral style in young infants and the effect of such differences on child development. To this end, a prospective or longitudinal study was required. Cross-sectional studies, which evaluate matched samples of same-aged subjects, can identify group trends on one or more variables over time; however, cross-sectional studies cannot trace the developmental course of individual subjects over time. Only a longitudinal study, which follows the developmental course of the same group of subjects over time, can hope to explore behavioral style and individual patterns of change and continuity and their meaning.

In a prospective study, data are collected at the time of or very close to the occurrence of the events under investigation. This procedure is essential. Several studies have revealed the problems of accuracy in parental reporting of the child's early history—even when the child's development has been normal [7,8,9]. The problem is the same when adults try to recall their own history. As noted by Vaillant: "How then may we obtain truth about the adult life cycle? Clearly, it must be studied prospectively. It is all too common for caterpillars to become butterflies and then to maintain that in their youth they had been little butterflies. Maturation makes liars of us all" [10:197].

\textit{Source of Data}

Before launching the NYLS, we faced the formidable problem of developing a method of obtaining and analyzing the data that could support or negate the temperament hypothesis. Close examination of the literature was not very helpful. Consultation with several neuropsychologists and developmental psychologists confirmed that this task was indeed a tough problem, but solutions were not forthcoming. The answer came unexpectedly during a pilot study with a group of mothers and their newborn infants. The women had been recruited for a simple experiment to determine whether infants could be classified according to their performance on a conditioned reflex pattern. The experiment didn't work, but, as the mothers talked about their babies' behavior in sleeping, feeding, and other routines of daily life, the solution became clear. Each baby seemed to come alive as the mothers spoke. The individual characteristics of each baby became clear as the mothers spoke, especially in the babies' response to what was familiar and what was new.

It became clear that the primary caregivers, usually the parents, were indeed a unique and comprehensive source of information on their infants' behavioral style. Because of their continuous involvement with their infants, parents could observe and report on all details of their babies' behavior in all aspects of daily life. They could also describe the child's reactions to anything new and different: the first bath, a new food, a stranger, an illness, a move to a new home, and so on. By contrast, an outside observer coming into the home for a few hours could only catch a slice of the overall behavioral repertoire of the child, and that slice might not be typical.

Yet parents can be biased in their perception and interpretation of their child's
behavior, as well as how they report the child's behavior. Accordingly, our interview protocol focused on obtaining detailed, factual, and descriptive items of behavior. For example, if a mother reported "He doesn't like cereal," she would be gently and firmly pressed for the child's actual behavior which led her to that conclusion. In the interview, special attention was given to any new events in the child's life. We did not stop with a description of the child's initial reaction to the new person, place, or situation. Parents were asked about their response to the child's reaction, followed by the child's subsequent response, and so on. Thus the entire sequence of the child's reaction to new stimuli and parental response was unraveled.

The accuracy of parents' reports during the infancy period was verified by two independent observers who obtained, in 18 cases, detailed reports of the child's behavior in the home. The observations were made on separate days, lasted two to three hours, and were done within two weeks of the parent interview. These observations were scored for temperament, using the same method as in the parent interview. A significant positive correlation, though not perfect agreement, was found between observer ratings and parental reports.

Setting and Sample

The original NYLS sample comprised 138 children from 85 families. Five subjects were lost to follow-up during the infancy period because the families moved from the New York area. In a recent follow-up, four subjects in their mid and late twenties dropped out for personal reasons. The remaining 129 subjects and their families have continued to participate in the research project, which yields a retention rate of 97 percent over the 25-to 30-year study period.

The original NYLS sample was gathered over a period of five years, starting in 1956. The families were unsolicited, referred through personal contacts, and were included if they expressed willingness to participate in the study for at least a ten-year period. Younger children born into these families during the sampling period were brought into the study. The inclusion of sibs made possible a number of comparisons concerning the development of brothers and sisters within the same household.

The sample comprised white, middle- and upper-middle-class families living in the New York City area. With few exceptions, all the parents were born in the United States. Such a homogeneous sociocultural group was desirable for a study of innate differences in children, because it minimized the influences that could be introduced by sociocultural variability. Use of such a homogeneous group does not, however, eliminate differences due to environmental influences. The study protocols gave appropriate attention to such phenomena as trauma, unusual events, and idiosyncratic parental attitudes.

