

Child Temperament and Parenting

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Running Head: Child temperament and parenting

In preparation for Bornstein, M. Handbook of Parenting, 2nd Edition. Mahwah, NJ: Erlbaum.

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INTRODUCTION

Parents often do not become believers in temperament until after the birth of their second child. Before this time, their child's behavior may be seen as a simple and direct outcome of their upbringing, "a tribute to" or "the fault of" the parents. With the second child, management strategies that worked well with the first child may no longer be effective. Problems experienced with the first child (in feeding, sleeping, coping with strangers) may not exist with the second, but new problems may arise. Such experiences suggest strongly that "nature" as well as "nurture" influences child development, that children differ from each other from very early in life, and that these differences have important implications for parent-child interaction. A number of these individual differences fall under the rubric of child temperament, which we define as individual differences in emotional, motor and attentional reactivity to stimulation, and in patterns of behavioral and attentional self-regulation.

The modern understanding that children make important contributions to their social interactions has two roots. The first is temperament research initiated by Thomas, Chess and colleagues in their pioneering New York Longitudinal Study (NYLS; Thomas, Chess, Birch, Hertzig, & Korn, 1963). The second is Bell's (1968) reconceptualization of socialization as a mutually interactive process, with both child and caregiver seeking to redirect, reduce, or augment the behavior of the other. These insights led to the recognition that children differ in such qualities as responsiveness to parental socialization strategies, capacity to control their emotional reactivity, and capacity to bring pleasure or distress to their parents. As Rothbart (1989a, p. 195) put it, "the infant's temperament regulates and is regulated by the actions of others from the earliest hours."

This chapter explores some of the important influences of parenting and temperament on child development. We begin by briefly describing ancient views of individual differences and Thomas and Chess' NYLS research study begun in the 1950s. Major dimensions of temperament, their stability over childhood, and issues regarding the measurement of temperament in relation to parenting are summarized. We then review empirical evidence for relations between temperament and parenting, discussing the role of intervening variables and focusing on combinations of temperament and parenting in the prediction of outcomes. Finally, we suggest important future directions for research and discuss implications of temperament theory and research for parenting.

THE NATURE OF TEMPERAMENT

Historical Background

Views of temperament as linked to the physiology of the individual are not new. Ancient Chinese philosophies referred to balances among forces of energy, and early Greco-Roman physicians regarded levels of bodily humors as determinants of individual differences in behavior (Diamond, 1974). Although versions of Greco-Roman ideas persisted to the twentieth century in adult temperament concepts (Eysenck & Eysenck, 1985), early research on individual differences in children was dominated by social learning and psychoanalytic approaches. These traditions largely discounted ideas of temperament, focusing instead on the powerful impact of experience. It was not until the 1960s that concepts of temperament gained a strong foothold in developmental theory and research.

In some of the earliest research on temperament in childhood, the NYLS (Thomas, Chess, Birch, Hertzig, & Korn, 1963) took a clinically oriented approach that was strongly related to parenting issues. The NYLS reacted against a tradition that saw parents as responsible for their children's problems. Chess and Thomas noted instances of child psychopathology that

occurred with healthy and committed parenting, and other cases where children showed a consistently adaptive developmental course despite severe parental disturbance, family disorganization, and social stress (Chess & Thomas, 1989). A major starting point for Thomas and Chess was the idea that the child's temperament must be considered in any discussion of appropriate parenting. In particular, the NYLS concept of *goodness-of-fit* between characteristics of the child and requirements of the child's environment has been influential in guiding later research, including that on parenting-temperament interactions.

Identifying Basic Dimensions of Temperament

In the early work of the NYLS, Thomas, Chess, and their colleagues analyzed the content of interviews with 22 parents of infants 2-3 months and older about their infants' reactions to everyday situations (Thomas et al., 1963). This analysis produced a set of nine temperament categories: Activity Level, Rhythmicity, Approach versus Withdrawal, Adaptability, Intensity, Threshold, Mood, Distractibility, and Attention Span/Persistence. They also identified behavioral patterns of "difficult" and "easy" infants.

"Difficultness" describes one cluster identified in the early NYLS work, including negative mood, withdrawal, low adaptability, high intensity, and low regularity (Thomas et al., 1963). The opposite pole to this cluster was described as "easy." The "difficult child" construct has had a strong influence on the field, and many studies of temperament and parenting have employed measures of child difficultness. In subsequent research in the area, however, dimensions making up this construct have not been found to cluster together (Bates, 1989). This has led some researchers to develop their own difficultness measures, creating problems in understanding and consolidating findings using the construct.

The difficultness construct has been criticized in the literature for other reasons as well (Plomin, 1982; Rothbart, 1982). It adds a value-laden connotation to temperament and ignores the fact that any temperament characteristic (e.g., high or low approach, high or low attentional focusing) may be "difficult" or "easy," depending on the age of the child and the requirements of the situation. To label a child as difficult also has the danger of becoming a self-fulfilling prophecy; to be assigned the role of the "difficult child" may both intensify and maintain the expression of difficult characteristics. Despite our reservations about the usefulness of the construct, a number of the research studies reviewed in this chapter rely upon difficultness, given its wide use.

The nine more specific NYLS dimensions have also been widely used in research on childhood temperament. However, concern has arisen about the extent to which scales measuring these dimensions show conceptual overlap with one another or are not internally consistent. Because of these problems, factor analyses of questionnaire items have been carried out on parent-report scales of infant temperament derived from the NYLS categories (Bohlin, Hagekull, & Lindhagen, 1981; Sanson, Prior, Garino, Oberklaid, & Sewell, 1987). A review of results from these analyses, along with analyses of scales derived from other theoretical frameworks, suggests that fewer than nine dimensions can account for infant temperamental variability (Rothbart & Mauro, 1990). This "shorter list" of temperament dimensions in infancy includes Fear, Irritability/Anger, Positive Affect (including approach), Activity Level, and Attentional Persistence. A sixth dimension of Rhythmicity has been reliably extracted, but tends to account for only a relatively small portion of the variance. Factor analyses of questionnaire items based on the NYLS for older children have revealed similar factors (Prior, Sanson, & Oberklaid, 1989; Sanson, Smart, Prior, Oberklaid, & Pedlow, 1994).

Some consensus about a more limited set of factors to describe childhood temperament is also emerging. Using the Children's Behavior Questionnaire, a parent-report measure of temperament for 3- to 8-year-olds (Ahadi, Rothbart & Ye, 1993; Rothbart, Ahadi, Hershey & Fisher, 2000), three broad factors have consistently been found. The first, Surgency, is defined primarily by the scales of Approach, High-Intensity Pleasure and Activity Level, as well as a negative contribution from Shyness. The second, Negative Affectivity, is defined by the scales of Discomfort, Fear, Anger/Frustration, Sadness, and loading negatively, Soothability. The third factor, Effortful Control, is defined by the scales of Inhibitory Control, Attentional Focusing, Low-Intensity Pleasure and Perceptual Sensitivity.

Analysis of temperament questionnaires developed for use with infants, toddlers, and adolescents has revealed both similarities and differences in structure across these age groups (Putnam, Ellis, & Rothbart, in press). Surgency and Negative Affectivity factors were extracted at all ages. In toddlers and adolescents, but not infants, an Effortful Control factor was also obtained. In infants, a factor referred to as Affiliation/Orienting emerged, defined by Duration of Orienting, Cuddliness, Low-Intensity Pleasure, and Soothability scales. A separate Affiliation factor, defined by the scales of Affiliation, Perceptual Sensitivity, and Low-Intensity Pleasure, was also extracted from the adolescent data.

The similarity of factors from the Children's Behavior Questionnaire to those arising from item-based analyses of the Childhood Temperament Questionnaire among children in the longitudinal Australian Temperament Project (ATP) is striking. The three major factors emerging from the ATP analysis are labeled Inflexibility, reflecting negative reactivity and lack of adaptability, similar to Negative Affectivity; Approach, encompassing many facets of Surgency; and Persistence, including items concerning attentional control. The fourth ATP factor is Rhythmicity (Sanson, Prior, Oberklaid & Smart, 1998). McClowry's School Age Temperament Inventory similarly shows a stable factor structure among children aged 8 to 11 years (McClowry, 1995).

The three most common temperament factors additionally show strong similarities with three of the "Big Five" factors that have emerged from analyses of personality in adults (e.g., Goldberg, 1990; McCrae & Costa, 1987). Results of a recent investigation to map temperament dimensions onto Big Five personality factors suggest that the Negative Affectivity factor maps on the adult dimension of Neuroticism or Negative Emotionality, Surgency is related to Extraversion, and Effortful Control is related to Control/Constraint. In addition, temperamental Orienting is related to the Big Five Openness factor (Rothbart, Ahadi, & Evans, 2000). Similar findings have recently emerged from the ATP: Across ages 11-12 and 13-14 years, Extraversion was predicted by Approach and Activity; Conscientiousness by Persistence; Agreeableness by Reactivity; Neuroticism by Reactivity; and Intellect/Openness (weakly) by Approach and Reactivity (Sanson, 2000).

Stability of Temperament

It generally has been assumed that, to be meaningful or important, temperament must show substantial stability across time. Typically, however, only modest to moderate stability across age has been found, with correlations ranging from .2 to .4 (see Rothbart, 1989b; Slabach, Morrow, & Wachs, 1991). How might we interpret these low levels of stability? It should be noted that even genetic underpinnings do not imply immutability over time (Hinde, 1989) and that some temperamental characteristics show considerable development (Rothbart, 1989b). In addition, later developing capacities of fear or effortful control, may serve to moderate other temperamental reactions (Rothbart & Bates, 1998). Finally, conceptual and methodological

problems may lead to lower stability. When these issues are dealt with, higher levels of stability are found.

