

INTRODUCTION

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Attachment theory (Bowlby, 1969, 1973, 1980) emphasizes the importance of a secure attachment relationship between care-giver(s) and child for socio-emotional development throughout life. Thus far, empirical research has borne out this supposition. The relevance of attachment theory to cognitive development and education is a relatively new area of interest. This issue presents theoretical and empirical contributions on this topic.

De Ruiter and van IJzendoorn present a brief review of attachment theory and recent developments in this area of research. Subsequently, the extant research literature on the relationship between attachment and cognitive development is reviewed, with special emphasis on exploratory and problem solving competence, parental teaching styles and high-risk samples. The chapter concludes with the presentation of a heuristic model of the relationship between attachment and cognition. The authors propose that a secure attachment, relative to an insecure one, has several positive influences on the child's academic development: increased willingness to cooperate with teachers and peers, increased mastery motivation, higher self-esteem, and lower test anxiety.

Grossmann and Grossmann focus on the role of emotion regulation in cognitively challenging situations. They propose that the internal working model of attachment serves as an emotional appraisal system, which they illustrate with findings gathered with the Adult Attachment Interview. Further, they provide empirical evidence that failures in emotion regulation in young children negatively influence cognitive performance in stressful situations.

Moss, Parent, Gosselin and Dumont provide an integration of the theoretical work of John Bowlby and Lev Vygotsky, thereby offering a conceptual basis for understanding the developmental interdependency between (meta-)cognitive and socio-affective processes. The authors present data from a study that compared collaborative styles of securely and insecurely attached mother-child dyads during the preschool period. Mothers of securely attached children were more inclined to verbally monitor and evaluate their children's activity in a task situation, while secure preschoolers showed more advanced development in the use of metacognitive strategies during collaboration.

Bus provides an integrative review of her research on the relationship between attachment and emergent literacy. She has found that the quality of attachment between mother and child affects the quality of assistance of the mother during interactive reading sessions. Also, securely attached dyads spend more time reading and the reading interactions are more rewarding. Finally, it could be demonstrated that secure preschoolers showed more advanced emergent literacy skills. These findings

support the notion offered by Moss and her colleagues in the previous chapter, that socio-affective and cognitive processes in development are interdependent.

Takahashi reports on a study in which mothers and their preschool children performed a referential communication task. Attachment security was studied in relation to the mother's tendency to control the child's task-irrelevant behaviors and errors in decoding. In contrast with the previous chapters, attachment security was assessed by the mother's perception of the child's relationship to her, and not with the Strange Situation. The author found that mothers of securely attached children tended not to control their child's off-task behaviors and that their children made more errors in decoding. She suggests that the discrepancy with findings from studies with Western children may be due to cross-cultural influences.

The chapters in this issue attest to the fruitfulness of the theoretical and empirical integration of attachment theory in studying cognitive development. Affective and motivational components, as revealed in the quality of internal working models of attachment, can have an impact on cognition and learning. Future research could extend the reach of the current approach into the school years, and focus more directly on the relationship between attachment and educational issues.

CHAPTER 1

ATTACHMENT AND COGNITION: A REVIEW OF THE LITERATURE

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Abstract

This chapter provides a review of the empirical literature on the relationship between the quality of attachment and cognitive development. First, a brief review of attachment theory is presented and the influence of the attachment bond between care-giver and child on the child's cognitive development is examined theoretically. Subsequently, the empirical literature is reviewed, focusing on exploratory and problem-solving competence, parental teaching style, metacognition and high-risk samples. Despite a number of caveats, the authors conclude that the findings of the research reviewed are promising. At the close of the chapter, the authors present a heuristic model of the relationship between attachment and cognition, which points to possible directions for future research.

Introduction

In this chapter we will review the literature pertaining to the role of the quality of the first attachment relationship between child and care-giver in the cognitive development of the child. The term "cognitive" is very broad and includes such diverse phenomena as intelligence, memory, reasoning, attention, language, and metacognition. These phenomena cover the range from nonconscious to conscious, from automatic to strategic processes (Williams, Watts, MacLeod, & Mathews, 1988). Our review is limited to studies that have examined attachment security as measured from the viewpoint of attachment theory in relation to a wide range of cognitive processes, such as reasoning, attention, and language. Studies that have examined cognitive development in relation to the general affective climate in the care-giver-child relationship have been omitted,

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because limiting our review to research on attachment theory provides an appraisal of the value of attachment theory in explaining individual differences in cognitive development.

Attachment Theory

Attachment theory is a theory of human social-emotional development. John Bowlby (1969, 1973, 1980) maintains that the human infant is endowed with an "attachment behavioral system," with which it ensures the proximity of primary care-givers (or "attachment figures"). Attachment behaviors include crying, reaching, smiling, and crawling. According to Bowlby, attachment behavior is evolutionary adaptive behavior, because it has ensured protection from predators in our "environment of evolutionary adaptedness." He has also mentioned the possibility that it allows the infant to learn various necessary survival skills from its attachment figure(s) (Bowlby, 1969/1989, p. 224).

On the basis of regular interaction with its attachment figure(s), the infant develops a mental representation of this (these) relationship(s). Bowlby (1973, 1980) termed these mental representations "internal working models," thereby emphasizing their dynamic ("working") nature (see also Crittenden, 1990). With increased cognitive ability, the models become increasingly sophisticated. Mary Ainsworth was the first to recognize individual differences in attachment behavior and internal working models of attachment relationships in 1-year-old infants (Ainsworth, Blehar, Waters, & Wall, 1978). She developed a laboratory procedure, the so-called Strange Situation, which exposes the infant to increasing levels of stress. The child's attachment behavior system is activated by exposing the child to an unfamiliar playroom, interaction with an unfamiliar adult, and two brief separations from the child's attachment figure. The infant's behavior during the two reunions with the attachment figure reveals the status of its relationship with the attachment figure. Ainsworth *et al.* (1978) distinguished three types of attachment: secure (also called B), anxious-avoidant (A), and anxious-ambivalent (C). Subsequent research has revealed a fourth type: anxious-disorganized (D; Main & Solomon, 1986, 1990).

Securely attached infants are characterized by seeking proximity to the attachment figure upon reunion. When distressed by the separation, they are relatively quick to recover and resume their exploration of the toys and room. Ainsworth (1973) coined the term "secure base from which to explore" to describe the role of the attachment figure for a securely attached infant. Infants who are anxious-avoidantly attached to their care-giver display avoidant behavior at reunion. The avoidance might be displayed by averting the face or diverting attention to the toys. With these infants, the attachment-exploration balance is tilted heavily toward exploration. However, the quality of their exploration is often low compared to secure children's exploratory behavior (see below). Anxious-ambivalently attached infants show a mixture of seeking proximity and resistant, angry behavior toward the attachment figure upon reunion. Sometimes they are difficult to soothe, and are generally slow to resume exploration again. In this case, the attachment-exploration balance leans considerably towards the attachment-side. Anxious-disorganized infants display the absence of a consistent

strategy for dealing with the stress induced by the Strange Situation procedure. For instance, they may demonstrate a combination of avoidant and ambivalent behavior, or disorganized behavior (e.g., freezing, stereotypic behavior). Several studies have documented the stability of these various internal working models of attachment over time, at least in middle class samples (Main, Kaplan, & Cassidy, 1985; Waters, 1978).

In her pioneering Baltimore study, Ainsworth related the three types of attachment then recognized to individual differences in care-giver behavior towards the infants (Ainsworth *et al.*, 1978). During intensive home observations in the first year of life, she found that mothers of secure infants were generally more sensitive and responsive to their infants' signals than mothers of anxiously attached infants. Mothers of avoidantly attached infants were the most insensitive and tended to dislike physical contact with their infants. The mothers of the ambivalent children were inconsistently responsive and somewhat inept in their care-giving role. Subsequent independent research has confirmed the finding that mothers of securely attached infants are more sensitively responsive than mothers of anxiously attached infants (Grossmann, Grossmann, Spangler, Suess, & Unzner, 1985; Smith & Pederson, 1988). Few studies have focused on the difference between care-givers of the avoidant and ambivalent categories. Those that have generally found that mothers of anxious-avoidant infants are characterized by an intrusive and interfering care-giving style (Smith & Pederson, 1988; Isabella, Belsky, & Von Eye, 1989; Lewis & Feiring, 1989; Isabella, 1990). Mothers of ambivalent infants tend to be understimulating (Belsky, Rovine, & Taylor, 1984). Since the anxious-disorganized attachment category has only recently been documented, research into its antecedents is scarce. Main and Hesse (1990) have hypothesized that this attachment type may be the result of frightened or frightening behavior on the part of the attachment figure. Such behavior is thought to be the result of unresolved grief due to loss or trauma.

Research into the antecedents of the different attachment types has recently received a new impetus due to the development of the Adult Attachment Interview by Mary Main and colleagues (AAI; George, Kaplan, & Main, 1984; Main *et al.*, 1985; Main & Goldwyn, in press). This interview allows classification of the internal working model of attachment in adolescents and adults into four categories (Dismissing, Secure, Preoccupied, Unresolved). The interview focuses on the subject's mental representation of his/her past relationship with parents (or other major attachment figures), rather than on factual biography. General descriptions of the parents (or other attachment figures) are compared to descriptions of more specific episodes relating to the parents, and inconsistencies and incoherencies are generally considered signs of insecure attachment. Dismissing attachment is revealed in a favorable image of the parent(s) at the general semantic level, accompanied by an inability to support this image with favorable episodic memories from the past. Dismissing adults tend to idealize their past attachment figures and claim to not remember much from their childhood. The interviews often show that the parents of these individuals were rejecting and unloving. Secure adults provide a coherent picture of their past and present relationship with their parents on the AAI. They tend to value attachment experiences and relationships, and lack idealization or preoccupying anger. Preoccupied individuals are characterized by continuing preoccupied involvement with past or present relationships with the parents. This involvement is evinced by involving anger and/or passively trying to please the

parents. An unresolved status of attachment is revealed in incoherencies in discussions of past losses and/or trauma during the interview.

Six independent studies have shown nearly 80% agreement between the attachment status of the care-giver measured with the AAI, and his/her child, measured with the Strange Situation, on the level of anxious versus secure attachment, thus providing evidence for intergenerational transmission of internal working models of attachment (see van IJzendoorn, 1992; van IJzendoorn & de Ruiter, 1991, for a review). The exact mechanism of intergenerational transmission is unknown. Main and Goldwyn (in press) have suggested that the secure adult is able to perceive attachment signals without much distortion because these signals do not threaten the existing mental representation of attachment, as is the case for the insecure adult. Modeling (grand-)parental child-rearing behavior could also be a mediator. Whatever the mechanism, it is very likely that a behavioral link via a construct such as parental sensitivity/responsiveness will be implied, since the child forms a mental representation of attachment on the basis of parental care-giving behavior. Several studies have documented this link between adult attachment and responsiveness to infant signals (Grossmann, Fremmer-Bombik, Rudolph, & Grossmann, 1988; Haft & Slade, 1989).

The development of an internal working model of attachment is paralleled by the development of an internal working model of self. The child who has received sensitive-responsive caretaking, develops a "secure" self-image of worthiness. The anxiously attached child, whose bids for contact and comfort have not received a sensitive response, develops a self-image of being unlovable. However, in the case of avoidant attachment this negative self-image appears to be masked by a defensive "good" self-image (Kobak & Sceery, 1988; Cassidy & Kobak, 1988). Ambivalent attachment status is accompanied by a relatively negative self-image (Kobak & Sceery, 1988).

In summary, the experiences in the first relationships with primary care-givers shape a child's internal working models of self and relationships. These working models will in turn have an impact on subsequent experiences, in that they function as mental templates the individual brings to subsequent interactions. Information processing, memory, and ideation, as these concern the self and relationships, are influenced by the model, creating selective input, which tends to stabilize the model. The potential influence of these qualitatively different models of attachment on a child's social and emotional development seems self-evident and has been documented by a substantial body of research (e.g., Erickson, Sroufe, & Egeland, 1985; Lamb, Thompson, Gardner, & Charnov, 1985; Main *et al.*, 1985; Sroufe, Egeland, & Kreutzer, 1990).

Attachment and Cognitive Development: A Theoretical Note

How does the affective quality of the care-giver-child relationship, i.e., the quality of the attachment bond, influence the child's cognitive ability? A number of hypotheses can be formulated. First, the securely attached child can use his attachment figure as a *secure base* from which to explore the world. His confidence in the care-giver's physical and psychological availability lays the basis for autonomous exploration and problem solving (Bretherton, 1985). Thus, we would expect securely attached children to be more willing to approach and persist in tasks than their insecurely attached peers.

Second, their greater trust in their care-givers enables securely attached children to better elicit and accept their care-givers' assistance. Third, we expect a secure internal working model, and thus harmonious adult-child interaction, to enhance the flow of information between adults and children (Estrada, Arsenio, Hess, & Holloway, 1987). Fourth, security of attachment is hypothesized to affect metacognitive processes, i.e., knowledge about cognition and regulation of cognition. A secure internal working model of attachment tends to be coherent, noncontradictory and nondefensive, whereas the insecure model is characterized by multiple contradictory models (cf. idealizing the parent without supportive episodic memories). Main (1991) has argued that these multiple models indicate that metacognitive knowledge has yet to develop or that there have been failures in corrective metacognitive monitoring.

It seems evident that the importance of the attachment bond between care-giver and child is especially relevant for theories of cognitive development which emphasize social influences on cognition. Vygotsky (1978) has made the strongest claim for the role of social interaction, especially between adult and child, in cognitive development. According to his theory the higher psychological functions are internalized by the child via social interaction with adults. In Piaget's theory (1932, 1968), social interaction is not considered as important in cognitive development. Piaget also emphasized the importance of symmetrical (peer) interaction in contrast to Vygotsky's asymmetric (children and adults or children and older children) interaction in facilitating cognitive development. It seems plausible that attachment quality will facilitate or inhibit socially mediated cognitive development in both asymmetric and symmetric interactions. So far, research in the area of attachment and cognitive development has focused on asymmetric (mostly mother-child) interaction, as a result of which the literature review in the next section does not include research on symmetric interaction.

We will discuss the research literature on attachment and cognition along the lines of the hypotheses formulated in this section. First, we will review research pertaining to the hypothesized relationship between the child's security of attachment and exploratory and problem solving competence (first and second hypotheses). Second, we will review empirical studies on the instructional behavior of the attachment figure during problem solving sessions with the child (third hypothesis). Third, we will focus on (the lack of) research in the area of attachment and metacognition. Finally, we will separately discuss studies of the relationship between attachment and cognition in high-risk samples.

Attachment and Cognitive Development: Empirical Research

Although the nature-nurture debate on cognitive development seems to have subsided, since both "camps" have acknowledged the importance of the other, nurturists, and, accordingly, attachment theorists, have to acknowledge that genetic factors play a large role in cognitive development. Nurturists have to be particularly careful not to attribute to nurture what is actually due to nature: the problem of indirect genetic mediation. Ideally, all studies examining the relation between the quality of the infant-care-giver relationship and cognitive sequelae in the child should control for care-giver IQ. This, however, is not the case in most studies in this area, which should be kept in mind when evaluating the findings reported here.

Exploratory and Problem-Solving Competence

Main (1973) found that toddlers who were securely attached as infants had longer attention spans during free play. Tracy, Farish, and Bretherton (1980) found no evidence for a relationship between attachment status and exploratory competence in a correlational study with 40 infants. However, Belsky, Garduque, and Hrcir (1984) found that securely attached infants were more competent in free play than insecurely attached infants, i.e., they showed less disparity between the highest level of play exhibited spontaneously and the highest level elicited by an experimenter. Hazen and Durett (1982) also found securely attached toddlers to be more active in exploring their environment.

Matas, Arend and Sroufe (1978) found that securely attached children engaged in significantly more symbolic play during a free play session at 2 years of age than avoidant and ambivalent children. The securely attached children were also more enthusiastic, compliant, and persistent, ignored the mother less, exhibited fewer frustration behaviors, and scored higher on positive affect and lower on negative affect (whining/crying) during two problem-solving tasks. Competence in problem-solving could not be reduced to differences in Developmental Quotient. Twenty-six of the 48 children of the Matas *et al.* study were seen again for a number of laboratory tasks when they were 4–5 years of age (Arend, Gove, & Sroufe, 1979). They were also rated by their nursery school or kindergarten teacher on ego-resiliency and ego-control (Block & Block, 1979). Ego-resiliency may be considered a competence construct since it is defined as the capacity to respond flexibly, persistently, and resourcefully, especially in problem situations (Arend *et al.*, 1979). Children who as infants were classified securely attached scored significantly higher on ego-resiliency on both teacher-rated and laboratory-based measures. They also scored significantly higher on three measures of curiosity.

The Matas *et al.* and Arend *et al.* studies are widely cited to demonstrate the relationship between attachment status and interaction during problem solving at the toddler/preschool age. However, both studies came from the same research laboratory, which called for independent replication. Frankel and Bates (1990) published such a replication and found that secure toddlers displayed more on-task time, less aggressive behavior and less verbal negativism during the problem-solving tasks than insecure toddlers. However, they could not replicate the Matas *et al.* finding of a significant difference on compliance, ignoring maternal commands, frustration or whining/crying.

Oppenheim, Sagi, and Lamb (1988) conducted a study of 59 5-year-old kibbutz children, whose attachments to mother, father and metaplot had been assessed in the Strange Situation when they were 11–14 months old. The children were rated on the California Child Q-set (CCQ; Block & Block, 1979) and the Preschool Behavior Q-set (Baumrind, 1968) by their kindergarten teachers and metaplot. There were no significant associations between infant–mother and infant–father attachments and the 5-year ratings, but infants who had been securely attached to their metaplot at 1 year were rated less ego-controlled, more emphatic, dominant, purposive, achievement-oriented, and independent than anxious–ambivalently attached infants (there were no avoidantly attached children in the sample).

van IJzendoorn, van der Veer, and van Vliet-Visser (1987) performed a follow-up

study of children who had been tested in the Strange Situation at 24 months of age. Parents and kindergarten teachers rated the children on the Dutch version of the CCQ (van Lieshout *et al.*, 1983). Securely and anxiously attached children did not differ significantly in ego-resiliency, neither in parent nor teacher ratings. According to the teachers, anxiously attached girls showed less optimal ego-control, but anxiously attached boys showed optimal control. It is difficult to compare the findings of this study with those of earlier ones because the analyses were conducted using a division into four attachment groups: A+C, B1, B2+B3, and B4.