On the other hand, the use of a relatively homogeneous sample limits the extent to which the findings can be generalized to other populations of different economic, cultural, and racial status. To deal with this issue, a second longitudinal study was initiated. The study followed 95 children of working-class Puerto Rican families from early infancy through childhood [11].

Data Collection

Originally, the plan was to begin collecting data from the neonatal period onward; however, a pilot study showed that the newborn infant's behavior varied significantly from day to day. We found that the infant's behavioral characteristics usually began to
show a consistency of pattern between the fourth and eighth week of life [12]. Hence, our initial interview with the parents was scheduled when the child was two to three months old.

Semi-structured parent interviews were conducted at three-month intervals during the first 18 months of life, at six-month intervals until five years of age, and then yearly until eight or nine years of age. In adolescence, the subjects were interviewed directly, their parents separately. The same procedures were followed in the 18- to 22-year period. In the most recent follow-up, the subjects were interviewed, but the parents were not.

When each child was three years old, a detailed structured interview that focused on parental practices and attitudes was conducted. The interview was held in the family home separately with each mother and father, but simultaneously. Immediately following the interviews, the interviewers rated each parent on a number of categories related to parental attitudes and practices.

Each interview, whether of the parents or the subjects, was modified according to the subject's age. Of particular interest was how each subject coped with new demands such as school, peer relationships, work, and sex. In direct interviews with the subjects, questions about self-image, goals, and special interests were included. Table 1 summarizes the timing and type of interview used in the study to date.

Data were also collected from nursery schools, kindergarten, and the first grade, through yearly interviews with the teachers and school observations lasting one to two hours. Standard psychometric testing was carried out when each child was three years old and again at six years. A running account of the child's behavior and verbal responses to the testing was made by a staff observer seated in the rear of the testing room. This procedure provided the I.Q. scores and insight into the style of the child's responses.

**The Clinical Sample**

A major goal of the NYLS was to determine the possible significance of temperament in the origins and evolution of behavior disorders [12,13]. Upon entering the study, the parents were told that a child psychiatrist would be available for consultation if behavioral problems emerged. Over the course of the study, several children were referred for psychiatric evaluation because of problems at school or at home. In many instances, the reported problems represented age-specific behaviors that were troublesome, but not deviant. In other cases, the problem consisted of unintentional yet

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**TABLE 1**

| Age        | Type         | Frequency               | Informant                |
|------------|--------------|-------------------------|--------------------------|
| 2-3 months | Initial      | Once                    | Parent(s)                |
| 3-18 months| Semi-structured | Every three months     | Parent(s)                |
| 1.5-5 years| Semi-structured | Every six months      | Parent(s)                |
| 3-6 years  | Semi-structured | Every year              | Teacher                  |
| 3 years    | Structured   | Once                    | Parent(s)                |
| 5-8 years  | Semi-structured | Every year              | Parent(s)                |
| 16 years   | Semi-structured | Once                    | Parent(s) and subject    |
| 18-22 years| Semi-structured | Once                    | Parent(s) and subject    |
| 25-30 years| Semi-structured | Once                    | Subject                  |
inappropriate methods adopted by the parents to manage the child. In these cases, parents were given suggestions by the psychiatrist concerning the relevant aspects of child care, and the “problem,” along with parental concern, usually disappeared.

In other instances, however, a simple change in routine was not or could not be carried out by the parent. The undesired patterns of functioning persisted or became worse. In such cases, a standard clinical evaluation was conducted by a member of the research staff (SC). In most cases, both parents participated in the evaluation. Neurological or psychological studies were performed as indicated by the psychiatric evaluation. If the presenting complaint involved school functioning, the teacher was interviewed, and additional observations in the school were done.

Following the diagnostic evaluation, there was a review of the research information available on the child. No diagnosis was changed because of this review. In each case, however, the formulation of the pathogenic child-environment interaction and the ontogenesis of the behavior problem were derived from a composite of clinical and research information. A decision was then made regarding treatment of the child—parental guidance or referral to other agencies. Even though the research protocol did not include data collection between middle childhood and adolescence, the clinical sample was followed at regular intervals. This follow-up was discontinued if the child showed complete and sustained recovery from his or her difficulties.