Given major changes in a child's behavioral repertoire, it is necessary to establish continuity in the temperament constructs studied across time (Pedlow, Sanson, Prior & Oberklaid, 1993). Early work did not attend to this issue with rigor. Apparent instability may therefore have been due to discontinuity in the underlying constructs. Another possible source of instability is likely to be error of measurement, also rarely taken into account. A study by Pedlow et al. (1993) on the ATP sample from infancy to 7-8 years of age used structural equation modeling to estimate stability of factors that applied either across the whole age range (Approach/Sociability, Rhythmicity) or across three or more time intervals (Irritability, Persistence, Cooperation-Manageability, and Inflexibility). The model, which corrects for attenuation of correlations due to error of measurement, yielded estimates that were considerably higher than those previously reported, mostly in the range of .7-.8. Even with these levels of stability, however, there is considerable room for individuals to change in their relative characteristics, and the norm was for modest, but not dramatic, change over time.

CONCEPTUAL AND METHODOLOGICAL ISSUES

The expectation that child temperament and parenting would be associated (with temperament influencing parenting, parenting influencing temperament, or both) seems reasonable. Nevertheless, it has proved difficult to predict on theoretical grounds what the nature of these associations should be and to obtain fully persuasive empirical evidence of such links. Methodological issues are one important basis for this difficulty.

A frequent critique of research relating parenting to child behavior is that apparent effects of parenting on the child may be related to the genetic similarity of parent and child (Scarr, 1992). This observation is particularly salient with regard to temperament, which is assumed to have a genetic basis. Studies reporting direct associations between temperament and parenting are therefore ambiguous in that they may reflect underlying biological factors influencing the behavior of both parents and children.

Compounding this problem, parent report is the most frequent source of data on infant temperament. If parent report is also used to assess parenting, there is clear potential for non-independence of measures, because characteristics of the parent may affect their reports of both their parenting practices and their child's temperament. Because the child's temperament is likely to be affected by prior parenting, any association between concurrent parenting and child temperament may also be the result of childrearing history. The correlational nature of the majority of such work further clouds interpretation. Clearly, temperament is not open to experimental manipulation and very few studies have attempted to manipulate parental factors in investigations of parent/temperament relations (cf. van den Boom, 1994, 1995). Finally, the generalizability of this work is restricted by the lack of research on fathering. Virtually all of the work reviewed in this chapter has investigated only parenting by mothers. The generalizability of findings to fathers or other primary caregivers awaits further research.

Given these caveats, it is not surprising that relatively few studies of parenting and temperament allow unambiguous interpretation of results. Some general relations between parenting and temperament have been expected; for example, that the more adaptable, easy to soothe, or sociable child would elicit warm and responsive parenting, whereas the more irritable, demanding, or withdrawing child would elicit parental irritation and withdrawal of contact or stimulation. Conversely, warm and responsive parenting may decrease the expression of negative emotionality in the child, and distant or inconsistent parenting may increase it. There is

evidence in support of these expectations. Most of the relevant studies have focused on distress-related temperament attributes (e.g., irritability, "difficultness," negative mood), which tend to covary with poor parenting and general unresponsiveness (e.g., Hemphill & Sanson, 2000; Hinde, 1989; Linn & Horowitz, 1983). Others have noted associations between the child's positive affect and self-regulation and parental responsiveness, social interaction, and use of rewards (e.g., Hinde, 1989; Kyrios & Prior, 1990).

It is also possible to argue for another association between parenting and child temperament. If we assume most parents to be highly invested in their children, we might expect parents with more irritable or difficult children to exert more positive efforts with them than with easier children, and empirical support has been found for this position. For example, Fish and Crockenberg (1986) found that crying and time to calm at 1 and 3 months were associated with more caregiving and social interaction with the mother at 9 months. Similarly, Caron and Miller (1981) found that African mothers were more responsive to highly irritable babies. Rubin, Hastings, Chen, Stewart, and McNichol (1998) found higher levels of both maternal warmth and negative dominance to be associated with male toddlers' dysregulated temperament. Thus, "difficult" temperament may be related to widely divergent parenting behaviors.

INTERVENING VARIABLES

Although several studies have found direct associations between parenting and temperament, there are also several published accounts of no association between temperament and parenting, and given the difficulty in getting such null results published, these may be an underestimate (Daniels, Plomin & Greenhalgh, 1984; Rothbart, 1986; Vaughn, Taraldson, Crichton, & Egeland, 1981; Wachs & Gandour, 1983). Null findings, and evidence for mixed effects in the relation between temperament and parenting, lead to the conjecture that third factors may also be involved. It is notable that, whereas the majority of the null findings are obtained from large-sample studies, most studies finding associations have been obtained from relatively small samples – these findings may be spurious, or it may be that, in large samples, the influence of competing third variables "cancels out" effects found with smaller and more homogeneous samples. We now consider several possible "third variables" in temperament and parenting studies.

The Child's Age

Crockenberg (1986) has suggested that age moderates associations between parenting and child temperament. For example, parents may begin by investing greater amounts of time and energy in their distress-prone child, but are not be able to sustain this effort over time. Consistent with this notion are findings of Peters-Martin and Wachs (1984): At 6 months, infant withdrawal, as assessed by mothers' report, was related to more maternal emotional and verbal responsiveness, and to less restriction and punishment. By 12 months, intensity (another aspect of negative affect) was related to less maternal involvement and more restriction and punishment. Similarly, in an observational study by Maccoby, Snow, and Jacklin (1984), mothers of boys who were difficult (fussy, intense, hard to soothe) at 12 months showed a reduction in their teaching efforts in a joint teaching-learning task at 18 months. Among easy-going boys, mothers' teaching efforts increased over this time. Greater teaching effort at 12 months also predicted a decline in boys' difficultness, suggesting bidirectional effects.

Bates (Bates, Olson, Pettit, & Bayles, 1982; Lee & Bates, 1985; Pettit & Bates, 1984) also found a reversal of relations over time. At both 6 and 13 months, babies with high ratings on a fussy/difficult measure derived from maternal report and direct observation received more affectionate contact and object stimulation from their mothers. At 24 months, however, more

difficult children resisted their mothers' efforts at control and received more negative control from their mothers. Although this result may partially reflect changes in underlying definitions of "difficult," these findings suggest that some mothers respond to their harder-to-parent infants with greater efforts, but cannot – or do not – maintain this over time.

The Child's Sex

A meta-analysis by Lytton and Romney (1991) found little difference in parenting of boys and girls overall, but the authors did not consider potential sex-by-temperament interactions. Differences in temperament and parenting associations for boys and girls have, in fact, been documented. Gordon (1983) observed 2- to 4-year-old children interacting with their mothers and found that mothers gave more commands to easy than to difficult boys, and fewer commands to easy than to difficult girls. Klein (1984) found that girls and boys who showed intense reactions to stimulation differed in the types of maternal contact they received – highly intense boys received high levels of physical contact and intense girls more distal vocal stimulation. Rubin, Hastings, Chen, Stewart, and McNichol (1998) found children's temperamental emotion dysregulation to be positively correlated with maternal warmth to boys, but not to girls. Two studies of fathers' parenting also reported sex differences: Lamb and colleagues (Lamb, Frodi, Hwang, Forstromm, & Corry, 1982) found fathers were more involved with difficult sons and easy daughters, and Rendina and Dickerscheid (1976) found fathers were more involved in social activities with difficult boys and less with difficult girls.

The majority of the research has found more parental acceptance of irritability and negative affect in boys than girls. There have, however, been findings contrary to this pattern. Crockenberg (1986) found mothers to be more responsive to the crying of irritable girls than boys. Maccoby et al. (1984) observed greater amounts of teaching effort by mothers to difficult than easy girls, and less to difficult than easy boys. Suggesting that the kind of negative affect expressed by the child may be important, Simpson and Stevenson-Hinde (1985) documented better relationships with mothers for shy (socially fearful) than for non-shy girls, but the opposite for boys.

Differential beliefs about the acceptability and desirability of temperamental attributes for boys and girls might help explain these patterns of parent responses, with more parental acceptance of irritability in boys and of shyness in girls. To the degree that patterns of parenting-temperament relations differ according to children's gender, failing to differentiate between girls and boys is likely to have resulted in some of the inconsistencies in parenting and temperament findings.

Parental Characteristics

In addition to child attributes, relations between parenting and temperament may be influenced by parents' psychological characteristics. Escalona (1968) noted that more anxious mothers tended to lose confidence when their soothing techniques failed to work with their infants, whereas the confidence of other mothers was relatively unaffected. She suggested that a sense of maternal incompetence might have far-reaching consequences for mother and child. This hypothesis was supported by Teti and Gelfand (1991), who concluded that maternal self-efficacy mediated a link between "fussy-difficult" ratings for infants and their mothers' lower competence (sensitivity, warmth, engagement).

Maternal depression also appears to be implicated in the relation between infant temperament and self-efficacy. Gowen, Johnson-Martin, Goldman, and Appelbaum (1989) found that infant irritability predicted both depression and a sense of parenting incompetence, and Cutrona and Troutman (1986) found infant difficultness to be strongly related to post-partum

depression, both directly and through maternal feelings of self-efficacy. Because depressed and nondepressed mothers vary in their parenting (Cummings & Davies, 1994; Goodman & Gotlib, 1999), temperamental difficultness may have an indirect impact on parenting.

Mothers' personality characteristics have also been examined as predictors of parenting style. Clark, Kochanska, and Ready (2000) cite several studies showing links between mothers' high levels of negative affectivity/neuroticism and a number of parenting variables, including low responsiveness and sensitivity, and high power assertion. In addition to finding the expected link between maternal neuroticism and high power assertive parenting, Clark et al. (2000) found that the use of power assertive techniques was unrelated to child temperament among mothers who were low in extraversion or high in perspective taking (empathy). However, negative temperament was associated with higher use of power assertion among mothers high on extraversion or low in perspective taking. Whereas neuroticism appears to place mothers "at risk" for the use of negative parenting techniques regardless of child characteristics, other personality traits may be most predictive of parenting when considered in conjunction with child temperament.

