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Attachment and Early Reading: A Longitudinal Study

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ABSTRACT. The relationship between quality of attachment in infancy and preschooler's reading interests and skills was explored. At 24 months, 77 children and their mothers were tested using the Strange Situation procedure. In a follow-up study 3 years later, 65 mothers completed a questionnaire about the reading interests and skills of their children. Preschool teachers completed a questionnaire about preparatory reading instruction, and the children's intelligence was measured with the Leiden Diagnostic Test. After 3 years, the securely attached children showed more interest in written material than did the insecurely attached children, regardless of their intelligence and the amount of preparatory reading instruction.

THE QUALITY OF ATTACHMENT between an infant and its mother may have far reaching consequences for cognitive development. In the first years of life, a secure attachment serves as a safe basis from which to explore the environment. In stressful situations, for example, being alone with the experimenter in a strange environment, a securely attached child is disconcerted, but after a reunion with the mother, soon feels safe enough to explore the environment. Children who are anxious about the relationship with their mother, however, feel that they have been deserted by her when left alone.

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Consequently, they have little confidence in the availability of their parent. After reunion, these anxious children do not pay much attention to their surroundings or, in case of anxiously avoidant attachment, they seem to play but manipulate their toys in a stereotypical and stressed way (Ainsworth, Blehar, Waters, & Wall, 1978).

Although the results of longitudinal research do not yet appear to be conclusive (Lamb, Thompson, Gardner, & Charnov, 1985), they suggest some consequences for future cognitive development resulting from the quality of attachment. Securely attached children, for example, appeared to be more active in exploring the environment at 2½ years (Hazen & Durett, 1982) and at 5 years of age (Arend, Gove, & Sroufe, 1979). Securely attached children also appeared to be more eager to learn, were more curious (Waters, Wippman, & Sroufe, 1979), and showed greater enthusiasm when solving problems (Matas, Arend, & Sroufe, 1978).

A secure parent-child relationship may be a good foundation for instruction as well. The parent and the child are emotionally so well attuned to each other that knowledge and skills can be transferred smoothly. One could imagine that the parent knows what type of support the child needs to solve a difficult task, because he or she is sensitive to even the subtlest of the child's signals. The child in turn may have the courage to tackle complex problems because he or she anticipates the help and support of the caregiver should insurmountable difficulties be encountered (Bretherton, Bates, Benigni, Camaioni, & Volterra, 1979). Furthermore, longitudinal studies by Sroufe (1983; Sroufe, Fox, & Pancake, 1983) and Van IJzendoorn, Van der Veer, and Van Vliet-Visser (1987) indicated that securely attached preschool children are socio-emotionally better equipped to explore new phenomena, solve new problems, and to overcome inevitable barriers than are anxiously attached children. Children who show a lot of insecure behavior in their second year of life appear to have much less ego-resiliency and less optimal ego control three or four years later. Ego-resiliency indicates flexibility and persistency in solving difficult problems, ego-control refers to the strength with which emotions are being regulated (Block & Block, 1980).

The point we wished to address in this study pertained to one of the most important aspects of the environment a preschooler has available for exploration—written material. We tried to relate the quality of attachment at 24 months to the early reading interests and skills of preschoolers. Little research has been done to prove the hypothesis that a secure relationship not only stimulates exploration and competence in general, but specific reading interests and skills as well. Clinical research, however, is beginning to indicate the relevance of such a hypothesis. Heard and Barrett (1982) noted that some children, even those with normal intelligence and without any detectable neurological problems, learned to read later if they had an insecure relationship with their parents. Heard and Barrett hypothesized that, without a safe haven

in times of stress, the child not only develops a negative attitude toward learning, but also a negative image of him- or herself. The confrontation with new phenomena, such as written language, may evoke feelings of anxiety and insecurity that interfere with optimal exploration. The child may then be in danger of moving into a destructive spiral leading to an ever growing aversion to written language. In clinical trials with dyslectic children, Heard and Barrett successfully employed therapy concentrating on the reestablishment of feelings of trust in the teacher and in the parents. They based their therapy on the Bowlby-Ainsworth attachment theory.

