

CHAPTER 5

ATTACHMENT THREE YEARS LATER. RELATIONSHIPS  
BETWEEN QUALITY OF MOTHER-INFANT ATTACHMENT  
AND EMOTIONAL/COGNITIVE DEVELOPMENT IN  
KINDERGARTEN <sup>1</sup>

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ABSTRACT

In this longitudinal study, we describe (dis-)continuities between quality of mother-infant attachment and emotional/cognitive development in kindergarten. 65 mother-child pairs participated in a Strange Situation study. Three years later mother and child were asked to participate in problem-solving tasks; parents and kindergarten teachers were asked to complete a Q-sort procedure, measuring ego-control and ego-resiliency. Attachment behavior appears one of the factors determining degree of ego-control and -resiliency; furthermore, the relationship between attachment and affective atmosphere during the problem solving tasks appears to point to some consistency in caregiver's responsiveness in the cognitive domain.

INTRODUCTION

After about one year of intensive and regular interaction, an attachment relationship between caregiver and infant develops. The quality of the relationship can be measured through the well-known Strange Situation procedure. If caregiving arrangements and family circumstances are relatively stable, the quality of attachment has been shown to remain the same through-

out the second year of life (Ainsworth, Blehar, Waters, & Wall, 1978; Vaughn, Egeland, Sroufe, & Waters, 1979; Waters, 1978). After that, the quality of attachment cannot be measured through the Strange Situation, because children "cognitively" grow out of this intendedly stressful procedure.

Nevertheless, quality of attachment is supposed to influence socio-emotional and cognitive development of toddlers and kindergarten children, and even of older children. This influence can be explained in two ways, corresponding to two currents in attachment theory. Firstly, it is hypothesized that an internal representation of the child itself, its caregiver, and the relationship between both develops. The roots of this internal representation can be found in the first year of life, but during some years thereafter a working model develops that is supposed to be relatively "robust" to external influences. This working model of the self and its relationship to the caregiver influences the interaction with the social and physical environment. In fact, the working model functions as one of the building blocks of personality (Main, Kaplan & Cassidy, 1985).

The second explanation is not so much focused on the child's internal representation as on its environment. It is hypothesized that contextual factors lead to the formation of a bond between caregiver and infant, and that the same factors stimulate a specific way of dealing with the environment (Lamb, Thompson, Gardner, & Charnov, 1985). A sensitive and responsive caregiver stimulates a secure attachment relationship in the first few years of life, but the same kind of responsiveness - adapted to the child's developmental status - provides a good foundation for instruction of the toddler- and kindergarten-aged child. The quality of attachment itself does not directly influence later cognitive and socio-emotional development. Continuity in adaptation to environmental tasks is a matter of caregiving and other contextual factors.

Without choosing between one of these hypotheses, one may assume that securely attached children, who trust their caregiver and his/her availability in stressful situations, find an optimal balance between proximity to their caregiver, and exploration of the wider social and physical environment. Anxiously attached children, however, remain concerned about the availability of the caregiver, and their attention is therefore fixed upon the attachment person. Too little room is left for unrestrained exploration. Securely attached children indeed regularly seek proximity to the caregiver during the second year of life, but by this seemingly dependent behavior the foundations are laid for autonomous exploration of the environment during the preschool period. These children had the opportunity to develop a feeling of competence through inter-

action with a sensitive caregiver in infancy. This feeling of competence or self-reliance could also be stimulated through responsive instructions of the caregiver to kindergarten children solving difficult tasks and problems. One can imagine that a responsive caregiver is quite capable of making available for the preschool child the so-called "zone of proximal development" (see the paragraph on instruction).