Social and Cultural Factors

In studies of SES, Bates et al. (1982) and Bates, Maslin, and Frankel (1985) found no consistent SES interactions on the effect of temperament on parent-child relationships. However, Prior, Sanson, Carroll, and Oberklaid (1989) found almost twice as many significant correlations between temperament factors and parenting dimensions in a high SES group than in a low SES group in the ATP. The authors interpreted this result as evidence of possible greater sensitivity to the individuality of their children among high SES mothers.

A second environmental variable of interest in parenting (although one that may be influenced by characteristics of the parent) is low social support, which may have a particularly strong effect on the parenting of difficult children: Crockenberg and McCluskey (1985) found that when mothers had low social support and their babies were more irritable as neonates, the mothers showed less sensitivity to their babies at 12 months. In addition to relieving the burden placed upon a mother by a difficult child, social support may benefit the child by providing additional sources of caregiving and affection.

Numerous studies have found mean differences on temperament scales between children in different cultures (e.g., Ahadi et al., 1993; Kohnstamm, 1989; Kyrios, Prior, Oberklaid, & Demetriou, 1989), and accounts of cultural differences in parenting practices are frequently reported (Kagitcibasi, 1996; Whiting & Whiting, 1973). Thus, research on temperament, parenting, and culture may prove to be an important direction for the future. One possibility for this research involves taking advantage of our knowledge about basic temperamental dimensions to investigate variations across cultures in the value assigned to the same temperamental characteristic. This approach is similar to research on differential values placed on temperament characteristics of boys and girls.

Chen and his colleagues have followed this direction in their study of cultural variation in parental attitudes and practices regarding children's behavioral inhibition in Canada and China (i.e., Chen et al., 1998). They noted that behavioral inhibition (anxiety and inhibition to novelty, reserve) is generally devalued among North Americans, whereas it is valued in Chinese culture. Consistent with this difference, they observed higher levels of behavioral inhibition in Chinese than in Canadian 2-year old children.

In addition, relations between behavioral inhibition and parent attitudes and behaviors differed between the two samples. In the Canadian sample, mothers of highly inhibited children

were less accepting and encouraging of achievement and scored higher on measures of punishment orientation and protection and concern than did mothers of less inhibited toddlers. In the Chinese sample, however, high levels of inhibition were associated with high maternal acceptance and encouragement of achievement and independence, and with lower rejection and punishment orientation.

These differences are congruent with the idea that cultural values influence parenting approaches. Chinese toddlers who did not display the reticence that is highly valued in their society were more likely to be rejected and punished by their mothers. Conversely, although Canadian mothers were highly protective of their inhibited children, their lower levels of acceptance are in keeping with the less favorable views of shyness held in Western culture.

Another study suggests the involvement of effortful control in the socialization of temperament. Ahadi et al. (1993) found a negative association between Effortful Control and Extraversion/Surgency factors in Chinese 6-7 year olds, but no relation between them in a US sample. In the US, however, Effortful Control was negatively associated with Negative Affectivity, with no relation in the Chinese sample. These findings require replication, but it would be very interesting if children's effortful or attentional control might be used to promote characteristics that are most valued in a culture and/or to minimize characteristics considered worthy of change.

CUMULATIVE AND INTERACTIVE EFFECTS OF PARENTING AND TEMPERAMENT

As noted above, the search for simple direct associations between parenting and temperament is somewhat unsatisfactory in comparison with more contemporary, process-oriented, approaches. Below, we review recent work that addresses the intricate workings of temperament/parenting associations.

Parent and Child Factors in the Development of Attachment

There is an ongoing debate concerning the relation of temperament to attachment. Although it has been argued that parents' sensitivity to infant behavior is the crucial antecedent to security of attachment (e.g., Sroufe, 1985), there is substantial empirical support for the notion that the child's temperament is related to how the child reacts during separation and reunion with the parent in the Strange Situation procedure, and this affects the child's attachment classification as securely or insecurely attached (see Goldsmith & Alansky, 1987). Some researchers have failed to find direct relations between temperament and attachment security (e.g., Bates et al., 1985; Sroufe, 1985). However, Calkins and Fox (1992) observed that this most frequently occurs in studies using parent reports of temperament rather than observational measures.

A variety of temperament attributes in infancy have been found to relate to later attachment security, including sociability to strangers and mother ratings as "easy" (Frodi, 1983), proneness to distress (Belsky & Rovine, 1987), neonatal distress reactivity (Calkins & Fox, 1992), and "object-orientation" versus "person-orientation" (Lewis & Feiring, 1989). Temperament characteristics of fear (Thompson, Connell, & Bridges, 1988) and difficultness (Weber, Levitt, & Clarke, 1986) have also been found to relate to the infant's negative reactions in the Strange Situation.

A particularly elegant example of the dynamic relation between temperament, mother-child interaction, and attachment, is a series of studies conducted by van den Boom (1989, 1994, 1995). Van den Boom (1989) used a neonatal behavior scale to select an extremely irritable group of infants representing the top 17% of the low-SES sample tested, and a group of non-irritable infants, drawn from the remaining 83% of the sample. She observed the selected infants with their mothers twice a month to the age of 6 months, measuring mother sensitivity (looking,

affective, stimulating, and soothing behaviors) and infant behavior (positive and negative social signals). A rating scale of maternal sensitivity including general attitude, availability, and physical and social contact was also used. Both mothers and observers completed temperament scales at 6 and 12 months, and attachment security was assessed at 12 months.

Mother and child behaviors differed in relation to newborn temperament. Irritable neonates expressed less positive, and more negative, affect with their mothers during the first months, but by 6 months of age, the two groups were highly similar in their emotional expression. The experience of caring for an irritable infant, however, appeared to have a lasting effect on maternal behavior. Irritability was associated with maternal perceptions of the infant as difficult at 6 and 12 months, and this difficultness was associated with less maternal involvement with increasing age, with these mothers being particularly unresponsive to the positive signals of their infants. Although maternal sensitivity was not related to attachment status at 12 months, irritable newborns were more likely to be later rated as insecure, with predominant classification in the avoidant category.

Perhaps the most persuasive part of van den Boom's study is its intervention component (van den Boom, 1994, 1995). Here, 50 low-SES mothers of 6-month-old infants assessed as irritable during the early days of life received specific training in soothing and playing with their babies, and were compared to a matched untreated control group of irritable infants and their mothers. At 9 months, intervention group mothers were more responsive, visually attentive, and stimulating. Their babies were more sociable and exploratory, cried less, and were more cognitively sophisticated in their exploratory behavior. Secure attachment, assessed at 12 months, was significantly more common in the intervention group (68% versus 28% of the control group).

A follow-up of these groups (van den Boom, 1995) demonstrated enduring effects of the intervention, with the treatment group continuing to contain higher proportions of secure attachments at 18 months (72% versus 26% of the control group). At 24 and 42 months, mothers of intervention children were rated as more accepting, accessible and responsive than control mothers, intervention children were more cooperative than controls, and mother-child interaction in these dyads was more likely to be characterized by observers as secure.

Suggesting far-reaching intervention effects, children's secure attachments to their mothers appeared to be related to other relationships as well. At 3 years, fathers in the intervention group were more responsive toward their children than control fathers. In addition, when viewed during interaction with a same-age peer, intervention group children were more cooperative and more likely to be sought out as a play partner. Thus, changes in mothers' behavior appear to have led to changes in mother-child interaction, facilitating changes in child behavior, which then influenced the children's relationships with others.

This study highlights the importance of tracking both temperament and parenting in detail to unravel the bi-directional processes involved. An irritable infant is predisposed to insecure attachment, likely due at least in part to the mother coming to ignore the infant. Intervention prevents this maternal component from further leading the child to develop avoidant coping strategies. This transactional nature of attachment development was suggested by Rothbart and Derryberry (1981, p. 68) two decades ago:

"As important as the mother's sensitivity and flexibility may be, the role of the child's constitutional capacities and limitations in shaping her behavior should not be underestimated. Nor should the sensitivity and flexibility of the infant be neglected, for infants vary greatly in their capacity to augment or reduce their own reactivity, and to

bring distress or pleasure to their care-givers. It seems essential that the mother-infant interaction and the resulting attachment process be viewed as a function of two intricate and flexible interactional systems, which can achieve a 'balance' in a number of ways."

Temperament and Parenting as Cumulative Influences on Adjustment

Additive effects of temperament and parenting have been found by several researchers. By combining 0- and 3-year temperament, maternal positive involvement (affection, teaching) and 3-year-old behavior problems, Bates and Bayles (1988) were able to strongly predict internalizing and externalizing behavior problems at 6 years. Similarly, Cameron (1978) found that an index of difficultness and persistence at 1 year, along with poorer parenting at 3 years, predicted later behavior problems. Additive effects were also found by Fisher and Fagot (1992); here, toddler temperament and parental discipline practices were independently related to children's antisocial and coercive behavior at 5-7 years.

Temperament and parenting have also been conceptualized as cumulative risk factors for behavioral outcome. For example, in the prediction of 4-5 year externalizing (hostile-aggressive and hyperactive-distractible) and internalizing (anxious-fearful) behavior problems for 1500 subjects from the ATP, infant difficult temperament on its own had little impact on outcome, but when it occurred in a context reflecting poor mother-child relationship and presumably poorer parenting style, the level of risk for behavioral problems increased substantially (Sanson, Oberklaid, Pedlow, & Prior, 1991). Other biological and environmental factors also contributed to cumulative risk, but the combination of difficult temperament and poor mother-infant relationship was the most reliable risk indicator. This combination was also characteristic of children described as hostile-aggressive at 7 to 8 years (Sanson, Smart, Prior, & Oberklaid, 1993).