**DATA ANALYSIS**

There are two approaches to research data analysis: qualitative and quantitative. Our data collection was primarily qualitative. For example, the parent and teacher interviews, the narrative description of the child’s behavior at school and during I.Q. testing were all qualitative data. The structured interview of the parent when the child was three was also qualitative in nature but was converted to a quantitative score. In other words, the data set was not amassed by means of questionnaires or other quantitative methodologies. The rigors and restrictions of such quantitative methods would have precluded the identification of meaningful subtleties in the developmental course of individual children.

On the other hand, impressionistic ratings of the child’s temperament from any single source of data would limit the power of statistical analysis and make reliable comparisons of ratings from different sources and different time periods impossible. Thus, in order to trace the consistencies and changes in a child’s characteristics over time and to determine systematically the influence of these characteristics on the child’s development, some sort of quantitative scheme was necessary.

Herbert Birch joined the research team to help in the accomplishment of this task. He defined nine categories of temperament through an inductive content analysis of the parent interviews for the first 22 subjects. He transformed the narrative data into categories with precision that permitted reliable measurement, which was a major contribution. Scoring criteria for each category were established, and a method of rating each item of behavior in each interview was determined. Finally, a three-point rating scale for each category (high, medium, low) was formulated, with each category being assigned a weighted score. Birch made it possible to employ statistical techniques for the data analyses as the longitudinal study progressed and the data set grew. He remained an important member of the senior research group until his untimely death in 1973.

The nine categories defined by Birch corresponded closely to those we had previously
defined by our own qualitative method. This correspondence offered support for the validity of the temperament categories.

The temperament categories, which have been discussed in detail elsewhere [11], are listed in Table 2.

Qualitative analysis, supplemented by factor analyses, led to the formulation of three constellations of temperament which appeared to have functional significance (refer to Table 3). Among those children in these constellations, however, there was wide variation within each category. In addition, some children (about 35 percent of the sample) exhibited different combinations of temperament traits and could not be placed in any one of these constellations.

It is apparent that the group of temperamentally easy children would require less effort to manage. These children adapt quickly and positively to new situations. By contrast, the temperamentally difficult child is hard to manage; adaptation to new situations is often distressing to the child and stressful for the caregivers. Slow-to-warm-up children may also present difficulties in child rearing, but, because their negative reactions to new situations and demands are expressed mildly, parents and teachers can usually tolerate their reactions and allow the child a bit more time to adapt. These temperamental constellations are, it should be noted, normal variations.

Using these nine temperament categories and the three constellations, it was possible

| TABLE 2 |
|----------------|
| Temperament Categories |
|----------------|
| 1. Activity Level: The motor component of the child's functioning, includes proportion of active and inactive periods |
| 2. Rhythmicity: The predictability or unpredictability of the child's functioning, such as in sleep, hunger, and elimination |
| 3. Approach or Withdrawal: The nature of the initial response to a novel stimulus, such as new food, toy, person, or situation |
| 4. Adaptability: Relative ease or difficulty in negotiating an effective response to new situations |
| 5. Threshold of Responsiveness: The level of stimulation required to evoke a discernible response |
| 6. Intensity of Reaction: The energy level of response, irrespective of its quality or direction |
| 7. Quality of Mood: The amount of pleasant, joyful, and friendly behavior compared to unpleasant and unfriendly behavior |
| 8. Distractibility: The degree to which extraneous environmental stimuli can interfere with ongoing behavior |
| 9. Attention Span and Persistence: The length of time an activity is pursued and the capacity to continue despite obstacles |

| TABLE 3 |
|----------------|
| Temperament Constellations |
|----------------|
| 1. Easy Temperament: The combination of biological regularity, approach tendencies to the new, quick adaptability to change, and predominately positive mood. This group comprised about 40 percent of the study population. |
| 2. Difficult Temperament: The combination of biological irregularity, withdrawal tendencies to the new, slow adaptability, and frequent negative emotional reactions of high intensity. This group comprised approximately 10 percent of the sample. |
| 3. Slow-to-Warm-Up Temperament: Characterized by withdrawal tendencies to the new, slow adaptability, frequent negative emotional reactions of low intensity—often labeled "shy." This group comprised about 15 percent of the sample. |
to rate all NYLS subjects in childhood, adolescence, and, recently, in early adulthood. The patterns of behavior do change and become increasingly complex at sequential age periods, so the criteria for rating temperament have to reflect developmental changes. For example, behavioral items for scoring temperament in infancy focus on sleep and feeding schedules, reactions to new foods and new people, loudness and frequency of crying and laughter, and distractibility during feeding. During the toddler stage, data collection concentrates on peer relations, play patterns, and persistence when playing with a new toy. In the older child, adaptation to school, parties, family, peers, play, and task-oriented activities are of interest. For the adolescent and adult, the identification of temperament is more complex because of the increasing individual variation in activities such as athletics, hobbies and special interests, social life, school curriculum, and job experience. Several research centers have developed temperament interviews and questionnaires that are appropriate for different age groups [13].