Crowell and Feldman (1988) studied behavior during problem-solving in a mixed sample of clinical and nonclinical groups (mean age = 37.5 months). In this study, mothers' internal working models of attachment, as measured by the AAI, were related to mother's and child's behavior in the problem solving session. Differences in the child's behavior were largely revealed in variables assessing the child's affect, and less so by task behavior. Children of insecurely attached mothers were less affectionate, more negative and avoidant, more controlling and anxious, and showed more subdued and angry affects. However, there were no differences on such task behaviors as persistence, self-reliance and enthusiasm, between children of secure and insecure mothers. The mixed nature of the sample may be partly responsible for the lack of significant findings on task behaviors. The children of preoccupied mothers scored significantly lower on persistence than those of dismissing mothers.

A number of investigators have studied the relationship between attachment quality and Developmental Quotient or Intelligence Quotient. The majority have failed to find a significant difference between secure and insecure infants in DQ (Matas, Arend, & Sroufe, 1978; Joffe, 1981; Pastor, 1981; Waters, Wippman, & Sroufe, 1979). Three studies reported a significant difference. Main (1973) found secure infants to be more competent on the Bayley test at 20 months. van IJzendoorn, Sagi, and Lambermon (1992) reported a follow-up on Dutch and Israeli children who had been observed in the Strange Situation with their father, mother, and professional care-giver. The Dutch children were assessed when they were around four with the McCarthy Developmental Scale (MOS; van der Meulen & Smrkovsky, 1985), and the Israeli children were assessed at five with the WPPSI test (Lieblich, 1974). In the Dutch sample, attachment network security (a composite score based on the attachment status of the three dyads in the network) showed a low, but significant correlation with DQ. In the Israeli sample, the correlation was somewhat higher and significant on both the network and the family composite score. Finally, van IJzendoorn and van Vliet-Visser (1988) found that securely attached (B2+B3) 5-year-old children scored significantly higher on a standardized IQ test for Dutch children. The marginally secure categories (B1 and B4) scored lowest, but did not differ significantly from A+C children.

Bus and van IJzendoorn (1988a) were first to study attachment security in relation to interaction in reading sessions and emergent literacy skills in a cross-sectional design. Attachment status was assessed using the Strange Situation procedure in 1½ year olds, and using Main *et al.*'s (1985) 1-hour reunion procedure at 3½ and 5½ years. They found that securely attached children explored stories and illustrations more than anxiously attached children. Bus and van IJzendoorn (1988b) also found a positive relationship between preschoolers' reading interests and attachment security measured 3 years earlier, independent of intelligence and degree of preparatory reading

instruction. For an extensive review of these and more recent studies on attachment and emergent literacy, we refer to the chapter by Bus in this issue.

Parental Teaching Style

In several of the studies mentioned in the previous section on problem-solving competence, the behavior of the parent during the problem-solving tasks was also systematically assessed. Matas *et al.* (1978) designed two seven-point rating scales, Supportive Presence (SP) and Quality of Assistance (QA), which were also used in a number of subsequent studies (e.g., Crowell & Feldman, 1988; Frankel & Bates, 1990). The SP-scale measures the extent to which the parent appears attentive and available to the child and supportive of its efforts. Providing a "secure base" by helping the child feel comfortable working at the task and being involved, as shown by parental attentiveness, form the core of the SP construct. The scale for QA measures the degree to which the parent helps the child see the relationship between actions required to solve the problem and giving minimal assistance needed to keep the child working and directed at a solution to the problem without solving it for him (e.g., initially giving space, timing and pacing of cues, providing cues the child can understand, cooperating with the child; Matas *et al.*, 1978). The QA construct could be considered a measure of sensitive scaffolding behavior (Wood, Bruner, & Ross, 1978).

Matas *et al.* (1978) found that mothers of securely attached infants scored significantly higher on SP and QA than mothers of insecurely attached infants. The two insecure groups did not differ significantly on the two scales. Arend *et al.* (1979) did not assess the behavior of the mothers during the laboratory visit at 4–5 years. However, they did find that mothers' SP and QA measured at 2 years predicted 5-year ego-resiliency in the child, measured in the laboratory situation. Frankel and Bates (1990) replicated the Matas *et al.* finding of significantly lower scores on QA and SP for mothers of insecure vs. mothers of secure infants. Interestingly, they also found that positive involvement at home, as measured at 6, 13, and 24 months showed a significant correlation with the quality of interaction during problem solving at 24 months. Crowell and Feldman (1988) averaged the scores on SP and QA into a composite variable called "mother's help and support." They also classified the mother's style of assistance on the most difficult problem-solving task into one of three groups: (1) promotion of autonomy and learning, (2) confusing or chaotic, and (3) directive or controlling. The results showed that mothers classified as secure by the AAI were significantly more supportive and helpful than mothers classified as dismissing and preoccupied. Sixty-two percent of the secure mothers demonstrated a teaching style that promoted learning and self-discovery. Most of the mothers in the dismissing group (78%) were directive or controlling, whereas the preoccupied mothers showed both controlling (35%) and confusing/chaotic (60%) instruction styles.

Londerville and Main (1981) examined four measures of maternal behavior (tone of voice, forcefulness of physical intervention, number of verbal commands, number of physical interventions) in a play session of 21-month-olds with an unfamiliar female person, and found that mothers of secure infants used warmer tones and were less forceful. In their follow-up study, van IJendoorn *et al.* (1987) observed their mother-child dyads in four problem-solving tasks. Mothers' behavior was measured

on three scales for emotional atmosphere (extent of smiling, sum total of positive and negative remarks, degree of maintaining physical distance) and three scales for instructional behavior (number of good prompts, number of interventions, speed of intervention when child performed suboptimally). The emotional climate factor did not differentiate the four attachment groups (A+C, B1, B2+B3, B4) on three of the tasks, but did on the most difficult task where the A+C group worked in the least favorable climate. Mothers of securely attached children did not give better instructions than mothers of anxiously attached children.

In the emergent literacy research, Bus and van IJzendoorn (1988a) found that mothers of secure children gave more reading instruction and disciplined less during reading-type interactions. These mothers seem to require more of their children in the area of reading, emphasizing reading instruction and proto-reading.

Metacognition

The theoretical and empirical integration of attachment theory with metacognitive development is a very recent endeavor (Moss, 1992; Moss, Parent, Gosselin, & Dumont, this issue). There is research indicating that parental training in metacognitive strategies affects metacognitive development (Carr, Kurtz, Schneider, Turner, & Borkowski, 1989; Moss & Strayer, 1990), but no studies in the literature have yet examined the role of attachment security in metacognitive development. The study by Moss, Parent, Gosselin and Dumont (this issue) is the first attempt to empirically study this relation.

High-Risk Samples

Studies of the relationship between attachment quality and cognitive development in high-risk samples should be considered separately from the studies in low-risk samples, since the high-risk environment includes a number of risk factors that influence cognitive development. Among them are lack of financial resources, single parent families, and psychiatric disturbance in the parent, each of which might interact with the quality of the affective bond.

In the Minneapolis study of disadvantaged families, attachment quality was systematically related to later social-emotional and cognitive development (i.e., ego-resiliency and ego-control) in a high-risk sample. Several different reports from this larger study showed significant predictions from early attachment status to later developmental outcomes, although prediction might have been positively affected by the fact that the samples were selected for stability of attachment from 12 to 18 months. It is well-known that attachment quality tends to be much less stable in high-risk than in low-risk samples (see Lamb *et al.*, 1985, Chapter 8 for a review). Sroufe (1983) studied 40 preschool children from a disadvantaged sample, who were enrolled in a special preschool program of the University of Minnesota. The teacher Q-sort of ego-resiliency and ego-control of the Arend *et al.* (1979) study was used, and their findings were essentially replicated. Children who had been securely attached as infants scored significantly higher on ego-resiliency than those who had been avoidantly and ambivalently attached, with the latter not differing from each other. Securely

attached children also scored significantly higher on a self esteem Q-sort measure. Erickson, Sroufe, and Egeland (1985) studied a disadvantaged sample consisting of the 40 children of the Sroufe (1983) study and 56 other children attending other preschools. Four of 7 observer behavior ratings (agency, dependency, social skills, compliance) in preschool class yielded significant differences, but none of the analyses distinguished B from both A and C children at the same time. The teacher-rated Preschool Behavior Questionnaire (PBQ; Behar & Stringfield, 1974) yielded 5 factors, of which two revealed significant differences between groups. Avoidant children were rated as more hostile than ambivalent children, and as giving up more easily than securely attached children. Unfortunately, the study of the Disadvantaged Minnesota sample did not include purely cognitive follow-up measures, such as problem-solving competence. In general, it seems that the differences between securely and insecurely attached children were somewhat attenuated in this sample, compared to the data from the middle class sample (see Matas *et al.*, 1978; Arend *et al.*, 1979).

Morisset, Barnard, Greenberg, Booth, & Spieker (1990) studied the impact of a number of environmental risk factors (SES, mother's conversational skills, and a composite including dyadic interaction and attachment status) on the child's 24-month Bayley scores and 36-month Preschool Language Scale (PLS; Zimmerman, Steiner, & Pond, 1979) in a disadvantaged sample. Hierarchical regression analyses revealed that the prediction of the 24-month scores was rather weak. However, 34% of PLS overall language quotient and 46% of Auditory Comprehension was predicted by the risk factors, of which 20% and 19%, respectively, were unique to the dyadic factor (mother-infant interaction and attachment). In a separate analysis comparing a group of children at extreme risk with a group of children at (relatively) low risk within this disadvantaged sample, the authors found that secure attachment operated as a protective factor with the extreme risk, but not the low-risk group.

To summarize the research discussed here, our review supports the notion that attachment quality has impacts on the child's cognitive development. Research in both normal and disadvantaged samples has shown that a secure attachment bond makes for more harmonious interactions in task situations and enhances a child's cognitive competence. A parent who has a securely attached child or is securely attached her/himself, tends to show sensitive scaffolding behavior in problem-solving situations with the child. The research on the relationship between attachment quality and DQ/IQ was the least unequivocal, but this may be due to the fact that the genetic endowment of the child plays a larger part in determining DQ, as measured by standardized tests, than in determining exploratory behavior and general problem-solving skills.

Rogoff (1990) argued that the *freedom to express* seems critical in emotional development and the *freedom to err* critical in cognitive development. The research presented here has shown that both tend to converge, each representing acceptance of the child by the parent, and the parent's sensitively regulating his initiatives.

Comment

The results of research on the relationship between attachment and cognitive development are definitely promising and we would like to close with a few comments and suggestions for future research. Research on the relationship between attachment

and cognitive development is a relatively recent endeavor, which may in part account for the scarcity of follow-up studies to school age and beyond. Long-term longitudinal studies are necessary if we want to demonstrate that the *early* social-affective bond with the care-giver makes a difference in later cognitive and educational development. The bulk of the studies are concerned with cognitive performance at the toddler and preschool age, when the child has not yet been exposed to a very large number of other possible influential agents, such as teachers and peers. As previously mentioned, the research so far has focused exclusively on asymmetric interactions, which seems to call for study of cognitive development in symmetric relationships.

Lamb *et al.* (1985) criticized attachment researchers' claims that early infant-care-giver attachment is *causally* related to later developmental outcomes, because they did not control for the concurrent quality of the care-giver-child relationship in most of their studies. This criticism is also applicable to the majority of the studies in our review. However, controlling for the concurrent quality of the relationship is required only if the influence of the *early* relationship is to be assessed independently from the concurrent relationship. If one is interested in the influence of attachment on cognition *per se*, controlling for concurrent factors is not very critical. Moreover, the quality of the internal working model of attachment tends to be relatively stable in middle class samples (Main *et al.*, 1985). An assessment of concurrent influences may be especially relevant in samples where attachment quality is subject to greater fluctuation due to environmental stressors.

A caveat in nearly all of the studies is the failure to measure the IQ of the child's care-giver. Although Barocas *et al.* (1991) have claimed that maternal IQ is not likely to be an important influence on the affective component of the maternal teaching style, it is not inconceivable that intelligence may be in some cases related to the quality of a parent's internal working model of attachment. We speculate that an individual with ample intellectual resources may be able to use these resources in such a way that his/her internal working model of attachment would be relatively open to new information and experiences. Intelligence might thus facilitate the development of a secure internal working model, even in individuals who have been exposed to rejecting and/or inconsistent parents in childhood and thus would be expected to develop into insecurely attached adults. However, one could also validly argue the opposite, namely that superior intelligence might increase the likelihood of intellectual defenses, such as rationalization, to stabilize an insecure internal working model by defending against processing information that is incongruent with the existing model. Only empirical research can determine which of these two speculations approaches reality most closely.

Attachment researchers have tended to focus largely on the differences in developmental sequelae between securely and insecurely attached children. Due to small sample sizes, more finegrained analyses, comparing avoidant and ambivalent children or focusing on the disorganized children, are rare. For theoretical insight into the specific developmental consequences of these different attachment strategies such studies are necessary. Main (1990) proposed that in the face of stress, avoidant children minimize attachment in favor of exploration, while ambivalent children maximize attachment to the detriment of exploration. Attachment theory predicts different outcomes with regard to cognitive development for children with these opposite strategies, i.e., avoidant and ambivalent strategies. Children who are classified as anxious-disorganized as infants

seem to be at particular risk, since they are found with high frequency in high-risk samples (children of depressive mothers; Lyons-Ruth, Connell, Grunebaum, & Botein, 1990; alcohol-abusing mothers; O'Connor, Sigman, & Brill, 1987; drug-abusing mothers; Rodning, Beckwith, & Howard, 1989; see van IJzendoorn, Goldberg, Kroonenberg, & Frenkel, 1992, for a review). Main *et al.* (1985) found that 6-year-old children who as infants had been classified as disorganized in the Strange Situation, displayed either directly punitive or anxious, overly bright "care-giving" behavior toward the parent upon reunion after an hour-long separation. The disorganized children performed worst with regard to fluency of discourse and openness in an interview concerning their family, compared to the avoidant, ambivalent and secure children. These behaviors (disfluency, lack of openness, controlling-punitive behavioral styles) are likely to have an impact on a child's cognitive growth.

If future longitudinal studies into the school years are conducted, several different topics might be worth investigating. Attachment quality may have an impact on academic achievement via several different *pathways*. The intricate relationship between the internal working model of relationships and the working model of self draws attention to the area of *self-esteem* (Cassidy, 1990). Anastasi (1984) summarizes studies documenting the influence of general self-esteem on achievement. Insecure attachment is likely to lead to low self-esteem (especially ambivalent and disorganized children) or defensively "inflated" low self-esteem (avoidant children). The latter group might be particularly vulnerable to test anxiety, which in turn would have a negative influence on achievement. A second pathway might be formed by attentional and motivational processes. Achievement is influenced by the time spent at a task, and *time on-task* is greatly influenced by *persistence* (Anastasi, 1984). The attachment studies previously mentioned showed a relationship between attachment quality and persistence in working at problem-solving tasks. Achievement is also influenced by *attention control*. Where one places one's attention, how deeply attention is focused, and how long attention is sustained contributes to cognitive growth (Anastasi, 1984). Some of the studies reviewed have found evidence for a relationship between attachment and attention-curiosity (e.g., Arend *et al.*, 1979; Main, 1973). Also, the *motivation for environmental mastery* is an important contributor to cognitive development. For instance, Yarrow *et al.* (1983, 1984, cited in Anastasi, 1984) found that an infant's motivation for mastery was a better predictor of later competence than early measures of competence. Attachment theory proposes that exploration, which is closely related to mastery motivation, will be greatest in children who can use their attachment figures as a secure base from which to explore and who have internalized this base into a secure representation of other and self. Finally, the quality of the attachment bond may be especially influential in the development of metacognitive skills, such as goal structuring, selecting strategies, and evaluating solutions, all of which tend to have an impact on academic achievement. The pathways are summarized in Figure 1.1.

The model hypothesizes a number of mediating factors for the relationship between attachment quality and cognition. The mediators are not exclusive; other factors, such as behavior problems might also play a role. The model could serve a heuristic purpose in that it indicates possible research directions. It also emphasizes the need for further theorizing on the psychological (and possibly biological) mechanisms that cause affective factors to have an impact on cognitive processes.

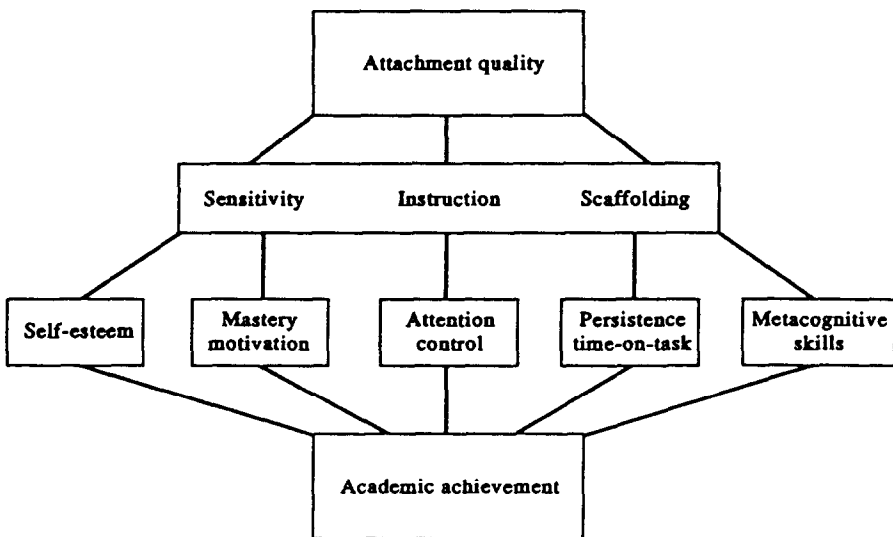


Figure 1.1. A model of pathways of the relationship of attachment to academic achievement.

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CHAPTER 2

EMOTIONAL ORGANIZATION AND CONCENTRATION ON REALITY FROM AN ATTACHMENT THEORY PERSPECTIVE

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Abstract

Feelings are presented as responses to specific situational evaluations rather than just biologically given basic entities. Infants' emotions are organized around the linkage between the infant's needs, their expressions and their attachment figures' subsequent response quality. Traditional attachment theory and research emphasized the quality of children's emotional and behavioral organization resulting from different experiences of attachment qualities throughout development into adulthood. These have been observed in children of various ages, as well as in adults' attachment representations. It is suggested that differences in secure vs. insecure attachment representation may also influence reality-oriented coping styles. Individuals' difficulties in integrating negative emotions into an emotionally anticipated positive outcome may result in emotional interferences with concentration on reality in challenging or stressful situations. A coherent emotional appraisal system, as learned in secure attachment relationships, allows more successful monitoring of difficult adaptational processes by cognitive means.