In their second year of life, anxiously resistant children make a very clinging and dependent impression, and they do not seem capable of controlling their emotions. Anxiously avoidant children, however, appear to be autonomous: they do not seem to care about their caregiver even in stressful situations. From attachment theory, it can be derived that neither group of infants developed a strong feeling of security, self-reliance and competence. They therefore remain vulnerable and dependent in a developmental stage in which they have to solve problems relatively autonomously as well as having to establish new relationships with peers and kindergarten teachers (Bretherton, Bates, Benigni, Camaioni, & Volterra, 1979; Sroufe, 1979). Besides, it can be hypothesized that unresponsive caregivers of anxiously attached infants remain less sensitive to the socio-emotional and cognitive needs of preschoolers. Therefore, instructions could be of low quality, which implies less stimulants for reaching the proximal zone of development. The anxiously attached child not only made a slow start in infancy, but because of its unresponsive caregiver, it may remain disadvantaged in the preschool situation as well. The child also has no model of a harmonious relationship with its attachment person when building new relationships outside the family.

We have seen that explanations for continuity of development focus on internal representations or "personality" on the one hand, and on social context, e.g., caregiving arrangements on the other. Do stable personality traits result in continuity or is continuity a consequence of qualitatively good, i.e., responsive and continuous caregiving? It does not seem adequate to discuss the matter of developmental continuity exclusively in terms of "internal representations" or in terms of "social context". Combining both hypotheses might be a more fruitful approach to the problem of continuity. However, the question remains which factor must be emphasized: are stable caregiving arrangement and continuity in responsiveness necessary or sufficient conditions for developmental continuity? Are there interactions between changing caregiving arrangement and "internal representation" resulting in discontinuity?

In this study we have tried to do justice to both aspects - internal representation and environment- without pretending to find definite answers to the above mentioned questions. The

study consists of two parts. On the one hand we will consider the quality of maternal instruction three years after measuring the quality of the attachment relationship between mother and infant. The cognitive dimension of instruction as well as the socio-emotional dimension will be taken into account. The question is whether continuity exists between quality of attachment in the Strange Situation procedure, and quality of maternal instruction three years later. On the other hand, we will study the relation between quality of attachment and development of "personality" in the preschool setting, without taking social context into account. Two aspects of personality presumably important for solving social and nonsocial problems, i.e., ego-resiliency and ego-control, will be emphasized. It is hypothesized that an optimal quality of attachment in the second year of life leads to optimal ego-resiliency and ego-control. It must be clear that we do not intend to produce crucial empirical evidence for choosing between the two hypotheses: "internal representation" or "social context". As emphasized above, a combination of these hypotheses will probably have the most explanatory power. In this study, we have only tried to consider both types of developmental continuity in attachment theory, i.e., the "internal" versus "external" continuity and have avoided making an *a priori* choice. It might be worthwhile, of course, to attach different weights to these hypotheses in the event the data corroborated them to a different degree.

Be that as it may, in the next paragraph we will first describe the background of our study on the relationship between attachment and ego-resiliency and ego-control. Next, we will focus upon the relationship between attachment and maternal instruction, which is central in the second part of this study. Then the results of the study will be presented, as well as a discussion of the two parts. Lastly, both parts will be related, and conclusions will be drawn with respect to the questions introduced above.

### *Ego-resiliency and ego-control*

Block and Block (1980) defined ego-resiliency as the competence to react flexibly, but also persistently, in problem situations. It is hypothesized that securely attached children develop a resilient approach to difficult tasks and problems, whereas anxiously attached children show more brittle responses. Block and Block (1980) consider ego-resiliency an important condition for being able to adequately solve difficult tasks in kindergarten. They provided much empirical evidence in favor of this thesis.

The quality of attachment also allows a prediction of the development of ego-control. Block and Block (1980) defined ego-control as the disposition or threshold to repress or express impulses and emotions. Kindergarten children with strong ego-control are rigid and inhibited, show anxiety in new situations and reject unexpected information. Children with a weak ego-control, however, react too "spontaneously", and do not like postponing the satisfaction of their needs. They are not capable of concentrating on one task or problem very long. Both types of ego-control - strong and weak - do not appear to be very adequate conditions for solving problems and functioning in social groups.

