

## **Relating Early Child Adjustment to Infant and Parent Temperament<sup>1</sup>**

Allan Scholom<sup>2</sup>

*Illinois Institute of Technology*

Robert A. Zucker and Gary E. Stollak

*Michigan State University*

*The central question at issue was the role of both infant and parent temperament in determining child adjustment at age 4. Within the conceptual framework of the New York Longitudinal Study (NYLS), both infant and parent temperament were assessed. Factor analyses yielded three comparable infant and parent temperament factors: Mood, Energy, and Consistency. Correlations with teacher ratings of child adjustment indicated the most significant relationship to be with the infant girls' Mood factor (comparable to the NYLS high-risk "difficult" infant factor). No infant factors were found to relate to boys' adjustment, while maternal Mood was significant across sexes. Indices of the temperamental similarity within families also revealed sex differences relative to adjustment, with similarity across all family members significantly related to adjustment for girls and boy-father dissimilarity significant for boys. Discussion centered around continuity-discontinuity issues relevant to sex differences.*

The present study is within the tradition of recent direction of effect research (Bell, 1968, 1971). Within the area of temperament, it moves away from the parent-cause/child-effect model to an interactive approach, where both parents and child bring to their encounters a unique set of behavioral dispositions, which have reciprocal impact and consequence. The New York Longitudinal Study (NYLS) (Thomas, Chess, Birch, Hertzig, & Korn, 1963; Thomas, Chess, & Birch,

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<sup>2</sup> Address all correspondence to Allan Scholom, Psychology Department, Illinois Institute of Technology, Chicago, Illinois 60616.

1968; Thomas & Chess, 1977) provided the first and most comprehensive demonstration of the relevance of early temperament to later behavioral outcome in children. In the NYLS, a clear relationship between temperament and behavior disorder was found, as was also the case in a study by Graham, Rutter, and George (1973).

One of the major findings from the NYLS was the discovery of a high-risk or "difficult" infant temperament pattern that was predictive of disproportionately high behavior disorder later in childhood among the study of children. This high-risk constellation of infant temperament traits consisted of (1) irregularity in biologically functioning, (2) predominantly negative withdrawal responses to new stimuli, (3) nonadaptability to changes in routine, (4) frequent negative mood, and (5) predominantly intense reactions.

The present investigation sought to elaborate on the NYLS findings by examining the conjoint influence of parent behavior – specifically parent temperament and infant temperament. Temperament was chosen as the parental behavior variable since it afforded us the opportunity to examine the relationship between parent and infant temperament as well as their respective and conjoint relationship to child adjustment.

The following specific questions were examined:

1. Will a temperament factor emerge for infants that replicates the first (high-risk) factor found in the NYLS? Will there be a similar factor for adults? Will other comparable factors emerge both for infants and adults?

2. Will a high-risk factor emerge for infants that is related to poor adjustment later in childhood? Will a comparable factor(s) emerge from the parent-temperament domain that is related to child adjustment? Will there be sex differences in the relationship or adjustment to temperament? And finally, what combination of infant and parent temperament factors best account for adjustment in boys and girls?

3. As an elaboration and extension of question 2, concerning the *combination* of infant and parent temperament factors that best account for child adjustment, we examined whether it was possible to establish a pattern among temperament factors that might enable us to describe a *high-risk family temperament* style. We asked whether degree of similarity or dissimilarity between family members along the various temperament factors would predict adjustment of the child. This problem can be conceptualized as one of "goodness of fit" between the various temperamental attributes of family members.

## METHOD

### *Sample*

The sample consisted of 132 well-educated middle- to uppermiddle-class families. There were 77 boys and 55 girls between the ages of 3 and 4. The chil-

dren were enrolled at four day care centers and nursery schools in the East Lansing, Michigan, area. The sample was quite homogeneous and demographically similar to that of the NYLS.

### *Instruments*

The measures of infant temperament were obtained from the Carey Infant Temperament Survey (CITS) (Carey, 1970a). The Thorndike Dimensions of Temperament Measure (TDOT) (Thorndike, 1963), and the Stollak Temperament Survey (STS) (Stollak, 1974) were used to assess parent temperament. All of these instruments have defined temperament similarly in terms of the *how or behavioral style* of the individual. Reliability and validity for the CITS have been documented (Carey, 1970b, 1972). In contrast, the STS is a new instrument consisting of self-ratings along a 5-point scale based upon one-paragraph descriptions of the nine NYLS temperament variables that were being used to assess the children.