Basic Emotions and Emotional Appraisal

Emotions appraise what a certain situation may mean to us (Lazarus, 1991; Bowlby, 1982). They represent a certain quality of feeling which is bound to our evaluation of what the consequences of a certain situation may be, that is, feelings about the risks of our intentions or actions in the many situations that demand some form of adaptation. Feelings can also come from within, e.g., feeling thirsty, hungry, sleepy, bored, longing for tenderness, etc. If properly evaluated, these feelings represent an appraisal of bodily changes or need states, which demand proper actions, such as drinking, eating, sleeping, explorative or informative activities, seeking tenderness, closeness, loving, etc.

A young infant's need for care and protection and longing for tenderness, as well as the qualities of care provided by the adults who feel responsible for the infant, is the beginning of a complicated social-emotional development. John Bowlby's attachment

theory (1982, 1973, 1980, 1988) provided the grounds for developmental research that has drawn our attention to emotional learning during the first year of life.

In the 1930s, emotional development was seen purely as a maturational process. According to Bridges (1932), the ontogenetic sequence started with displeasure, excitement, and anger and continued to produce aversion, pleasure, fear, satisfaction, sympathy for adults, and jealousy. There was very little consideration of the fact that the infant, being dependent upon adults, needed to understand them and, simultaneously, to be understood by them. This was partially ignoring the functions of emotional evaluation and emotional expression which Charles Darwin (1872) had 50 years earlier already put into a proper comparative and evolutionary perspective.

One approach to the study of emotional development concentrates on so-called basic emotions. Ortony and Turner (1990, p. 316) list the fundamental emotions cited by fourteen authors and found noticeable inconsistencies even in the number of basic emotions. James (1890), for example, lists fear, grief, love, and rage; McDougall (1926) lists anger, disgust, elation, fear, subjection, tender-emotion, and wonder; Watson (1930) lists fear, love, and rage; Mowrer (1960) lists pain and pleasure; Weiner and Graham (1984) list happiness and sadness; Izard (1971) lists anger, contempt, disgust, distress, fear, guilt, interest, joy, shame, and surprise; Ekman, Friesen, and Ellsworth (1981) list anger, disgust, fear, joy, sadness, and surprise. These approaches have played a major role in the search for cross-culturally stable emotional expressions. The basic emotions indeed appear to be very similar in different cultures (Ekman, 1980; Eibl-Eibesfeldt, 1984) and in similar situations (Hochschild, 1983; Campos, Barrett, Lamb, Goldsmith, & Stenberg, 1983). However, they do not focus on the role of emotions in the individual's development of an appraisal system, which accompanies active relationships with people and which functions as an evaluator of important situational changes.

In their challenge of basic emotions theories, Ortony and Turner (1990) state:

It might be more profitable to consider the linkage between certain components of expressions as being basic and biologically given than it is to attribute this property to the emotions themselves (p. 321).

This is in line with the notion of the development of an emotional organization around an attachment figure as conceptualized by attachment theory. The authors suggest that

many physiological responses are better understood not as indicators of a specific emotional state but as responses to specific evaluations of the situation and of how it can be dealt with—that is, as meaningful subcomponents of the emotional response (p. 322).

It is, they say, quite likely that differences in physiological responses among so-called basic emotions such as anger, disgust, fear, joy, sadness, and surprise are actually due to differences in appraisals, emotional intensities or response tendencies resulting from "specific appraisals and their corresponding responses" (p. 322).

The situation, very often a social situation, which is to be specifically appraised has, unfortunately, not been part of Ortony and Turner's theoretical analysis. It is, however, an integral part in Bowlby's appraisal and selection theory of emotional development.

Bowlby (1982, Chapter 7) conceives of emotions as a dynamic process of evaluating one's situation through a steadily flowing interplay of curiosity, doubt, fear, clear enjoyment, and mixed feelings. Of course, the young infant experiences enjoyment when mother returns after a brief separation and there is a clear expression of

concern—even sadness—if there are no responses to his or her emotional expressions. Most of the emotional expressions, however, cannot usually be clearly identified as so-called “basic” emotions, because the individual constantly monitors situational changes and thus the appraisals might change. Appraisals develop on the basis of emotional communication within infants’ attachment relationships and on the basis of mental as well as behavioral activities in the infant’s ecological environment.

Early Infancy

The infant is equipped by nature to express emotions from the very beginning. At the same time, the infant is also equipped to make increasingly clear evaluations of the influences of his or her own expressions of emotion on others, as shown by studies on anticipatory quieting of infants less than 6-months-old (Gekoski, Rovee-Collier, & Carulli-Rabinovitz, 1983; Lamb & Malkin, 1986). In addition, from six months on at the latest, infants’ appraisals depend on a rather limited number of people, called attachment figures, who constitute a hierarchy with (usually) the mother as the principle figure (Grossmann & Grossmann, 1991).

The quality of a caretakers’ responses to an infants’ emotional expressions shapes the developing emotional appraisal system (Main, Kaplan, & Cassidy, 1985). Differences in caretakers’ sensitivity to the infants’ communications generate qualitative differences in the development of the infants’ emotional organization and communication (Ainsworth, Bell, & Stayton, 1974). Furthermore, these qualitative differences may have long-lasting consequences for the predominance of certain feelings over others, for the child’s expression of feelings and for the emotional appraisals of changes in the individual’s psychological life space and life circumstances (Grossmann & Grossmann, 1991). These effects are particularly important whenever the child feels uneasy and when supposedly her/his attachment system is aroused. Long-term negative consequences are expected and have been empirically demonstrated when infants’ emotional expressions are ignored or rejected instead of being attended to and receiving an appropriate and prompt response (Ainsworth, Blehar, Waters, & Wall, 1978; Grossmann & Grossmann, 1991; Main *et al.*, 1985). The emotional responses resulting from such differences in responsiveness extend from very brief moments of concern, to a short-ranged rigorous search for an attachment figure in moments of separation, to long-range consequences for the organization of inner representations of self and others. Longitudinal data clearly show that infants whose bids for tenderness are frequently ignored learn to inhibit the expression of feelings related to unhappiness at 1-year-old, are less open in preschool and indulge more often in withdrawal, self-pity and hostility (Grossmann *et al.*, 1989; Suess, Grossmann & Sroufe, 1992; Wartner, Grossmann, Fremmer-Bombik & Suess, *in press*). The “inner working model” is John Bowlby’s name for the development of an individual’s style of organizing his/her emotions on the basis of past attachment experiences. If the expressions of negative emotions or helplessness of the infant become associated with rejection by or unavailability of the attachment figures, the communication style of the child changes in adaptation to this experience. The child’s attachment figure is her/his most important part of his environment. Securely attached children, as well as their parents, develop a working model of themselves and others as lovable and worthy of help and behave accordingly. Insecurely attached children,

as well as their parents, develop a working model of themselves and others as liable to be ignored or rejected and therefore behave avoidantly, ambivalently, or sometimes disorganizedly (Main & Solomon, 1990; Main & Hesse, 1990). As a consequence the children's and their parents' access to their own emotions and even memories of emotions may also become limited (Grossmann, Fremmer-Bombik, Rudolph & Grossmann, 1988; Main *et al.*, 1985).

Quality of Attachment as an Organizer of Emotional Appraisal

The early quality of a relationship is represented by the infant's communications and the attachment figures' sensitivity: their perception and interpretation of and prompt and appropriate responses to the infant's emotional communications. Implicit in this definition is the notion that all of the infant's behaviors are communications of his/her needs, feelings and states.

The first indication of the operation of an assumed "inner working model" was demonstrated more than twenty years ago in the differential behaviors of 1-year-old children in Ainsworth and Wittig's (1969) Strange Situation. When the infant is observed as the mother reappears in the door, the infant's behavior is interpreted as his/her *expectation* of the mother's response to his/her displayed or suppressed separation distress. The inner working model serves as an organizer of the emotional appraisal system in situations that may interfere with the child's intentions when he needs help and consolation. Main and her colleagues found different responses of 6-year-old children in a variety of experimental situations according to their previous attachment experience: viewing a recent family photograph, imagining separation, drawing a picture of their family in action and communicating with their mothers after an hour-long separation. Early security of attachment to mother, but not to father, predicted the child's emotional openness during discussions of symbolic parent-child separations and the fluency of parent-child discourse after a real separation (Main *et al.*, 1985). In addition, their mothers were thoroughly questioned in a clinical interview called the Adult Attachment Interview (AAI; Main & Goldwyn, in press) about their childhood memories. The AAI is not a retrospect attempt to reconstruct adults' past child-parent relationships, but rather a method to assess their present state of attachment representation. Mothers judged to have a secure attachment representation had free access to their childhood memories regarding their relationship to their parents. These were either rather positive and detailed, or mixed, but with a sympathetic understanding for their parents' emotional life. In contrast, mothers judged to have an insecure attachment representation, either did not remember much or dismissed the emotional gratifications inherent in close attachment relationships altogether. Those who did not remember much of their childhood experiences either tended to idealize their parents in a somewhat cliché-like manner, without any substantial support from convincing narrative episodes in the transcribed interviews, or disparaged their parents, denying any effect on their own emotional well-being. Their mental organization of their emotions connected with their childhood experiences was incomplete and not realistic (Main *et al.*, 1985). We were able to replicate and expand Main *et al.*'s findings, thereby taking it out of a culture-bound perspective (Grossmann *et al.*, 1988).

Two main differences in the organization of emotions were found:

(1) Access to one's own emotions was shown mainly by mothers who had a secure relationship with their children. It was not shown by most mothers who had an anxious-avoidant relationship with their children. It was shown to some extent, but without the ability to distance themselves from past experiences, by mothers who had an anxious-ambivalent relationship with their children. Fathers behaved very similarly, although the concordance with infant attachment was somewhat lower.

(2) Emotional coherency and integration was shown by parents with a secure relationship with their children. An unrealistic integration—revealed by noticeable incoherencies and unfounded idealization in the interviews—was mainly shown by parents who had an avoidant relationship with their children. A sober appraisal without being caught up or “enmeshed” in present details was impossible for most parents who had an anxious-ambivalent relationship with their children (Main *et al.*, 1985; Grossmann & Grossmann, 1991).

There were also a few parents who were emotionally confused in other ways because they had not overcome a significant loss in the past. Interestingly, indices of an incoherent attachment-related behavioral strategy could also be detected in most of their 12-month-old infants. They have been labeled “disoriented, disorganized” by Main and Solomon (1990).

The “inner working model” as reflected in the parents' response styles to Main's Adult Attachment Interview seems to function as an organizer of attachment-relevant information. It is still an open question whether it also functions in a similar manner in other “challenging” situations not as clearly related to attachment.

Emotions and Cognitions

In attachment theory, as in ethology, emotions and emotional expressions are considered to have survival value. They are the basis for a quick appraisal of one's life space. In human infants the emotional appraisal system develops by receiving responses from significant adults called attachment figures. Despite great variations in newborns' behaviors and dispositions, there is an evolutionary predisposition for emotional communication. At the same time, there are noticeable differences between various significant adults in the appropriateness and promptness of their responses to infants' emotional expressions. Learning to understand each other thereby constitutes a—by necessity—highly individualized emotional learning process (Bowlby, 1987).

The ideas presented so far concern the ontogeny of emotional organization based on the biological necessity of developing attachment relationships. If emotional learning is so vital for the infant, we may assume that it also influences later cognitive functioning.

In Western cultures, the best predictor of success in school is the intelligence quotient (IQ) as measured by standard tests, because school success has always been the main validator of the IQ. Validity is reduced but still significant for income, vocational level and professional success. This may be because in routine situations and routine behaviors emotions play only a minor role, as these situations do not require close monitoring by the emotional appraisal system. Only situations where the emotional appraisal system is challenged are expected to make a difference. If challenged, the quality of an individual's emotional organization and its appropriate representation of the subjective

meaning of reality become an important contribution to the individual's coping style. Challenging in contrast to routine situations are: threat of helplessness, deprivation of food or shelter, loss of support or esteem, lack of access to material objects vital for one's life style, failing to accomplish tasks demanded by superiors, schools and other institutions, etc., general lack of control (Grossmann, in press.; Grossmann, Scheuerer-Engelsch, & Loher, 1991). From achievement motivation research, we know quite well that the problem-solving ability is dependent upon the person's motivational structure (Heckhausen, 1989). The question from an attachment perspective is: what role do different qualities of emotional organization play in perception, interpretation and prompt and appropriate behavior in situations lacking ready-made solutions?

The idea behind the question is that emotional organization functions not only as an organizer, but also as a continuous regulator during the processes of finding a new goal and of obtaining a solution outside of repetitive daily routine.

Emotional Appraisal and Reality

The emotional organization may influence unsuccessful strategies or the redefinition of goals, the process of securing assistance from others and the process of acquiring the knowledge and skills necessary in certain problem-solving situations. The emotional organization may, however, interfere with the mental representation of the goal and with the means to obtain a goal if it is no longer connected to reality. Reality means that the emotions reflect one's attempts to find a suitable mental (thinking) or behavioral (active) pathway to change the challenging situation according to one's goals. If emotions become too unbearable, because the negative ones cannot be properly integrated into an overall positive goal-corrected strategy (Bowlby, 1987), then they may be denied, or unrealistically changed, or the situation may be avoided altogether and remain unsolved. This was clearly seen in the aforementioned adult attachment interviews.

Four basic styles were recognizable in the mothers' interviews about their own childhood memories: the mothers called "autonomous" by Main and Goldwyn (in press) remembered good as well as bad experiences. Their language was open and clear. They had a full understanding of their own parents' life circumstances. Therefore they were able to see their negative childhood memories embedded in a context of basically positive, accepting, sympathetic relationships. They had solved the ambivalence of their intense feelings towards their parents, which in Freud's psychoanalytic thinking constituted—if unresolved—a major component of neurotic development.

The vast majority of the autonomous mothers were highly sensitive to their infants in the first year. The secure attachment relationship observed with their 1-year-old infants and later with their 6-year-old children was characterized by communicative openness (Grossmann & Grossmann, 1991; Main *et al.*, 1985).

The children of autonomous mothers, when observed in preschool amongst their peers with only teachers present, were significantly more concentrated in their play behavior, solved conflicts by discourse with their potential conflict partners and had fewer problems, as judged by teachers as well as by observers. In a social perception test containing pictures of children who harmed other children accidentally or intentionally, they were either realistic, or they perceived benevolent rather than

antagonistic behaviors. This means that in interpretation of the situations depicted the 5-year-old securely attached children of autonomous mothers expected positive rather than negative encounters and they communicated their emotions—positive and negative—openly (Suess, Grossmann, & Sroufe, 1992).

As mentioned before, there were two kinds of autonomous mothers. One group developed coherent and integrated memories because of good childhood experiences. Another group, however, had to actively resolve the ambivalence resulting from mainly rejecting childhood experiences. We called this group “reflective.” The reflective mothers developed a *post hoc* understanding of their poor attachment-related experiences, which was thorough enough to achieve the necessary mental integration of their emotions. They were able to develop an openness for reality and for their own children’s expressions of emotional needs, because they did not suppress their own negative emotions and the reality represented by them.

The majority of the incoherent and less well-integrated mothers were less sensitive to their infants’ expressions of emotional needs in the first year. The infants developed an anxious–avoidant attachment relationship and showed in the Strange Situation, at one year and again at six years, a lack of openness in communicating with their mothers after one hour of separation. The 6-year-old children also responded in a less realistic manner to suggested separations and—in contrast to the children of securely attached autonomous mothers—they did not provide any constructive solutions. If told, e.g., that their parents had to go on a journey for 14 days without them, the majority of the avoidantly attached children showed feelings of insecurity or sadness but, at the same time, they rarely offered alternative solutions such as going to visit a relative or grandparents. These children did not enjoy the family photograph and their drawings of their families doing something together was schematic, barren, and less individualized; they tended to draw “smileys” onto all faces (Main *et al.*, 1985; Wartner *et al.*, in press; Pfäffl-Gerullis, 1988).

In preschool, the children of idealizing or dismissive mothers with avoidant attachment classifications in the Strange Situation played in a much less concentrated manner. They did not solve conflicts with peers with the same constructive and self-reliant discourse as did the children of autonomous mothers. Instead, they told the teachers in a self-righteous manner. Only insecure–avoidant preschoolers were aggressive towards other children without any obvious reason. In the social perception task, these 5-year-old children saw more antagonistic than altruistic intentions in the pictures. They expected negative rather than positive encounters and they were on guard and not open for developing communication and relationships (Suess *et al.*, 1992; for a summary of these findings see Grossmann & Grossmann, 1991).

The Role of Emotional Organization in Person-Oriented and in Task-Oriented Situations

It is obviously of great interest to see whether the differences in emotional integrity also exist in areas more remote from the inner working model of self and others. In a recent publication, we contrasted a narrow and a wider view of attachment (Grossmann & Grossmann, 1990). The narrow view stresses 12-month-old infants’ behavior in the Strange Situation as an indicator of the quality of attachment and its consequences for emotional organization. The wider view explores the quality of emotional organization

in a variety of developmental tasks and situations. How can Bowlby's inner working model be conceptualized in motivational and task-related contexts? And how does the inner working model explain adaptations in challenging situations as a hypothetical construct?

In infancy, exploratory, playful activity requires an attachment figure as a secure base. In adulthood, goal-corrected behavior requires a secure attachment representation (Bowlby, 1988). A secure attachment representation is a disposition toward significant others based on empathy, integrity and coherency of emotions. Access to one's own emotions and to those of loved ones is an element of mature love. Conflict between love and hate, as in unresolved ambivalent or avoidant relationships, is considered less mature.

Planned active goal-corrected behavior in a wider view of attachment (Grossmann & Grossmann, 1990) ultimately means to contribute constructively to one's group, society or culture. Consequently, the development of one's full autonomy and creative potential have become a kind of realistic utopia in Western educational psychology.

Piaget dealt only once with this problem. He stated:

Affectivity can cause accelerations and retardations in the development of intelligence, it can disturb intellectual functioning and modify its contents, but it can neither engender or modify structures (Piaget, 1981, p. 73).