Although concepts like ego-resiliency and ego-control are broad, and the psychoanalytic origin is unmistakably present, Block and Block have been successful in constructing and validating an original operationalization. The measure is a Q-sort (Stephenson, 1953), consisting of 100 behavioral descriptions. These descriptions, written on small cards, have to be distributed among nine categories from "strikingly present" to "strikingly absent" (see next paragraph; Van Lieshout, Riksen-Walraven, Ten Brink et al., 1983). Studies on the validity of the CCQ (California Child Q Sort) showed that ego-resiliency and ego-control indeed influence the quality of interaction with the physical and social reality (Block & Block, 1980; Van Lieshout et al., 1983). From attachment theory it can be derived that quality of attachment in infancy is related to ego-resiliency and ego-control in kindergarten. Van Lieshout and his colleagues (1983) even suggested interpreting resiliency and control as continuous developmental dimensions which are being expressed in infancy through the quality of the attachment relationship with the caregiver. Empirical evidence, however, is relatively scarce; few (time-consuming) longitudinal studies have been done.

Waters, Wippman and Sroufe (1979) found that securely attached children three years later scored significantly higher on scales for ego-strength and social competence, as compared to anxiously attached children. Their measurements of attachment quality and ego-strength, however, were poor substitutes for validated and well-known measures like the Strange Situation and the CCQ. One is inclined, therefore, to regard this study as only a first exploration of the field.

In this respect, the study of Arend, Gove and Sroufe (1979) was more convincing: the Strange Situation procedure was used, as well as the above mentioned Q sort. Securely attached children turned out to be significantly more resilient than anxiously attached children on a Q sort completed by the kindergarten teacher. The differences, however, were very small. For ego-control, no more than a trend in the expected

direction could be reported. Anxiously resistant children, expressing their emotions in the Strange Situation in an uncontrolled way through crying etc., were somewhat more undercontrolled than securely attached children. The latter children scored slightly higher than the anxiously-avoidant attached group. Resistant children tend towards undercontrol, avoidant children towards overcontrol. The sample, however, is very small ( $n=26$ ), and the authors rightly conclude that further research, hopefully allowing for the generalization of the results, is necessary.

Sroufe (1983; Sroufe, Fox, & Pancake, 1983) studied a sample of 40 carefully selected children from disadvantaged homes, who had been seen in the Strange Situation in their second year of life. The children visited an experimental kindergarten and optimal conditions for collecting observational material were created. We shall focus here on the results of the measures for ego-resiliency and ego-control. Three teachers sorted 100 items. Sroufe computed the usual resiliency and control scores, as well as a score for dependency, on the basis of 12 of the 100 items. Securely attached children indeed were more resilient than anxiously attached children. No differences were found between the resistant and avoidant groups. Sroufe (1983) remains somewhat unclear about ego-control. He reports that the resistant and avoidant children did not differ in ego-control, but whether this also held for securely and anxiously attached children is not clear. The securely attached group appeared less dependent than the anxiously attached groups, which themselves did not differ with respect to dependency. Due to the selection of the sample, it is somewhat difficult to generalize from the results.

Dutch research on the relationship between attachment behaviors and ego-resiliency and ego-control is reported by Van Lieshout et al. (1983). Firstly, 100 children participated in an intervention study on exploratory behavior, contingency analysis and habituation speed in their first year (Riksen-Walraven, 1977). Six years later this sample was studied, using, among other things, a Dutch version of the CCQ. Secondly, 64 children who participated as two-year-olds in a study on problem solving (Van Lieshout, 1975) were observed 10 years later with the CCQ.

The first follow-up study indicated that exploratory behavior is related to resiliency at seven years of age, and that crying behavior significantly correlated with (weak) ego-control. Optimal control, computed as the absolute value of ego-control scores, could not be predicted through variables measured in the first year. From the second follow-up study it was concluded that children oriented predominantly towards the

mother, seeking her proximity in the problem-solving situation and showing less anger and distress, appeared ten years later to be more ego-resilient and more optimally ego-controlled. However, these interrelations could not be observed in every subgroup of children. Details about the subgroups - boys and girls, first and later-born children - can be found in Van Lieshout et al. (1983). Accepting crying behavior, proximity seeking, and display of anger and distress as indicators of attachment, the results appear to confirm the hypothesized relationships between attachment on the one hand and ego-resiliency and ego-control on the other.

