

Attachment and Caregiving:  
The Caregiving Behavioral System

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“An 8-month-old infant clambers on... a fallen tree while its mother sits about 7 feet below. The infant slips and hangs by two hands. [His mother] looks up, stands on two legs, and barely reaches the foot of her infant. She pulls it to her chest but it wriggles free, repeats the climb only to slip at the same place again, to be rescued once more by its mother.”

♦ G. Schaller, 1963, p. 263 (Gorilla)

“Gremlin’s concern for Gimble went way beyond merely responding to his appeals for help: like a good mother she would anticipate trouble... Once, as she was carrying him along a trail, she saw a small snake ahead. Carefully she pushed Gimble off her back and kept him behind her as she shook branches at the snake until it glided away.”

♦ J. Goodall, 1990, p. 169 (Chimpanzee)

“One day Effie was observed contentedly feeding about twenty feet behind the group, while Poppy, some six feet behind her mother, was solo playing and swinging in a Seneco tree... suddenly Effie twirled around and stared at Poppy... Poppy had fallen and was hanging by her neck in a narrow fork of the tree. The infant could only feebly kick her legs and flail her arms as the stranglehold began cutting off her oxygen. Instantly Effie ran to her baby. With considerable effort she tugged at Poppy, trying to release her from a potentially fatal position. Effie was wearing a horrified expression of fear similar to that of a human parent whose child is in mortal danger... At last Effie succeeded in releasing her infant from the tree’s stranglehold. Immediately upon regaining her breath, Poppy began to whimper, then attached herself to Effie’s nipple for four minutes before her mother carried her off, in a protective ventral position, toward the group, which were unaware of the drama that had unfolded behind them.”

♦ D. Fossey, 1983, p. 88 (Gorilla)

Bowlby's attachment theory has inspired a dramatic shift in the way we understand the development of the early infant-caregiver relationship and of relationships across the life span. In particular, by reframing relationships in terms of the ethological concept of behavioral systems, new meaning has been added to our understanding of relationship development and function. The term "attachment" has become a shorthand phrase for an enduring relationship that encompasses classes of observable behavior that, according to ethological theory, are regulated by the attachment system. The attachment system is one of many behavioral systems that have evolved to promote survival and reproductive success (Hinde, 1982a). The goal of attachment behavior is to seek protection by maintaining proximity to the attachment figure or parent in response to real or perceived stress or danger (Bowlby, 1969/1982). Although the actual behavior may vary according to context and age, the goal of that behavior remains the same across the life span. The empirical evidence supporting the role of the attachment relationship in the child's development is impressive. Almost three decades of research has shown that this relationship is an important contributing factor to the individual's ability to accomplish age-appropriate social-emotional and cognitive tasks in childhood and adulthood (see e.g., Jacobsen, Edelstein, & Hofmann, 1994; Sroufe, 1988; Thompson, this volume, Weinfield, Sroufe, Egeland, & Carlson, this volume; Weiss, 1991). Research has shown that marked aberrations in the organization of this relationship are associated with problems in behavior and mental health in children (Solomon & George, in press; Lyons-Ruth & Jacobvitz, this volume ) and adults (Adam, 1994; Adam, Sheldon-Keller, & West, 1995; Fonagy, Steele, Steele, Leigh, Kennedy, Mattoon, & Target, 1995; Manassis, Bradley, Goldberg, Hood, & Swinson, 1994; Pianta, Egeland, &

Adam, 1996).

According to attachment theory, the most important factor guiding this pivotal relationship is the child's experience with caregivers. All infants who receive some form of basic regular care appear to select attachment figures, suggesting that simple propinquity of the attachment figure is sufficient for the development of attachment (Bowlby, 1969/1982). The quality of care determines the qualitative organization of the relationship through its effect on the child's confidence in the availability of the caregiver (i.e., security -- Ainsworth, Blehar, Waters, & Wall, 1978; de Wolff & van IJzendoorn, 1997; Weinfeld et al., this volume). What are the origins of the attachment figure's sensitivity? What indeed causes parents to provide care for their infant, care that sometimes requires costly personal sacrifices on the part of the parent?

Bowlby proposed that the behavior of the attachment figure is organized by a caregiving behavioral system (Bowlby, 1969/1982, 1988). Until recently there has been neither interest in caregiving as an organized behavioral system, nor consideration of how of the caregiving system contributes to the development of the child-parent relationship. It is likely that this lack of interest is the product of several interacting factors. First, aligned with child-centered disciplines (psychoanalysis, developmental psychology, pediatrics, social work), Bowlby and subsequent attachment researchers focused predominantly on the needs and development of the child. The parent has been considered an adjunct to the child's development. We do not mean to suggest here that the parent has been viewed as unimportant. Indeed, this is not the case; the literature on parenting in developmental psychology, for example, is comprehensive and covers a wide range of topics and concerns (Bornstein, 1995). What is lacking from these disciplines, however, is a view that integrates parental goals with child outcome. Second, the concept of behavioral

systems, extrapolated from biology and foreign to developmental psychology and psychoanalysis, has been overshadowed by the dominant explanatory constructs of these disciplines.

Developmental psychology has emphasized discrete behavior or behavior patterns (following learning theory), and more recently, parental attitudes and attributions (following cognitive and social cognitive theory). Evolutionary theory has only just reemerged as an area of interest in psychology and has never had a place in traditional or contemporary psychoanalysis. Third, the historical focus of developmental psychology has been almost exclusively on the development of children through adolescence. Even today, the empirical study of adult development, with the exception of some aspects of personality and cognitive development, is the purview of life-span developmental psychology, a branch of psychology that adheres to different theoretical models and generally does not address issues regarding continuity or coherence from childhood to adulthood.

With the development of the Adult Attachment Interview (AAI: George, Kaplan, & Main, 1984/1985/1996), a semi-structured clinical-style interview asking adults to describe their childhood attachment experiences, the field has seen a burst of research linking parents' mental representations of attachment to child attachment and developmental outcome (Crowell & Shaver, this volume; van IJzendoorn, 1995). The AAI has also provided a model of assessment for a small group of pioneering researchers interested in parents' mental representations of their child. Following the semi-structured format of the AAI, these researchers developed interviews that asked parents to describe their perceptions and subjective experiences of their child, interactions with their child, and their relationship (Aber, Slade, Cohen, & Meyer, 1989; Bretherton, Biringen, Ridgeway, Maslin, & Sherman, 1989; Cox, Owen, Henderson, & Margand,

1992; Cramer et al., 1990; Pianta & Marvin, 1992; Zeanah & Barton, 1989). Parental representations are typically analyzed in terms of rating scales drawn from (a) the AAI (e.g., coherence, lack of resolution – Main & Goldwyn, 1985/1991/1994), (b) Ainsworth's original maternal interaction scales (e.g., sensitivity, acceptance), and (c) scales derived from attachment theory or research (e.g., intensity of involvement, joy, anger). Although their approaches differ somewhat, these researchers have been successful in describing individual differences in parental attributions and perceptions of the child as related to the child's attachment (Benoit, Parker, & Zeanah, in press; Zeanah, Benoit, Hirschberg, Barton, & Regan, 1994; Bretherton et al., 1989; Marvin & Pianta, 1996), the child's behavior (Aber, Belsky, Slade, & Crnic, 1997; Benoit, Zeanah, Parker, Nicholson, & Coolbear, 1997; Slade, Belsky, Aber, & Phelps, 1997; Slade & Cohen, 1996) and the mother's adult attachment classification (Benoit et al., 1997; Slade et al., 1997; Slade & Cohen, 1996). These approaches have provided important insight into child attachment, parental perceptions and attitudes, and developmental risk. They do not, however, take an organized behavioral systems approach to understanding caregiving behavior.