**DISCUSSION**

*Biological Issues in Temperament Research*

Individual characteristics in temperament are apparent within the first few months of life and become dramatic by the latter half of the first year of life. No consistent qualities have been identified in parental practice and attitudes that can adequately account for this variability in temperament. For example, a comparison of NYLS infants with a sample of working-class Puerto Rican families revealed no dramatic differences in temperament distribution [11]. Korner [14] contends, in a critical review of the literature, that even in infancy, parents, especially mothers, treat girls differently from boys. Yet in the NYLS, only modest sex differences in temperament scores were found. A final bit of evidence comes from a study of premature infants in which data were collected and analyzed as in the NYLS [11]. In these infants, parents were legitimately concerned, even anxious, about whether their children would develop normally. Yet, despite heightened parental anxieties, temperament scores for these premature infants were not significantly different from the full-term infants in the longitudinal study [11].

Positive evidence in the same direction is provided by two major twin studies [15,16]. A Norwegian study of 50 same-sexed twin pairs, 34 monozygotic and 16 dizygotic, found significant differences between the two groups at nine months of age. Behavioral interviews of mothers were conducted at two and nine months of age, using NYLS protocols. At two months of age, the intra-pair differences were minor. At nine months, however, the differences were statistically significant for all nine temperament categories. For each category, the monozygotic twin pairs were more similar to each other than were the dizygotic twins. Because the mothers were not aware of the zygosity, it is unlikely that this biased the results. Similar findings were reported by Buss and Plomin [16], who studied 139 pairs of same-sexed twins with an age range of one to nine years. Although they used a different categorization for temperament, they found that the intra-pair correlations were significantly higher for the monozygotic twins.

The relationship of temperament to hormonal factors has been under study by Kagan and his associates [17,18]. A sample of 120 children, 60 in each group, was classified at 21 months of age as inhibited or uninhibited. The criteria for uninhibited and inhibited corresponded closely with NYLS temperamental category of approach or withdrawal. The two groups of children were compared at age 5½ years. The inhibited group were more reluctant with peers and more cautious in situations of mild
risk. Physical findings such as a high and stable heart rate and larger pupil size under cognitive stress were observed in the inhibited group at 21 months and were also present at 5½ [17]; however, these differences were not as pronounced when the children were reassessed two years later [18]. The authors propose that one or more stress circuits that link the hypothalamus to the pituitary, reticular activating system, and sympathetic chain may be more excitable among inhibited children.

Goodness or Poorness of Fit

For each subject in the NYLS who required evaluation for a behavior problem, data were compiled about the subject’s temperamental characteristics. In addition, parents and teachers provided insight into the expectations and demands on each child. In each case, we found excessive conflict in the interaction between the child’s temperamental qualities and these expectations. On the other hand, when parental and social demands were consonant with temperamental style, there were few cases of maladjustment.

From the evaluations that traced each child’s healthy or pathological adjustment, the concepts of “goodness of fit” and “poorness of fit” emerged. A goodness of fit resulted when environmental expectations and demands of parents and others were consonant with the child’s temperamental characteristics. With such a goodness of fit, the child’s optimal development was possible. Conversely, poorness of fit was marked by dissonance between environmental demands on the one hand and the child’s capabilities and temperament on the other. Under such circumstances, development was thwarted and maladaptive functioning occurred.

Thus, the model of goodness or poorness of fit provides a framework for analyzing the child-environment interaction, which, in turn, offers therapeutic aid toward healthy development through parental guidance. The approach of such guidance is first to collect the data and analyze the dynamics of a goodness or poorness of fit. The specific area or areas that are the center of undesirable parent-child interaction are invariably described by the parents through concrete examples in the child’s life. The parents’ inimical conclusions regarding the child’s behavior, which may be within normal limits, are clarified. Different management approaches that would suit the child’s needs better and promote development of the child can be suggested to the parents. The beneficial effect for both parents and children act as powerful reinforcers for continued goodness of fit.