The effect that quality of attachment has on learning to read probably shows most clearly during the period when pupils receive little if any formal reading instruction, but do continually experience words, letters, and texts. For preschool children there are many opportunities to obtain knowledge about written language. Printed language is a striking part of store-fronts, street signs, television, and a great variety of containers. In addition to this exposure, many children come into direct contact with print. A television program such as *Sesame Street* presents information about letter images and the sound of letters in words. In many homes, parents and older siblings read to young children, and, in addition, children have toys, such as magnetic boards with letters, chalkboards, and books with words and pictures, which provide additional opportunities to learn about written language.

Based on research into natural reading development and early readers (pupils who learn to read without formal reading instruction), it appears that some pupils try to find out what words and letters mean at a very early point in their development (Torrey, 1979). Durkin (1966) compared early readers, traced by means of a screening test, with a matched group of nonreaders. Although it appeared from interviews that parents of early readers had more time and therefore often helped their children to read or write, this aspect did not appear to be decisive. The difference in the need to explore was more important. The early readers had a great interest in written language and started to recognize words and to write words and letters by themselves. This is why Durkin terms them "paper and pencil kids." Although no experimental research has been done, activities such as writing letters and words may have a stimulating influence on a child's progression from sight word knowledge (recognizing names and labels) to reading by using letter-sound associations (Mason, 1980).

In the present study, we examined the relationship between preschoolers' exploration of written language and the quality of attachment in infancy. We hypothesized that 2-year-olds who showed behavior patterns of avoidance or ambivalence to their mothers would show less intensive and effective exploratory behavior with respect to written language at 5 years of age than would children who demonstrated secure attachment. Our prediction for a subgroup of securely attached children, the "B4" children, deviated from this global

hypothesis, however. Although B4 children are classified as securely attached, their behavior in stressful situations is more comparable to that of anxiously resistant attached children, for example, in terms of a lack of exploratory behavior. It was recently proposed to call these B4 children anxiously dependent to their caregiver (Van IJzendoorn, Goossens, Tavecchio, & Kroonenberg, 1985; Sagi, Lamb, Lewkowicz, Shoham, Dvir, & Estes, 1985). Therefore, we tentatively expected that B4 children would show less exploratory behavior with respect to written language than would other securely attached children.

Method

Subjects

Seventy-seven children (M age = 24 months; range, 23 to 25 months) and their mothers were tested using the Strange Situation procedure. In a follow-up study 3 years later, 65 mothers filled out a questionnaire about the reading interests and skills of their child. Teachers completed a questionnaire about prereading instruction at the kindergarten. An intelligence test was also given, and data about socioeconomic background were collected.

Although only 65 of the original 77 mother-child pairs participated in the follow-up study, there were no indications that the nonparticipants were a specific subset of the original sample. Through t tests and chi-square analyses, the Strange Situation data for both groups were compared. No differences appeared to be significant.

The original sample was recruited from the higher socioeconomic classes (M = 4.6 on an occupational index ranging from *unskilled labor* (1) to *high-level and academic occupations* (6); see Van Westerlaak, Kropman, & Colaris, 1975). The mean age of the children at the second stage of the study was 64 months (range, 56 to 72 months).

Materials and Procedures

Strange Situation. The quality of attachment relationships is usually measured using the Strange Situation procedure. This procedure involves two periods of separation between caregiver and child, and a confrontation with a stranger who tries to comfort the child to some extent through play and other types of communication. The procedure consists of eight episodes, each episode lasting approximately 3 min. It is especially through observing the interactive behavior of parent and child during the two reunion episodes (the parent returns to the playroom after having left the child for approximately 3 min) that different types or qualities of attachment can be discerned (Ainsworth et al., 1978). The different qualities are indicated by the letters A, B,