Recently, we have begun to outline an approach to the study of caregiving based on the postulate that caregiving behavior is organized within a behavioral system that is independent from, but linked developmentally and behaviorally to attachment (George & Solomon, 1996; Solomon & George, 1996a). In this chapter we expand upon this perspective and present a behavioral systems framework for conceptualizing and studying caregiving. As with our colleagues, our approach was developed based on our research on mental representations of caregiving. One unique contribution of our approach is noting the importance for the parent of making the shift away from the perspective of being protected (the goal of the child) to the

perspective of providing protection (the goal of the parent). In our view, the consideration of this shift is fundamental to understanding the meaning of, and motivation underlying, critical aspects of parental behavior, cultural differences in providing care, the development of the infant's attachment, and the mechanisms of intergenerational transmission. We propose that understanding this shift will also contribute to intervention with parents of children “at risk.” The chapter begins with a review of the defining characteristics of behavioral systems and an examination of variations in patterns of care from a functionalist or evolutionary perspective. We then describe a behavioral systems-based model outlining major influences on the etiology of the caregiving system. We follow with a summary of our own research and describe the ways in which our studies of mothers’ mental representations of caregiving have informed us about the caregiving system. We end with a discussion of what the behavioral systems approach to caregiving adds to our understanding of parent-child interaction and how this perspective may be used to enhance relationship-based intervention.

### Defining the Caregiving Behavioral System

#### A Behavioral Systems Model of Caregiving

Bowlby grounded attachment theory in ethology. In this section we examine behavioral systems, one of the key components of the ethological approach. According to ethologists, much of the behavioral repertoire in humans and other species is organized by behavioral systems. Briefly, behavioral systems are defined by the following basic principles (Bowlby, 1969/1982; Hinde, 1982): Behavioral systems (a) comprise behavior that is coordinated to achieve a specific goal and adaptive function; (b) are activated and terminated by endogenous and environmental cues; (c) are “goal-corrected” (i.e., regulated by goals that extend over long periods of time, with

the behaviors needed to achieve those goals being adjusted flexibly, in a nonrandom fashion, to a wide range of environments and to the development of the individual); (d) are guided at the biological level by a feedback system that monitors internal cues (central nervous system activity, hormones) and environmental cues leading to the system's activation or termination; (e) are related to and interact with other behavioral systems; (f) involve developmental integration of sequences of behavior that become functional over time as the product of organism-environment interaction; and (g) are believed to be organized and integrated by specific cognitive control systems (in the case of humans, mental representations). We begin our discussion of caregiving by examining the first four of these principles. The remaining principles will be discussed in later sections.

We assume, as did Bowlby, that the caregiving system is reciprocal to, and evolved in parallel with, the attachment system. The way in which the infant's behavioral systems (e.g., attachment, exploration, affiliation) interact with each other was outlined thoroughly in Bowlby's and Ainsworth's original work and has become a standard feature of attachment theory and research (Cassidy, this volume). The ways in which the infant's behavioral systems interact with those of the caregiver, and the ways in which the caregiver's behavioral systems interact among each other are as yet largely unexplored.

The first step in defining the caregiving system is to delineate its adaptive function and behavioral goal. Following Bowlby, we propose that the adaptive function of the caregiving system, as with attachment, is protection of the young and, ultimately, one's reproductive fitness (see also, Belsky, this volume; Simpson, this volume). Following ethological theory and paralleling Bowlby's (1969/1982) discussion of attachment, the behavioral goal of the caregiving

system is to provide protection for the child. Central to Bowlby's theory was his identification of factors involved in the activation, termination, and regulation of the child's attachment system (Bowlby, 1969/1982). Internal or external cues or stimuli associated with situations that the child perceives as frightening, dangerous, or stressful were thought to activate the attachment system. It follows that with regard to the caregiving system, internal or external cues associated with situations that the parent perceives as frightening, dangerous, or stressful for the child should activate the caregiving system. These situations include, but are not limited to, separation, child endangerment, or the child's verbal and nonverbal signals of discomfort and distress. Once activated, the caregiver can call upon a repertoire of behaviors. The goal of these behaviors, including retrieval, maintaining proximity, carrying, following, signaling the child to follow, calling, looking, and in humans, smiling, is to ensure protection of the child.<sup>1</sup> The child's attachment system is deactivated by proximity and/or physical or psychological contact with the attachment figure when he or she responds to the child's attachment needs in a satisfactory manner. Again following Bowlby's template for attachment, the parent's caregiving system should be deactivated by physical or psychological proximity and signs that the child is comforted, contented, or satisfied. Just as Bowlby proposed attachment to be associated with and regulated by strong feelings, including joy and anger in response to whether or not the caregiver is within proximity, caregiving is also associated with and regulated by strong emotions. Mothers express intense feelings of pleasure and satisfaction when they are able to provide protection for their child; they experience heightened anger, sadness, anxiety, and despair when separated or when their ability to protect the child is threatened or blocked.

Behavioral systems are goal-corrected, a feature that potentially allows for maximum

behavioral flexibility. This suggests that the specific type and range of caregiving behavior will vary depending upon context, age, and experiences of parent or child. We also presume, as with the attachment system, that this goal-corrected quality is regulated in part by neurological systems in the brain. The actual mechanisms related to providing care and the ways in which physiological substrates are influenced by learning and experience need further investigation. There have been studies, however, that examine physiological responses in the young to attachment-activating situations. Rats, monkeys, apes, and human infants respond to separation with an increase in stress-related hormones (e.g., cortisol) and other physiological indicators of heightened stress (e.g., heart-rate acceleration) ([Hertsgaard, Gunnar, Erickson, & Nachmias, 1995](#); [Hofer, 1995](#); [Sroufe & Waters, 1977](#); [Suomi, 1995](#), this volume). Examination of the attachment figure's hormonal and physiological responses to caregiving situations would contribute to our understanding of the biological basis of caregiving.

Once the caregiving system is activated, the caregiver must "decide" whether and how to behave. The caregiver's behavior depends upon his or her conscious and unconscious evaluation of competing sources of information. One source of information is the caregiver's evaluation of the child's signals. Another source of information is his or her own perception of danger or threat. In the role of caregiver the parent must always be vigilant, scanning regularly for cues from these sources. From the caregiver's perspective he or she must then organize the various perceptions and select a response. Sensitive mothering has been given a central place in the etiology of secure attachment. Sensitive mothers have been defined as those who perceive and evaluate the child's cues appropriately and respond quickly and contingently ([Ainsworth et al., 1978](#)). The concept of sensitivity emphasizes caregiving behavior from the child's perspective.

Examining caregiving from the parent's perspective, we note that the parent has access to more information than the child, including a wealth of information drawn from his or her evaluation of the context and personal past experience (as a child and/or as a parent). In addition, especially in humans, the parent is cognitively more mature than the child and thus potentially capable of evaluating caregiving situations from multiple perspectives and in a more sophisticated manner. Of course, in some situations sophisticated cognitive involvement is not a necessary condition for caregiving behavior; that is, some behavior appears to be nearly automatic (e.g., blocking the child from stepping in front of a moving vehicle). As the child gets older, however, caregiving becomes more difficult. Consider, for example, situations in which the parent's caregiving system is activated but the child's attachment system is not. As parents who have "survived" their child's adolescence know, the parent's desire to protect his or her child is often in conflict with the child's desire for the parent to relinquish demonstrative protective behavior (frequently interpreted by the adolescent as parental control or intrusion). This conflict between parent and child behavioral systems is a major source of the arguments between teens and their parents. In this culture at least, it often behooves the parent to consider as many perspectives of the situation as possible (i.e., multiple perspective taking and metacognitive capabilities are involved) before deciding how or whether to take steps to protect their child. In sum, providing care is extremely complex, and ultimately, the information and affect that contribute to the parent's response has more to do with the internal organization of his or her caregiving system than with the child's cues or behavior. The child's cues activate the system. What happens next is influenced strongly by the parent's caregiving system.