Piaget sees affective structures as isomorphic with cognitive structures. They "have to do with an intellectualization of the active aspect of our exchanges with other people." Piaget stated, in agreement with Bowlby, "that schemes arising from interpersonal relationships are subsequently internalized and applied by the individual to himself." Intellectualization does not mean that there is a formative or modifying action of the intellect on affectivity or of affectivity on the intellect. Rather, it means that "affective structures become the cognitive aspect of relationships with other people." Intelligence and emotions are not "distinct but analogous mental faculties acting on each other." Any adaptive behavior is action guided by cognition, monitored by an emotional appraisal system; some emotions are felt under certain circumstances and sometimes they are expressed.

Piaget distinguishes "between behaviors related to objects and behaviors related to people. Both have structural or cognitive and energetic or affective aspects. In behaviors related to objects, structural aspects are various empirical and logico-mathematical knowledge structures, while energetic aspects are the interests, efforts, and intra-individual feelings that regulate behavior. In behaviors related to people, the energetic element is made up of interpersonal feelings

Emotions are the complement of activity aimed at achieving equilibrium between real events and their cognitive representations through assimilation and accommodation (Piaget, 1981).

Thus it is possible to assume that the emotional organization which results from interpersonal experiences functions similarly in behaviors related to objects if the goal is rather difficult or impossible to obtain. Such behaviors are clearly seen in young infants, almost from birth on: curiosity (Berlyne, 1960), mastery drive (White, 1959), sensorimotor behavior (Piaget, 1973), the intellectual acquisition of cultural rules (Bühler, 1925), and a language acquisition support system (Bruner, 1983) are but a few examples. The relationship between emotional security and exploratory activities is like a balance, or a teeter-totter. If emotional insecurity is experienced and the attachment system

is aroused, exploration will be low, while the child who feels secure will play and explore.

It has been shown repeatedly that intellectually valuable experiences at two years (Carew, 1980) and at three years of age (Loher, 1988) occur much more frequently in the presence of and during interaction with the mother or other confidential play partners, rather than while alone. Culture is transmitted from knowledgeable older brains to younger brains (Trevvarthen, 1987). We assume that it does not have to be the mother, but rather any confidential partner who participates in children's attempts to build up a representational model of the relationships between objects on the basis of reinforcement, imitation and guidance. In intellectual encounters, there are frequent shifts and mingling between behaviors related to objects and behaviors related to significant people. It is doubtful whether intellectual development could function without it.

It is the child who finally decides whether he will participate in social-intellectual challenges offered by others or not. There is, however, still uncertainty regarding the conditions under which children are ready for intellectual excitation and when fear of rejection, emotional ambivalence, or emotional disorganization result in emotional conflicts that may interfere with the acquisition of the various empirical and logico-mathematical knowledge structures necessary for defining and solving problems.

Differences in Emotional Behavior in Task-Solving Situations: A Research Study

In the first stage of the study, Loher (1988) observed the emotional atmosphere in 50 3-year-old children's homes. The emotional atmosphere was classified as warm, pleasant, factual, inconsistent or tense. Quality of interaction was positively related to atmosphere and negatively to prohibitions, critical interferences, and restrictions observed in the homes. It was, as could be expected, also positively correlated with the children's General Cognitive Index (GCI: McCarthy, 1972) and with the mothers' IQ. In contrast to corresponding research in Bermuda by Scurr (1985), the observed concentration of the children at play was still significantly related to atmosphere, even after partialing out the children's GCI and the mothers' IQ, the child's most intellectually valuable experiences were in the presence of a supportive interaction partner.

The hypothesis of emotional interference in challenging task-oriented behavior was tested six months later (Loher, 1988). The then 3½-year-old children were confronted with a series of tasks which were too difficult for them to solve. The children had to solve four puzzles, dress a doll with a skirt, pullover and shoes, perform a block test from the Wechsler, throw little bags at a target in order to test motor behavior, and build a puzzle with Duplo construction blocks. The experimenter maintained a neutral expression and did not support the children's performance with praise or encouragement. If the child asked for help the experimenter explained that she wanted to see if the child could do the task alone without any help. She did not criticize any errors the child made and provided only factual information.

The children showed marked behavioral differences while working. These concerned positive self-evaluation, searching for help and assistance, and verbalization of

difficulties. Some children also tried to change the difficult situation in a productive manner by developing creative alternatives and by changing the level of difficulty.

There were also unproductive attempts to manage the difficult experiences through socially skillful deviations, through unproductive manipulations of the materials, and through escape, that is, by dissociation from the task, mentally as well as physically. In addition, some children refused, openly and verbally, to continue, arguing that the task was really too difficult for them, whereas others showed their opposition through gestures, facial expressions and other non-verbal means of communication. The sum of rejection, opposition and negative behavior expressions constituted an index for the total aversive behavior. The children's quality and intensity of stress expressions was a second source of information. Some children responded to the excessive demands with a depressed and ambivalent mood. Others, in contrast, remained neutral or even cheerful (Grossmann, 1992; Grossmann, Scheuerer-Engelisch, & Loher, 1991; Loher, 1988).

In the present context, however, we were mainly interested in the longitudinal results. Those children who had experienced less warmth and empathetic support at home half a year earlier in their family settings showed more aversive and less playful behavior in the experimental situation at 3½ years.

In addition, as expected, the majority of the children who had frequently encountered intellectually valuable experiences in their families at age 3 showed significantly less evasive behavior in the experimental task situation at age 3½.

Those children who, as rated by the home observers, often acted without any recognizable goals and who were more often rejected and supported less by their mothers, also expressed fewer positive verbal self-evaluations in the experimental situation. They tried to obtain assistance in a rather undifferentiated and non-verbal manner judged as immature by naive observers. These children tried to approach the experimenter only emotionally and not for getting information for the task at hand. Incompetent utterances in the experimental situation were shown significantly more often by children who had little support and were less independent at home. Children coming from a more positive emotional atmosphere and enjoying more maternal attention at home showed more competent verbal behavior in the experimental situation.

The children who appeared rather stressed in the laboratory were not very playful at home, were often rejected by their mothers and lacked support at home, particularly in stressful situations. The less responsive the mothers were at home and the lower the interaction quality was altogether, the more stress symptoms were shown by the children in the laboratory, independent of children's GCI and mothers' IQ.

A new data collection from these children has just been completed (Schildbach, 1992). The children were seen again when they were 6 years old. Again, we probed their emotional disposition in the face of difficult tasks and we also observed the quality of interaction with their mothers at this age.

The areas of intellectual competence and task-oriented behavior in the 6-year-old children were no longer correlated with the home observations. However, significant correlations still existed between the quality of child-mother interaction at 3 years and the emotional stress symptoms of the 6-year-old children. There was no direct pathway from emotional support to intellectual competence, or to interest development, etc.

in several of our studies. The emotional dispositions, however, were still correlated positively with the absence of restrictions and with the level of emotional support while coping with intellectually valuable experiences (Schildbach, 1992). We had seen these differences already in the 5-year-old children in preschool (Suess *et al.*, 1992). We discovered them again when we conducted very intensive interviews with 8-year-old children with known attachment histories regarding the children's emotional responses in a variety of stress situations (August-Frenzel, 1993). We also saw very similar patterns in 10-year-old children from our first longitudinal study started in 1976 (Grossmann, Grossmann, Huber, & Wartner, 1981). In addition to attachment history, we also knew the mothers' sensitivity to the infants' emotional communications at 2, 6, and 10 months of age by direct observation. Differences in emotional organization could be demonstrated at each age level—5, 6, 8, and 10 years—but the children had to be challenged in highly demanding situations. Testing their limits was necessary, because there were rather few differences in routine situations (Grossmann, Grossmann, Spangler, Suess, & Unzner, 1985; Grossmann & Grossmann, 1991). At present the complexity of the data allows only a sketchy presentation. Detailed analyses will be forthcoming in subsequent publications.

Consequences and Discussion

We consider the following results the most important:

(1) Intellectually valuable experiences during mother-child interaction at home were correlated with more task-oriented, flexible, and socially skillful behaviors in extremely demanding situations at 3½ years; and (2) The emotional home atmosphere influenced the emotional organization of the children in a highly challenging task situation under controlled laboratory conditions at 3½ and 6 years.

Sandra Scarr assumed such influences when she stated:

My thesis, borrowed from many others, is that the child's current intellectual level is a function of a motivationally determined history of learning in which motivation has played as much as, or more of, a part than cognition in helping or hindering the child's intellectual development. Therefore the development of competence can best be described as a series of genotype-environment correlations. This view leads to assessment strategies that are quite different from those that are now standard (Scarr, 1981, p. 1160).

Scarr concludes her contribution on testing for children:

To imply that a problem is a (genetically determined) cognitive deficit, however, is to ignore the children's history of lack of motivation and lack of adjustment in school learning. Interventions that address the motivational and adjustment aspects of learning may well be more effective with these children than those that primarily address the cognitive lags (Scarr, 1981, p. 1165).

Our observations provide a clear basis for the role of social-emotional communication skills and emotional support at home not only in the development of attachment relationships and subsequent inner working models of self and others, but also to some degree in emotional organization in the face of challenging tasks. The inability to integrate positive and negative emotions into a general positive coping strategy deprives these individuals of the flexibility of an emotional organization in which negative and positive emotions serve as realistic appraisals of any given situation. Obviously, an emotional organization that incorporates all the emotional representations of real

experiences, positive as well as negative, contains more elements and represents a higher organizational order than an organizational system that relies on selective perceptions and the inaccessibility of important emotional representations of distinct aspects of reality.

Our finding that children as young as 3½ years with different emotional experiences show different degrees of conflict as well as different abilities to concentrate on difficult tasks shows that a poorly integrated emotional organization can disturb intellectual functioning. The inner working model is thus extended beyond the narrow domain of attachment into the wider domain of more or less constructive adaptation to life tasks. The development of a coherent emotional appraisal system enables a person to more successfully monitor difficult processes of adaptation by cognitive means without being unduly endangered by unsuitable emotions, as compared to persons with incoherent, less well-integrated emotional appraisal systems.

Biographies

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CHAPTER 3

ATTACHMENT AND THE DEVELOPMENT OF METACOGNITIVE AND COLLABORATIVE STRATEGIES

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Abstract

This chapter examines the theoretical and empirical bases for a relation between attachment and metacognitive development. The parallels between Bowlby's and Vygotsky's theories are discussed as a conceptual basis for a co-constructive organizational model of development. Results of a study involving the comparison of collaborative activity of 19 secure and 18 insecure preschoolers and their mothers are presented in support of this model. Theoretical implications for understanding developmental continuity are discussed.

Introduction

Developmental researchers have increasingly come to focus on the relation between affective aspects of family interaction and children's cognitive functioning (Barocas, Seifer, Sameroff, Andrews, Croft, & Ostrow, 1991; Bretherton, Bates, Benigni, Camaioni, & Volterra, 1979; Cicchetti & Schneider-Rosen, 1984). A recent longitudinal study (Estrada, Arsenio, Hess, & Holloway, 1987) relating the quality of early mother-child relationships to school-age measures of cognitive functioning, show that even after controlling for maternal IQ, SES and children's mental ability at age 4, a positive affective mother-child relationship during the preschool period predicts school achievement at age 12. Moreover, according to attachment theory, the behavioral patterning of early child-care-giver relationships predicts later social and cognitive functioning (Sroufe

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& Fleeson, 1988). Although there is little doubt that the affective quality of early relationships affects later cognitive functioning, there is a great deal of ambiguity concerning both the mechanisms of influence and the specific cognitive processes involved. In 1987, Hartup speculated, on the basis of both Vygotskian theory and empirical studies of mother-child interactions, that the cognitive processes most likely to be affected by social relationships are those related to metacognition. Metacognition refers to one's knowledge of his cognitive resources and of the self-regulatory processes which control their execution (Brown, 1987; Flavell, 1987). These metacognitive skills include identifying the problem, strategic planning, monitoring routines, and evaluating outcomes. By age 7, individual differences in metacognitive abilities are clearly evident and predict strategy acquisition and transfer (Borkowski, Carr, Rellinger, & Pressley, 1990). In addition, school success has been directly related to the use of metacognitive strategies in learning tasks (Bransford *et al.*, 1982). Studies by Flavell and his colleagues (Flavell, 1987; Flavell, Speer, Green, & August, 1981), Kopp (1982) and Díaz, Neal, & Amaya-Williams (1990) have shown that basic metacognitive skills develop between 3 and 5 years of age. Thus, by the preschool period, it should be possible to study emerging differences in these executive processes between securely and insecurely-attached children. The theoretical and empirical elaboration of the relation between attachment and metacognitive functioning is a completely new research endeavor with few existing references. In this article, we will examine the theoretical and empirical bases for a relation between attachment and metacognitive development.

John Bowlby and Lev Vygotsky: The Achievement of Affective and Cognitive Self-Regulation through Collaboration

Two prominent developmental theorists who conceptualized the early establishment of a collaborative dyadic context are John Bowlby and Lev Vygotsky. Bowlby's theory of the development of attachment (1969, 1973, 1980) and Vygotsky's concept of the social origins of cognitive functions (1978, 1986) are classic in their respective traditions of social and cognitive developmental psychology.

Bowlby (1969, 1982) described how early patterns of close physical proximity regulated almost entirely by the mother in early infancy, gradually give way to more reciprocal patterns where either partner can effectively signal the attention of the other from a distance. The infant's attachments with the primary care-giver develop in the course of the first year with identifiable individual patterns appearing by the middle of the first year of life. The infant who has experienced consistent, sensitive and responsive care-giving is able to better equilibrate autonomous exploration and dependency. The quality of the infants' exploration of novel environments is also dependent on the degree to which the infant has internalized a model of a care-giver who will meet the child's need for protection and physiological regulation (Emde, 1989). The infant who lacks a secure base (Bowlby, 1969) will show poorer master motivation in exploring the environment and engagement with objects.

According to Vygotsky's theory, children first acquire problem-solving skills during adult-child activity, gradually acquiring the ability to independently perform cognitive functions. Children are active contributors to this internalization process, not only in the sense that they participate in interactions but also in that they transform and reorganize

the skills being acquired. Adults may facilitate children's development by gradually empowering the child with responsibility for regulating joint activity at a pace which is slightly ahead of the child's manifest competence or within their zone of proximal development.

Theoretically, the parallels between Bowlby's and Vygotsky's ideas become most compelling as the toddler approaches the preschool stage. By the third year of life, a true collaborative context for joint problem-solving emerges with the transformation of the attachment relationship into a goal-corrected partnership (Bowlby, 1973). With the growth of language and perspective-taking skills, the child becomes able to communicate his own intentions and plans, understand those of the mother, and engage in negotiations aimed at jointly achieving a common goal (Cicchetti, Cummings, Greenberg, & Marvin, 1990; Marvin, 1977). Thus, the establishment of an effective collaborative context is made possible by the transformation of repeating physical patterns of proximity/exploration into a generalized mental representation.

Particularly important to conceptualizing the longitudinal relation between early socio-affective interactional patterns and later personality profiles is Bowlby's notion of "internal working models" (1969, 1973, 1980, 1982). These mental representations constructed by the individual reflect the history of interactional patterns experienced by the infant with the attachment figure. The internal working model of the infant-parent relationship will be formed out of a history of the infants' actions and parental responses to these initiations. These models may not only influence expectations and attitudes concerning collaborations with attachment figures but also those with other social partners. At the stage of goal-corrected partnership, insecurity in the attachment relationship between care-giver and child is manifested through deficiencies in the mutual communication of feelings, motivations, and plans (Crittenden & Ainsworth, 1989). An effective goal-corrected partnership (Bowlby, 1969) requires the ability to verbally negotiate shared plans which may conflict with individual motives. Thus, affective self-regulation is intrinsically linked to the representational organization of information concerning the goal-directed interactive behavior of oneself and others.

It is at the phase of goal-corrected partnership that Bowlby's developmental ideas begin to most closely complement those of Vygotsky. Vygotsky did not extensively discuss the early infancy period, centering his own work from the preschool period onward (van der Veer, & van IJzendoorn, 1985). Vygotsky's studies (1978, 1986) focused strongly on the role of verbal communication in structuring the child's developing cognitive processes although he did not elaborate the specific influence of the emotional context of communicative exchanges on cognitive development. Vygotsky, like Bowlby viewed representational and communicative functions as intertwined and saw the child's early construction of goals as an essentially interpersonal experience (Lee, 1977). According to Vygotsky, as linguistic functions mature fuelled by interactions with the socio-cultural environment, there is increasing differentiation between the representational and interpersonal functions of speech. By the preschool period, parental directives which have been internalized by the young child are becoming manifest in social and self-directed speech. The development of more complex representational abilities is thus directly related to language in two ways: by being able to direct one's own activities through self-regulating speech, and by benefitting from others' language which structures and directs thinking and concept formation processes.

Of equal interest in constructing a theoretical model of the relation between socio-affective and cognitive interdependency is Vygotsky's concept of the zone of proximal development. This concept was introduced by Vygotsky as a descriptive term marking the emphasis on the study of emerging as opposed to already developed psychological functions. On a theoretical level, this idea epitomized Vygotsky's emphasis on the central role of social mediation in the construction of cognitive functions. He described a dialectical relation between two states of mental organization—actual and potential—mediated by the child's transactions with the socio-cultural environment (Valsiner & van der Veer, 1991). Vygotsky's multidimensional view of development outlined in his early discussions of the developmental process (Vygotsky, 1933/1984) emphasizes qualitative structural reorganizations involving both phases of acquisition of new psychological functions and periods during which earlier attainments are inhibited. As an intermediate phase in this cycle of dialectical synthesis is a period when new organizations are nearing formation or consolidating. As Moss has explained elsewhere (1992), acquiring abilities effectively related to the reorganization of cognitive resources may be developmentally related to early patterns of care-giver–infant co-regulation. Taking the risk of letting go of habitual patterns may depend on whether the child has come to expect that support will be available for constructing new strategies. Former interactive experiences which involved social reactions emphasizing the incompetence of the child may have been internalized, resulting in anxious or avoidant child emotional responses which inhibit the activation of cognitively-reflective activity.

In summary, consideration of the similarities between these two models, provides a basis for conceptualizing the developmental interdependency of socio-affective and cognitive processes. Fundamental to both theories is the idea of the gradual transfer of social and cognitive functions from the *interpersonal to the intrapersonal* plane through a process of internalization. Both emphasize that early patterns of care-giver–child co-regulation are *fundamental models* for later engagement in collaborative enterprises. Finally both theorists conceptualize *internal representations* as underlying developmental continuity in the affective and cognitive domains. Both theories highlight the importance of early adult–child relationships in leading the young child towards greater affective and cognitive self-regulation. Consideration of Bowlby's and Vygotsky's perspectives together suggest that early socio-affective experiences may significantly color interactive learning, becoming a critical determinant of later individual differences in metacognitive abilities. Internalized models of early mother–child scaffolding contexts might then be expected to influence the child's self-regulatory abilities and effectiveness in using peers and adults as cognitive resources. As a consequence of these behavioral differences, we might expect to find differences in metacognitive components, both knowledge base and on-line strategies, which control the execution of procedures for engaging in socially-mediated learning and problem-solving.