To assess child adjustment, an instrument was developed from Baumrind's (1967; Baumrind & Black, 1967) five dimensions of child competence: (1) self-control, (2) self-reliance, (3) approach-avoidance tendency, (4) subjective mood, and (5) peer affiliation. For present purposes it was decided that since the degree of relationship was of outmost importance, a linear dimension of adjustment would be most useful. The scales were combined to yield a single adjustment score for each child by summing across a 1-to-4 rating on the five dimensions.

### *Procedure*

Data came from 172 families, from four day care centers and nursery schools. Families were contacted directly by letter and then by phone. Of the 172, 40 had to be dropped, either because they were single-parent families or because they had not fully completed the questionnaires. Both parents answered the TDOT and STS individually. The CITS was completed jointly, based upon parents' recollection of the child as an infant at age 6 months (2-3 years in the past).

Teacher ratings of their children's adjustment were obtained after 2 to 4 hours of training involving their supervisors and the senior author. Teachers had known each child for a minimum of 4 months (more typically 8 months), during which time the children were in school for at least a half day. All the children in each class were rated, although less than half were involved in the study. A comparison of the study group against the total group to determine if there was any difference in their overall adjustment (e.g., higher adjustment from participants) showed there were no differences (study children  $\bar{X} = 14.67$ , range of 5 to 20; total school population,  $u = 14.75$ ;  $t < 1$ ).

## RESULTS

### *Establishing the Infant and Parent Temperament Factors*

Scores on the nine infant temperament variables from the CITS were factor-analyzed using a principal axis solution with varimax rotations. The same analyses were performed on the 19 parent temperament variables (10 TDOT and 9 STS), separately for mothers and fathers. Our purpose here was to see if a similar/parallel set of temperament factors for infants, mother, and fathers could be established that would then be used in subsequent analyses.

The results of the factor analyses are summarized in Table I.<sup>3</sup> Three factors emerged for infants, which we shall hereafter call (1) Mood, (2) Consistency, and (3) Energy. The Mood factor is defined by approach, adaptability, mood, and threshold. A high score on this factor describes an infant with a predominantly positive mood, who approaches people and objects, and is adaptable to changes in his routine. The threshold dimension, taken together with the other scales, suggests the easy arousal of these attributes. On balance, then, this factor holds together quite well both empirically and conceptually, and is of particular interest in view of its similarity to the NYLS high-risk factor (mood, approach, adaptability, intensity).

The second factor, Consistency, is best defined by regularity and persistence, implying a constant versus cyclical behavioral style, or even tempered versus labile personality pattern.

The third factor, Energy, is defined by activity level, intensity of reactivity, and distractability. Distractability is the only ambiguous scale in this factor. One would anticipate that it would fit conceptually both here and in the Consistency factor, but empirically our data show it clusters considerably more with Energy level.

The factor analyses of the 19 mother and father temperament attributes each yielded seven factors. Three factors for both mothers and fathers were selected for subsequent analyses on the basis of the following criteria: (1) conceptual resemblance to the infant factors, (2) internal consistency, and (3) empirical importance relative to other factors (i.e., they accounted for approximately half of the variance in their respective analyses and were the first three factors to emerge).

### *The Relationship of Infant and Parent Temperament to Child Adjustment*

To proceed with the second set of analyses involving the relationship of temperament to adjustment, standardized factor scores for infants and parents on the Mood, Energy, and Consistency Factors were generated. These

<sup>3</sup>The factor analyses are available from the senior author.

**Table I.** Summary of Defining Variables for Temperament Factors Used in Subsequent Data Analyses

Factor	Defining variables				
	Infant <sup>a</sup>	Mother		Father	
Mood	Adaptability	Adaptability	STS <sup>b</sup>	Adaptability	STS
	Approach	Mood	STS	Approach	STS
	Mood	Cheerful	TDOT	Mood	STS
	Threshold	Placid	TDOT		
Energy	Activity	Activity	STS	Activity	STS
	Intensity	Active	TDOT	Intensity	STS
	Distractability			Active	TDOT
				Ascendant	TDOT
				Sociable	TDOT
Consistency	Regularity	Regularity	STS		
	Persistence	Responsible	TDOT	Responsible	TDOT
		Planful	TDOT	Planful	TDOT

<sup>a</sup>All infant variables derived from Carey Infant Temperament Survey.