#### The Caregiving System: Interaction and Competition among Behavioral Systems

According to ethological theory, behavior is the product of the interaction among behavioral systems (Hinde, 1982a). We propose, therefore, that another important step in defining the caregiving system is to examine the interaction between the parent's caregiving system and other behavioral systems that may compete with providing care for any particular child (Bowlby, 1969/1982; Solomon & George, 1996a; Stevenson-Hinde, 1994). This is true at the ultimate (functional) as well as at the proximate (psychological and physiological) level of analysis. Trivers (1974) pointed out that, from a functionalist's view, although parent and child have overlapping interests, that they also have inherent and inevitable conflicts. This point is fundamental to evolutionary analyses of successful adaptation (i.e., reproductive fitness) and is a point that has been lost in recent discussions of attachment and parental care (Belsky, this volume; Belsky et al., 1991; Solomon & George, 1996a). At the ultimate level, parent-child conflict is an especially important component of discussions of caregiving, because becoming a parent (having a baby or raising a child) is the defining condition of the parent's fitness (unless, as in some other species, the individual decides to become an "auntie," accomplishing reproductive success through a less direct pathway). Further, the child acts to protect his or her own survival and reproductive success, but parents' fitness depends on the fitness of all of their children. At the proximate level, conflict among behavioral systems is also an inherent part of caregiving. Parents' adult roles are both biologically and socially defined. When we consider parents' roles in terms of other behavioral systems, in addition to being a caregiver to one child, a parent may be a caregiver for other children, a friend (affiliative system), a sexual partner (sexual system), a worker (exploratory system), or a child to his other own parents (attachment system). We have noted elsewhere that just as the infant or child must seek a dynamic balance between

attachment and other behavioral systems (e.g., exploration, affiliation), a parent must strike a balance between his or her need to protect and care for the child and her need to pursue other goals ([Solomon & George, 1996](#)). As a consequence, the optimal caregiving strategy requires the parent to be flexible in relation to all his or her goals. In relation to the ultimate or functional level of causality, parental behavior is constrained or determined by environmental factors such as distribution of resources and environmental hazards ([Kaplan, 1996](#)). At the proximate level the parent is constrained by cultural and individual factors. Elsewhere we have detailed the ecological, developmental, and cultural constraints that may influence caregiving strategies ([Solomon & George, 1996a](#)).

Flexible care, i.e., a high level of involvement through toddlerhood followed by less direct supervision as the child matures, appears to be characteristic of all humans. This flexibility is founded upon the mother's ability to attend to and balance cues both from the child (including developmental cues) and the environment (including cultural press) in order to determine when protection is and is not needed ([Ainsworth et al., 1978](#); [Belsky & Isabella, 1988](#); [Isabella, 1993](#); [Solomon et al., in press](#)). Flexibility appears to contribute to selective advantage under difficult environmental conditions ([Kermorian & Liederman, 1986](#)). Under other conditions it may be more appropriate or more advantageous to the parent to develop alternative or compromise strategies that are manipulations of a primary behavioral system strategy ([Hinde, 1982b](#); [Hinde & Stevenson-Hinde, 1991](#)). With regard to the attachment system, [Main \(1990\)](#) has argued that security is the primary attachment strategy, and that avoidant and ambivalent attachment are conditional patterns that allow the child to maintain proximity to the mother. Following this thinking, we have proposed that mothers of avoidant and ambivalent children develop

alternatives strategies of care. Following this thinking, we proposed that culture with high levels of avoidant and ambivalent children promote alternative caregiving strategies (e.g., [Grossmann & Grossmann, 1990](#); Sagi, 1990; [Miyake et al., 1985](#)). Under conditions in which it is desirable from the mother's perspective for the infant to become precociously independent, providing care "from a distance" may be more advantageous. Under conditions in which it is desirable for the child to delay maturity, care that encourages physical and psychological closeness may be more advantageous (for a full discussion see [George & Solomon, 1996](#); [Solomon & George, 1996a](#); [Solomon et al., 1995](#); for an alternative view, see Belsky, this volume). In either case, conditional caregiving strategies afford the child some degree of proximity to the mother yet also leave the child somewhat more vulnerable than children whose mothers engage in flexible care. Distance care limits the mother's ability or desire to attend to her child and limits her accessibility; keeping the child close decreases the mother's need to attend to cues from both the child and the environment because she assumes her child is safe simply by virtue of its physical proximity to her. Based on the conditional strategies argument, we have proposed elsewhere that flexible care is the caregiving pattern associated with attachment security; similarly, we argued that distance and close care are patterns associated with avoidance and ambivalence, respectively ([Solomon & George, 1996a](#)).

The success of flexible, distance, or close proximity patterns of caregiving can be evaluated in terms of the relative costs and benefits to parent and child. A functional analysis of these patterns from the point of view of adult reproductive success is made difficult by the range of culture-specific factors that determine reproductive behavior, e.g., social scripts pertaining to sexual behavior, birth control, and parenting. If we are correct in assuming, however, that the

goal of caregiving is protection of the young, then a very broad range of caregiving strategies may be considered to be “good enough” to the extent that the mother’s behavior under conditions of risk or threat to the child is organized around protection. We will argue later that from this perspective, mothers of infants classified as avoidant and resistant as well as secure may be considered to be “good enough”. In contrast to these, we will argue, mothers of infants classified as disorganized may properly be labeled “disabled” as caregivers, because they intermittently or persistently abdicate their protective role. We acknowledge that our definition of “good enough” departs somewhat from what was originally intended by the term “good enough” (Winnicott, 1958) and from what is the common judgement about mothers of insecure children within the field of attachment, where maternal sensitivity is the yardstick by which caregiving is judged. We believe this view is supported indirectly, however, by accumulating evidence that disorganized attachment, in contrast to the organized secure, avoidant, and ambivalent patterns, is associated with pathological risk (Carlson, 1997; [Fagot & Kavanagh, 1990](#); Lyons-Ruth, 1996; Lyons-Ruth & Block, 1996; [Moss, Parent, Gosselin, Rousseau, & St-Laurent, 1996](#); Moss, Rousseau, Parent, St-Laurent, & Saintonge, in press; Solomon et al., 1995; Solomon, George, & Wallerstein, 1995 – for parallel findings in adults see, e.g., [Adam et al., 1995](#); Fonagy et al., 1995; Liotti, in press; West & George, in press).

In sum, our functional view in combination with the findings of attachment studies that include recent research focusing on attachment disorganization suggest that (1) distance and close caregiving patterns may be somewhat out of balance as compared with the flexible care that supports attachment security; however, (2) in the absence of other risk factors to the mother, the child, or the relationship, it is likely that these caregiving patterns contribute to the mother’s and

the child's fitness. One hallmark of our work is the suggestion that the field may benefit from considering these caregiving patterns (and the patterns of attachment associated with them) as "good enough." This view moves away from the position of early research and theory. We will return to the issue of "good enough" care later in this chapter.

#### A note about caregiving in mothers versus fathers

It is likely that interaction and competition among behavioral systems are somewhat different depending on the gender of the parent. Attachment research has focused on mothers and, although there is a smattering of research on fathers' behavior in relation to child attachment, no attention has been devoted to defining the caregiving system in relation to other behavioral systems for human fathers. Our emphasis in the remainder of this chapter, therefore, will be on mothers. Before leaving the subject of fathers, however, we note that the function of the caregiving system is protection and we have no doubt that fathers protect their young. It is likely, however, that the behaviors organized by the caregiving system and the contexts that activate the system differ for mothers and fathers. That maternal caregiving in humans and non-human species involves direct forms of care and protection has been well-documented. Descriptions of protection of the young by fathers in non-human primates are qualitatively different than those for mothers. Bowlby (1969/1982) noted that in some instances males may attack or threaten the infant when danger approaches, sending the infant fleeing to its mother. In gorillas, males provides protection more generally for the group as a whole (including the juveniles), signaling danger by chest beating or hooting ([Schaller, 1963](#)). Researchers have demonstrated that human fathers are perfectly capable of sensitive care, but like non-human primate fathers they remain less involved with their infants than mothers (Lamb, 1991). In

attachment research, behaviors associated with sensitivity as defined for mothers have not successfully predicted the infant's attachment security in the Strange Situation for fathers. Rather, security seems to be associated with paternal play and problem-solving interactions ((Belsky, 1993, Easterbrooks & Goldberg, 1984; Grossmann, 1997; Schneider-Rosen & Rothbaum, 1993). From a behavioral systems view, these kinds of father behavior may be expressions of the affiliative or exploratory behavioral systems rather than the caregiving system. In sum, the field is beginning to explicate the nature of father-infant interaction, but the nature of attachment and caregiving systems in the father-child relationship remains somewhat of a mystery.