and C, and within these main categories another eight subcategories (A1, A2, B1, B2, B3, B4, C1, and C2) are distinguished (see Ainsworth et al., 1978, for detailed descriptions). Caregiver-child pairs in which the child's behavior is characterized by almost no tendency to avoid or resist the caregiver during the reunion episodes are categorized as secure or B pairs. Approximately 65% of mother-child dyads can usually be placed in this normative group (Van IJzendoorn & Kroonenberg, in press). The A and C groups are termed insecure because the caregiver is not greeted in a favorable way but is treated ambivalently, either with resistance (C) or avoidance (A). The children of the A group seem to be unconcerned about separation and appear fixated on their material environment instead of on the caregiver. Subtle forms of avoidance can be seen, however, and psychophysiological research has shown that these children actually feel greater stress than securely attached children (Donovan & Leavitt, 1985). The C child is usually confused after separation, and the caregiver is not capable of comforting the child after reunion.

The videotapes of the Strange Situation were scored on four interactive scales during reunion episodes 5 and 8. The four scales are proximity seeking, contact maintaining, avoidance, and resistance (Ainsworth et al., 1978). Two observers independently scored 22 randomly selected mother-child pairs. The intercoder reliability, computed with Pearson's r , was satisfactory: for proximity in the two reunion episodes, .77 and .91 respectively; for maintaining contact, .95 and .97; for resistance, .88 and .92; and for avoidance, .86 and .91. On the basis of these interactive scales and the descriptive notes on the other episodes, the mother-child pairs were classified into A, B, or C groups (see Grossmann, Grossmann, Huber, & Wartner, 1981). The intercoder agreement for this step was 95.5%; for the subcategories, it was 91.5%. The scores on these scales, and the classification are reported elsewhere (Goossens, 1986).

In accordance with Lamb et al. (1985), we found the Strange Situation to be a valid procedure for 24-month-old children. Although these 24-month-olds appeared to be more active on proximity seeking than younger children (age 1 to 1.5 years), no age differences were found on the scales for resistance and avoidance, or for the classification (Goossens, Van IJzendoorn, Kroonenberg, & Tavecchio, 1985).

The Early Reading Questionnaire. A 20-item questionnaire was sent to the mothers. Most of the questions required multiple choice responses, for example: *seldom, sometimes, often*. The questionnaire was developed by Mason (1980) to find out what preschoolers know about letters and words, how they explore them in their play, and what experiences children have with written language. For the Dutch situation, some inappropriate questions, especially those concerning television activities, were deleted. Six questions refer to the child's knowledge of written language.

1. How many letters does the child try to print?
2. Can the child recite the alphabet?
3. Does the child write his or her own name?
4. What words have you noticed your child reading?
5. Does the child try to read by sounding out the letters?
6. How many letters does the child recognize?

Three questions refer to exploratory manipulations.

1. Does the child name letters when playing?
2. Does the child ask for a printed word to be read to him?
3. Does the child make alphabet letters when drawing?

The questionnaire also contains questions about activities at home that might influence reading development.

1. Does someone teach the child some reading skills?
2. Does the child read books by him or herself?
3. Does the child have a subscription to a child's magazine?
4. How often is the child read to?
5. Does the child visit the public library?
6. Does the child ask to have favorite books reread?
7. Does the child watch Sesame Street on television?

In a pilot study the Early Reading Questionnaire was validated in a sample of 21 mother-child dyads (M age of the kindergarten children = 6 years). Children individually completed word recognition and letter knowledge tests (Bus, 1986). The mothers completed the Early Reading Questionnaire. We found significant correlations ($p < .05$) between the amount of words that children could recognize (according to their mothers) and the amount of unpracticed words that the child could read in a test situation ($r = .79$), between the amount of letters that the children could write (according to their mothers) and the letter recognition test ($r = .59$), and between reading by sounding out the letters (according to the mothers) and children's ability to recognize six unpracticed short words in a test situation ($r = .64$). These correlations imply that the mothers' answers to the questions on the questionnaire converge with the test outcomes.