In contrast to the abundance of literature focusing on the infancy period, there have been few studies which compare joint problem-solving interactions of securely- and insecurely-attached preschoolers (de Ruiter & van IJendoorn, this volume). As a result, we know almost nothing about how internalization of functional or dysfunctional early patterns of mother–child coregulation continues to influence the development of socially-mediated learning beyond the toddler period. This study compares collaborative styles of securely- and insecurely-attached mother–child dyads during the preschool

period—a time when the learning of basic metacognitive skills enters the zone of proximal development. We expected that: (1) mothers of securely-attached children would be more likely to model metacognitive skills and encourage greater child participation; (2) securely-attached preschoolers would show more advanced development in the use of metacognitive strategies during collaboration.

Attachment and Mother–Preschooler Collaboration

In order to test our hypotheses concerning the relation between attachment and the development of metacognitive strategies we observed the collaborative styles of 37 mother–child dyads during a joint planning task. Subjects included 19 securely-attached and 18 insecurely-attached preschoolers (mean child age = 42 months) with 9 boys in each group. Subjects were recruited through daycare centers servicing diverse SES groups in the Montreal francophone community and were matched with respect to maternal scolarity and family revenue.

The mothers and children included in this sample were each scheduled for a lab visit which lasted approximately 2 hours. The procedure followed for the lab visit permitted each child to complete a collaborative problem-solving task with his own mother and a second time with an unfamiliar female adult. In addition, each mother completed the *Revised Attachment Q-sort* (Waters & Deane, 1985) during the 2-hour visit. The Q-Sort was used to identify groups of children who differed on security scores according to Park and Waters' (1989) criteria. The application of these cutoff points to our own sample created a group of insecure children that represented approximately 35% of the total sample.

The collaborative task that we used was adapted from a task used by Mary Gauvain and Barbara Rogoff with older children (1989). Our adapted version for younger preschool-aged children was introduced to the adult–child dyad as a grocery store game. They were told that the goal of the task was the retrieval of a series of grocery items presented as a pictorial list (in the form of cards) provided by the experimenter. The child was to make use of a plastic figurine to help him/her retrieve the items. The following rules were explained to the dyad: (a) the figurine must enter through the door, collect the grocery items and exit through the door; (b) the figurine must walk along the aisles and not fly through the air; (c) once the figurine has located an item on the list, it must be stationed in front of the item while the child places the item in the basket; (d) the child, using the figurine, must take the shortest route in order to retrieve the items on the list and (e) the child and mother may place the cards (list) in any order they choose in order to help find the shortest route. Each dyad received a 3-item list preceded by a short (2-minute) exploration period. The grocery store task was video-taped using a camera placed behind a one-way mirror.

Coding Scheme for Collaborative Problem-Solving Activities

The grocery planning task was coded both for cognitive and socio-affective aspects of dyadic interaction in line with our objectives to identify how socio-affective interpersonal contexts interact with the level and types of cognitive and metacognitive exchanges

between adult and child. These coding procedures were adapted from the previous work of Gauvain and Rogoff (1989), Matas, Arend, and Sroufe (1978) and Moss and Blicharski (1986). There are 4 global categories of codes (socio-affective co-ordination, object exploration, metacognitive activity, and performance) which are subdivided into more specific subcategories. Computation of the Cohen's Kappa coefficient between trained observers ranges from 0.69 to 0.73. Definitions* of the codes are provided below:

Socio-affective co-ordination includes (1) attempts to orient partner's attention and (2) positive and negative affective behaviors. *Orienting partner's attention* includes simple behaviors which attempt to focus the partner on an activity that he or she is not yet involved in (e.g., "Hey, look!"). *Positive affect* includes approval of partner's person, task performance, or suggestion and expressions of joy or desire for contact (e.g., hugs). *Negative affective expressions* include disapproval of partner's person, performance, or suggestions and expressions of avoidance (e.g., child deliberately stops and takes another route to avoid drawing near to the mother), aggression, annoyance or discontent.

Object exploration codes include three levels of object-focused behavior of increasing sophistication: (1) nongoal-oriented object manipulation, (2) verbal descriptions aimed at labelling, or perceptual and functional cue-highlighting, (3) contextual object descriptions involving categorical relations. *Nongoal-oriented manipulations* involve nonverbal object behaviors which are unrelated to specific task goals or subgoals. *Verbal descriptions* include verbalizations concerning naming objects, physical and sensory attributes (e.g., size, shape, colour, texture, smell, sound) and their instrumental use (e.g., "The shampoo is for washing your hair"). *Contextual cues* include exchanges of information which underline contextual links between objects or events (e.g., "The popsicle goes with cold things") or available material resources (e.g., "There are no bananas in the grocery store").

Metacognitive activity includes four metacognitive skills (problem definition, planning, monitoring, and evaluation). *Problem definition* involves identification of task subgoals (e.g., "Let's pick up this item"), goals, and elaborations which occur before the execution of the designated action. Elaboration refers to specifically relating an aspect of the task to a context outside of, or preceding the actual task. For example, in our grocery store task, mothers often introduced the grocery store task to their children by saying "This model is just like our corner store." Also included are discussions and demonstrations related to task rules ("You need to leave by the door of the grocery store"). *Planning* behaviors include determining the location of task-specific objects and routes through the store, ordering of items, resource management, division of labor, and predicting the consequences of these plans. For example, an adult shows the child some cards to be ordered and asks, "Which one should we go get first?" *Monitoring and evaluating behaviors* correspond to statements which contain information related to checking, controlling and evaluating ongoing or already executed activities as a function of available resources or task constraints. For example, mother puts a card on the bottom of the pile and says, "We've found one item, there are two left."

*The following definitions of categories refer to both verbal and nonverbal instances of behavior unless otherwise specified.

Dyadic performance was evaluated as the number of items picked up without transgressing any rules (ranging from 0 to 3).

Comparison of Secure and Insecure Dyadic Activity

In comparing collaborative dyadic activity of the secure and insecure preschoolers, we first looked at the overall frequency of mother and child activity for each group. As illustrated in Figure 3.1, insecure children, as well as their mothers, are generally more active (both $F_{s(2,34)}=4.8$, $ps<.02$) than are the secure dyads. Specifically, the frequency of nonverbal behavior is higher for insecure children ($F(1,35)=9.1$, $p<.01$) while their mothers are both verbally and nonverbally more active (both $F_{s(1,35)}>6.0$, $ps<.02$). However, when we look at the proportion of child behavior that is pertinent to the task we see that secure children have a significantly higher level ($t(24.6) = -2.4$, $p<.03$) of task-relevant activity than do their insecure peers (see Figure 3.2). The fact that the insecure dyads' higher rate of activity is not enhancing task performance is further shown by the fact that groups do not differ in overall performance scores ($t(35)=1.2$, $p>.10$). Both succeeded in correctly gathering approximately the same number of items (about 1 out of 3).

In our next analyses, we looked more specifically at the particular content of maternal and child activity in each category. Starting with interpersonal co-ordination, there is no evidence that mothers or children differ in the relative frequency of positive or negative affect expressed or in orienting their partners' attention (both $F_{s(3,33)}<1.0$). At first glance, these results seem to conflict with those of other attachment researchers (Erickson, Sroufe, & Egeland, 1985; Main, Kaplan, & Cassidy, 1985; Matas *et al.*, 1978; Sroufe, Fox, & Pancake, 1983) who have found that interactions of secure dyads are generally more affectively positive and less negative than those of insecure dyads. However, we would like to point out that the task we are using is more structured than those generally used in attachment research and probably does not elicit too many purely affective interchanges. The lack of differences between mothers and children in the orienting category should be interpreted in light of the significant differences in their

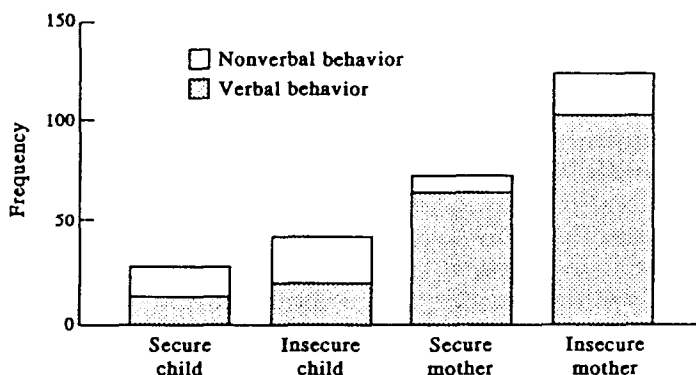


Figure 3.1. Frequencies of verbal and nonverbal behaviors for mother and child as a function of attachment. These frequencies do not include task performance.

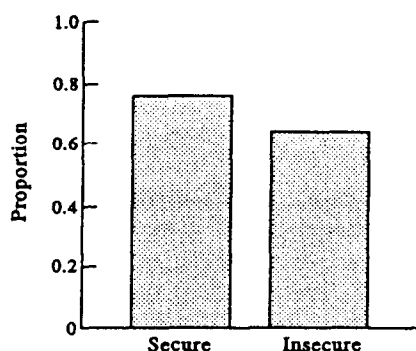


Figure 3.2. The proportion of child task relevant behavior as a function of attachment.

proportion of task relevant behaviors. Even though the activity of insecure children is less pertinent to the task, their mothers do not attempt to compensate by orienting them more. Similarly, insecure children do not solicit mother's attention more frequently than do their secure peers, even though such efforts might increase task effectiveness.

Our next analyses compared the proportion of object-oriented behavior used by both groups. Mothers are much less involved with exploring objects than their children (only about 10% of their total behavior relates to this category compared with 40% of children's). There are no significant differences between maternal groups related to this kind of behavior. On the other hand, object exploration represents the single greatest component of child activity. In Vygotskian terms, this can be considered to be a zone of consolidated as opposed to proximal development, referring to already-acquired skills that are no longer dependent on interpersonal regulation. As demonstrated in Figure 3.3, there is considerable heterogeneity in the exploration styles which have emerged in the behavioral repertoire of secure and insecure children. As noted earlier, our coding system describes three levels of object-oriented behavior ranging from the simplest object manipulations with no apparent goal to contextual highlighting which involves the recognition of categorical relations. In order to test the existence of a linear relationship with respect to child use of more complex exploratory strategies and for group differences in the nature of this relationship, a trend analysis was performed. Results revealed a significant group \times linear interaction ($F(1,35) = 5.6, p < .03$). As illustrated in Figure 3.3, secure children are more likely to reduce the proportion of their object behavior in the lower categories while investing in the more sophisticated contextual kind of exploration. By comparison, insecure children have a higher proportion of their behavior in the less sophisticated categories with a linear decrease in more complex exploratory behavior.

Finally, we compared the use of metacognitive strategies as a function of attachment. Mothers did not differ with respect to the proportion of their overall metacognitive behavior nor with respect to use of specific strategies (definition, planning, monitoring/evaluation). However, examination of the proportion of maternal metacognitive activity expressed verbally (cf. Table 3.1) revealed that mothers of secure preschoolers were higher ($F(3,33) = 3.7, p < .03$) particularly with respect to monitoring and evaluation of child activity ($F(1,35) = 4.9, p < .04$). The same series of analyses of child behavior

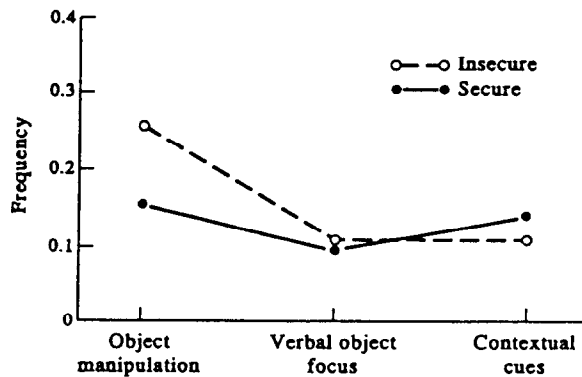


Figure 3.3. The proportion of child behavior within object exploration category as a function of attachment.

Table 3.1
Proportion of Mother and Child Metacognitive Strategies as a Function of Attachment

Category	Group	Total behavior		Verbal behavior	
		Mean	(S.D.)	Mean	(S.D.)
<i>Mother</i>					
Definition	Secure	.16	(.05)	.97	(.07)
	Insecure	.18	(.08)	1.00	(.00)
Planning	Secure	.08	(.05)	.88	(.23)
	Insecure	.06	(.06)	.70	(.36)
Monitoring/ evaluation	Secure	.29	(.08)	.95	(.07)
	Insecure	.31	(.09)	.86	(.15)*
<i>Child</i>					
Definition	Secure	.08	(.08)		
	Insecure	.05	(.07)		
Planning	Secure	.10	(.09)		
	Insecure	.13	(.15)		
Monitoring/ evaluation	Secure	.14	(.09)		
	Insecure	.07	(.06)†		

* $p < .05$; † $p < .01$.

showed significant group differences with respect to use of component strategies ($F(3,33) = 3.0$, $p < .05$). Secure children used a higher proportion of monitoring and evaluation ($F(1,35) = 8.1$, $p < .01$). Secure and insecure children expressed a similar proportion of verbal metacognitive strategies. In summary, mothers do not show major group differences in the kind of metacognitive strategies they use or in the proportion of their overall activity allocated to these activities. Both groups of mothers allocate about the largest proportion of their behavior to problem definition, planning and monitoring and evaluating their children's task performance. However, the modality of expression of these strategies differs significantly. Mothers of secure children use a larger proportion of verbal regulation than do mothers of insecure children. This is particularly true for their monitoring and evaluation of child behavior. A comparison of child activity shows parallel results since secure children display greater self-monitoring and evaluation.

The Role of Attachment in the Development of Metacognitive Strategies: Theoretical and Empirical Considerations

At the beginning of this article we discussed the value of studying social and cognitive development as interdependent processes. We proposed that joint consideration of Bowlby's and Vygotsky's models would constitute an appropriate heuristic framework for this purpose. Three essential theoretical commonalities were outlined: (1) the emphasis on the transfer of functions from the interpersonal to the intrapersonal plane; (2) consideration of early patterns of coregulation as models for later collaboration; (3) conceptualization of internal representation as the mediator of developmental continuity. Discussion of the results of our comparative study of mother-child joint problem-solving as a function of attachment will revolve around these issues.

Transfer of Functions from the Interpersonal to the Intrapersonal Plane

At the outset of collaboration, partners may not necessarily share a common definition of the situation. Particularly in the case of expert-novice interactions, one partner assists the other in progressing towards more sophisticated understanding of the context. According to Wertsch (1984), in order to progress within the zone of 'proximal development, the novice must not only add new elements to his initial representation of the situation but also implicitly agree to transform this into one which is closer to that of the expert. This dynamic negotiation of the situational definition which guides ensuing activity is the essence of Vygotsky's concept of the co-constructive process. According to Bowlby, the skill of maintaining a goal-corrected partnership which essentially involves the ability to collaborate under a single set of goals and plans develops in the context of attachment care-giving interactions. This is made possible by advances in communicative and cognitive abilities which permit the child to take the others' perspective and negotiate shared plans of action. However, effectively applying these new skills in a relational context in adjusting one's own action pattern to a shared goal may actually depend on socio-affective aspects of the interaction process. In order to appropriately scaffold their preschoolers' metacognitive development, it is critical that mothers seek to raise the level of cognitive exchange slightly beyond their children's level of actual development and flexibly support developmental reorganization on both the intrapsychological and interpsychological planes (Griffin & Cole, 1984). It is equally critical that children respond positively to these maternal initiations of more advanced tactics. Thus, adopting a shared goal entails an interactional pattern which involves children's acceptance of mothers' guiding role in facilitating their acquisition of difficult metacognitive strategies and mothers' sensitivity to ceding control to their children in the application of more familiar problem-solving strategies. In this view, security of attachment should influence the readiness of the novice to transform his own situational definition within the co-constructive process and the flexibility of the expert in adjusting to his partner's level.

Our results support this hypothesis in the sense that insecure children are less likely to both acquiesce and persist in sharing a common goal with their mother, as shown by their higher proportion of task irrelevant behavior. This occurs despite the fact

that mothers of these children appear to be as task-centered as are mothers of secure children as evidenced by their similar proportion of metacognitive activity. On the other hand, secure dyads seem to achieve co-construction more efficiently in that the children emit more behaviors in line with the task goal and dyadic activity is characterized by greater economy of activity. It is possible that secure children's higher proportion of task-pertinent behavior simply reflects greater compliance with maternal directives rather than real sharing in a common goal. However, the fact that secure children also play a greater role in monitoring task execution argues against such a purely behavioral interpretation in favor of a more cognitive one, emphasizing their greater skill in negotiating a joint task.

With regard to the comparison of scaffolding styles, although mothers used a similar proportion of supervision, the greater emphasis on verbal as opposed to nonverbal expression shown by mothers of the secure group has considerable implication for the development of both child understanding and motivation. Both Bowlby and Vygotsky view verbal mediation as a key element in the transfer of functions from the interpersonal to the intrapersonal plane. Both affective and cognitive self-regulation are intrinsically linked to the representational organization of information concerning the goal-directed interactive behavior of oneself and others. By pointing out to the child that his ongoing activity is facilitating or interfering with goal attainment using monitoring and evaluative statements or questions (e.g., "Is that the item we are looking for?") rather than nonverbal gestures (e.g., moving the child's hand away from items not on the list), the child's own processing and organization of relevant information is enhanced to a much greater degree. Moreover, as Wood (1988) has pointed out, children who have experienced reciprocal and cognitively-engaging instruction are far more motivated to take a more active role in facilitating their own learning than are children who have been exposed to teaching methods which do not allow the child to express competence.