### Ontogeny of Maternal Caregiving

#### Intergenerational Transmission?

As a reflection of the psychoanalytic roots of attachment theory, and in the absence of a broad biological and developmental view of caregiving, attachment theorists and researchers have emphasized caregiving as the developmental endpoint of early attachment experiences (Bowlby, 1969/1982; Bretherton, 1985; Sroufe & Fleeson, 1986). We have described this view as the assimilation model of caregiving (Solomon & George, 1996a). According to cognitive developmental theory, assimilation is the process by which new experiences and information are integrated into existing schemes; attachment theorists have suggested that under normal circumstances the caregiver integrates her experiences with the child into her mental schemes of attachment.

The assimilation model has been endorsed by a growing number of attachment theorists (Bretherton, 1985; Fonagy et al., 1995; Main, 1995; Main, Kaplan, & Cassidy, 1985; van

IJzendoorn, 1995). This model has long been accepted as the mechanism of intergenerational continuity in psychoanalysis (Fonagy, 1994, this volume). At first glance, the assimilation model appears to be supported empirically. Most researchers studying this phenomenon have reported a strong correspondence between mothers' representations of attachment and the quality of their infants' attachments to them (Ainsworth & Eichberg, 1991; Benoit, Parker, & Zeanah, in press; Benoit & Parker, 1994; Bus & van IJzendoorn, 1992; Crowell & Feldman, 1988; Fonagy, Steele, & Steele, 1991; George & Solomon, 1996; Grossmann, Fremmer-Bombik, Rudolph, & Grossmann, 1988; Haft & Slade, 1989; Main et al., 1985; Slade et al., 1995; van IJzendoorn, 1995; Ward, Botyanski, Plunket, & Carlson, 1991; Zeanah, Hirshberg, Danis, Brennan, & Miller, 1995). Concordances were seen as the product of direct transmission of mothers' representation of childhood attachment. According to the assimilation model, the mechanism for transmission across generations is maternal sensitivity. That is, based on her mental representations of attachment the mother responds to her infant's signals and thus contributes to the building blocks for her baby's attachment. Indeed, based on a recent meta-analysis of the extensive number of studies investigating some aspect of maternal sensitivity, de Woolf and van IJzendoorn (1997) concluded that maternal sensitivity, indeed, contributes to attachment security.

On the surface there appears to be strong evidence for the assimilation model and, without a doubt, the mother's representation of attachment contributes greatly to her interaction with her child. As we have discussed previously (Solomon & George, 1996), more careful examination of the data shows, however, that concordance between mother and child attachment is found predominantly for mothers judged secure. Concordance is lowest for insecure mothers, particularly where the mother is unresolved about early loss. In addition, looking more carefully

at the evidence supporting maternal sensitivity as the mechanism of transmission, de Woolf and van IJzendoorn noted that the correlations between sensitivity and attachment security are moderate at best. They concluded, “Sensitivity has lost its privileged position as the only important causal factor. A multidimensional approach of parenting antecedents should replace the search for the unique contribution of sensitivity” (p.32). Their statement echoes the voices of a small number of attachment researchers who have called for a contextual understanding of attachment, in particular examining characteristics of the mother, the family system, and the environment (e.g., [Belsky & Isabella, 1988](#); [Cowan, Cohn, Cowan, & Pearson, 1996](#); [Grossmann & Grossmann, 1990](#); [Jackson, 1993](#); [Miyake, et al., 1985](#); [Solomon & George, 1996a](#)).

#### Development of Maternal Behavior

The next step, then, in defining the caregiving system is to describe a contextual framework for caregiving. There have been contributions to such a framework from a variety of disciplines. Following Bronfenbrenner’s (1979) ecological systems theory, Belsky and his colleagues proposed a model of the “determinants of parenting” ([Belsky, 1984](#), this volume; [Belsky & Isabella, 1988](#); [Belsky, Rosenberger, & Crnic, 1995](#)) that emphasizes proximal contextual influences on attachment relating to the parent (e.g., personality), the child (e.g., temperament), and the context (e.g., the parent’s marriage). Fleming and Corter ([Fleming, Corter, & Steiner, 1995](#); [Cortet & Fleming, 1995](#)) described the similarities and differences associated with birth for rat and human mothers (see also [Polan & Hofer](#), this volume.) They described proximal factors that influence maternal behavior, including sensory (e.g., tactile stimulation of the young), biological (e.g., adrenal and ovarian hormones), and experiential (i.e., value of the mother’s experience with the young) influences. Similarly, [Keverne \(1995\)](#), emphasizing the remarkable

similarity across species of hormonal priming associated with pregnancy and birth, examined species differences in the neurological systems influenced by hormones and experience that maintain maternal behavior. [Pryce \(1995\)](#) has developed the only comprehensive model of mothering, including a discussion of the developmental pathways that could lead to the development of “good” and “bad” mothering (based on Cicchetti & Rizley’s, 1981, discussion of the sequelae of child abuse). Pryce stressed the importance of interacting developmental influences such as species and genotype, the mother’s neurobiological development, developmental history (including sensitive periods), and culture. In addition to the transaction between these childhood factors, he suggested that maternal behavior is also guided by adult influences such as hormonal changes, caregiving environment (e.g., social support, stress), characteristics of the infant, and “maternal motivation” (defined as the mother’s motivation to provide care based on the reward value of the baby).

Although the goals and caregiving dimensions described in these models differ, the general premise on which these models are based overlaps with the view presented here. Central to our argument is that the development of the caregiving system, and therefore caregiving behavior, is the product of a complex transaction among an array of biological and experiential factors. Following attachment theory, and similar to the position advanced by Pryce, we propose that the caregiving system has important roots in childhood as well as adult influences. Belsky, Fleming and Corter, and Kerverne confined their models to examining influences on the female once she has become a mother. And although Belsky and Pryce both suggested that their models add to the understanding of the development of the child’s attachment behavioral system, they differ from the view presented here in that these models do not examine mothering from the

perspective of a separate caregiving behavioral system. Further, although Pryce offered a comprehensive look at influences on caregiving, his discussion was not linked specifically to attachment research.

As the reader will recall, one basic tenet of a behavioral systems model concerns the development and integration of behavior over time. In the remainder of this section we outline ontogenetic factors beyond the mother's own attachment experience that we consider important to the development of the caregiving system. Some of these developmental influences have been considered briefly by other researchers as they are related to the development of maternal behavior (e.g., Fraiberg, 1980; [Sroufe & Fleeson, 1986](#)), but not in terms of their relation to the caregiving system. Our discussion here is an extension of our earlier work ([George & Solomon, 1989, 1996](#); [Solomon & George, 1996a](#)) and is influenced by the models of caregiving we described above. We consider the following discussion as work in progress and do not intend it to be a definitive statement on caregiving. Our primary goal is to stimulate future thinking about the development of the caregiving system.

### Factors Important to the Development of the Caregiving System

Childhood influences. All behavioral systems begin with immature forms of behavior that are integrated to become fully organized or "mature." Behavioral systems contribute to the individual's fitness, but they do not develop at the same rate or at the same time during the life course. Behavioral systems essential for the survival of the young (e.g., attachment, feeding) mature quickly. Behavioral systems important to later stages of development (e.g., caregiving, sexual) mature more slowly. Immature, isolated, and incomplete forms behavior associated with a behavioral systems can be observed before the system has reached maturity (see for example

Bowlby's, 1969/1982, description of the phases of attachment; see also, Marvin & Britner, this volume). Behavior resulting from immature systems also differs qualitatively from behavior resulting from mature systems. The stimuli activating immature behavioral systems are more varied than those that activate mature behavioral systems. Upon maturity the individual discriminates stimuli better and the system becomes organized, integrated, and goal-corrected (Bowlby, 1969/1982).