Many parents, perhaps 50 percent, are eager and able to carry through the program of behavioral change recommended to them. In such cases, only several discussions are necessary for its full implementation. The guidance sessions reveal misconceptions, confusion, defensiveness, anxiety, or guilt in some cases. Additional discussions are then required for clarification of those parental attitudes and practices that interfere with the child’s development. In other cases, parents may reject a temperamental interpretation, insist on a malevolent motivation, and pursue an unchanged course. Psychopathology in the parents may be rigidly fixed and will block any changes in their handling of the child. In these cases, the child continues to respond to the excessive stress and develops or retains a behavior disorder [13]. Such failure of parental guidance then leaves the recommendation for direct psychotherapy for the child, and perhaps separate therapy for the parents.

Continuity and Change in Temperament

Early in the search for individual differences in the style of functioning—initially, with infants and young children; then, as these children grew up, with youngsters in
middle childhood, with adolescents and young adults—we assumed that such stylistic characteristics would remain constant throughout life. The boisterous baby would become the vigorous adult. The shy child would be, in adulthood, the quiet grown-up. The youngster who moved toward new activities would continue to be outgoing in adolescence and as a mature person.

As these babies became older, however, such continuities have not always been the case. And, in reflection, why should it be so? Temperamental qualities of the child at various ages influence the attitudes and actions of caregivers, which, in turn influence the child. We also found, for example, that the young adult seeks out, to an impressive extent, a congenial environment rather than remaining true to temperamental characteristics. Because temperament and environment have mutual influences upon each other, it may be that many of the alterations in temperamental style are due to this counter influence of the environment. In some cases, this setting can be the internal environment, such as changes in cognition, in physical abilities, and in motivations that emerge at different ages. In other cases, it is the external environment: the family, changes in the people, the places, and the circumstances that comprise the child’s external reality. The expectations placed on the developing child by the family and the larger environment may be more, less, or simply different, depending on the child’s age. These expectations are also likely to be different for different individuals. In response to these features of the environment, the person’s temperament may be affected [11].

A question now facing temperamental research is whether there is a lawful manner in which such changes occur. Are there, for example, a group of individuals who are “changers” and others whose stability is part of their biological endowment? Are some temperamental qualities more responsive to alteration by environmental pressures than others? There may be some developmental periods that bring such enormous temperamental change that parents may wonder whether it’s still their child and not a “changeling” in the old folklore sense. The physical maturation seen in adolescence provides a biological model for this sort of alteration.

Temperament and Personality

Temperament is one of the significant factors in development, but it is not identical with personality [2]. It is true that, in the very young infant, temperamental characteristics seem to be the whole personality, but, as the child grows older, a host of other factors enter and contribute to personality development [19]. Marmor [20] has enumerated the types of variables which have to be considered: temperament, parenting, cultural values and expectations of the parents, economics, racial and ethnic realities, diet, family relationships, peers, teachers, and school systems. He emphasizes the complexity of tracing the origin of personality and warns against reductionism.

CONCLUSIONS

George Engel [21] has proposed a new biopsychosocial medical model as a challenge for biomedicine. We submit that temperament is a mediating variable in a similar biopsychosocial model. Temperament is a “neurobiologically determined variable which mediates between an internal or external stimulus and the response of the brain which is then expressed in the feelings, thoughts and behavior of the individual” [22].

The New York Longitudinal Study began in an era in which the environment was considered the predominate influence in a child’s development. The project was undertaken, in part, because we questioned that assumption. Qualitative methods were
employed in the beginning because the ideas were new and quantitative methods were not available. Over time, categories were defined, and quantitative measurement became possible. The findings from the NYLS strongly support the hypothesis that the child's constitutional characteristics interact with the environment in important ways. A challenge for future research is to uncover the biologic correlates of temperament [19].