Our results show that secure preschoolers are more competent in self-monitoring by age 3–4. They more adequately evaluate ongoing or already executed team activities as a function of available resources such as time and materials or as a function of task constraints. The most common examples of child self-monitoring that were observed involved repetition of rules and subgoals while executing steps of the task (e.g., child reminds himself not to fly over grocery store rows while repeating, "Walk, walk" as he displaces the figurine). They are beginning to be involved in checking or controlling what has already been done, what is actually being done and what has to be done (e.g., child takes a card illustrating an item that has just been found and puts it aside). Secure children's sharing of metacognitive responsibility appears to facilitate both more efficient progress in the pursuit of task objectives as well as child mastery of fundamental collaborative skills.

Early Patterns of Co-regulation as Models for Later Collaboration

Consideration of this question necessitates posing three subquestions: (1) What dyadic patterns may have developmentally led to those we are observing at the preschool period? (2) Within the preschool period, to what degree should we expect cross-

situational consistency? (3) What models for later collaboration are likely to emerge from these preschool patterns?

Antecedents of preschool mother-child patterns

Earlier we discussed the patterns of negative reciprocity and dyssynchrony that have been observed to characterize the behavior of mothers and insecure children during the toddler period. Several studies have also shown that these dysfunctional patterns interfere with reciprocal task engagement. Although in this study we did not observe a higher proportion of negative affective exchanges for insecure dyads, there was a notable dyssynchrony with respect to mothers and children's task-pertinent behavior. The notion of internalization according to Bowlby and Vygotsky suggests that the affective patterns which were present on an interpersonal plane during a former developmental period may continue to interfere with later activity through internal mediation. The child may have internalized former mother-child interactive patterns and constructed an internal working model which guides subsequent collaborative behavior with the attachment figure. For example, the direct opposition manifested by younger insecure children may have been replaced by more socially-mature, indirect object-mediated resistance. In other words, although mothers did not differ with respect to the kind of information they communicated regarding the task, insecure children's activity was less on-task. Instead of affectively and openly refusing to collaborate, opposition may now involve focusing away from maternal goals to an alternate activity such as simply manipulating task objects without complying with maternal directives aimed at using them effectively in the task.

Cross-contextual consistency of child collaborative patterns

In a recent study (Parent, Gosselin, & Moss, 1992) we compared the collaborative styles manifested by secure and insecure preschoolers on the grocery store task described here with two different partners: their own mother and a strange woman who was also the mother of a preschool-aged child. Our objective was to investigate the extent to which attachment affects both the nature of the child's shared metacognitive experiences with the primary care-giver as well as with new social partners. We observed a consistent pattern which characterized dyads including an insecure child. Both the proportion of child task-irrelevant behavior and the level of adult activity were higher, suggesting that the difficulties that seem to characterize insecure children's co-construction are not specific to the mother-child relationship. In fact, although the overall behavioral profile of both secure and insecure children was similar with the stranger, there was a marked discrepancy in their performance results. Whereas secure children performed better when they did the task a second time with the stranger, insecure children's problem-solving performance deteriorated in spite of the fact that they had already practiced the same task with their mother. This deterioration was all the more striking given the fact that there were no significant differences in performance results for the mother-child context. Thus, the collaborative style of secure children with their mothers appears to better prepare them for further joint activities. Furthermore, secure children

consistently showed a higher proportion of task monitoring and evaluation activities. These results provide further evidence for the idea that secure children's higher level of task-focused behavior does not simply reflect greater compliance with adult directives. Rather, internalization of early patterns of co-regulation appears to contribute to the development of collaborative skills which can be cross-contextually applied.

Developmental sequelae of preschool patterns

In order to predict what models for later collaboration are likely to emerge from these observed preschool patterns, it is necessary to consider the nature of the internal working models the insecure preschoolers are developing. Just as early patterns of negative reciprocity developmentally gave way to more object-mediated resistance, this preschool pattern may in turn be transformed by the school-age period. As we discussed earlier, the dyssynchrony in sharing of dyadic responsibility for task regulation seems to be a consequence of insecure dyads' ineffectiveness in defining a common goal. Internalization of this interactive pattern where the adult is overly involved in task control creates particular expectations for teacher-child functioning in the school context. At the outset, the insecure child is less likely to view the relation between the teacher and himself as an active learning partnership. When the teacher's goal goes against the child's own short-term interest, the latter is less likely to adapt his own objectives accordingly. As a consequence, the child is less likely to benefit from teacher scaffolding, eventually anticipate teacher expectations and progressively acquire the ability to self-regulate his learning activities. According to Meichenbaum, and Biemiller (1990), a child who shows a self-regulatory deficiency in his classroom profile is likely to be perceived by teachers as less competent and is given fewer opportunities to display autonomy and overcome this deficit. With continued experience in the school context, insecure children may develop more serious self-monitoring deficits which increase their dependency on adult directives, limit effective peer collaboration and, in turn, reduce opportunities for the further development of interpersonal negotiation and self-regulatory skills.

The Mediating Role of Internal Representation in Developmental Continuity

As discussed above, both Bowlby and Vygotsky emphasized the importance of representational mediation in development. The former introduced the concept of internal working models which reflected dynamic internalized representations of the infant's relationship with attachment figures. Vygotsky identified internalized language as a cognitive tool which structures thinking and regulates action. One of the strengths of Bowlby's original idea was that the self is represented in interaction with others. As Bretherton (1985) has explained, although concepts of self and others are progressively differentiated from internalized features of relationships, they remain connected even in adult models. Thus self-concept is never to be viewed as a totally individual construct but as a relational one necessarily bound up with one's perception of others' view of the self.

Main (1991) has recently suggested that the attentional resources of insecure children are so devoted to monitoring the accessibility of attachment figures that little is left for exploratory purposes, including monitoring of cognitive processes. This explanation is consistent with current models of metacognitive functioning (e.g., Flavell, 1987; Lefebvre-Pinard & Pinard, 1985; Pressley, Borkowski, & Schneider, 1987) which view attentional resources as limited and subject to the competing demands of affective, cognitive and self-regulatory processes. However, a social constructivist view of cognitive development such as the Vygotskian framework suggests a more direct relationship between the quality of attachment and the development of cognitive and metacognitive abilities. Accordingly, the emergence of metacognitive functions in children depends on how social interaction helps to mediate and organize the young child's representational processes. These shared metacognitive experiences, in essence, are hypothesized to create and support the development of an internal working model allowing the child to later direct his/her own cognitive activities through self-regulating speech. This Vygotskian perspective of the internal working model's influence on the development of metacognitive abilities allows us to view the social and cognitive aspects of these models as interdependent rather than separate components.

Although it is widely accepted that internalized interactive patterns of the infancy period guide toddler exploratory patterns, little thought has been given to how internalized models of the toddler period might influence preschool cognitive functioning and preschool models, in turn, school-age patterns. Although our earliest representation of the internal working model may continue to exert influence throughout the lifespan, it is probable that there are important developmental transformations in these models which also contribute to the development of functions which are in the zone of proximal development. For example, Corno and Rohrkemper (1985) have described self-regulated learners as those who can intentionally "deepen and manipulate the associative network in a particular content area and monitor and improve that deepening process" (p.69). An essential component of these transformational processes is learning to conceptualize influential factors in learning situations and to use the social resources available to accomplish objectives. The joint experiences in activity monitoring engaged in by secure children and their mothers involves the early practice of these skills on an interpersonal plane. Through these experiences, secure children may not only develop their metacognitive competencies but also come to attribute greater efficiency to themselves as self-regulated learners.

It is also important to identify factors which might influence different maternal styles. The way in which the child demonstrates his ability to independently use acquisitions of earlier periods is an important clue to the adult about how quickly to progress within this zone of proximal development. Thus, the achievement of metacognitive levels of exchange also depends on the child's greater cognitive flexibility in combining verbal representations, redirecting attention and transforming the situation definition. Secure children who are more advanced in the acquisition of verbal object exploratory skills by the preschool period are more suitable as partners for metacognitive verbal exchanges in which verbal skills are the tools for creating new combinations of strategies. Moreover, secure children's more advanced skill in relating several objects means that mothers can more easily shift the dialogue to a more superordinate level. Finally, the general enthusiasm for joint cognitive enterprises evidenced by secure children's more task-

oriented profile shows their acceptance of mother's guiding role in facilitating their acquisition of difficult metacognitive strategies.

In conclusion, in contrast to the more common view of cognitive mediators which develop primarily within the individual, this "co-constructive organizational" model sees social interactive abilities and the development of cognitive functions in a continuous reciprocal feedback loop. In as much as internal working models can benefit from continued social input through self-monitoring functions which monitor the concordance and discrepancy of incoming information, metacognitive abilities can be seen as not only emerging from social interaction but continuing to develop within social interactions throughout the lifespan.

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CHAPTER 4

ATTACHMENT AND EMERGENT LITERACY

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Abstract

In this chapter the relation between early reading development, parent-child interactions around written material, and the affective bond between parent and child is explored. We found some evidence for a relation between quality of assistance during storybook reading and emergent literacy skills. The studies demonstrated a relation between the security of the relationship and the reading process: if the children feel secure the reading sessions are less problematic and more rewarding and the mothers are better able to attune to their children's needs. We also found that the security of the mother-child relationship is related to the frequency of reading. On the basis of our studies on this issue, a model is presented to explain the emergence of literacy skills before formal reading instruction.

Introduction

The attachment relationship between children and parents (or other care-givers) is defined as a relatively enduring, affective relationship between a child and one or more adults with whom he/she regularly interacts. From a secure attachment relationship children derive a feeling of trust in their social environment, especially in their parents, as well as trust in their own ability to influence this environment (Bretherton, 1985). From the safety of a secure attachment relationship, the children are assumed to explore unknown aspects of their environment (such as written material) with more confidence and less anxiety. Feelings of trust also imply that the attachment figure is a more effective "teacher" of the child. Secure children are more inclined to trust their attachment figure when being taught useful and pleasant subjects. The attachment figure is also able to instruct the child somewhat more easily because he/she knows

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exactly how to deal with the child's signals of anxiety or curiosity. If the relationship with the parent is an anxious one, children are less able to trust their care-giver as a teacher, and because of their fixation on the attachment figure (they want to be close to their attachment figure but are not able to derive security feelings from their relationship), they are blocked in their exploration of the environment (Ainsworth, Blehar, Waters, & Wall, 1978).

The emergence of literacy has been linked to the preschooler's experiences with written language in daily life. In our Western society the environment of children abounds with written material on sweets, T-shirts, sodas, food, etc. Even during the infancy and preschool years, many children have a number of books, that parents or older siblings read to them. In popular T.V. programs such as *Sesame Street* a lot of attention is paid to aspects of written language development. It is assumed that conceptual knowledge of written language develops as a result of attempts at interpreting written material in daily life, with or without the assistance of adults (Sulzby & Teale, 1987). Several studies have shown that components of written language competence are already available during the period in which children do not yet know how to read and write conventionally (Bus, 1986; 1990b; Ferreiro & Teberosky, 1982; Sulzby, 1985).

Because written language can be found almost everywhere, there may be some doubt as to whether differences in knowledge are only related to differences in material conditions, such as the number of booklets available. An environment in which written language is abundant, does not appear to be a guarantee for a child's acquisition of new knowledge. Ethnographic studies have made it plausible that the effects of written language experiences depend to some extent on the support of adults (Heath, 1982). Children have to be actively involved in attempts to make sense of written language and adults have to assist them adequately. In accordance with attachment theory the affective bond may determine the quality and quantity of instructive interactions between parents and children. In the following paragraphs, the relation between early reading development, parent-child interactions around written material, and the affective bond between parent and child is explored on the basis of our studies on that issue.

Attachment and Exploration

In attachment theory, differences in exploratory behavior as well as differences in adequacy of instructive interactions are supposed to be related to the child's feelings of trust in its parents. In this respect, the so-called "Strange Situation" procedure revealed clear differences between children. During this procedure, 1-2 year old children are separated from their parent (or other care-giver) for a few minutes. They stay behind with an unknown person in an unknown laboratory playroom. The children's reaction to the reunion with the parent is closely observed. Many children feel uncomfortable in this stressful situation, including many securely attached children, but after reunion the latter children quickly feel at ease again and use their parent as a secure base to explore the environment. Anxiously attached children, however, seem to have little trust in the availability of their parent in stressful circumstances and after reunion they remain alert to further separations from their attachment figure. They hardly pay any attention to the

environment (the "resistant" type of anxious attachment), or they seem to be focused on the play material but are playing in a stereotyped and superficial way (the A or avoidant type of anxious attachment) (Ainsworth *et al.*, 1978).

In a longitudinal study (Bus & van IJzendoorn, 1988a), we studied the effects of these relation characteristics on the development of written language. Mothers of five-year-old children who were observed in the Strange Situation procedure at the age of two, completed a questionnaire on the emergent literacy of their children. Besides questions about knowledge of written language ("How many letters does your child try to write?"; "How many words is he able to write") and questions about activities at home ("Does your child subscribe to a children's magazine?"; "Does your child visit a library?"), the questionnaire also contains questions about exploratory behavior ("Does your child name letters during play?"; "Does your child ask you to read words?"; "Does your child write letters in drawings?").

We did not find differences in the kind of activities at home between securely and anxiously attached children. The questions about knowledge of written language did also not differentiate between the two groups. But the securely attached children appeared to show more interest in written language. They were more curious and eager to know more about this strange aspect of their environment. This study therefore supports the hypothesis that the quality of the attachment relationship between mother and child influences the exploratory behavior of the child. In contrast, the exploratory behavior did not result in differences in written language competence. A possible explanation is that the mothers themselves were asked to indicate what knowledge about written language the child possessed. We may question the validity of the instruments used in this study. Although a pilot study showed the outcome of the questionnaire to be related to observational data, this instrument might be less adequate to monitor individual differences. However, we found these results to be promising enough to continue in this direction.

In subsequent studies, we focused on the process of interaction between parent and child during reading-like activities. An important point of research in the home is that literacy events occur in many forms other than parental bookreading (Teale, 1986). Mason and Allen (1986), however, suggest that these literacy events are not as beneficial to the child as bookreading is. Because in most Dutch families reading to children is a daily activity, we have studied this activity more intensively. The follow-up studies focus on mothers reading to their children, not because we doubt the fathers' role in emergent literacy but because it requires separate studies to uncover and describe this role more precisely.

Reading Simple Books to 1½-, 3½- and 5½-Year-Olds

Interactive reading is necessary to help children understand the story (Teale, 1981). From a cultural-historical perspective, adults create a zone of proximal development during storybook reading (Pellegrini, Brody, & Sigel, 1985). The adult tries to evaluate what children do not yet understand and adapts his/her assistance accordingly. This idea implies that older and more competent children will be read to in a different way than younger and less competent children. A cross-sectional study on 1½-, 3½- and 5½-year-olds provided some support for this hypothesis (Bus & van IJzendoorn, 1988b). In this

study, all mothers read to their children from two different booklets. Because of the youngest group we chose booklets with a very simple plot. The first one was a book with letters of the alphabet and corresponding illustrations. The second book was a story about a mother dog looking everywhere in the house to find her puppy Spot. In looking behind flap-overs the children can decide themselves whether Spot is under the table, in the drawer, or somewhere else. In addition, the 3½- and 5½-year-olds completed a number of emergent literacy tests.

Dependent upon age and competence the interactions during reading were found to differ. We discriminated between discussions focused on the meaning of an illustration or text fragment or discussions focused on formal aspects of written language such as the relation between letters and sound, word identification, letter naming and the spelling of words. This study appeared to indicate that older and more competent children pay increasing attention to formal characteristics of written language, whereas the meaning of illustration or text fragments became less central. This result suggests that new aspects of written language come into focus as soon as the more basic aspects can be understood without assistance.

The choice of components of the reading process that are practised does not only depend on the developmental stage, but also on the book characteristics. Spot, for example, provoked less proto-reading than the letter book. Further studies of different kinds of books might be helpful in explaining different components of emergent literacy.

The reading process may not only depend on the way in which mothers succeed in adequately tuning in to the child's knowledge level but also on the child's willingness to cooperate. In general, anxiously attached children appear to be less enthusiastic and curious in difficult task settings (Matas, Arend, & Sroufe, 1978) and they are less cooperative and obedient to adults (Bates, Maslin, & Frankel, 1985). To determine security of attachment, the 1½-year-olds were observed in the Strange Situation procedure. The 3½-year-olds and the 5½-year-olds were separated from their mothers for about an hour during which they completed some tests. The reunion between mother and child was scored on a three-point security scale derived from Main's security scale (Main, Kaplan, & Cassidy, 1985).

We found a strong relation between security and number of problematic interactions during the reading sessions. Children who were more anxiously attached appeared to be more easily distracted during reading and their mothers had to discipline them more often to recall their attention to the booklets. The study also demonstrated that mothers of securely attached children are able to demand more from these children, probably because these children have more trust in their care-giver and in themselves during difficult or stressful situations. Compared to anxiously attached dyads, mothers of secure children paid less attention to illustrations and more to the formal characteristics of written language.

Reading a Complex Story to Three-Year-Olds

The selection of appropriate words as well as the way in which a written story is being told is different from oral language (Olson, 1977). Whereas verbal interaction is strongly dependent on the physical, linguistic and paralinguistic context, the reader/listener has to derive contextual information from the text itself. Because young children are not

used to written language, it is mostly not sufficient for parents to read just the literal text. Before children themselves are able to understand a text they need support during storybook reading which, however, we expect to differ according to children's former experiences with storybook reading. In a follow-up study (Bus & van IJzendoorn, 1992) we explored individual variations in reading a complex story to three-year-olds. To get an idea of the effect of children's past experience with reading on mothers' attempts to make a complex story understandable to three-year-olds we compared dyads strongly differing in past reading experience. If children acquire general knowledge about the vocabulary and narrative structure of a story the mothers' support will differ as a function of past experience. The differences might be helpful in explaining which learning processes occur. During a session at our laboratory the mothers read to their children from a new book in which all elements of a complete story were available (Stein & Glenn, 1979). We intentionally selected a story that was hard to understand for most three-year-olds. From earlier studies it is apparent that simple stories provoke very few explanations even from high SES mothers (cf. Pellegrini *et al.*, 1985). In coding the reading sessions we focused exclusively on verbal interactions during reading; modifications of the text were excluded from the analyses.

The study supports the hypothesis that a child's past experience with reading decreases the need for assistance by the mother in reading a new book. Mothers of children with infrequent reading experience have to focus their child's attention on the task more often. Inexperienced dyads also communicate more about the content of the story; the mothers provide more explanations and interact more often with their child. These results show that experienced children are less liable to be distracted and that they need less support to be able to make relevant conclusions and associations. However, frequent experience with being read to did not lead to a different kind of maternal instruction; all mothers not only try to stimulate labelling and describing, but also to explain complex and implicit relations in the text. It therefore appears that most three-year-olds are able to understand a complex story and that reading experience leads to a better understanding of the vocabulary and narrative structure of stories in general. Analyses of children's recall protocols may further specify what children retain from storybook reading sessions as described here.