The caregiving system appears to be first expressed by isolated, immature, non-functional forms of care and affection, elements of which are observable at early ages in primates, including humans. For example, "play-mothering" is common among juveniles in primate species, especially females (Pryce, 1995). Throughout childhood and adolescence, human children typically express the desire to care for and the behavior associated with providing care when they are around babies or animals (especially baby animals), or playing with dolls. There are important differences, however, between play-mothering and mature caregiving. One difference is that in play-mothering the behavior is fragmented and behavioral sequences are incomplete (i.e., the child does not follow through in providing complete or satisfactory care). Another crucial difference is that the child's attention is easily distracted away from the baby (Pryce, 1995), which means that the child may place the baby in jeopardy.

Behavioral biologists emphasize that it is likely that maternal behavior in juveniles is cued not only by the presence of an infant, but also by the child's own experiences of maternal care (Pryce, 1995). Play-mothering does not occur, for example, in rhesus macaques who are isolated from their own mothers during the first year of life. Further, when these monkeys become mothers themselves, they fail to show normal preferences for their own infant over infants of

other females ([Pryce, 1995](#)). [Sroufe and Fleeson \(1986\)](#) and [Bretherton \(1985\)](#) have suggested that a child develops a sense of caregiving (specifically, mental representations of providing care) by his or her experiences with the mother.

Although there is no research on caregiving behavior during the middle childhood years (roughly ages 5-11), we expect that under child-rearing conditions in which the child does not assume primary responsibility for providing care and protection for siblings or their parents, the caregiving system matures gradually. In many cultures siblings take on major responsibility for care of siblings. In these contexts, mothers typically tutor and guide their older children in caring for younger ones. The degree to which this experience contributes to the early maturity of the child's caregiving system (i.e., to making it fully organized and integrated) is an empirical question.

Adolescence. We propose that the caregiving system begins a transformation toward maturity during adolescence ([Solomon & George, 1996a](#)). This view fits with the developmental perspective that adolescence is the period during which many characteristics in the child (e.g., physical, mental, self) mature into adult forms. [Fullard and Reiling \(1976\)](#) found that when given a choice between pictures of adults and infants, children between the ages of 7 and 12 preferred adults. A shift to adult-like preferences for pictures of infants was observed for girls ages 12 to 14 and boys ages 14 to 16. These shifts in preferences coincide with the average ages that girls and boys become capable of reproduction. It is likely that the adolescent transformation of the caregiving system is partly based on the biological changes associated with puberty. Kerverne (1995) noted that evolutionary biologists define parental care in terms of the biological capabilities of gamete production and placental development (i.e., the development associated

with puberty). In the evolutionary view, then, the transition to parenting would emerge at a younger age for most females (with the exception of young teens) than when parental care is defined from the psychological perspective (pregnancy and postnatal care). In girls, changes in the hypothalamus, pituitary, and ovaries result in menarche and are associated with dramatic changes in primary and secondary sexual characteristics, including ovulation and the production of adrenocorticotrophic hormones (ACTH). As we will describe in more detail below, given the influence of hormones on mammalian and primate mothering, we speculate that these changes may be a catalyst toward maturity of the caregiving system during adolescence. This transition is also influenced by experience. Stressful childhood experience, for example, may provoke the early onset of menarche ([Moffitt, Caspi, Belsky, & Silva, 1992](#)). With regard to actual mothering, in cultures like our own that discourage adolescent sexual behavior and pregnancy, the influence of cultural mores and taboos may override the girl's biological predisposition for a baby. It is our experience, however, that despite cultural pressures against adolescents having babies, many older adolescent girls (e.g., ages 17-19) suddenly reveal remarkable interest and thoughtfulness regarding mothering that extends beyond the intellectual knowledge of reproduction. During these later adolescent years, girls are often consumed by questions about whether or not they will be a good mother, how it is that a mother comes to love a baby, and what it would be like to be responsible for an infant.

Transition to parenthood. The caregiving system probably undergoes its greatest development during the transition to parenthood (pregnancy, birth, and the months following birth). Developmentalists conceptualize transition as a “crisis” or “bio-social-behavioral shift” that results from the transaction between unique biological, psychological, and social factors

([Cole & Cole, 1996](#); [Lee, 1995](#)). Our model of caregiving emphasizes a similar kind of qualitative shift during this period. At the biological level, this period for mothers is accompanied by intense hormonal and neurological changes that especially influence the hypothalamus and the limbic system ([Pryce, 1995](#)). For example, in non-human mammals (e.g., rats) ovarian steroids, such oxytocin, progesterone, and oestradiol, produced during this period have been shown to influence maternal behavior directed toward infants. In humans, maternal behavior may be more related initially to adrenal hormones (e.g., ACTH – related to attention of sensory systems) rather than ovarian steroids ([Fleming, et al., 1995](#)). Fleming proposed that hormones may have a similar important (though not exclusive) role in producing the sensory acuity, emotional calm, and closeness with infants in human mothers that has been demonstrated in animal mothers. Finally, researchers have noted an enormous upsurge in thoughts, doubts, and worries about the self as a parent, the spouse, and the past in this period, and an upwelling of anxiety that some have suggested is essential for a reorganization of the self ([Ammaniti, 1994](#); [Benedek, 1959](#); [Bibring, Dwyer, Huntington, & Valenstein, 1961](#); [Brazelton, 1981](#); [Cowan, 1991](#); [Deutscher, 1971](#); [Lee, 1995](#); [Liefer, 1980](#)).

The caregiving system has been shown to be influenced by the experience of childbirth itself, including the hormonal milieu and stimuli emanating from the young ([Bahr, 1995](#); [Fleming et al., 1995](#)). Rats and goats, for example, need contact with their young immediately following birth in order for the mother to accept the baby ([Klaus, Kennell, & Klaus, 1995](#)). Factors surrounding the baby's birth were once thought to be critical to mothering in human mothers as well, although the strong interpretation of these effects has now been tempered ([Klaus et al., 1995](#)). Providing human mothers with bonding experiences (i.e., the opportunity for extended

closeness and physical contact with her infant immediately following birth) has been found to enhance touching, kissing, talking to the baby, and nursing, especially for mothers at risk (e.g., those experiencing economic risk, high stress, unplanned or unwanted pregnancies). The mother's bonding experiences have not been found to be related to the child's attachment security later in infancy (Rode, Change, Fisch, & Sroufe, 1981). Manning-Orenstein (1997), however, found that the mother's birthing experience was significantly related to her representations of self as a caregiver. In this study, mothers who were assisted by a doula showed a significantly greater representational shift between the last trimester of pregnancy and the first trimester following birth toward caregiving security (associated with child attachment security), and away from rejection and helplessness (associated with child avoidant and disorganized attachment), than mothers who were assisted by a Lamaze coach. (We will discuss the relation between caregiving security and helplessness and child attachment in a later section.) Manning-Orenstein argued that the doula, as compared with the Lamaze coach, served as a "secure base" for the mother during this transition period that raised the mother's confidence in herself as a mother.

In our view, the degree to which childbirth and other influences associated with the transition to parenthood influences the caregiving system is a question that needs further investigation. The experiences that the mother brings to her baby's birth, her representation of herself as a caregiver, her interpretation of the birth experience, and her experience of the birth itself (e.g., miscarriage – Slade et al., 1995; premature birth – Steele & Steele, 1994; foster care – Dozier & Stovall, 1997; birthing technique – Manning-Orenstein, 1997) may be synergistic factors that together could influence (positively or negatively) the caregiving system for at least a subset of mothers.

The baby. Other factors that may influence the development of the caregiving system are associated with the baby itself ([Bell, 1968](#); [Crockenberg, 1986](#); [Fraiberg, 1988](#); [Sameroff, 1993](#)).

The baby has enormous power to evoke caregiving behavior. Lorenz (1943) suggested that the physical features of “babyhood,” a combination of the prominent features of the infant (e.g., rounded, oversized head; large eyes), evoked caregiving behavior in adults. In addition to physical attractiveness, Suomi (1995) noted that neonatal behavioral, perceptual, and social biases, including distinctive emotional expressions, make human infants and their closest primate relatives (Old World monkeys and apes) attractive to any caregiver. In humans, adults, particularly women, prefer pictures of infants over pictures of adults ([Fullard & Reiling, 1976](#)).