In other studies, temperament has been conceptualized as a resilience factor when there is a high level of psychosocial stress and parenting is poor (e.g., Werner & Smith 1982); in these situations, the sociable or adaptable child may be able to elicit more care and concern from parents and from significant others, who can act as mentors to protect the child from adverse outcomes. Temperament has also been seen as an important factor in the divorce literature; Lengua, Wolchik, Sandler and West (2000) found both temperament (low negative emotionality and impulsivity, high positive emotionality) and parenting (low rejection and inconsistency) to be independently predictive of successful adjustment following divorce. Interactive effects were also found, with rejection most strongly associated with behavior problems among children low in positive affect, and inconsistent discipline most strongly associated with dysfunction for highly impulsive children.

Temperament/Parenting Interactions and Adjustment

An important development in research on temperament and parenting involves the increased focus by researchers on multiplicative combinations of temperament and parent variables in the prediction of a variety of outcomes. Below, we review examinations of such interactions. We do not attempt an exhaustive review, but focus primarily on findings that have been conceptually replicated in independent samples.

Bates (1989) has commented that, in the interests of parsimony, the independent contributions of temperament and parenting to outcome (additive effects) should be assessed before addressing any interactive (multiplicative) effects. While it is valid to suggest that such additive effects should be investigated first, researchers, having found additive effects, have often not gone on to investigate potential multiplicative ones. It is these more complex

interactions, which are likely to further our understanding of the processes by which temperament and parenting mutually affect the developmental process.

When multiplicative effects have been reported, researchers also differ in their interpretation of the results. A distinction can be made between work done within a framework where temperament is seen to moderate the effect of parenting, and one in which parent behavior is seen to influence outcomes associated with temperament. This distinction is both conceptually important and potentially directive of intervention efforts. Views of temperament as a moderator of parenting emphasize the need for parents and others to be sensitive to individual differences among children in their choice of socialization techniques. Views of parenting as a moderator of temperament focus more specifically on how parent behaviors may act as risk or protective factors in child development.

Activity level and stimulation. One of the more robust findings of a multiplicative relation between temperament and parenting concerns activity level as a moderator of parenting in the development of cognitive competencies. Gandour (1989) found high levels of maternal attention focusing to be associated with high exploration scores among inactive children. Among more active children, however, attention focusing was negatively related to exploration competence. Similarly, Wachs (1987) found that for highly active 12-month-olds, parents' naming of objects was related to less mastery behavior; for low-active children, parents' naming was related to higher mastery. Comparable findings have since been reported by Miceli, Whitman, Borkowski, Braungart-Rieker, and Mitchell (1998). As suggested by Escalona (1968), children low in activity level may benefit from parental stimulation that helps to guide their explorations, while the exploratory behavior of active children, more internally driven, may be interrupted by additional stimulation.

Behavioral inhibition and parent protectiveness. A second set of replicated findings investigates the development of behavioral inhibition. Kagan (1994) has argued that infants with a low threshold for negative affect may not learn to independently regulate their reactivity if raised by parents who are highly sensitive to, and accepting of, their children's fearfulness. Multiple studies have provided support for this contention (Arcus, Gardner & Anderson, 1992; Park, Belsky, Putnam & Crnic, 1996; Rubin, Hastings, Stewart, Henderson & Chen, 1998). Arcus et al. (1992) and Park et al. (1996) measured negative reactivity during infancy. Arcus et al. (1992) measured mothers' responsiveness to fretting and crying and their tendencies to be indirect, rather than controlling, when setting limits on child behavior, whereas Park et al. (1996) used more general indices of parental intrusiveness and sensitivity. In both studies, negative infants who received more sensitive parenting were likely to be behaviorally inhibited as toddlers, whereas parental sensitivity was not associated with inhibition in children who were less negative during infancy.

Conceptually similar are the results of Rubin, Hastings, Stewart, et al. (1998). These authors found a strong correlation between maternal ratings of child fearfulness and children's observed inhibition toward peers when mothers were oversolicitous (a composite of behaviors including exaggerated positive affect and affection, unsolicited assistance and a lack of attention to child cues). In contrast, when mothers were low in oversolicitousness, there was little association between mother-rated fearfulness and inhibition toward peers. This set of findings suggests that caregivers may inadvertently support the stability of their children's fearful temperament by being overprotective, thus not allowing children to develop regulatory strategies to overcome uncertainty on their own. Another possibility is that parents may be more

responsive in the early months to the kind of negative affect that is predictive of later behavioral inhibition.

Fear, conscience, and aggression. Recent research has also revealed interactions between fearful temperament and parenting in the development of conscience. Kochanska (1991, 1995) found that parenting characterized as low in power assertion predicted conscience development among fearful, but not fearless, children. In contrast, the moral behavior of uninhibited children was higher when mothers were highly responsive and when the mother/child attachment was secure. Responsivity and attachment did not contribute to the conscience development of fearful children (Kochanska, 1995, 1997). Related findings were reported by Colder, Lochman, and Wells (1997); school-aged boys who were highly or moderately fearful were more likely to be aggressive if raised by parents high in self-reported use of harsh punishment, whereas for boys low in fear, harsh punishment and aggression were not significantly related.

These studies strongly suggest different developmental pathways for temperamentally dissimilar children. Gentle discipline de-emphasizing power appears to fit well with fearful children's intrinsically high levels of arousal, allowing the child to more effectively internalize parental messages, whereas highly power assertive techniques may raise these children's arousal to levels that may interfere with encoding of parent agendas. Low power-assertive strategies do not, however, promote morality in fearless children, possibly because gentle discipline does not provoke sufficient levels of arousal. Fearless children appear to be more attuned to the rewarding aspects of responsive parenting and the close relationship with their parent, which may motivate them to endorse parental and societal agendas.

Negative emotionality, self-regulation, and parenting. A number of studies have also revealed interactions between more general temperamental negativity and parenting in the development of behavior problems. Crockenberg (1987) found that irritable infants who had angry, punitive mothers were more angry, non-compliant, and less confident as 2-year-olds than irritable infants with less punitive mothers. Among less irritable infants, however, the links between maternal style and child behavior were attenuated. Belsky, Hsieh and Crnic (1998) proposed that children with difficult temperament are most susceptible to parental influence and found some support for this proposition. Parenting of male infants was more predictive of externalizing behavior problems at 3 years for infants high in negativity than it was for infants low in negativity. Stice and Gonzales (1998) also found evidence of temperament moderating the effects of parenting; maternal control and support were more strongly related to antisocial behavior among adolescents who were high on behavioral undercontrol and negative affectivity, than among those with less extreme scores. After regressing out main effects for 24-month externalizing, a three-way interaction between sex, temperament, and parenting in the prediction of 42-month externalizing disorders was found by Shaw et al. (1998). For boys, noncompliant temperament and maternal rejection exerted main effects on externalizing. For girls, however, noncompliance was predictive of later behavior problems only when combined with rejection.

The majority of work viewing parent behavior as moderating the effects of temperament has concerned aggression and other externalizing difficulties. Maziade et al. (1990), for example, found that children who at 7 years had an extremely difficult temperament and came from dysfunctional families (characterized by a lack of rule clarity, consistency, and parental consensus) were highly likely to exhibit oppositional or attention deficit disorders at 12 and 16 years. In contrast, few of the children with difficult temperament but good family functioning

had behavioral disorders. Finally, few of the extremely easy children exhibited difficulties at age 12, regardless of the level of family functioning.

Three recent studies supplement the findings of Maziade et al. (1990). Calkins and Johnson (1998) measured child frustration, maternal interference, and aggressive behaviors during a battery of tasks designed to elicit frustration in 18-month-olds. Frustration was positively correlated with aggressive behaviors overall, but the relation was stronger when mothers were highly interfering. In a study by Rubin, Hastings, Chen et al. (1998), dysregulated temperament (an aggregate of observed anger expressions and maternal ratings of approach and anger), maternal negative dominance (a composite of negative control and hostile affect), and children's aggression toward peers were measured during separate episodes of two laboratory sessions. When mothers were low in dominance, no relation was obtained between temperament and aggression. However, dysregulation and aggression were positively correlated among toddlers whose mothers were highly dominant. Finally, in a sample of 5-6 year old children, Paterson and Sanson (1999) found that parental use of physical punishment had little effect on the externalizing behavior of flexible (adaptable, low-reactive) children, but punishment was associated with considerably elevated levels of externalizing behavior among inflexible, reactive children.

In contrast to the studies discussed above, in which temperament characteristics such as anger, emotion dysregulation and negativity are most likely to lead to maladaptive outcomes when parents are interfering, negatively dominant or power assertive, are the results of studies by Bates, Pettit, Dodge, and Ridge (1998). In two separate samples, these authors examined temperamental resistance to control as it interacted with maternal restrictive control in the prediction of externalizing behavior problems. Resistance to control, assessed concurrently at 13 and 24 months in one sample and retrospectively when children were 5 years of age in the second, referred to tendencies to persist in activities when directed to stop by a parent. Restrictive control reflected the frequency with which mothers restrained, scolded, or punished their children when they misbehaved during home observations at either 6, 13, and 24 months (sample one) or at 5 years (sample two). In both studies, the relation between resistance to control and externalizing difficulties during middle childhood was low when mothers were high in restrictive control, whereas significant correlations between resistance to control and externalizing were obtained when maternal control was low. These results were found whether teachers or parents rated externalizing problems.