The main purpose of the present study was to examine differences in the ways in which parents mediate a text when reading a new story to three-year-olds. Differences in style of reading may be related to the socio-economic status of the families. Several studies (Heath, 1982; Ninio, 1980) suggest that lower class mothers have a different style of interacting with their children than middle class mothers and that these differences explain why middle class children are generally so much more competent at the beginning of elementary school than low SES children. However, comparing frequently reading dyads from a low and a high SES did not reveal any differences in troublesome interactions, the number of explanations by the mother, the interactions between mother and child, or in the level of demands by the mother. We cannot exclude the possibility that the way the task was structured by the material used may have masked any SES-related differences in instruction. The complicated text may have caused mothers to explain implicit events and complex relations.

To test the effect of attachment patterns on the process of reading a complex new story, all children were separated from their mother and their behavior during the

reunion with the mother was observed. The children's behavior during the first 5 mins of the reunion was coded on an adjusted version of Main, Kaplan and Cassidy's (1985) security scale for six-year-olds. The number of negative or disciplinarian contextual interactions did appear to be related to the security of the attachment. In addition to this replication of the effect of attachment on the atmosphere during reading, we found a relation between security of attachment and quality of instruction: securely attached children tended to get explanations on a higher level, that is, less labelling of the illustrations and more discussion on the level of textual interpretations. In general, mothers appeared to discipline their children less and to involve them more often in discussions about the text if the children were more securely attached to their mothers.

This study confirms that individual differences in style of interaction cannot be accounted for simply in terms of income level or cultural background (cf. Sulzby & Teale, 1987). A more complicated pattern turns up suggesting that individual differences in the mothers' style of interacting with their child are products of a number of factors in the family. Our results contradict studies (Heath, 1982; Ninio, 1980) which demonstrate an effect of social class differences on the mothers' style of interaction. However, results are not incompatible when we take into account that insecure relationships are to be expected more often in lower class families and that in the present study the scores representing several characteristics of the reading process were adjusted for differences in security.

Interestingly, in the group of infrequent readers the insecurely attached dyads were strongly over-represented (73%) compared to the groups of frequent readers from a low and high SES with respectively 33 and 13% insecure dyads. This result indicates that a relation may exist between the quality of reading sessions, the affective bond between parent and child, and the frequency of reading at home. It may be hypothesized that mothers read more frequently to their child if the reading sessions take a more pleasant and rewarding course.

Maternal Antecedents of Quality and Quantity of Reading

From a series of studies, it may be derived that the quality of the mother-child attachment relationship is dependent on the way in which the mother evaluates her attachment relationship with her parents—in her childhood and at present (Main *et al.*, 1985; for a review, see van IJzendoorn, 1992). Her mental representation of the bond with her parents is supposed to determine the quality of new attachment relationships, including that with her own child. A secure representation of her past attachment experiences, enables the mother to be open to all signals and needs of her child, even if these signals are threatening or anxious. An anxious representation is supposed to lead to blocking off those signals (like crying) that remind the mother too much of her own painful experiences with attachment and separation in her childhood (Main & Goldwyn, in press). From this theory, the hypothesis may be derived that the mental representation of the mother's own attachment experiences in the past, are related to the frequency and quality of the reading sessions and—indirectly—to the child's emergent literacy skills.

In our study (Bus & van IJzendoorn, 1992b), we measured the mothers' mental

representation of her own attachment experiences. We used the so-called "Adult Attachment Interview," developed by Main and her colleagues (Main *et al.*, 1985). The Adult Attachment Interview is a semistructured interview in which questions about general characteristics of the relationship with their own parents are supplemented with questions about specific childhood events and about the current relationship with the parents. The coding system leads to classification of the interviews in terms of security of attachment (for details, see Main & Goldwyn, in press).

From our data the mental representation of attachment appeared to be related to the quality of the attachment relationship between mother and child, as observed in the separation–reunion episode of the Strange Situation. If mothers have a more secure representation of their own childhood, they also tend to have a more secure relationship with their own child. Our data also confirm the hypothesis that secure mothers, that is, mothers with secure mental representations of their attachment experiences, read more frequently to their child. Secure mothers also need to do less disciplining to focus their child's attention on the task and these children have more advanced emergent literacy skills. These data provide further support for the idea that the affective dimension of the mother–child relationship is an important factor in the child's cognitive development. The attachment relationship determines at least in part the development of literacy skills through the quality and quantity of the mother–child reading interactions.

This finding makes it less plausible that the reading sessions influence the child's behavior during the separation–reunion episode. First, in the present study the affective bond between mother and child is being observed from two different, but convergent, perspectives. In the Adult Attachment Interview, the parental perspective is emphasized, whereas in the separation–reunion episode attention is focused on the child's perspective. If both scores converge, we may be more convinced of the validity of those results. Second, it is not easy to defend that the reading sessions influence the outcome of the Adult Attachment Interview. Because the Adult Attachment Interview is tapping deep-rooted representations of the parent's attachment experiences in childhood and in adulthood, the outcome is relatively resistant to change (Bowlby, 1969). It is hypothesized that only as a result of major life events such as a new partner relationship or a puberty crisis, or as a result of psychotherapy, may the mental representation of attachment change from secure to anxious or reverse (Bowlby, 1969). Therefore, it is more plausible to suggest that the outcome of the Adult Attachment Interview determines in part the frequency and quality of the reading sessions and—indirectly—the development of emergent literacy skills.

Conclusion

The purpose of our studies is to uncover the mechanisms which determine the development of literacy skills and to explain the existence of differences in the ways in which parents "tune in" to the child's intentions, knowledge and interactional patterns (Bus, 1990a). Our studies support some hypotheses about the relation between emergent literacy skills, quality and quantity of reading sessions, and the bond between mother and child. First, it has been demonstrated that reading to children influences the assistance required to make a story comprehensible. Experienced children are less liable to be distracted and they need fewer explanations to be able to follow the story. Second,

mothers adapt their interactive reading behavior to the level of competence. We found some evidence for the relation between quality of assistance and emergent literacy skills: when reading simple books older and more competent children receive more instruction about complex aspects of written language such as letter-sound combinations and less instruction about the meaning of illustrations and text fragments. Third, the studies demonstrated a relation between the security of the relationship and the reading process. If the children feel more secure and their bond with the mother is a safe haven from which to explore the environment, the reading sessions are less problematic and more rewarding and the mothers are better able to attune to their children's needs. Fourth, the security of the mother-child relationship is related to the frequency of reading. Secure mothers probably read more frequently because the reading sessions take a more pleasant course. Fifth, we demonstrated that individual differences in the style of reading a complex new story cannot simply be explained by SES differences between the families. In a group of frequently reading dyads within-SES variations seem to be as large as between-SES variations. Lastly, we demonstrated that the mothers' mental representation of their own attachment experiences is related to the security of their bond with the child, to the frequency of reading sessions, and to the quality of the reading. These results support the following model of the emergence of literacy skills before formal reading instruction.

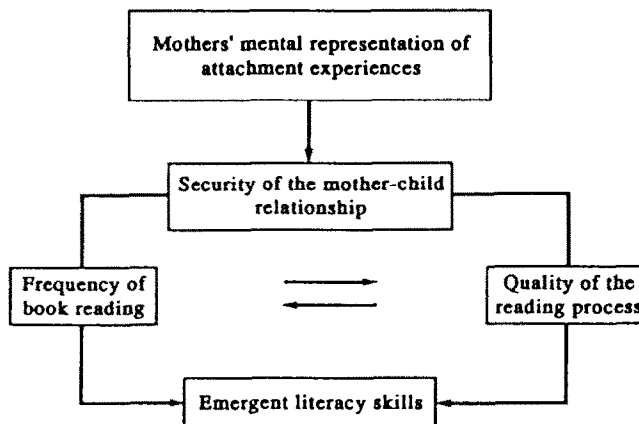


Figure 4.1. A model of emergent literacy: attachment and reading as the main determinants.

Further research should explore this model in more detail. Longitudinal and experimental studies are needed to support the causal implications of our model.

Biography

Adriana G. Bus, Ph.D., is associate professor at Leiden University. She is currently conducting research on emergent literacy, in particular on the parental role in helping children to become literate.

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CHAPTER 5

CHILD'S ATTACHMENT TO MOTHER AS A NEGATIVE PREDICTOR OF MOTHER'S COMMUNICATION EFFECTIVENESS

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Introduction

It has been firmly supported by empirical findings that close relationships between a subject and a model/reinforcer enhance the subject's susceptibility to the latter's social influence and/or social reinforcement. For example, classic studies (e.g., Bandura & Huston, 1961; Bandura, Ross, & Ross, 1963) indicated that children more readily imitated the behavior of a nurturant model than when the model was unnurturant or neutral.

Recent research has gone into particulars on this issue. First, it has been shown that even infants earnestly try to get information from significant attachment figures (Campos & Stenberg, 1981; Feinman, 1982, 1992; Walden & Ogan, 1988), and that by the time they are toddlers, they have acquired the capacity to be compliant to the nurturant mother in the developmental process toward autonomy (Kopp, 1982; Kuczynski & Kochanska, 1990; Minton, Kagan, & Levine, 1971; Sonnenschein, 1988; Vaughn, Kopp, & Krakow, 1984). Secondly, securely attached children are characterized as compliant to, and cooperative with, their mother, whereas noncompliance and/or defiant behaviors toward the mother characterize abused or insecurely attached children (Londerville & Main, 1981; Matas, Arend, & Sroufe, 1978; Oldershaw, Walters, & Hall, 1986). Furthermore, researchers have made clear the nature of effective mothers in socialization: mother's low-key or moderate assertions (Crockenberg & Litman, 1990; Kuczynski, Kochanska, Radke-Yarrow, & Girnius-Brown, 1987; Parpal & Maccoby, 1985), maternal responsiveness (Stayton, Hogan & Ainsworth, 1971), and positive mood of mother-child relations (Lay, Waters, & Park, 1989) tend to induce young children to respond positively to mothers' demands or proposals.

This evidence supports the affect-facilitation assumption of socialization, that is, a

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nurturant person to whom the child is attached, can convey social influences easily. A corollary of this assumption is that a person in whom subjects trust and to whom they attach, can use the warmth of the relationship as a resource in socializing with the subjects, getting them to comply with either general or specific expectations.

However, is the affect-facilitation assumption true across a variety of situations? Are nurturant mothers always effective social reinforcers and are they always willing to use the close relationships as a resource in socialization?

Some recent studies have cast doubts on this generality. Many researchers (Kuczynski, 1984; Lytton, 1980; Maccoby & Martin, 1983; Radke-Yarrow, Zahn-Waxler, & Chapman, 1983) have pointed out that nurturant mothers do not necessarily make children comply in all social contexts. When mothers perceive a given situation to be urgent and want to exert immediate control over children, the nurturant mothers use their affective resources and control their children more effectively than their unnurturant counterparts. However, contrary to the expectations based upon the above assumption, in contexts or situations which they see as merely playful or game-like, the nurturant mothers are reluctant to force their children to obey. They use more pleasant and milder control strategies such as negotiations and suggestions (Kuczynski, 1984), and allow the children not to obey their directives (Matas *et al.*, 1978) more than their unnurturant counterparts, apparently valuing the long-term good mother-child relationship over the desire to fulfill the demands of the task at hand.

Therefore, assuming that nurturant mothers' control strategies vary according to social context, we can hypothesize that only when we place mother-child dyads in task-oriented contexts, such as problem-solving situations used in the classic studies where subjects are pressed to achieve the task and their mothers, though implicitly, are assigned the role of a model or social reinforcer, will mothers use the nurturant relationship as a resource to have the child comply. In those task-oriented situations in which mothers are naturally expected to have so-called instrumental functions, they will concentrate on getting their children to achieve good performances. In other words, because of their affective resource, in those task-oriented situations, mothers to whom their children are attached have an advantage over their unnurturant counterparts.

However, if we put the dyads in playful contexts, such as game-like situations, the mothers who have close relationships with their children may prefer to enact so-called expressive functions, devoting themselves to maintain their close relations. They thereby reveal permissive attitudes toward children's noncompliance or defiance, and are reluctant to control playful behaviors of their children that do not conform to the rules of the game. The closer the relationship, the more inclined the mother is to place importance on the expressive role, because the closeness means that the relationship is a major emotional investment for her, and this may well prevent her from taking the necessary steps to get the child to complete the "task" successfully.

The purpose of the present study was directly to test this "social-context" assumption, i.e., that maternal control strategies vary according to the nature of the social context. It was specifically hypothesized that in a game-like problem-solving situation in which the role of the mother was rather ambiguous, the degree of the child's attachment to her, from which we could assume the close relationships between mother-child dyad, would be negatively related to the mother's effectiveness as a socialization agent as measured by children's performances in the game, because in such a situation the mother would be

content to maintain and enjoy the relationship. Two specific predictions were examined: (a) the child's strength of attachment toward the mother would be negatively correlated to the performance in the game; and (b) the mother's engagement in the maintenance of good relations with the child would negatively affect the child's performance in the task.

Method

In a game-like referential communication situation, the relationship between the child's attachment to the mother and the child's performance of decoding messages sent by the mother was investigated. Moreover, to elucidate the relationship, the attitudes and strategies by the mother during the communication of the message were analyzed.

Subject

Thirty-six mother-child dyads were studied. The children, 16 boys and 20 girls, had been participating in a longitudinal study since childbirth, and this study was administered when the children were 3.0 to 3.2 years old. They were first born of intact nuclear families from the lower-middle class, living in a few middle-sized cities near Tokyo. All the mothers were high school graduates, and full-time, primary care-givers. None of the children attended an institution such as a day care center or kindergarten.

Procedure

The measurement of attachment to the mother

Attachment towards the mother was assessed by the PAT (Picture Attachment Test) constructed by the author (Takahashi, 1978). The PAT consisted of two sets of eight picture cards, one set for girls and one set for boys. Each card illustrated a daily life situation in which attachment behaviors towards other persons would be induced in young children. Example situations included: "When you play out of doors, who would you like to play with?," "Who would you want to take a bath with?," "If you were sick, who would you want to be with?." Being shown each of the PAT cards, the mother was asked by an interviewer to report the name of the person(s), whom she believed her child would select in each daily-life situation. We did not ask the children the questions, because it was assumed that they were not mature enough to respond to some of the PAT cards. The total number of appearances of the mother as the most preferred person was considered as showing the strength of attachment to her (Range = 0-8, $M = 3.94$, $SD = 1.82$).

In order to validate this index we correlated it with their patterns of attachment identified by the Strange Situation procedure (Ainsworth, Blehar, Waters, & Wall, 1978). Twenty-seven mother-child pairs out of the 36 dyads were assessed by the

procedure at their 24th month, and except for 2 children of C-type, all of the children were classified into B-type. Since the conventional A–B–C classification was not informative, eight kinds of attachment behaviors towards the mother (touching; being within arm's reach of; following; showing/giving toys to; speaking to; imitating; looking at; smiling at) were counted for each 10 s period during episodes 2, 3, 5 and 8. The total frequency of the eight kinds of attachment behaviors towards the mother was correlated significantly with the present attachment index ($r = .46, p < .05$).

The measurement of mother's communication effectiveness

The mother's communication effectiveness was measured by a referential communication game, a slightly modified version of the Picture Book Communication Game constructed by Dickson (Dickson, 1981; Dickson, Hess, Miyake, & Azuma, 1979). As Figure 5.1 indicates, the instrument used in the game involved two notebooks, each with a set of four pictures in different arrangements. Under each picture on the listener's notebook is a button connected by a wire to a light under the corresponding picture on the sender's notebook. This game is similar to conventional referential communication tasks with two innovations for the button–light system. First, by a light under the picture the sender can promptly identify the choice of the listener, and second, the sender can thus know the appropriateness of her prior message and provide feedback or further information if s/he would like to do so.

In the game the mother was instructed to give a message constructed by herself about a target referent in the set of four alternatives, so that the child could choose the referent, which would be located in a different place in the child's notebook. In the present study we used only abstract figures in order to make the situation more game-like, as shown in Figure 5.2. It was supposed that those abstract figures would make the mother perceive the situation as a game. This is because firstly, as there were no designated "correct" messages the mother could send a vague or tricky description if she liked. Secondly, as it was difficult to send appropriate messages to help the child push the correct buttons, the mother might pretend that it was all play, not a cognitive task.

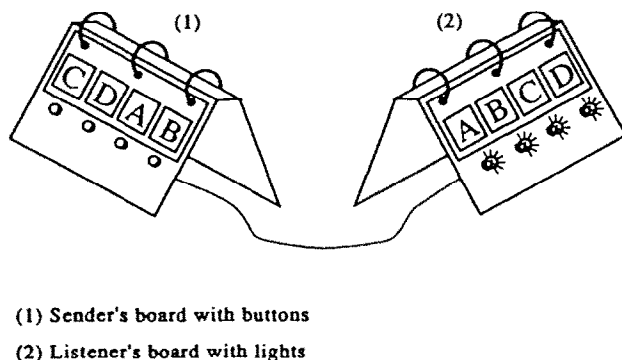


Figure 5.1. The picture book communication game.

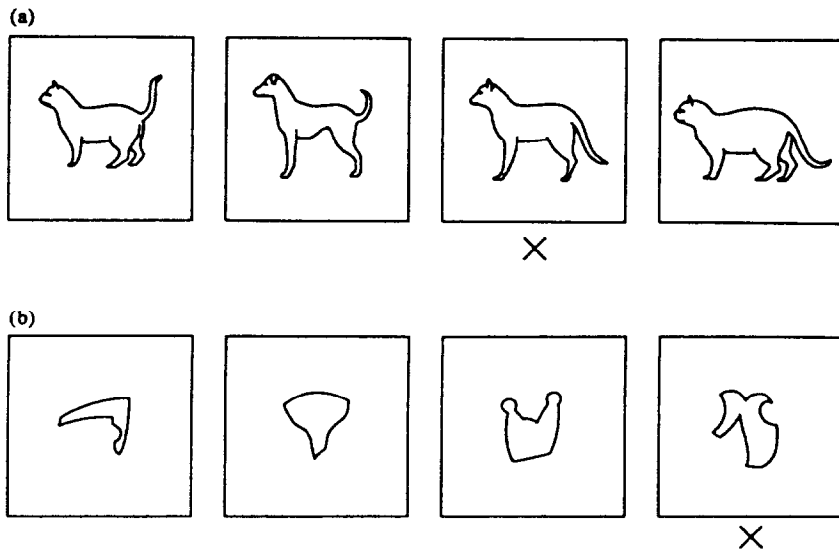


Figure 5.2. The example figures used in the mother-as-sender session.