Physical abnormalities in the baby can elicit maternal rejection and neglect. Babies perceived by their mothers as unattractive receive less attention than attractive babies ([Langlois, Ritter, Casey, & Sawin, 1995](#)). Infants with physical malformations are often rejected, and in other species or in other cultures or historical periods in humans, killed or abandoned ([Langlois, 1988](#)). Infant cues and proximity have been shown to influence patterning of behavior and the mother's motivation to respond in rats and humans. In rats, the pup's odor (chemosensory cues) appears to be an attractant for the mother. The stimulation of touching the pups produces retrieval behavior and lactation. Human mothers recognize and prefer their own baby's cries and odors, and their baby's vocalization elicits affectionate behavior and instrumental caretaking ([Fleming et al., 1995](#)). [Anisfeld, Casper, Nozyce, and Cunningham \(1990\)](#) found that physical contact with the infant by using a soft baby carrier, as compared with an infant seat, was associated with increased sensitivity in early infancy and attachment security at one year.

It is likely that the influence of the baby on the caregiving system is part of a feedback loop,

i.e., is transactional, rather than linear and unidirectional. The activation of the caregiving system, and resulting caregiving behavior elicited by the baby, appears to be influenced heavily by other factors associated with the mother, including, as we discussed earlier, her own representations of attachment. The mother's perception of her infant and their relationship appears to be a more important factor than any single quality in the baby ([Egeland & Farber, 1984](#); [Pianta, Marvin, Britner, & Borowitz, 1996](#)), and we believe that her perception of the infant is influenced by her caregiving system. Temperament (the infant's emotional reactivity, degree of psychomotor arousal, and capacity for regulation) does not appear to have a direct influence on whether or not a baby will develop a secure attachment to the mother (Belsky & Rovine, 1987; Vaughn & Bost, this volume), although some researchers have found irritability or neurological difficulties in the baby associated with ambivalent ([Cassidy & Berlin, 1994](#); Vaughn & Bost, this volume) and disorganized infants (Spangler, Fremmer-Bombik, & Grossman, 1996; Spangler & Grossmann, in press).

The notion of the importance of this feedback loop for the mother-infant relationship is supported by the results of some intervention studies. Suomi (1995) reported that when temperamentally reactive or behaviorally inhibited rhesus monkey infants were reared by highly nurturing foster mothers, these infants developed "secure" relationships; when infants with similar reactive temperaments were raised by punitive foster mothers, they developed "insecure" relationships. The attachment that developed between foster mother and infants for temperamentally uninhibited infants, on the other hand, seemed to be little affected by the type of foster mother. The results of this research suggest that the mother-infant transaction was especially important for fragile infants. In humans, the transaction between mother and infant

behavior has been examined in the context of clinical interventions aimed at changing the mother's behavior. Intervention that teaches the mother to be more sensitive to her baby has had some short term success (see van [IJzendoorn, Juffer, & Duyvesteyn, 1994](#), for a review). van den Boom (1994) found that enhancing maternal sensitivity and responsiveness in mothers with irritable babies increased security of attachment at 12 months as compared with irritable infants whose mothers received no intervention. Intervention studies concentrating on changing the mother's mental representation of attachment have been less successful. This form of intervention may require more time, that is, have a "sleeper effect" (van [IJzendoorn et al., 1994](#)). It appears that strategies that emphasize immediate changes in the mother's perceptions and behavior may be the most effective place to begin intervention. We will return to this issue specifically with regard to the caregiving system at the end of this chapter.

Social contextual factors related to providing care. Social-contextual variables such as the extent of the mother's satisfaction with her social support network, her marriage, or economic factors, can either support or compete with her ability to focus providing care for her child. These factors have been found by some researchers to be related to the quality of the parent-child relationship (Anisfield et al., 1994; [Belsky, Gilstrap, & Rovine, 1984](#); [Belsky et al., 1995](#); [Cowan, Cowan, Heming, & Miller, 1991](#); [Diamond, Heinicke, & Mintz, 1996](#); [Kerig, Cowan, & Cowan, 1993](#)).

In our view, it is likely that the mother's partnership with the baby's father or another co-parent may especially influence her ability to provide care (see also [Gable, Belsky, & Crnic, 1992](#)) From a behavioral systems perspective, the parent's partner can enhance or compete directly with the ability or desire to be caregiver. Marital satisfaction, in and of itself, has not

been found to be a strong predictor of child attachment with the mother (Belsky et al., 1995)

Other aspects of the marriage may, however, influence child attachment and maternal caregiving.

In our research we have been interested in particular in parental conflict and communication patterns. We found in our recent study of infants of divorce that mothers' reports of high parent conflict and low communication with the baby's father was related to the baby's attachment insecurity with the mother, especially attachment disorganization ([Solomon & George, 1996b; 1997; Solomon, George, & Wallerstein, 1995](#)). Our analyses of the mothers' caregiving interviews, and interview that asks the parent to describe her experiences with the child and her view of herself as a caregiver ([George & Solomon, 1989, 1996](#)), showed that relationship conflict was sometimes the product of the father's inability or unwillingness to participate in a caregiving partnership. In some of the more severe cases in our sample the father blocked the mother from providing care and protection for the baby.

The importance of the marital context to the mother's capacity to parent has also been demonstrated in the Cowans' studies of the family system. These investigators examined the links between the mother's and the father's adult attachment representations, marital quality, and the child's development. Overall their studies showed that quality of marital interaction and the father's AAI classification were related to the child's adjustment to school. They found that both secure and insecure women functioned better as wives and mothers when they were married to secure men ([Cohn, Silver, Cowan, Cowan, & Pearson, 1992; Cowan, Cohn, Cowan, & Pearson, 1996](#)). In other words, a secure husband appeared to buffer the mother, regardless of her own attachment status, from personal distress, marital dissatisfaction, and poor interactions with her child (lack of warmth and controlling parenting style). Our caregiving-system

interpretation of these findings is that the secure partner provides a “secure base” for the mother.

It is likely that the secure partner participates in a caregiving partnership by not placing other conflicting demands on the mother and drawing her attention away from the child, allowing her to take care of other competing needs, and participating to some degree in caring directly for the child. Finally, it is also likely that the secure partner is the mother’s “haven of safety” – i.e., the one to whom she turns when her own attachment system is aroused (see also [Berman, Marcus, & Berman, 1994](#)).

### Representational Models of Caregiving

According to ethological theory, behavioral systems are regulated in the mind by working cognitive models that evaluate, emotionally appraise, and organize the organism’s real-life experience (Bowlby, 1969/1982). These models are updated and reworked to achieve internal consistency and are available for use in novel situations or as the basis of future plans. Since Main, Kaplan and Cassidy’s (1985) expansion of the concept of mental representation over a decade ago, the definition and nuances of representational models of attachment are well-known and do not require elaboration here (see also which? \*\*\* chapters, this volume).

If the caregiving system is a behavioral system in its own right then it should be guided by a set of representational schemes related to providing care. In our work we have sought to define the representational schemes of the caregiving system as assessed from a semi-structured caregiving interview ([George & Solomon, 1989, 1996](#)). Briefly, we found that mothers of secure children were best characterized as flexible in their mental representations of caregiving. Mothers of secure children were positive and realistic about potential threats to child security as they responded to questions that asked them to describe themselves as parents, their child, and

their relationship. They evaluated caregiving in relation to the situation, the child's personality and developmental needs, their child-rearing goals, and their own needs. Their responses to questions were forthright and did not appear to reflect any predominant form of defensive processing.

Mothers of avoidant and ambivalent children appeared to have developed conditional representational models of caregiving. Mothers of avoidant children described strategies of protecting the child from a distance (a conditional strategy we described earlier from a functionalist perspective), guided at the representational level by mild rejection. They evaluated the self and child as unwilling and unworthy individuals and emphasized the negative aspects of their interactions. The most discriminating feature that set mothers of avoidant children apart from mothers of children in other attachment groups was the quality of their defensive processes in response to our interview. Mental representations of rejecting mothers were characterized by cognitive deactivation. Mothers dismissed or devalued their child's attachment needs, thus deactivating their caregiving system. They never, however, abandoned their role in providing care and protection. In contrast to mothers of avoidant children, mothers of ambivalent children were characterized by their behavioral and representational uncertainty. They described strategies to keep the child close (a conditional strategy we also described earlier from a functionalist perspective), promoted dependency, and appeared insensitive to child cues. In terms of defensive processes, the mental representations of uncertain mothers were characterized by cognitive disconnection, as revealed by their inability to integrate positive and negative, good and bad, desirable and undesirable. This mental position appeared to leave them confused, and as a product of their uncertainty their caregiving appeared to be heightened but somewhat ineffective.