Teachers' questionnaire. Almost all Dutch children attend kindergarten. To control for the possible influence of preparatory reading instruction, we asked the kindergarten teachers of the 65 children to answer two multiple-choice questions about prereading instruction. One question concerned the type of prereading activities and the other, the time spent on it. Seventy-seven percent of the teachers returned a completed questionnaire.

Intelligence test Each child completed five subtests of the Leiden Diagnostic Test (LDT): block design, word span, repeat sentences, picture completion, and comprehension (Van IJzendoorn & Van Vliet-Visser, 1987). This test has been standardized for Dutch children (Schroots, 1979).

Statistical Analysis

First, frequencies and percentages were computed for the reading interests and skills of the children. Second, the Kruskal-Wallis test was used to determine whether the reading behavior of securely and anxiously attached children differed. Because response order was relevant (seldom, sometimes, often) and because the size of the sample was small, this test was preferable to Pearson's chi-square test (Marascuillo & McSweeney, 1977, p. 316). We tested which contrasts determined the difference in reading behavior, and corrected the results for ties.

Results

Most children appeared to be interested in reading (according to their mothers). Many children were able to recognize five or more words (46%). Sixty-nine percent of the children recognized words such as *papa* (daddy), *mama* (mummy), *opa* (grandpa), *oma* (grandma), and *pop* (doll) (see Table 1). Thirty-four percent of the children recognized labels on storefronts, sweets, and soft drinks. Most children knew 10 letters or more (81%), and many used this knowledge (sometimes or often) to write letters in pictures (75%) and mentioned (sometimes or often) letters while playing (86%). Most children tried to find out what written words mean; they asked adults (sometimes or often) to tell them the meaning of words (98%) or tried (more or less frequently) to find a word's meaning by sounding out the letters (58%).

Because some of the attachment categories were rather small (see Van IJzendoorn & Van Vliet-Visser, 1987) and because B1 and B4 are usually regarded as marginal (Ainsworth et al., 1978), a few of the eight categories were joined together to form four equivalent groups. A/C ($n = 14$), B1 ($n = 18$), B2/B3 ($n = 19$), and B4 ($n = 14$). The B2/B3 group (secure children) served as the reference group. The insecure children were placed in the A/C category. The dependently attached children were categorized as B4 (Sagi et al., 1985; Van IJzendoorn et al., 1985).

The variables measuring exploration of letters and words significantly distinguished between attachment groups (see Table 2). A first inspection of the mean rank order showed that scores were consistent with hypotheses: The A/C group scores were low and those of the B1 and B2/B3 groups were high.

On two variables, the B4 group deviated negatively from the other B groups. Testing the contrasts confirmed this impression. The mentioning of

TABLE 1
Types of Printed Words Recognized by Children
According to Parental Report

Types of Words	n	%
Names	40	69
Names of family members or friends	38	65
Mamma (mommy), pappa (daddy), opa (grand-dad), oma (granny), pop (doll)	24	41
Labels	20	34
Television words (Tom & Jerry, Sesame Street)	8	13
Store names	7	12
In (entrance), uit (exit), stop (stop), nat (wet)	6	10
Te koop (for sale), pauze (pause)		
Drink and food labels	5	8
Politie (police), PTT (A.T.T.)	4	6
Names of journals or magazines	3	4
Labels on toys	2	3
Nouns	17	29
From a reading method (used in 80% of the Dutch schools)	13	22
Other nouns	11	18
Other words	6	10
Verbs	3	4
Ook (also), maar (but), toen (then), en (and)	3	4
Dag (bye)	1	1

letters while playing happened significantly ($p < .05$) less often in the A/C and B4 groups than in the B1 and B2/B3 groups, $\psi = -23.3$ (confidence interval between -46.1 and $-.4$). For *asks to read words* the findings were the same: The A/C and B4 groups did significantly less well than the other kindergarten children, $\psi = -24.7$ (confidence interval between -47.0 and -2.4). Pairwise comparisons of A/C children with B1 and B2/B3 children also yielded significant contrasts: for A/C and B1, $\psi = -20.0$ (confidence interval between -36.0 and -4.0); and for A/C and B2/B3 $\psi = -16.0$ (confidence interval between -32.0 and $-.07$). Only the contrast between A/C and B4 was not significant. For *writes letters in pictures* the contrast between both B2/B3 on the one hand and A/C on the other was significant: $\psi = -29.1$ (confidence interval between -56.5 and -1.3). With respect to knowledge of written language, such as the amount of recognized letters and alphabet knowledge, the four attachment classes did not differ.