A maximum of three errors was scored per item, and the total number of errors was counted over 7 items of the mother-as-sender (MAS) communication game. This number was used as a negative indicator of the mother's communicative effectiveness.

To partial out the child's ability in the task, the number of errors over 10 items, all concrete figures, of the experimenter-as-sender (EAS) task, in which the experimenter sent messages following a written scenario, was used as a control variable in the following analysis. The EAS scores were significantly negatively related to Binet-IQ scores at 3 years of age ($-.55, p < .01$), but the MAS scores were not significantly related to IQ ($r = -.26$). The *Ms* and *SDs* of the EAS (Score range 0–30) and the MAS (0–21) were 10.42 (3.18), and 9.81 (3.52), respectively.

Before proceeding to the MAS session, the mother observed the EAS session to understand how to send a message and to give feedback to the child. The games required about 15–25 min altogether.

Ratings of mother's behavior

To obtain indicators of the mother's attitudes and strategies, all mother-child interactions during the game were transcribed from audio-tapes, and rated on four 4-point rating scales (4 = clearly shows the tendency, to 1 = hardly shows the tendency). Each scale was aimed at assessing the mother's tendency to maintain a close and reciprocal relationship. The scales were: (1) the mother's tendency to refer to the child's personal experiences; (2) the mother's tendency to ignore the child's errors; (3) the mother's tendency to persist in her message; and (4) the mother's tendency not to control the child's irrelevant behaviors.

Ratings were given for each item and then averaged over the 7 items. *Ms* and *SDs*

were 1.25 (0.30), 2.15 (0.38), 2.08 (0.48), 1.94 (0.79), respectively. Inter-rater agreements (Cohen's kappa) for the rating were .86 on the average.

Results

Because preliminary analysis of sex differences in each score of MAS, EAS, PAT and each of the four ratings of maternal attitude toward the tasks and child's performances indicated nonsignificance between the sexes, the data were combined.

Relationships Between Attachment to the Mother and Child's Errors in the Game

The correlation between the strength of attachment to the mother and number of errors in MAS was significant when the number of errors in EAS was partialled out ($.30, p < .05$). The result indicated that the more strongly the child attached to the mother, the more errors s/he tended to make in decoding.

Effects of the Maternal Attitudes on Child's Errors in the Game

As Table 5.1 shows, only one out of the four ratings of maternal attitude during the game, the mother's tendency not to control the child's irrelevant behaviors, was correlated significantly with the number of errors in MAS, when the number of errors in EAS was controlled ($.51, p < .01$).

Moreover, the correlation of the child's attachment to the mother with the number of errors in MAS, controlling for that of EAS, became nonsignificant when the mother's reluctance to control the child's irrelevant behaviors was partialled out ($.22, p > .10$). Thus, when the mother was not willing to control child's behavior to channel it toward the goal or toward performing well in the game, the child made errors in decoding.

Table 5.1
Correlations between Number of Errors in Mother-As-Sender Session and Ratings of Maternal Behavior

Maternal Ratings	Number of errors in MAS ($N = 36$)	
	Simple r	Number of errors in EAS Partialled
1) Tendency to refer to personal experiences	.24	.22
2) Tendency to ignore child's errors	.06	.03
3) Tendency to persist in her message	.09	.13
4) Tendency not to control irrelevant behaviors	.42*	.51*

* $p < .01$.

In fact, highly attached mothers were generally reluctant to control their children's irrelevant behaviors. Typical interactions were as follows.

Case Ryu

Ryu's scores of MAS and EAS were 12 and 7, respectively. He was identified as a boy strongly attached to the mother. That is, his mother reported that he would name her as an attachment figure in 6 out of the 8 PAT cards. In the following interaction the mother was sending messages as to the target (a) in Figure 5.2.

- M: Look here, Ryu. This is . . . , you see cats and dogs.
C: Yes.
M: Ryu, you love both cats and dogs.
C: Yes.
M: Well, it has standing ears. The ears are standing upright. And it has a tail that hangs down.
C: Yes.
M: It is a dog. Where is the dog which has a hanging down tail?
C: Yes, this one . . . , and this one . . . , and this one . . . , and this one
M: Stop! There must be only one [target] dog.
C: This one? (He pushes an incorrect button.)
M: Look at the pictures carefully.
C: (He pushes another incorrect button.)
M: A dog which has standing-up ears.
C: (He pushed buttons at random.)
M: Stop! NO!
C: (He continues to push buttons at random.)

Case Kaz

Kaz was a boy with 15 errors in MAS and 10 errors in EAS. His mother reported that he would select her in 5 of the 8 PAT cards. The target figure was (b) in Figure 5.2.

- M: Well . . . , What do you see? Hmmm . . . (She thinks) I cannot explain well. I . . .
C: (Pushes three buttons at random.)
M: Kaz, don't touch the buttons.
C: Can't I push the buttons?
M: Hmmm . . . The left side of the figure is smaller.
C: Which figure? (He peeps into the mother's notebook.)
M: OK, look at your own book. Your figures are all the same as mine. Could you see a figure in which the left side is small and the right side is large? It consists of two parts.
C: Two?
M: How do you see the [target] figure?

- C: Is this it? (He points to the notebook and pushes an incorrect button.)
M: I cannot explain this. Hmmm . . . (She thinks.)
C: This one? (He pushes an incorrect button.)
M: Then, which is the figure like the ribbon?
C: I don't have a ribbon.
M: I know that you don't have a ribbon. Please find a figure like a ribbon in your board.
C: No. There is none.
M: No?
C: (He lies down on the floor.)
M: Kaz . . .
C: Look! I've got big. (He stands up lifting both his arms. He laughs.)
M: I cannot explain this figure.
C: (He pushes buttons at random.)
M: (She laughs.) No . . . I cannot . . .

Case Kuk

Kuk was a girl who made 10 errors in MAS and 8 errors in EAS. Her mother reported that she would name her (the mother) in all 8 PAT cards. The target was (b) in Figure 5.2.

- M: This is a very interesting figure consisting of a little part and a large part, isn't it? Like this. You see?
C: (She smiles.)
M: I suppose that you don't understand by such a description. You see, Kuk, there are many shapes in the figure. Listen, Kuk.
C: Yes.
M: This is the last task. So, listen, Kuk. There are four figures, do you see?
C: Yes.
M: And, among them there is a figure which consists of a small figure, like a moon and a large figure, like a crown. Do you find it?
C: Is it this? (She points to her notebook.)
M: Which one do you mean? Let me know it by pushing the button.
C: (She pushes an incorrect button and she laughs.)
M: (She laughs.) Oh! Sorry. You made a little mistake. Let me try again. A shape like a new moon and a shape like a bottle opener by which we open a soda bottle joined together. Do you find it? Push the button.
C: Is it this? (She pushes another incorrect button.)
M: Oh. Sorry, again. You made a little mistake, again.
C: Is it this? (She points to her notebook.)
M: Unless you push a button, I cannot know which one you are pointing to. Now of course, if you just push all 4 buttons successively, one of them will be correct. (She laughs.)
C: Is it this? (Laughing, she pushes another incorrect button.)
M: No . . . (She laughs.)

- C: Is it this? (She finally touches the correct button.)
M: Finally, you found the correct button. You pushed all four buttons one after another, so it was only natural that you would hit the right one! (She laughs.)
You are great! You did a fine job! (She says this a little bit sarcastically.)
C: (She laughs.)

The mothers in the first two examples were reluctant to strictly control the child's behavior and the mother in the last case enjoyed the game and was not so much involved in the child's performance itself, although the daughter finally succeeded by chance. All of them enjoyed interacting with their children and were not so much concerned with the child's performance or the goal of choosing the right picture with a minimal number of errors. Consequently, the children did not perform well at least in the short run.

Discussion

As predicted from the "social context" assumption and the auxiliary assumption that attached mothers are unwilling to control their children's behaviors unduly, the present study revealed that the child's attachment to the mother was negatively correlated with the child's performance in the referential communication game. The mothers who reported strong attachment relationships with their children were characterized as reluctant to control their children's playful behaviors during the game. They were much more concerned with having pleasant interactions with the child than with the child's achieving.

In this section, I will discuss how to interpret the negative correlation, especially in the light of the closeness of Japanese mother-child pairs. I will also examine the nature of "attachment" as assessed in this study.

The Importance of Mother's Interpretations of the Situation: Is it a Game or a Task?

The negative correlation between children's attachment toward the mother and their performances in the game corroborated the findings of the previous research, which emphasized the importance of the mother's perception of the situation as a determinant of her effectiveness (Kuczynski, 1984; Lytton, 1980; Maccoby & Martin, 1983; Radke-Yarrow, Zahn-Waxler, & Chapman, 1983). That is, if the target situation is perceived by the mother not to be critical nor urgent, the child's attachment toward her is not used as a resource to make the child perform well, but serves as an elicitor for the mother to reinforce their close and reciprocal relationship. In fact, the mother-child pairs with higher scores of attachment no doubt seemed to enjoy their interaction during the game.

Needless to say, the present results should never be taken to mean that Japanese mothers are not able to use the child's attachment as a resource in socialization in general. In fact, from daily observations, there are many successful examples of socialization by mothers through utilizing their close relations with their child. As a result, for example, even preschoolers can read and spell their name, and

also can count. We don't need any "Head Start"-type project before entrance to elementary school because Japanese mothers are so competent as "tutors." These informal observations are consistent with the empirical findings by Bus (this issue) which suggest securely attached children's superiority in emergent literacy over their insecurely attached peers.

Their failure to enable their children to perform well in this experiment only means that in a game-like situation they tend to prefer to enjoy their close relations with the child at the expense of trying to achieve a goal. We expect that when a situation has one or more strong or clear cues pushing the mother to use the child's attachment as a resource for achieving good results, she can and will do that. In fact, a cross-cultural study between Japan and the U.S.A. revealed that, in intellectual achievement situations, Japanese children showed less task resistance to the mother than their American counterparts (Azuma, Kashiwagi, & Hess, 1981).

Effects of Children's Attachment May Vary According to the Level of Closeness to the Mother

Being influenced by the Japanese child-centered culture, the Japanese have long favored child-rearing customs in which the mother is to be near and have close relationships with the child (Befu, 1971; Caudill & Weinstein; 1969; Mii, 1988). In fact, repeated studies failed to find any A-type (avoidant-type) attachment children among Japanese subjects (Takahashi, 1986; 1990a; 1990b). Because the Japanese mother-child relationships tend to be closer than their Western counterparts (e.g., Befu, 1971), it could reasonably be assumed that even the present Japanese mother-child pairs wherein the child was reported as being not so much attached to the mother, nevertheless had close relationships.

This may explain why the "affect-facilitation" assumption was not supported while the "social-context" assumption proved to be tenable in this study. For adult model-child pairs whose nurturance is below a certain level, differences in the extent of child's attachment may make no difference in mother's effectiveness as a socializing agent. Only the dyads with enough love may be able to afford to enjoy their interactions in a game-like context, yet behave effectively in a serious and/or urgent context, in short, may reveal clear effects of social context. Further studies among subjects of other countries, such as those of Western countries among which some A-type attachment patterns are identified, would be helpful to advance our understanding about this issue.

The Issue of Attachment Assessment

Some people, who are familiar with attachment assessment based on the Bowlby-Ainsworth paradigm and also with those the findings which have suggested advantages of B-type children in the general development, may wonder if the present results would be reliable. They may claim that the negative function of attachment should be taken with some reservation until the validity of attachment assessment used in this study is proven.

In fact, in this study attachment toward the mother was assessed by the PAT. Based on a theory of social relationships which is described elsewhere (Takahashi, 1990c), the PAT assesses a relative importance of the mother as an attachment figure at the present, because each child is developing and reconstructing a framework of social relationships which consists of multiple figures. The attachment assessment of the present study differs from the conventional attachment measurement in three ways. Firstly, we measured attachment at the moment of the observation, i.e., at 3 years of age, whereas traditional attachment studies usually use types of attachment at 12–18 months of age as a stable index of quality of attachment. Secondly, we measured relative strength of attachment toward the mother, whereas the conventional attachment assessment only and separately focuses on relationships with the mother. Finally, we used the mother as an informant of attachment figures because she was assumed to have had enough observations of the child's everyday life, whereas in the traditional research attachment is usually observed and assessed in a laboratory setting. In this sense, the PAT is similar to the Attachment Q-sort method by Waters and Deane (1985).

In spite of these differences, it is supposed that there is close correspondence between the results of the PAT and the strange situation procedure that guarantees the relevance of the present results to the attachment theory. In addition to the above-mentioned correlations of the frequency of responses to the mother in the PAT with the frequencies of attachment behaviors toward the mother which appeared in the Strange Situation procedure one year before, another longitudinal study of ours indicated that B-type infants, identified as such by the Strange Situation procedure at their 12th month, significantly more frequently chose the mother as an attachment figure in the PAT at 3 years of age, according to their mothers, than their C-type counterparts.

Although both the attachment assessment procedure and cultural backgrounds of mother-child dyads were different to those in the Western mainstream studies, none of this makes the present study too exceptional. We believe that the present study adds knowledge and casts new light on the growing interest in the relationship between attachment and socialization.

Biography

Keiko Takahashi (Ph.D. 1972, Tokyo University) is professor of developmental psychology at the University of the Sacred Heart in Tokyo. She is the editor of *The Japanese Journal of Educational Psychology*. Her theoretical and research interests are focused on life-span development of attachment, role of attachment relationships in development, and cross-cultural studies of social relationships. Her publications include "Affective relationships and their lifelong development" (see References), and "The role of personal framework of social relationships in socialization studies" in H. Azuma, H. Stevenson, and K. Hakuta (Eds.), *Child Development and Education in Japan*. New York: Freeman (1986).

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EPILOGUE:

SOME SPECULATIONS ABOUT ATTACHMENT IN THE SCHOOLS

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In this special issue, the effects of attachment relationships on learning and instruction processes in early childhood have been emphasized. It has become clear that the quality of the infant–parent attachment relationship has far-reaching consequences for learning and instruction in several domains. Attachment has not only been shown to influence the preschoolers' social development but also their cognitive abilities and their adaptation to new and/or strange circumstances. Secure children have a headstart over insecure children when they enter school and they acquire basic, emergent literary skills at an earlier stage. At school they might very well be the pupils who are easy-to-teach and their headstart might become the starting point for the Matthew effect (Stanovich, 1986) whereby the initial differences between pupils increase instead of decrease through the process of schooling. It is for this reason that educationalists should be aware of the high impact of early attachment development on learning and instruction at home and in the schools.

But there is another reason to highlight the contribution of attachment theory to educational science. Attachment is a life-span phenomenon (Ainsworth, 1989), not only crucial during the early preschool years and within the family system. Attachment has to be seen as a vital condition for human functioning at every stage in life and within any social context (school, work, social network). Although hard empirical data to support this contention are not abundant there are too many clinical findings to neglect the likelihood that secure attachment relationships are the foundation for a balanced social and cognitive development during childhood and adolescence (Bowlby, 1985). In the school setting, attachment might be taken into account at four levels.

First, the attachment needs of pupils might be met optimally only within a school system in which continuity of relationships is guaranteed. The same teacher and pupils should remain together for an extended period of time to enhance the opportunities for the development of secure relationships. Highschools in which teachers and groups of pupils change every two hours or so, might provide too few chances for adolescents to build meaningful relationships among themselves and with their teacher.

Secondly, teachers might learn from the sensitive responsiveness with which parents

instruct their children in the family context (Ninio & Bruner, 1978). If teachers are aware of different types of attachment relationships (avoidant, secure and ambivalent attachments) they might be better able to deal with their pupils' subtly and indirectly expressed attachment needs and to meet these needs as part and parcel of the instruction process. In general, knowledge of attachment theory could help teachers in being sensitively responsive to the attachment needs of children in stressful situations, such as being a novel pupil in a class or having to cope with death of a family member or divorce of parents. In all these cases, a child's attachment behavioral system will be activated and, depending on the specific quality of its mental representation of attachment, it will make different demands on its social environment, including school teachers. Meeting these demands will enhance adaptation and school performance. Studies on parent-child interactions in difficult task settings have shown how much more efficient learning and instruction takes place if the relationship is a secure base to explore new and potentially threatening phenomena. The same might very well be true for teacher-pupil interactions. Pianta (1992) has documented empirical evidence on the existence of attachment relationships between teachers and pupils, comparable to those between parents and children.

Thirdly, Bowlby (1989) proposed that beyond childhood, attachment needs might not only be fulfilled within relationships between two people, but also in the wider context of the group or social system. The "corporate identity" of an effective school might stimulate the pupils' identification with "their" school. In the U.S.A. much more attention has been paid to the schools' identity (e.g., through school-based sporting teams) than in Europe. If the schools were integrated more in the pupils' lives and allowed for identification and attachment processes, they might serve as a secure base to explore uncharted intellectual and cultural territories.

Fourthly, attachment theory is playing an increasingly important role in the treatment of learning disabilities (Barrett & Trevitt, 1991). With troubled and learning disabled children the educational therapist has at least three roles: teacher, educational attachment figure and consultant to teachers in schools. In educational therapy, the focus is on the significance of attachment for the development and persistence of learning disabilities (Barrett & Trevitt, 1991). Many pupils are referred to educational therapy or even to special schools, who experienced separations that have proved traumatic (e.g., illness, hospitalization, divorce, or death of attachment figures) and clinical evidence suggests that these pupils often have a history of unresolved grief within the family which affects the pupils' learning abilities. Bowlby (1985) suggested that schoolphobia—which of course affects the child's learning potential—might originate from dysfunctional attachment relationships within the family. To ignore these roots in the treatment of learning disabilities might perpetuate the basic problems beneath the symptomatology.

In conclusion, we offered some speculative considerations as to the role of attachment in the schools. In the foregoing papers the place of attachment in learning and instruction during early childhood has been emphasized. In this epilogue we have tried to indicate some applications of attachment theory to the schools. Important areas of interest were: attachment relationships with peers, attachment between teacher and pupil, attachment to the school, and educational therapy of learning disabilities. Because empirical data

are still scarce, we were only able to formulate some hypotheses and directions for further studies on the complex issue of attachment in the schools.

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