The inconsistency between the findings of Bates et al. (1998) and other studies summarized above is surprising, in that the measures used to index mother behavior were fairly consistent across the studies, typically involving maternal displays of negative affect and control. The key discrepancy between the Bates et al. (1998) study and the others may be the nature of the temperament variable. In studies finding greater links between temperament and externalizing when parental control was high, the temperament construct of interest was negative affectivity. In contrast, only one of the four questionnaire items indexing resistance to control in Bates et al. (1998) referred to negativity. Bates et al. (1998) contended that resistance to control may reflect a strong attraction to rewards, a weak fear system, and/or low levels of effortful control. Although parental control may lead to coercive cycles of parent/child interaction resulting in externalizing problems when children are predisposed to high negativity, children who are resistant, but not particularly negative, may actually benefit from parental intervention by learning to effectively manage their aggressive impulses.

RESEARCH SUMMARY

Relations between temperament and parenting are complex, with child and parent behaviors affecting each other in a dynamic manner that is affected by a number of additional factors, both internal and external to the family. Characteristics such as high negativity may be related to parental involvement and concern during early infancy, but to more negative parental reactions in later years. Similarly, some aspects of surgency (e.g., high-intensity pleasure) and negative affect (e.g., anger) appear to be more accepted in boys, whereas characteristics such as fear and shyness are less discouraged in girls. Values placed on particular expressions of temperament are also set against a backdrop of cultural influence, with more positive reactions to surgency/extraversion in Western societies and greater emphasis on reticence or constraint in Asian cultures. Within a culture, psychological characteristics of parents such as personality and depression are also likely to affect parenting behavior. In turn, child temperamental characteristics may influence maternal feelings of self-efficacy and depressive mood.

A recurring theme in research concerning parenting-temperament interactions is the tendency for power-assertive, intrusive parenting to be especially predictive of externalizing disorders for children who are high in negative affect. In comparison, insecure parent/child attachments, combined with low parental responsiveness, may contribute to compromised moral development among children who are temperamentally high in surgency and/or low in fearfulness or effortful control. On an optimistic note, the intervention component of van den Boom's (1994, 1995) research indicates that training parents to respond to the specific needs of their individual child can successfully lower the incidence of problem behavior.

FUTURE DIRECTIONS FOR RESEARCH

Increasing recognition of the importance of temperament for developmental outcomes has led to more researchers inserting measures of temperament into their predictive models. Unfortunately, this has sometimes involved a dredging of the available data for temperament-like constructs, including those retrospectively measured, without due regard for conceptual and measurement issues. Items initially regarded as measures of behavior problems are sometimes reconceptualized as measures of temperament (e.g., Caspi, Henry, McGee, Moffitt, & Silva, 1995; Kendler, Sham & MacLean, 1997). Given the problem of separating temperament measures from behavior problem measures even with the best-developed scales (Sanson, Prior, & Kyrios, 1990), such an atheoretical approach to the measurement of temperament is unlikely to advance knowledge. In fact, Rothbart and Bates (1998) note that even the best-developed measures of temperament have inadequacies, and that an important research task is to try to develop measures with better construct validity. We reiterate this plea.

We noted above the difficulty of obtaining "clean" measures of both temperament and parenting before they start to influence each other. Parents have attitudes about parenting before the birth of their child, however, and although it is well known that the relation between attitudes and behavior is far from perfect, these attitudes may give us hints about what parenting would be like before it is affected by the child's individuality. Some researchers have shown that prenatally measured attitudes are related to postnatal temperament ratings (e.g., Heinecke, in this handbook; Vaughn, Bradley, Joffe-Lyle, & Seiffer, 1987). Others have indicated that beliefs about parenthood remain relatively constant from the prenatal period to 5 months postnatally (Lamb et al., 1982).

Pre-existing parental personality traits and prenatal expectations of child temperament have been shown to be modestly predictive of postnatal temperament ratings (Diener, Goldstein, & Mangelsdorf, 1995), suggesting another important research direction. Parental expectations of

the child may influence the socialization strategies used as well as parents' interpretations of their children's actual behavior. It may be additionally informative to search for particular infant behaviors that contribute to discontinuity in parents' pre- and postnatal ratings of temperament. A related issue is whether parents modify their parenting attitudes and behavior once the child is born, and whether this is systematic for children with different temperament characteristics. We need to be asking questions like: "You thought X about parenting before your child was born; do you still think so?" "Is this what you do?" "Does it work as you thought it would?" There is little direct data on these questions. Observing several adults interacting with the same group of children, including children differing in their temperament characteristics, may also inform our understanding of the "active" and "evocative" effects of temperament (Scarr & McCartney, 1983).

Given the evidence that temperament is not immutable, it is important to understand conditions in the social environment promoting 'positive' temperament qualities associated with healthy adjustment, such as self-control/self-regulation, which may lessen problematic qualities such as irritability. To investigate whether and how parenting affects expressions of temperament, we need evidence of change in temperament when parenting varies, or of mutual parenting-temperament changes. Van den Boom (1989, 1994, 1995), in both the observational and intervention phases of her study, provided a good model of the detailed analysis needed to address these issues. Further work following her model of observation and experimental intervention, systematically addressing other aspects of temperament, other facets of parenting, and other child outcome variables among different age groups, would be most beneficial.

The studies reviewed provide a strong case for the importance of third variables for temperament-parenting relations. Parents' underlying beliefs, values and expectations are likely to significantly affect their responses to children's individual characteristics, including whether parents respond to an irritable and inflexible child with efforts to find effective ways of soothing and managing the child, or by labeling the child as "difficult" or "bad." Little research attention has been directed to this issue.

Another area where additional study of parenting-temperament associations could be informative is in relation to gender. Such research might help to explain the anomaly that, while temperament differences between boys and girls are initially slight (Prior, Smart, Sanson, & Oberklaid, 1993), differences in later social adjustment are marked. We noted that relations between temperament and parenting often differ for boys and girls. Differential beliefs about the desirable characteristics of boys and girls are likely to be part of the story here, but it is also possible that the small differences in temperament between boys and girls may have larger-than-expected effects through their interaction with parenting. In infancy, boys have been found to have higher activity levels (Eaton & Enns, 1986). This, combined with the possibility of earlier language development among girls (Maccoby & Jacklin, 1974), may make girls, on average, more susceptible to early socialization than boys (Rothbart, 1989a). There is opportunity for careful longitudinal work from infancy to address these questions.

The belief that the developmental process is best explained by a transactional model (involving interactions between temperament, parenting, and other intrinsic and social context variables) appears to be widely endorsed by researchers, and investigations of multiplicative interactions between temperament and parenting have become increasingly prevalent over the past decade. Studies of interaction effects have not always been theory-driven, however, so interpretations of findings can be unclear. Future research needs to specify the developmental models being tested, and be explicit about expected direct, mediated and moderated effects.

Future research will additionally gain from increased specificity, moving from global measures of temperament such as "difficult," which confound several facets of temperament, to more specific dimensions (self-regulation, irritability, fear or shyness). There is now clear evidence that different aspects of temperament are related in a systematic way to different outcomes (Sanson & Prior, 1999). The research reviewed here further points to differential interactions between these facets of temperament and parenting dimensions. Research focusing on basic levels of temperamental variation, along with clearly specified dimensions of parenting, holds great promise for increasing understanding of temperament and parenting.

One area where research has only just begun is testing of hypotheses concerning particular combinations of temperament traits and parenting. As noted in our review, there are preliminary suggestions that fear can moderate aggressive responses and that self-regulation can moderate reactive tendencies. These suggestions deserve fuller exploration. Observations of parenting in extreme temperament groups may be a useful starting point. We also noted above that almost all the available research in this area has involved mothers. As the diversity of family structures and parental roles continues to increase, the need to examine these questions among fathers and others in the caregiving role is clear.

Finally, the question of generalizability of results takes us back to issues of parental expectations, beliefs and values. It may be no accident that the current interest in temperament and parenting has arisen in individualistic Western cultures. In more collectivist cultures, where their relation to the group more often defines individuals, temperamental variation among individuals may be of less relevance and salience than in more individualistic Western culture (Kitayama & Marcus, 1994). The applicability of conclusions based on Western samples to other cultural groups thus also needs investigation.

IMPLICATIONS OF TEMPERAMENTAL VARIABILITY FOR PARENTING

An implication of taking children's individuality seriously is that it becomes more difficult to give universal prescriptions for "good parenting." Because children may differ in their responses to similar patterns of parenting, parents need to be attentive to the temperament characteristics of their children, and to be able to adapt their parenting behaviors to them. This requires attention to the signals of the child concerning their state and needs. A goal of parenting may then be accomplished in one way for one child, and in a different way for another, depending on the child's temperament characteristics.

Another conclusion emerging from the literature is that some temperament characteristics pose more parenting challenges than others, at least in modern Western societies. Although infant crying and irritability may elicit more maternal contact, this contact often does not seem to be sustainable over time, and children's proneness to distress can contribute to the emergence of avoidant or negative, mutually coercive, parent-child interactions. Van den Boom's (1994, 1995) studies, however, show that these influences can be countered with extra support and training for mothers of distress-prone infants. The importance of thoughtful socialization is thus enhanced rather than diminished when the child's temperament is taken into account.

Temperamental variation is also important when we take a broader perspective on parenting; not only in parents' direct behavior toward the child but also in decisions made about childcare, timing of school entry, size and structure of school, kinds of extracurricular activities, and so forth (Bradley & Sanson, 1992). Some hints of the relation of temperament to childcare come from findings of Volling and Feagans (1995) showing that the child:caregiver ratio affected the social play of fearful children, and from the observation of Fein, Gariboldi and Boni (1993) that, when children entered childcare, caregivers initially attended most to the distressed

children, but after three months responded more to children who were cheerful or demanding. Also relevant are the findings of Orth and Martin (1994), in which the off-task behavior of preschool children who were high in task orientation was relatively unaffected by variations in instructional method, but children who were lower in task orientation showed lower rates of off-task behavior in a computer instruction condition than in a teacher instruction condition. Findings such as these suggest the value for parents of taking temperament into account when making decisions concerning their children's education.