<sup>b</sup>STS = Stollak Temperament Survey, TDOT = Thorndike Dimensions of Temperament.

factor scores were then correlated with child adjustment. In addition, a stepwise regression equation<sup>4</sup> was computed to determine the optimum combination of the nine factors that best accounted for child adjustment. This was done separately for both boys and girls.

Furthermore, to highlight the effects in view of the relatively high overall adjustment of the entire sample ( $\bar{X} = 14.67$ , range of 5 to 20), a parallel set of analyses was run on an extreme high and low group from the sample. Children one standard deviation above and below the mean were used for this (23 boys and 23 girls). Results of these analyses are presented in Table II.

For girls, by far the most significant factor related to adjustment was infant Mood. This finding is consistent with the NYLS results wherein the high-risk factor best predicted behavior disorder. In the total sample, the relationship was quite high ( $r_t = .42$ ,  $p < .01$ ), while in the high-low group, the magnitude of the correlation was even more striking ( $r_{h-1} = .70$ ,  $p < .001$ ). More generally, correlations in the high-low group replicate those of the total sample, but with considerably higher magnitude.

Also related to adjustment for girls was the Mood of the mother ( $r_t = .28$ ,  $p < .05$ ) and, marginally, the Consistency ( $r_t = .24$ ,  $p < .10$ ) of the father. One would expect a positive relationship between maternal Mood and child adjustment, as was borne out here.

A final marginal finding for girls was the positive relationship between Energy and adjustment in the high-low group ( $r_{h-1} = .37$ ,  $p < .10$ ). Thus

<sup>4</sup>In the interest of avoiding redundancy, the multiple regression data are not reported. In all cases the significant correlational relationships found correspond quite closely with the regression equations.

**Table II.** Pearson Correlations Between Child Adjustment and Individual Infant, Mother, and Father Temperament Factors

Temperament measures	Boys (Adjustment)		Girls (Adjustment)	
	Total sample ( <i>N</i> = 77)	High-low group ( <i>N</i> = 23)	Total sample ( <i>N</i> = 55)	High-low group ( <i>N</i> = 23)
<b>Infant</b>				
Mood	.00	-.04	.42 <sup>c</sup>	.70 <sup>d</sup>
Consistency	-.01	.13	.04	.10
Energy	.08	.18	.15	.37 <sup>b</sup>
<b>Mother</b>				
Mood	.23 <sup>b</sup>	.45 <sup>b</sup>	.28 <sup>b</sup>	.42 <sup>b</sup>
Consistency	.15	.26	-.10	-.15
Energy	.13	.37 <sup>b</sup>	-.12	-.23
<b>Father</b>				
Mood	-.15	-.11	-.01	-.13
Consistency	.00	.03	.24 <sup>a</sup>	.39 <sup>a</sup>
Energy	.12	.35 <sup>a</sup>	.06	-.17

<sup>a</sup>*p* < .10.<sup>b</sup>*p* < .05.<sup>c</sup>*p* < .01.<sup>d</sup>*p* < .001.

high activity for infant girls bears some relationship to later adjustment, a finding that one might anticipate more clearly for boys.

This, however, was not the case. For boys, none of the infant temperament factors were associated with later adjustment in either the total or high-low group. This is in marked contrast to the infant girls. Thus striking sex differences are in evidence here.

For boys, later adjustment was related to Mood of the mother in both the total and high-low groups ( $r_t = .23/r_{h-1} = .45, p < .05$ ). This was consistent with what we found for girls and was anticipated across both sexes. No other factor was significantly associated with boys' adjustment in the total sample.

However, in the high-low group there was a trend for the energy level of both mother and father to be related to child adjustment. These data point to the importance of greater energetic involvement of both parents in rearing boys, a finding that is consistent with cultural expectations for sex-role differences.

#### *Similarity of Family Members' Temperament and Child Adjustment*

To address the issue of what a high-risk family temperament style might be, we examined the degree of similarity of temperament among family mem-

bers. The question we posed was: Does similarity or homogeneity of temperament among infant, mother, and father lead to greater "goodness of fit," or is heterogeneity of some sort more likely to result in more positive child adjustment?