Now that we have described the mental representations of caregiving associated with flexible, rejecting, and uncertain mothering, we return to examine our proposition that these three caregiving groups are associated with “good enough” protection and care. The reader will recall that, when viewed from a behavioral systems framework, maternal behavior is not only the product of activation and termination of the mother’s caregiving system, but also the mother’s integration of her own and the child’s competing behavioral systems. At the representational level, we found that the hallmark of caregiving associated with attachment security (flexible care) was the mother’s commitment to finding a way to integrate and balance her own behavioral systems (i.e., her multiple roles and own attachment needs) with those of the child ([George & Solomon, 1989, 1996](#)). Mothers described how often this balancing act was very difficult to achieve, and many mothers of secure children in our samples reported situations that made them unhappy or distressed (i.e., security is not a synonym for happiness). In particular, mothers in the infant divorce sample described tremendous stress associated with conflicting goals and great difficulty reaching a satisfactory resolution. What stands out in their interviews, however, is that this conflict was resolved through finding some acceptable balance.

What was apparent in the interviews of rejecting and uncertain mothers was the degree to which they were successful at the representational level in establishing approximations of behavioral system integration, although their emphases when evaluating contextual cues and their own and the child’s behavior appeared to be somewhat out of balance. Rejecting mothers were, under some circumstances, unwilling to integrate fully cues that would activate their caregiving system and require immediate provisions of care. For example, one mother put several “distance” caregiving strategies into place, including providing swimming lessons and putting

the child's older sibling in charge rather than staying in proximity when the child was in the pool.

They emphasized the self and their own needs and desires over those of the child. They described investing more time and energy in their perceived role as caregiver than in responding to their child's actual attachment cues. For example, rejecting mothers often reported that mothering was the most important "job" that they could ever have, yet they would interpret their child's hurt or distress as attempts at manipulation (note, however, that they were not oblivious to the child's cues). They also stressed the importance of activities and goals associated with other behavioral systems (e.g., relationship with romantic partner) over their caregiving system. Uncertain mothers tended to over-emphasize caregiving and over-interpret their child's attachment cues. They emphasized the child over the self, sacrificing the goals of other behavioral systems to caregiving and the child's attachment. These mothers, for example, were so concerned with their availability to the child that they deliberately scheduled their employment hours or errands to occur when the child was in school or asleep. Although out of balance, as compared with the mothers we describe in the next section, mothers in both groups emphasized providing some degree of care and protection for their child.

#### The Disabled Caregiving System: Abdication of Care, Helplessness, and Disorganized Attachment

In contrast to mothers of children with organized attachment, we found abdicated caregiving to be characteristic of mothers of disorganized and controlling children ([George & Solomon, 1996](#); [Solomon & George, 1996a](#)). These mothers evaluated themselves as helpless to protect their child (and often themselves) from threats and danger; their discussion of caregiving and the child brought out strong themes of inadequacy, helplessness, and losing control. The majority of

mothers in this group described how they lacked effective and appropriate resources to handle caregiving situations. In some instances this was due to their perception of the self as being totally ineffective or unable to find or utilize resources. In other instances they described attempts to provide care that they felt were blocked by other individuals, or by the circumstances at hand (e.g., court-imposed visitation with a father the mother does not trust – Solomon et al., 1995). These mothers also described themselves as helpless to provide assurance for their frightened child. As a result, at the behavioral systems level these mothers were markedly out of balance (i.e., dysequilibrated); at the representational level these mothers portrayed themselves as being out of control or desperately struggling to remain in control of themselves, the child, or the circumstances.

For most mothers, descriptions of their child generally paralleled descriptions of the self. The child was described as being out of control – for example, wild, acting like a “maniac,” strong willed, defiant, or hysterical, and the self as helpless to combat or organize the child’s behavior. Some mothers, however, viewed their child as completely opposite of the self, as precocious and amazingly in control of the situation or of others. In particular, the child was described as especially sensitive (e.g., a skilled caregiver, adultified) or as possessing extraordinary gifts or qualities. We viewed these mothers as abdicating care because, as a product of the child’s caregiving, role reversal, or special gifts, mothers interpreted their own caregiving to be relatively unimportant or ineffective. In addition, it was clear that for some of these mothers their concerns for themselves overshadowed caring for the child; and often, oblivious to the needs of the child, these mothers appeared relieved that the child was so advanced that it could care for itself. Finally, for some mothers, caregiving and control were not in the forefront of their thinking

because of their “special” understanding or relationship with their child. These mothers described the child and the self as psychologically merged (“I am one with this child”); thus behavior and thought regarding providing care for the child were based on evaluations of the self. In short, all of these mental representations reflected a caregiving system that had been disabled by the mother’s helplessness (Solomon & George, 1996a).

In contrast to the interviews of mothers of insecure-avoidant and ambivalent children, the interviews of mothers of disorganized children failed to reveal any predominant defensive processing strategies. Rather these mothers described their own extreme behavioral reactions or feelings of impotence or constriction, and their inability to select, evaluate, or modify their own behavior or that of their child. Evaluations of the self or child as helpless were often associated with strong emotions and affective dysregulation, and they evaluated themselves as unable to control affect.<sup>2</sup>

We propose that abdication disables the caregiving system, and the result is a disorganized and dysfunctional form of providing care (Solomon & George, 1996a).<sup>3</sup> Under some circumstances it may be in the mother’s best interest to abdicate care. Under extreme conditions the mother may abandon or kill her infant ([Clutton-Brock, 1991](#); [Miller, 1987](#); [Scheper-Hughes, 1987](#)), but these forms of physical abdication are relatively rare, may interfere with the mother’s reproductive fitness (exceptions include when the mother finds a better mate), and in our own culture are considered pathological. Of particular interest to us is a subset of mothers who do not dispose of their infant but who nevertheless abdicate their caregiving system, thus leaving their infant or child without adequate care or protection. For these mothers, when the caregiving system is disabled, the mother’s attachment and caregiving systems are dysequilibrated. This

means that these reciprocal behavioral systems fail to mutually inform each other, and the caregiving system fails to mediate between the mother's own attachment system and that of the child's. As a result, the mother experiences caregiving and her relationship with the child in terms of profound helplessness and fear. This picture of relationship disorganization is supported not only by our caregiving data, but also by representational studies of attachment in children and adults. Disorganized children depict the self and attachment figures as helpless, threatening, or out of control (Bretherton, Ridgeway, & Cassidy, 1990; Kaplan, 1995; Solomon et al., 1995); unresolved adults portray themselves and others as isolated, threatened, unprotected, and unable to contain or prevent danger (George, West & Pettem, in press).

In sum, evidence from representational studies of caregiving and attachment suggests that there is every reason to believe that these mothers are afraid, although the mother need not be constantly preoccupied with or consciously aware of her fear. [Main and Hesse \(1990\)](#) suggested that the mother's fear, specifically as expressed by frightening or frightening behavior toward the infant, that causes attachment disorganization. Recent studies have begun to find some empirical support for this hypothesis (see Lyons-Ruth & Jacobvitz, this volume). We have proposed, however, that in order to fully understand attachment disorganization, mother-child interaction must be also examined from the perspective of the caregiving system (Solomon & George, in press). Based on this perspective, two guiding caregiving-related questions system emerge: What is the mother afraid of? And what is it about the mother's caregiving behavior that frightens the child?