Given culturally-based parental beliefs about desired child (or boy versus girl) characteristics, research on individual differences in temperament can help parents and educators avoid a tendency to try to fit all children, all girls, or all boys into a single mold. Temperament research can lead to recognition of the legitimacy and value of multiple patterns of children's behavior. As has been stressed, whether a particular characteristic is difficult depends on its fit with the environment, whereas the notion of difficult temperament implies that the problem lies in the child.

The notion that the parent's major efforts should be directed toward modifying the child's temperamental expressions is additionally problematic when one considers the initial asymmetry in parent and child contributions to interactions (Rothbart, 1989a). Young infants react to their own internal states and to the immediate situation, including the caregiver's soothing and activating stimulation. Caregivers interpret the infant's emotional reactions as signals of the need for increasing, decreasing, or changing stimulation. Only at later ages can the child be expected to play a more active and anticipatory role in the interaction. Thus the initial responsibility for adaptation lies strongly with the parent.

Parenting Programs

Manuals and courses on parenting abound, and community interventions have been directed toward improving parenting skills. How well can these efforts take child temperament into account? Any program giving prescriptions about "the right way to do it" will clearly be deficient if it does not also direct parents' attention to individuality and to the need to be flexible in their approach to childrearing. Some books and programs specifically focus on temperament; examples include Turecki and Tonner (1989) and Cameron, Hansen, and Rosen (1989). In these, there is a focus on "difficult" temperament. As noted above, some characteristics are often, but not invariably, a source of difficulty for parents in modern individualistic societies, and acknowledgment that some children are harder to parent is often helpful. Advice on how to handle particular "difficult" temperament characteristics can also be useful. Against these potential advantages however, there must be weighed the previously noted problems associated with the concept of the difficult child.

An approach to parenting education, incorporating information about temperament in a more flexible and non-judgmental way, is the First Three Years curriculum project developed by Birth to Three in Eugene, Oregon. This program is designed around parent support groups, where parents are invited to consider basic individual differences in children's temperament (Birth to Three, 2000). Taking into account what the parent wishes the child to learn (parental values and goals), as well as the child's developmental stage and temperament (child capacities), the parent is able to think about both strengths and challenges of the child's temperament. "For example, if a parent understands that by temperament her child tends to be highly impulsive, that means the child probably will have an easy time with transitions and new experiences (the strength) but will need help with learning self control, focus, and persistence (the challenge). A reserved or 'shy' child may be able to play alone or wait her turn easily (the strength) but will

need help with learning to take risks (the challenge)...Understanding individual differences helps parents eliminate perceptions of 'bad intent' on the part of the child and, instead, appreciate the challenges their child faces (J. Rusch, personal communication, August 2000)."

In Birth to Three support group sessions, parents develop strategies (games, stories, role playing, songs, and modeling) to give their children a wider range of behaviors to choose from. Thus a shy child might gain experience in speaking up with an idea or seeking out friendships; a more impulsive child may develop skills in slowing down and planning ahead. The idea is not to change the child's temperament, but to work with it to increase the likelihood of positive outcomes. This is a complex view of temperament and development, but one that is both communicable and appropriate to our current understanding. It is also a view that forgoes unitary value judgments about temperamental tendencies, stressing instead the idea that each temperamental characteristic offers both costs and benefits, depending on the child's age, the environmental context, and the specific goals for learning.

CONCLUSIONS

A child's temperament is apparent from early infancy and is an important influence on development. Variations in temperamental reactivity and self-regulation can be assessed in terms of characteristic patterns of positive and negative emotionality, sociability, and attentional persistence for each child. These patterns are moderately stable over time but are by no means immutable. Temperament contributes to a wide range of child outcomes in behavioral, cognitive and social domains. The task for parents in thinking about temperament is to take their child's particular characteristics into account when choosing strategies to soothe, control, stimulate and guide their child, and in arranging the overall childrearing environment.

Information for parents can be drawn from analyses of the effects on child outcome of particular combinations of parent behavior and child temperament. Appropriate parenting can lead to positive outcomes even for children extreme in temperament. For instance, van den Boom's (1994, 1995) study has illustrated how maternal training in dealing with irritable infants can lead to improved cognitive, social and emotional outcomes for these infants. Similarly, studies by Wachs and his colleagues (e.g., Wachs, 1987) reveal how different levels of social and environmental stimulation appear to be appropriate for children with differing temperament profiles.

We have suggested that some of the consequences of taking temperament into account might be to adapt parenting behavior and the child's environment to provide as good a "fit" to the child's temperament as possible, while at the same time encouraging the child's adaptations to situations; to recognize that, while a child's temperament is not immutable, changes over time are unlikely to be dramatic; and to avoid value judgments about these individual differences. Even though it may be recognized that in a given social and cultural context, some children take more effort to parent, there is nothing inherently inferior about these children, nor are temperament characteristics the result of "naughtiness."

In sum, the concept of temperament directs our attention to important aspects of child individuality that must be considered in parenting. It has long been recognized that appropriate parenting depends on the age of the child; temperament characteristics also determine what is appropriate. Even if this recognition complicates both the task of the parent and that of the researcher, such complication is unavoidable. The task then for the parent and the practitioner is to foster "respect for the individuality and integrity of each child, and flexibility in creating environments that may lead to positive outcomes for them and for us" (Rothbart, 1989a, p. 236).

Acknowledgments

Authors Sanson and Putnam have made equivalent contributions to this chapter; they are listed above in alphabetical order. Preparation of this chapter was supported in part by National Institutes of Mental Health (U.S.) Grants R01 MH43361 and K05 MH01471 to Mary Rothbart, National Health and Medical Research Council (Australia) Grants 980627 and 9937433 to A. Sanson and J. Toumbourou, and by funds allocated to Sam Putnam from NIMH (U.S.) grant 5 T32 MH1893. The authors wish to thank S. Ahadi, M. Prior, and M. Rothbart for their generous help on a previous version of the chapter and J. Bates for directing us to some of the recent research on parent/temperament interactions. Direct inquiries to: Mary K. Rothbart, Department of Psychology, University of Oregon, Eugene, OR 97403.

References

- Ahadi, S. A., Rothbart, M. K., & Ye, R. M. (1993). Children's temperament in the U.S. and China: Similarities and differences. European Journal of Personality, *7*, 359-377.
- Arcus, D., Gardner, S., & Anderson, C. (1992). Infant reactivity, maternal style, and the development of inhibited and uninhibited behavior profiles. In (Chair) Temperament and environment. Symposium conducted at the Biennial Meeting of the International Society for Infant Studies, Miami, FL.
- Bates, J. E. (1989). Applications of temperament concepts. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.), Temperament in childhood (pp. 321-355). Chichester, England: Wiley.
- Bates, J. E., & Bayles, K. (1988). The role of attachment in the development of behavior problems. In J. Belsky & T. Nezworski (Eds.), Clinical implications of attachment (pp. 253-299). Hillsdale, NJ: Erlbaum.
- Bates, J. E., Maslin, C. A., & Frankel, K. A. (1985). Attachment security, mother-child interaction, and temperament as predictors of behavior-problem ratings at age three years. In I. Bretherton & E. Waters (Eds.), Growing points in attachment theory and research. Society for Child Development Monographs (Vol. Serial No. 209, pp. 167-193).
- Bates, J. E., Olson, S. L., Pettit, G. S., & Bayles, K. (1982). Dimensions of individuality in the mother-infant relationship at 6 months of age. Child Development, *53*, 446-461.
- Bates, J. E., Pettit, G. S., Dodge, K. A., & Ridge, B. (1998). The interaction of temperamental resistance to control and restrictive parenting in the development of externalizing behavior. Developmental Psychology, *34*, 982-995.
- Bell, R. Q. (1968). A reinterpretation of the direction of effects in studies of socialization. Psychological Review, *75*, 81-95.
- Belsky, J., Hsieh, K.-H., & Crnic, K. (1998). Mothering, fathering, and infant negativity as antecedents of boys' externalizing problems and inhibition at age 3 years: Differential susceptibility to rearing experience? Development and Psychopathology, *10*, 301-319.
- Belsky, J., & Rovine, M. (1987). Temperament and attachment security in the strange situation: An empirical rapprochement. Child Development, *58*, 787-795.
- Birth to Three (2000). The first three years curriculum. Unpublished manuscript.
- Bohlin, G., Hagekull, B., & Lindhagen, K. (1981). Dimensions of infant behavior. Infant Behavior and Development, *4*, 83-96.
- Bradley, B., & Sanson, A. (1992). Promoting quality in infant day care via research: Conflicting lessons from the day care controversy? Australian Journal of Early Childhood, *17*, 3-10.
- Calkins, S. D., & Fox, N. A. (1992). The relations among infant temperament, security of attachment, and behavioral inhibition at twenty-four months. Child Development, *63*, 1456-1472.
- Calkins, S. D., & Johnson, M. C. (1998). Toddler regulation of distress to frustrating events: Temperamental and maternal correlates. Infant Behavior and Development, *21*, 379-395.
- Cameron, J. R. (1978). Parental treatment, children's temperament, and the risk of childhood behavioral problems: I. Relationships between parental characteristics and changes in children's temperament over time. Annual Progress in Child Psychiatry and Child Development, 233-244.