The functional significance of temperament holds the promise for the prevention, management, and treatment of most behavior disorders in children. Parents, mental health professionals, teachers, pediatricians, and nurses can identify and recognize the behavioral individuality of children's temperamental characteristics [12]. Then the statement "Treat each child as an individual" can become more than a cliché. For the parents who believed that they were responsible for their child's deviant behavior, the knowledge of the part played by the child's temperament may relieve them of a needless oppressive burden of guilt and anxiety. At the same time, parents may figure out for themselves or through professional help how to achieve the optimal approach for each temperamental pattern. For professionals in child and adolescent psychiatry, more clear-cut objective insight into the child's temperament and its implications can be substituted for speculative assumptions of complex psychodynamic mechanisms [12,13]. The parent or teacher of a child who cannot attain the expected norm of behavior need not brand the youngster as "bad," "willful," or "disobedient." Such negative judgments may distort the child's self-image, create inappropriate defenses, and lead to a self-fulfilling prophecy. By contrast, if parents and teachers respect the child's behavioral style, their expectations will be more in line with the child's abilities and temperament. The youngster can gain self-confidence and insight and develop without unnecessary conflict.

Stress and conflict are inevitable concomitants of the developmental process. New expectations and demands for change and progressively higher levels of functioning occur continuously as the child grows older. Demands, stresses, and conflicts, when consonant with the child's potential, can be constructive and are not likely to cause a behavior disorder. Behavioral disturbance seems to be caused by excessive stress resulting from poorness of fit.

ACKNOWLEDGEMENTS

The author acknowledges the efforts of Mary G. McCrea Curnen, M.D., Melvin Lewis, M.D., and Lawrence Seahill, M.S.N., M.P.H., in the preparation of this paper.

REFERENCES

1. Eisenberg L: Mindlessness and brainlessness in psychiatry. British J Psychiatry 148:497–508, 1986
2. Thomas A, Chess S, Birch HG: Temperament and Behavior Disorders in Children. New York, New York University, 1968, 309 pp
3. Bruch H: Parent education or the illusion of omnipotence. American J Orthopsychiatry 24:723–732, 1954
4. Orlansky H: Infant care and personality. Psychological Bull 46:1–48, 1949
5. Klatskin EH, Jackson EB, Wilkin LC: The influence of flexibility in maternal child care practices on early child behavior. American J Orthopsychiatry 26:79–93, 1956
6. Cattell RB: Personality: A Systematic and Factual Study. New York, McGraw-Hill, 1950, 689 pp
7. Haggard EA, Brekstad A, Skard AG: On the reliability of the amnestic history. J Abnormal and Social Psychology 61:311–315, 1960
8. Robbins LC: The accuracy of parental recall of aspects of child development and of child rearing practices. J Abnormal and Social Psychology 66 (3):261–270, 1963
9. Wenar C: The reliability of developmental histories. Psychosomatic Medicine 25:505–509, 1963
10. Valliant GE: Adaptation to Life. Boston, Little Brown, 1977, p 197
11. Thomas A, Chess S: Temperament and Development. New York, Brunner-Mazel, 1977, 270 pp
12. Thomas A, Chess S, Birch HG, Hertzig ME, Korn S: Behavioral Individuality in Early Childhood. New York, Brunner-Mazel, 1963, pp 53–55
13. Chess S, Thomas A: Temperament in Clinical Practice. New York, Guilford, 1986, 315 pp
14. Korner AF: Sex differences in newborns, with special references to differences in the organization of oral behavior. J Child Psychology and Psychiatry 14:19–29, 1973
15. Torgerson AM, Kringlen E: Genetic aspects of temperamental differences in infants. J American Academy of Child Psychiatry 17:433–444, 1978
16. Buss AH, Plomin R: A Temperament Theory of Personality. New York, Wiley, 1975, 256 pp
17. Resnick JS, Kagan J, Snidman N, Gersten M, Baak K, Rosenberg A: Inhibited and uninhibited children: A follow-up study. Child Development 57:660–680, 1986
18. Kagan J, Resnick JS, Snidman N, Gibbons J, Johnson MO: Childhood derivatives of inhibition and lack of inhibition to the unfamiliar. Child Development 59:1580–1589, 1988
19. Rutter M: Temperament, personality and personality disorder. British J Psychiatry 150:443–458, 1987
20. Marmor J: Systems thinking in psychiatry: Some theoretical and clinical applications. American J Psychiatry 140:833–838, 1983
21. Engel GE: The need for a medical model. Science 196:129–135, 1977
22. Chess S: Temperament and personality. Presented at Symposium on the Neuroscience of Learning at the Cleveland Clinic Foundation, September 1988