It was conceivable that experiences with written language at home differed and that therefore reading interests varied. According to the Kruskal-Wallis test, differences between the four attachment groups were not sig-

nificant for any of the reading experience variables. Furthermore, the four attachment groups also did not differ in respect to the time spent on reading at kindergarten. Therefore, differences in reading behavior could not be solely explained by opportunities to experience written language at home or at kindergarten. Finally, intelligence did not correlate with reading behavior.

Discussion

The results support the hypothesis that anxiously attached children do not experience their caregiver as a basis from which to explore written material effectively. Securely attached children showed more interest in written material than anxiously attached children. The differences between securely and anxiously attached children cannot be ascribed to other contextual variables. The children in the four attachment categories were provided with the same chances to experience written language, at home as well as in the kindergarten. Because intelligence did not correlate with reading behavior, differences in intelligence between the children do not confound their different reading interests.

TABLE 2
Mean Rank Orders of Reading Behaviors for Different Attachment Categories

Behavior	Attachment categories				Corrected χ^2
	A/C	B1	B2/B3	B4	
Exploration of					
Letters					
Naming letters when playing	23.8 ^a	36.4 ^b	34.6 ^b	23.9 ^a	8.24*
Printing letters when drawing	25.2 ^a	25.3 ^a	39.8 ^b	30.2	8.58*
Words					
Asks for words to be read	17.3 ^a	37.3 ^b	33.4 ^b	28.6 ^a	12.60**
Knowledge of					
Letters					
Printing letters (number)	28.3	31.0	32.9	29.0	.99
Recognizing letters (number)	33.1	30.8	27.8	29.0	1.05
Alphabet	38.3	30.2	26.3	29.2	3.95
Words					
Writes own name	28.3	29.9	32.1	33.4	1.20
Number of known words	36.3	29.4	29.3	30.6	1.48
Sounds out letters	23.0	35.3	29.5	31.9	4.43

Note. Different superscripts (a, b) indicate significant contrasts.

* $p < .05$. ** $p < .01$.

The contrasts between the categories indicate that a secure relationship of the B1 and B2/B3 type is related to reading interests. Children who trust their caregiver (B1 and B2/B3) were reported by their mothers to show more exploratory manipulation with written material than anxiously attached children (A/C). The results confirm the marginal position of the B4 subcategory. Although most of these children scored higher on the reading variables than the children in the A/C category, they lagged significantly behind the securely attached group on two important reading variables.

According to the results, an anxious relationship was not negatively related to skills such as letter knowledge and word recognition. We did not expect to find such a relationship, because cognitive variables might compensate for the lack of exploratory manipulation. Because of the negative relation to important reading interest variables, an anxious relationship could be a negative condition in learning to read, especially when there are other barriers to learning and development. Therefore, the quality of attachment could prove to be a factor in explaining delayed reading development.

The question to be answered, however, is whether quality of attachment per se is causally related to reading interest. Parental behaviors leading to the formation and maintenance of a secure attachment relationship may stimulate the emergence of curiosity and competence in other domains (Lamb et al., 1985). Thus, security of attachment would not be a necessary antecedent to reading interest, but rather differences in security of attachment as well as differences in reading interest would follow from the same types of parental behavior. In our case, however, this hypothesis is less plausible. Securely and anxiously attached children did differ with respect to exploration of written material, although maternal stimulation of reading interests did not differ between attachment classifications.

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