The data-analysis strategy utilized in addressing this question involved generating range scores between each of the family members' factors scores, on each of the temperament factors. For example, on each factor, the degree of homogeneity or similarity between infant and mother was taken to be the absolute value of the difference between their factor scores; the greater the range, the less similar they are. This was done for each infant-mother, infant-father, mother-father, and infant-mother-father combination separately on each factor.

We then used these range scores as indices of similarity of temperamental attributes and correlated them with adjustment. We also generated stepwise multiple regression equations as before. Again, this was done separately for girls and boys as well as with the high-low sample. The results are presented in Table III.

For girls, the degree of homogeneity between mother and father on the Consistency dimension was most significantly related to girls' adjustment ( $r_t = -.40, p < .01$ ). It appears that for girls it is best for mother and father to be similar in the Consistency dimension of their temperament. The high-low data indicate that similarity across all factors and family members significantly results in better adjustment for girls ( $r_{h-1} = -.40, p < .05$ ). Thus Consistency was the most significant factor, but overall family temperamental similarity was also significantly related to adjustment.

For boys, a different trend is suggested. Using the entire sample, child adjustment is related to dissimilarity to the father's temperament across all factors ( $r_t = .27, p < .05$ ), and most specifically to boy-father heterogeneity on the Consistency factor ( $r_t = .24, p < .05$ ). In other words, the greater the similarity between infant boy and father temperament, the poorer the adjustment. When looking at the high-low group, we find the same pattern emerging.

Once again, very clear sex differences emerge, with similarity of temperament between infant, mother, and father related to significantly better adjustment for girls, and dissimilarity between infant and father resulting in better adjustment for boys.

## DISCUSSION

### *The Emergence of Three Temperament Factors*

With the exception of the NYLS, where the nine categories of infant temperament were derived from content analyses of parent interviews, work on

Table III. Pearson Correlations of Child Adjustment and Indices of Temperament Similarity Between Family Members

Factor	Temperament similarity index <sup>a</sup>	Boys (Adjustment)		Girls (Adjustment)	
		Total sample (N = 77)	High-low group (N = 23)	Total sample (N = 55)	High-low group (N = 23)
Mood	I-M	.00	-.13	-.04	-.27
	I-F	.08	.10	-.05	-.24
	M-F	.07	.05	.10	.05
	I-M-F	.07	.01	.00	-.25
Consistency	I-M	.06	-.01	-.03	-.07
	I-F	.24 <sup>c</sup>	.36 <sup>b</sup>	-.15	-.24
	M-F	.00	-.02	-.40 <sup>d</sup>	-.57 <sup>d</sup>
	I-M-F	.14	.13	-.29 <sup>c</sup>	-.44 <sup>c</sup>
Energy	I-M	.00	-.13	-.03	-.11
	I-F	.19 <sup>b</sup>	.33	.00	-.14
	M-F	-.05	-.00	-.13	.10
	I-M-F	.07	.10	.04	-.08
Total	I-M	.03	-.14	-.00	-.24
	I-F	.27 <sup>c</sup>	.46 <sup>c</sup>	-.10	-.32
	M-F	.01	.01	-.10	-.32
	I-M-F	.16	.17	-.12	-.40 <sup>c</sup>

<sup>a</sup>I-M = Infant-mother; I-F = Infant-father; M-F = Mother-father; I-M-F = Infant-mother-father.

<sup>b</sup> $p < .10$ .

<sup>c</sup> $p < .05$ .

<sup>d</sup> $p < .01$ .



temperament has evolved out of clinical and conceptual starting points (Birns, Barten, & Bridger, 1969; Buss & Plomin, 1975; Graham et al., 1973; Wilson & Lewis, 1974). Here we followed an empirical model and generated three temperament factors from data that began with the nine NYLS dimensions. In examining these factors, we find that the Mood dimension, which includes approach, adaptability, mood, and threshold, holds together quite well empirically, conceptually, and in its similarity to the NYLS high-risk factor. The high end of our Mood factor is best characterized by infants who are sociable, buoyant, malleable, and with easy arousal. When we consider the adaptive value of an infant's sociability in developing early positive attachments (see for example Stayton, Hogan, and Ainsworth, 1971), the significant relationship of this factor to adjustment found here, and of the high-risk factor to behavior disorders in the NYLS, makes compelling sense.