- Cameron, J. R., Hansen, R., & Rosen, D. (1989). Preventing behavioral problems in infancy through temperament assessment and parental support programs. In W. B. Carey & S. C. McDevitt (Eds.), Clinical and educational applications of temperament research (pp. 155-165). Amsterdam, Netherlands: Swets & Zeitlinger.
- Caron, J., & Miller, P. (1981). Effects of infant characteristics on caregiver responsiveness among the Gusii. Paper presented at the meeting of the Society for Research in Child Development, Boston.
- Caspi, A., Henry, B., McGee, R. O., Moffitt, T. E., & Silva, P. A. (1995). Temperamental origins of child and adolescent behavior problems: From age three to fifteen. Child Development, *66*, 55-68.
- Chen, X., Hastings, P.D., Rubin, K.H., Chen, H., Cen, G., & Stewart, S.L. (1998). Child-rearing attitudes and behavioral inhibition in Chinese and Canadian toddlers: A cross-cultural study. Developmental Psychology, *34*, 677-686.
- Chess, S., & Thomas, A. (1989). Issues in the clinical application of temperament. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.), Temperament in childhood (pp. 378-386). Chichester: Wiley.
- Clark, L. A., Kochanska, G., & Ready, R. (2000). Mothers' personality and its interaction with child temperament as predictors of parenting behavior. Journal of Personality and Social Psychology, *79* (2), 274-285.
- Colder, C. R., Lochman, J. E., & Wells, K. C. (1997). The moderating effects of children's fear and activity level on relations between parenting practices and childhood symptomatology. Journal of Abnormal Child Psychology, *25*, 251-263.
- Crockenberg, S. B. (1986). Are temperamental differences in babies associated with predictable differences in care giving? In J. V. Lerner & R. M. Lerner (Eds.), Temperament and social interaction during infancy and childhood. New Directions for Child Development, No. 31, 53-73. San Francisco: Jossey-Bass.
- Crockenberg, S. (1987). Predictors and correlates of anger toward and punitive control of toddlers by adolescent mothers. Child Development, *58*, 964-975.
- Crockenberg, S., & McCluskey, K. (1985). Predicting infant attachment from early and current behavior of mothers and infants. Paper presented at the meeting of the Society for Research in Child Development, Toronto, Ontario.
- Cummings, E. M., & Davies, P. T. (1994). Maternal depression and child development. Journal of Child Psychology and Psychiatry, *35*, 73-112.
- Cutrona, C. E., & Troutman, B. R. (1986). Social support, infant temperament, and parenting self-efficacy: A mediational model of postpartum depression. Child Development, *57*, 1507-1518.
- Daniels, D., Plomin, R., & Greenhalgh, J. (1984). Correlates of difficult temperament in infancy. Child Development, *55*, 1184-1194.
- Diamond, S. (1974). The roots of psychology. New York: Basic Books.
- Diener, M. L., Goldstein, L. H., & Mangelsdorf, S. C. (1995). The role of prenatal expectations in parents' reports of infant temperament. Merrill-Palmer Quarterly, *41*, 172-190.
- Eaton, W. O., & Enns, R. (1986). Sex differences in human motor activity level. Psychological Bulletin, *100*, 19-28.
- Escalona, S. A. (1968). The roots of individuality: Normal patterns of development in infancy. Chicago: Aldine.

- Eysenck, H. J., & Eysenck, M. W. (1985). *Personality and individual differences: A natural science approach*. New York: Plenum.
- Fein, G. G., Gariboldi, A. & Boni, R. (1993) The adjustment of infants and toddlers to group care: The first six months. Early Childhood Research Quarterly, 8, 1-14.
- Fish, M., & Crockenberg, S. (1986). Correlates and antecedents of nine-month infant behavior and mother-infant interaction. Infant Behavior and Development, 4, 69-81.
- Fisher, P. A., & Fagot, B. I. (1992, April). Temperament, parental discipline, and child psychopathology: A social-interactional model. Poster presented at the annual meeting of the Western Psychological Association: Portland, Oregon.
- Frodi, A. M. (1983). Attachment behavior and sociability with strangers in premature and fullterm infants. Infant Mental Health Journal, 4, 13-22.
- Gandour, M. J. (1989). Activity level as a dimension of temperament in toddlers: Its relevance for the organismic specificity hypothesis. Child Development, 60, 1092-1098.
- Goldberg, L. R. (1990). An alternative "description of personality": The Big-Five factor structure. Journal of Personality and Social Psychology, 59, 1216-1229.
- Goldsmith, H. H., & Alansky, J. A. (1987). Maternal and infant predictors of attachment: A meta-analytic review. Journal of Consulting and Clinical Psychology, 55, 805-816.
- Goodman, S. H., & Gotlib, I. H. (1999). Risk for psychopathology in the children of depressed mothers: A developmental model for understanding mechanisms of transmission. Psychological Review, 106, 458-490.
- Gordon, B. (1983). Maternal perception of child temperament and observed mother-child interaction. Child Psychiatry and Human Development, 13, 153-167.
- Gowen, J. W., Johnson-Martin, N., Goldman, B. D., & Appelbaum, M. (1989). Feelings of depression and parenting competence of mothers of handicapped and nonhandicapped infants: A longitudinal study. Special Issue: Research on families. American Journal on Mental Retardation, 94, 259-271.
- Hemphill, S. & Sanson, A. (2000) Relations between toddler and preschooler temperament and parenting style in an Australian sample. Paper presented at the 16th Biennial Meetings of the International Society for the Study of Behavioral Development, Beijing, July.
- Hinde, R. A. (1989). Temperament as an intervening variable. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.), Temperament in childhood (pp. 27-34). Chichester: Wiley.
- Kagan, J. (1994). Galen's Prophecy. New York: BasicBooks.
- Kagitcibasi, C. (1996). *Family and human development across cultures*. Mahwah, NJ : Erlbaum.
- Kendler, K. S., Sham, P. C., & MacLean, C. J. (1997). The determinants of parenting: An epidemiological, multi-informant, retrospective study. Psychological Medicine, 27, 549-563.
- Kitayama, S., & Markus, H. (Eds.) (1994). Culture and emotion. Washington, DC: American Psychological Association.
- Klein, P. (1984). The relation of Israeli mothers toward infants in relation to infants' perceived temperament. Child Development, 55, 1212-1218.
- Kochanska, G. (1991). Socialization and temperament in the development of guilt and conscience. Child Development, 62, 1379-1392.
- Kochanska, G. (1995). Children's temperament, mothers' discipline, and security of attachment: Multiple pathways to emerging internalization. Child Development, 66, 597-615.

- Kochanska, G. (1997). Multiple pathways to conscience for children with different temperaments: From toddlerhood to age five. Developmental Psychology, *33*, 228-240.
- Kohnstamm, G. A. (1989). Temperament in childhood: Cross-cultural and sex differences. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.), Temperament in childhood (pp. 483-508). Chichester, England: Wiley.
- Kyrios, M., & Prior, M. (1990). Temperament, stress and family factors in behavioral adjustment of 3-5-year-old children. International Journal of Behavioral Development, *13*, 67-93.
- Kyrios, M., Prior, M., Oberklaid, F., & Demetriou, A. (1989). Cross-cultural studies of temperament: Temperament in Greek infants. International Journal of Psychology, *24*, 585-603.
- Lamb, M. E., Frodi, M., Hwang, C., Forstromm, B., & Corry, T. (1982). Stability and change in parental attitudes following an infant's birth into traditional and nontraditional Swedish families. Scandinavian Journal of Psychology, *23*, 53-62.
- Lee, C. L., & Bates, J. E. (1985). Mother-child interaction at two years and perceived difficult temperament. Child Development, *56*, 1314-1325.
- Lengua, L. J., Wolchik, S. A., Sandler, I. N., & West, S. G. (2000). The additive and interactive effects of parenting and temperament in predicting problems of children of divorce. Journal of Clinical Child Psychology (29), 232-244.
- Lewis, M., & Feiring, C. (1989). Infant, mother, and mother-infant interaction behavior and subsequent attachment. Child Development, *60*, 831-837.
- Linn, P., & Horowitz, F. (1983). The relationship between infant individual differences and mother-infant interaction during the neonatal period. Infant Behavior and Development, *6*, 415-427.
- Lytton, H., & Romney, D. M. (1991). Parents' differential socialization of boys and girls: A meta-analysis. Psychological Bulletin, *109*, 267-296.
- Maccoby, E. E., & Jacklin, C. N. (1974). The psychology of sex differences. Stanford, CA: Stanford University Press.
- Maccoby, E. E., Snow, M. E., & Jacklin, C. N. (1984). Children's dispositions and mother-child interaction at 12 and 18 months: A short-term longitudinal study. Developmental Psychology, *20*, 459-472.
- Maziade, M., Caron, C., Cote, R., Merette, C., Bernier, H., Laplante, B., Boutin, P., & Thivierge, J. (1990). Psychiatric status of adolescents who had extreme temperaments at age 7. American Journal of Psychiatry, *147*, 1531-1536.
- McClowry, S. G. (1995). The development of the school-age temperament inventory. Merrill-Palmer Quarterly, *41*, 271-285.
- McCrae, R. R., & Costa, P. T., Jr. (1987). Validation of the five-factor model of personality across instruments and observers. Journal of Personality and Social Psychology, *52*, 81-90.
- Miceli, P. J., Whitman, T. L., Borkowski, J. G., Braungart-Rieker, J., Mitchell, D. W. (1998). Individual differences in infant information processing: The role of temperamental and maternal factors. Infant Behavior & Development, *21*(1), 119-136.
- Orth, L. C. & Martin, R. P. (1994). Interactive effects of student temperament and instruction method on classroom behavior and achievement. Journal of School Psychology, *32*, 149-166.