We suggest that the mother is afraid of her own profound helplessness, a helplessness that may be the product of overlapping fears. She may be afraid for the safety and protection of

herself and/or her child. She may also fear losing control of her emotions and her behavior, and/or of circumstances or people (self, child, or others) that threaten her fragile resources. Determining the immediate causes of the mother's fear – that is, the situational cues that elicit the mother's fear in the moment– is more difficult; they are likely to be very idiosyncratic and related to her own childhood and/or current experience. Unresolved childhood loss and trauma have been linked to attachment disorganization (Ainsworth & Eichberg, 1991; [Main & Hesse, 1990](#); [Manassis, Bradley, Goldberg, Hood, & Swinson, 1994](#)); however, research is needed to examine how lack of resolution is linked explicitly to a mother's fears and helplessness. In addition to childhood trauma, we propose that the mother's caregiving system may be immobilized because she is afraid of the challenges raised by a particular child or circumstances (Pianta et al., 1996; Solomon, George, & Wallerstein, 1995). Irrespective of the source of her fear, because fear is associated with increased stress and arousal, and hypervigilance (Perry, Pollard, Blakley, Baker, & Vigilante, 1995), we believe that to isolate the particular features of interaction that lead to attachment disorganization it is necessary to observe mother and child under stressful circumstances, specifically, situations that threaten the mother's ability to manage (regulate) either her child's negative affect or behavior or her own.. Our data suggest that mothers of disorganized children can sometimes provide organized protective care (Solomon et al., in press), and under some circumstances, they evaluate themselves as effective. Observations of mother-child interaction under low stress conditions have failed to differentiate between organized and disorganized groups (Scheungel, van IJzendoorn, Bakersman-Kranenburg, & Blom, in press; [Stevenson-Hinde & Shouldice, 1995](#); Solomon et al., in press) as compared with observations of mother-child interaction under more stressful circumstances (Jacobvitz, Hazen,

& Riggs, 1997; Stevenson-Hinde & Shouldice, 1995). Links between stress and helplessness (and therefore, disorganization) have also been found in studies directly measuring parental stress. Parents who reported high levels of helplessness (as assessed by measure derived from our helplessness rating scale) also reported attributions of severe daily stress (Magana, 1997) and marked post traumatic stress symptoms (Coulson, 1995). Thus, the mother's fear must be understood in the context of those stressful events or cues that dysregulate her and leave her feeling vulnerable, unprotected, and helpless.

In order to explain what in the mother's behavior frightens the child, let us examine the chain of events that we propose is likely to prevail during mother-child interaction in disorganized dyads. Hypervigilant and lacking robust, organized defenses, the mother is susceptible to being overwhelmed by helplessness and fear as the result of cues from the baby, the environment, or perhaps from within (e.g., being flooded by cognitively closed affect). This state of panic or helplessness is disabling to caregiving because it renders the mother herself closed (impermeable) to the child's attachment cues. Thus, the mother is not able to care for or respond to the child needs or distress for some of time. Importantly, from a caregiving-system perspective, we stress that what frightens the child is the mother's simultaneous abdication of care and impermeability to the child's cues or bids for care. As has been suggested by Main and Hesse, in her frightened state, the mother may also exhibit fear behavior. Following Perry and his associates (1995), the mother's fear would be expressed through one or many of the following classes of fear behavior: freezing, flight, and frightened facial expressions or movements. These behaviors may, in and of themselves, frighten the child or the child may be frightened by the mother's extreme unresponsiveness. In either case the child's attachment system is activated and

a parallel chain of events is then set in motion. The child becomes hypervigilant, and potentially frightened and disorganized, depending on its evaluation of the mother's availability. The child's evaluation of the mother and resulting behavioral (and relationship) disorganization reflects its individual history of interaction with the mother and developmental status. Behavioral constriction, hypercompliance, flight, freezing, defiance, dissociation, disorientation, numbing, or aggression are all possible reactions (see [Perry et al., 1995](#)). Note that some of these fear behaviors have been described to be characteristic of children judged to be disorganized in the laboratory or thought to be disorganized due to experiences with the parent (e.g., [George & Main, 1979](#); [Main & Cassidy, 1988](#); [Main & George, 1982](#); [Main & Solomon, 1990](#)). As the product of fear and the mother's impermeability, the child's attachment system becomes closed and the child's desire and ability to seek protection and care from the mother (even if she should try to provide care) are blocked. Mother and child are left simultaneously vulnerable, mutually impermeable, helpless, and afraid, and leading to a dialectic cycle of failed protection. We propose that it is under conditions of failed protection – that is, abdication of the caregiving system – that the mother fails to provide “good enough” care for the child.

### Conclusions and Implications

We believe that by focusing on the attachment system alone, the field has missed important insights into the child-parent relationship that emerge only when the caregiving system perspective is added; indeed, this chapter was dedicated to describing those contributions. Attachment researchers, and more broadly developmental psychologists and psychoanalysts, have approached mothers historically as a “variable.” Maternal behavior has been carved into an almost infinite list of qualities and behaviors. Attachment theorists have described mothers, for

example, as sensitive, rejecting, accepting, intrusive, or frightened. In this chapter we argued that what is needed to understand caregiving is to move from the level of the mother as “variable” to seeking to understand the mother as an individual in her own right. Mothers as individuals represent a complex interplay of developmental factors and challenges, including, as we emphasize in this chapter, an integration of competing behavioral systems.

What is added to our understanding of maternal caregiving and attachment by adding the lens of the caregiving behavioral system? We propose that this lens has important implications for understanding the development of caregiving behavior throughout the life span and we have made specific suggestions for future research throughout this chapter. We now consider a major clinical implication of this view of the caregiving system.

The caregiving system provides clinicians with a powerful tool -- framing maternal behavior and perceptions of her child in terms of protection. The mother’s desire and ability to provide protection are the central organizing feature of the child’s attachment. Behavioral interventions usually focus on changing the mother’s “bad” behavior. Further, as we discussed earlier, attachment theory, and therefore intervention, has assumed that maternal sensitivity is the strongest determinant of attachment security. Captivated by this concept, the field has focused on getting mothers to be more sensitive to their child in a variety of interactive settings (e.g., play, problem-solving, or feeding) and has strayed away from the type of sensitive interaction that is fundamental to attachment, sensitivity to the child’s needs for protection. Even mothers with very traumatic and disturbed attachment histories are strongly motivated to protect their child (Fraiberg, 1980). In our experience, mothers with serious intellectual, behavioral, or adjustment problems, who may not be able to benefit immediately from insight oriented therapy

or some forms of didactic parent education, have been able to understand what it means to provide or fail to provide protection for their child. Attachment theorists are beginning to suggest that there may be other ways to influence mother-child attachment. We propose that one powerful influence that has been overlooked is intervention organized around the framework of the caregiving system, that is, the mother's evaluation of the self as effective in providing protection for her child.

#### Footnotes

1. A good question is raised here as to whether other maternal caregiving behaviors, also central to the baby's survival, may be considered "a part" of this system: e.g., nursing, cleaning, behavioral thermoregulation, "affectionate" behavior, grooming/licking/washing. Whether or not these behaviors are included, it is clear that a much wider variety of maternal behaviors can and must be brought to bear (organized) to serve the goal of protection, especially when the infant is immature and immobile.
2. One might expect that the interviews of these mothers to resemble the AAI discourse patterns of lack of resolution since the Unresolved (U) adult attachment group appears to be the adult form of child disorganization (George & West, 1997) and lack of resolution is seen as one of the major caregiving contributions to disorganized attachment ([Main & Hesse, 1990](#)). The hallmark of lack of resolution is an individual's inability to monitor discourse or reasoning. Interestingly, these monitoring-related features of thought were not found when mothers of disorganized/controlling children described their caregiving, despite the fact that many of them were classified unresolved with respect to loss on the AAI ([George & Solomon, 1996](#)). We see this as evidence that further supports our view that the mother's thinking about her

caregiving and her attachment experiences are regulated by separate representational models for the attachment and caregiving behavioral systems.

3. Dysfunction as associated with attachment disorganization has only been defined to date in terms of developmental or mental health risk. Dysfunction from a functionalist view (i.e., in the environment of evolutionary adaptedness) would take into consideration caregiving that undermines the mother's adaptive fitness.

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