While the New York group did not find any other factors holding up well, we found Energy and Consistency factors that were empirically and conceptually sound. Whether these factors are best regarded as more fundamental dimensions than the NYLS temperament characteristics that define them, or rather as a statistical creation obscuring more basic dispositions, is as yet unclear.

Perhaps importantly, though, we found adults parallel to infant temperament both empirically and conceptually. We were able to discern patterns of attributes that appear to be comparable to infant temperament. While we can say little about the evolution of these characteristics from infancy through adulthood, the ability to determine parallel temperament factors can provide a starting point from which to examine this process more systematically in the future.

#### *The Relationship of Infant and Parent Temperament to Child Adjustment*

The clearest and most powerful study findings concern the relationship between positive adjustment and the Mood factor in girls. This may be seen as replicating the NYLS findings (although sex differences there were not examined), where the analogous high-risk factor was found in a large proportion of the clinical cases identified. In the high-low group we found that the Mood factor contributed half the variance among all study variables in accounting for girls' adjustment. While the effects of temperament should be more pronounced in early childhood and decrease in its directness of impact as socialization experiences accumulate over time, our data demonstrate a significant effect for temperament through age 4 for girls.

The strength of the data for girls is in sharp contrast to another major finding, that of no relationship between boys' temperament and adjustment. It does not make compelling intuitive sense that boys' and girls' temperaments should have such striking differences in their impact on later adjustment.

In attempting to account for these findings let us turn to some longitudinal work relevant to continuity-discontinuity issues. Both Kagan and Moss (1962) and Bronson (1971) emphasize the emergence and submergence of various behavioral patterns during particular developmental periods. Kagan and Moss have called this the "sleeper effect," in referring to relationships found at particular age periods for variables correlating with similar (derivative) variables later in life, but *not* throughout life.

From the standpoint of the present data, it may be that early socialization experiences allow for the easy expression of certain temperament attributes for girls, which mediate positive adjustment. Thus a clear relationship for girls is found, while for boys socialization experiences may submerge or diminish in importance the effects of their temperament on adjustment at age 4. This is certainly consistent with Kagan and Moss's emphasis on the sex-linked nature of the "sleeper effect."

Another issue that may be involved in the sex differences observed concerns the stability of temperamental traits over time. Recent work has demonstrated the relationship between transient psychophysiological states during pregnancy and infant temperament. Sameroff and Kelly (1975) found that maternal emotional maladjustment was related to less adaptability, greater intensity, and more negative mood, while Eichler, Winickoff, Grossman, Anzalone, and Gofseyeff (1977) observed a relationship between maternal anxiety and infant irritability. It seems quite plausible that such factors could effect the stability of temperamental attributes over time, in that their effects on behavior may not be quite as enduring as genetic influences. Thus temperament may change over time as the transient factors contributing to its formation are no longer biologically salient.

With regard to the present data, these changes may occur differentially between sexes, as do other sex-specific maturational processes. Furthermore, such changes in infant temperament presumably have consequences for early family interaction and later outcome, as may be the case here.

Turning briefly to the role of parent temperament in predicting child adjustment, we find the expected importance of the mother, and particularly her mood, in determining adjustment for both sexes. The father's temperament was also significant, although not so consistently as was the mother's. In general, the degree of significance of the parent temperament data may have been limited by the problem of comparability of instruments and variables to the infant measures. While we found considerable overlap in our measures and parallels in our factors, instruments developed from the same conceptual and empirical basis for infants, children, and adults are clearly needed.

#### *Similarity of Family Members Temperament and Adjustment*

As to determining what a high-risk family temperament style(s) is, our data again underscore the importance of sex differences. For girls, similarity

of temperament among infant, mother, and father was found to be significantly related to positive adjustment, whereas for boys, dissimilarity between infant and father was most significant. The sex differences observed were striking and provide a point of departure for future work.

From these data we cannot argue clearly or consistently for a general model of "goodness of fit" between infant and parent temperament. What we can derive from them is the importance of an overriding question: How does temperament, in both infants and parents, interact with sex differences in influencing early family interaction and later outcome?

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