- Park, S., Belsky, J., Putnam, S., & Crnic, K. (1997). Infant emotionality, parenting, and 3-year inhibition: Exploring stability and lawful discontinuity in a male sample. Developmental Psychology, *33*, 218-227.
- Paterson, G. & Sanson, A. (1999). The association of behavioural adjustment to temperament, parenting and family characteristics among 5 year old children. Social Development, *8*, 293-309.
- Pedlow, R., Sanson, A. V., Prior, M., & Oberklaid, F. (1993). The stability of temperament from infancy to eight years. Developmental Psychology, *29*, 998-1007.
- Peters-Martin, P., & Wachs, T. (1984). A longitudinal study of temperament and its correlates in the first 12 months. Infant Behavior and Development, *7*, 285-298.
- Pettit, G. S., & Bates, J. E. (1984). Continuity of individual differences in the mother-infant relationship from 6 to 13 months. Child Development, *55*, 729-739.
- Plomin, R. (1982). Behavioral genetics and temperament. In R. Porter & G. M. Collins (Eds.), Temperamental differences in infants and young children (Ciba Foundation Symposium 89). London: Pitman.
- Prior, M., Sanson, A., Carroll, R., & Oberklaid, F. (1989). Social class differences in temperament ratings of pre-school children. Merrill-Palmer Quarterly, *35*, 239-248.
- Prior, M. R., Sanson, A. V., & Oberklaid, F. (1989). The Australian Temperament Project. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.), Temperament in childhood (pp. 537-554). Chichester, England: Wiley.
- Prior, M., Smart, D. F., Sanson, A. V., & Oberklaid, F. (1993). Sex differences in psychological adjustment from infancy to eight years. Journal of the American Academy of Child and Adolescent Psychiatry, *32*, 291-304.
- Putnam, S. P., Ellis, L. K., & Rothbart, M. K. (in press). The structure of temperament from infancy through adolescence. To appear in A. Elias & A. Angleitner (Eds.), Advances/proceedings in research on temperament. Germany: Pabst Scientist Publisher.
- Rendina, I., & Dickerscheid, J.D. (1976). Father involvement with first-born infants. Family Coordinator, *25*, 376-378.
- Rothbart, M. K. (1982). The concept of difficult temperament: A critical analysis of Thomas, Chess & Korn. Merrill-Palmer Quarterly, *28*, 35-40.
- Rothbart, M. K. (1986). Longitudinal observation of infant temperament. Developmental Psychology, *22*, 356-365.
- Rothbart, M. K. (1989a). Temperament and development. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.), Temperament in childhood (pp. 187-247). Chichester, England: Wiley.
- Rothbart, M. K. (1989b). Biological processes of temperament. In G. Kohnstamm, J. Bates, & M. K. Rothbart, (Eds.), Temperament in childhood (pp. 77-110). Chichester, England: Wiley.
- Rothbart, M. K., Ahadi, S. A., & Evans, D. E. (2000). Temperament and personality: Origins and outcomes. Journal of Personality and Social Psychology, *78*, 122-135.
- Rothbart, M. K., Ahadi, S. A., Hershey, K., & Fisher, P. (2000). Investigations of Temperament at 3-7 Years: The Children's Behavior Questionnaire. Manuscript submitted for publication.
- Rothbart, M. K. & Bates, J. E. (1998). Temperament. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), Handbook of child psychology: Vol. 3. Social, emotional and personality development. (5th ed.) (pp. 105-176). New York: Wiley.

- Rothbart, M. K., & Derryberry, D. (1981). Development of individual differences in temperament. In M. E. Lamb & A. L. Brown (Eds.), Advances in developmental psychology (Vol. 1, pp. 37-86). Hillsdale, NJ: Erlbaum.
- Rothbart, M. K., & Mauro, J. A. (1990). Questionnaire measures of infant temperament. In J. W. Fagen & J. Colombo (Eds.), Individual differences in infancy: Reliability, stability and prediction (pp. 411-429). Hillsdale, NJ: Erlbaum.
- Rubin, K. H., Hastings, P., Chen, X., Stewart, S., & McNichol, K. (1998). Intrapersonal and maternal correlates of aggression, conflict, and externalizing problems in toddlers. Child Development, *69*, 1614-1629.
- Rubin, K. H., Hastings, P. D., Stewart, S. L., Henderson, H. A., & Chen, X (1997). The consistency and concomitants of inhibition: Some of the children, all of the time. Child Development, *68*, 467-483.
- Sanson, A. (2000) Temperament and social development. Keynote address to International Society for the Study of Behavioral Development, Beijing, July.
- Sanson, A. V., Oberklaid, F., Pedlow, R., & Prior, M. (1991). Risk indicators: Assessment of infancy predictors of preschool behavioural maladjustment. Journal of Child Psychology and Psychiatry, *32*, 609-626.
- Sanson, A. & Prior, M. (1999) Temperamental and behavioral precursors to Oppositional Defiant Disorder and Conduct Disorder. In H. C. Quay & A.E. Hogan, Eds, Handbook of Disruptive Behavior Disorders (pp. 397-417). New York: Kluwer Academic/Plenum Publishing.
- Sanson, A., Prior, M., Garino, E., Oberklaid, F., & Sewell, J. (1987). The structure of infant temperament: Factor analysis of the Revised Infant Temperament Questionnaire. Infant Behavior and Development, *10*, 97-104.
- Sanson, A., Prior, M., & Kyrios, M. (1990). Contamination of measures in temperament research. Merrill-Palmer Quarterly, *36*, 179-192.
- Sanson, A., Prior, M., Oberklaid, F. & Smart, D. (1998) Temperamental influences on psychosocial adjustment: From infancy to adolescence. Australian Educational and Developmental Psychologist, *15* (2), 7-18.
- Sanson, A. V., Smart, D. F., Prior, M., & Oberklaid, F. (1993). Precursors of hyperactivity and aggression. Journal of the American Academy of Child and Adolescent Psychiatry, *32*, 1207-1216.
- Sanson, A. V., Smart, D. F., Prior, Oberklaid, F., & Pedlow, R. (1994). The structure of temperament from three to seven years: Age, sex and sociodemographic influences. Merrill-Palmer Quarterly, *40*, 233-252.
- Scarr, S. (1992). Developmental theories for the 1990s: Development and individual differences. Child Development, *63*, 1-19.
- Scarr, S., & McCartney, K. (1983). How people make their own environments: A theory of genotype-environmental effects. Child Development, *54*, 424-435.
- Shaw, D. S., Winslow, E. B., Owens, E. B., Vondra, J. I., Cohn, J. F., & Bell, R. Q. (1998). The development of early externalizing problems among children from low-income families: A transformational perspective. Journal of Abnormal Child Psychology, *26*, 95-107.
- Simpson, A. E., & Stevenson-Hinde, J. (1985). Temperamental characteristics of three- to four-year-old boys and girls and child-family interactions. Journal of Child Psychology and Psychiatry, *26*, 43-53.
- Slabach, E. H., Morrow, J., & Wachs, T. D. (1991). Questionnaire measurement of infant and child temperament: Current status and future directions. In J. Strelau & A. Angleitner

- (Eds.), Explorations in temperament: International perspectives on theory and measurement (pp. 205-234). New York: Plenum.
- Sroufe, L. A. (1985). Attachment classification from the perspective of infant-caregiver relationships and infant temperament. Child Development, *56*, 1-14.
- Stice, E. & Gonzales, N. (1998). Adolescent temperament moderates the relation of parenting to antisocial behavior and substance use. Journal of Adolescent Research. Vol *13*(1), 5-31.
- Teti, D. M., & Gelfand, D. M. (1991). Behavioral competence among mothers of infants in the first year: The mediational role of maternal self-efficacy. Child Development, *62*, 918-929.
- Thomas, A., Chess, S., Birch, H. G., Hertzig, M. E., & Korn, S. (1963). Behavioral individuality in early childhood. New York: New York University Press.
- Thompson, R. A., Connell, J. P., & Bridges, L. J. (1988). Temperament, emotional, and social interactive behavior in the Strange Situation: A component process analysis of attachment system functioning. Child Development, *59*, 1102-1110.
- Turecki, S., & Tonner, L. (1989). The difficult child. New York: Bantam.
- van den Boom, D. (1989). Neonatal irritability and the development of attachment. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.), Temperament in childhood (pp. 299-318). Chichester, England: Wiley.
- van den Boom, D. C. (1994). The influence of temperament and mothering on attachment and exploration: An experimental manipulation of sensitive responsiveness among lower-class mothers with irritable infants. Child Development, *65*, 1457-1477.
- van den Boom, D. C. (1995). Do first-year intervention effects endure? Follow-up during toddlerhood of a sample of Dutch irritable infants. Child Development, *66*, 1798-1816.
- Vaughn, B. E., Taraldson, B. J., Crichton, L., & Egeland, B. (1981). The assessment of infant temperament: A critique of the Carey Infant Temperament Questionnaire. Infant Behavior and Development, *4*, 1-17.
- Vaughn, B. E., Bradley, C. F., Joffe-Lyle, S., & Seiffer, R. (1987). Maternal characteristics measured prenatally are predictive of ratings of temperamental "difficulty" on the Carey Infant Temperament Questionnaire. Developmental Psychology, *23*, 152-161.
- Volling, B. L. & Feagans, L. V. (1995) Infant day care and children's social competence. Infant Behavior and Development, *18*, 177-188.
- Wachs, T. D. (1987). Specificity of environmental action as manifest in environmental correlates of infants' mastery motivation. Developmental Psychology, *23*, 782-790.
- Wachs, T. D., & Gandour, M. J. (1983). Temperament, environment, and six-month cognitive-intellectual development: A test of the organismic specificity hypothesis. International Journal of Behavioral Development, *6*, 135-152.
- Weber, R. A., Levitt, M. J., & Clarke, M. C. (1986). Individual variation in attachment security and social interactive behavior in the Strange Situation: The role of maternal and infant temperament. Child Development, *57*, 56-65.
- Werner, E. E., & Smith, R. S. (1982). Vulnerable, but invincible: A longitudinal study of resilient children and youth. New York: McGraw-Hill.
- Whiting, B., & Whiting, J. (1973). Children of six cultures: A psychocultural analysis. Cambridge, MA: Harvard University Press.