On the basis of these studies we feel justified in concluding that empirical evidence for the hypotheses formulated above is still insufficient. Waters et al. (1979) and Van Lieshout et al. (1983) only produced indirect evidence, and in the small-scale study of Arend et al. (1979) the differences found between attachment groups are very small. Sroufe's study (1983) showed that securely attached children indeed are more resilient, but the relation with ego-control is unclear. The findings are contradictory with respect to a possible differential development of ego-resiliency and control for the two anxiously attached groups. Arend et al. (1979) suggest that avoidant attachment is correlated with strong control and resistant attachment with weak control, but this hypothesis could not be confirmed in Sroufe's research. Data on the relationship between anxiously dependent attachment, the so-called B4 classification (Van IJzendoorn, Goossens, Kroonenberg, & Tavecchio, 1985), and ego-resiliency and ego-control are absent, the reason for this being that in the aforementioned studies the B4 category contained too few subjects for separate analyses to be possible. We submit that the anxiously dependent group is less resilient and less optimally controlled than the other B-subcategories because of its resemblance to the anxiously resistant group (Van IJzendoorn et al., 1985).

In the first part of this study we will try to replicate and extend the existing studies on the relationship between attachment and ego-resiliency and ego-control. Our main question is whether optimally adapted two-year-old children, that is, children who have built up a secure attachment relationship, are optimally adapted in kindergarten, i.e., show much ego-resiliency and optimal ego-control. Special attention is given to differential development of avoidant and resistant types of anxious attachment and to the status of the dependently attached B4-group. Lastly, we shall have a look at the influence on ego-resiliency and ego-control of such contextual factors as working status of the mother and exceptional events, e.g., divorce or stay in hospital.

### *Instruction*

The emphasis on ego-resiliency and ego-control as conditions for optimal problem solution seems to ignore the great importance of adequate instructions in acquiring problem-solving abilities. The child is depicted as being detached from its social surroundings, as being solely dependent on its own "internal representations" and "schemata" acquired in the past. Such an approach has met, and rightly so, with severe criticism the last few years. Bruner, for instance, criticized an approach in which the child's development is pictured as a "lone venture for the child, in which others could not help unless the child has already figured things out on his own". Somewhat maliciously he held Jean Piaget responsible for this attitude. Instead, Bruner proposed a theory in which cognitive and affective processes are seen to develop in a social context, which actively participates in moulding the child's development.

Bruner may have been inspired by his reading of the cultural-historical theory. This theory time and again underlined the central importance of the child's surroundings for cognitive development. The originator of the theory, the Soviet researcher L.S. Vygotskij, attached great importance to the adult's role in child development. In social interaction with adults the child acquires the cultural tools of its society (Van der Veer, 1985a). Within the cultural-historical school, this conception has been elaborated with respect to the concept of the "zone of proximal development". In cooperation with a sensitively operating adult, the child is able to perform certain tasks which it could not have managed independently. In the eyes of cultural-historical researchers such creation of the zone of proximal development is of paramount importance for the child's cognitive development (Rogoff & Wertsch, 1984). Various researchers are currently trying to lay bare the processes taking place in the zone of proximal development. In line with Vygotskij's original emphasis on the concept of social interaction, the focus is on the mother-child dyad. The child is dependent on the adult for its cognitive development to proceed optimally (cf. Wertsch, 1985). Attachment theory is not always very clear in explaining findings demonstrating attachment quality's great value for cognitive development. Longitudinal research demonstrated the fact that securely attached children of 2½ (Hazen & Durrett, 1982) and 5 years of age (Arend, Gove & Sroufe, 1979) are more inclined to explore the surroundings than anxiously attached children. Securely attached children are also more eager to learn, show more inquisitiveness (Waters, Wippman, & Sroufe, 1979), and display more enthusiasm during problem-solving

(Matas, Arend, & Sroufe, 1978). This higher cognitive competence may be connected with a more harmonious caregiver-child relation. Caregiver and child are so well attuned to each other emotionally that the transmittal of knowledge and abilities proceeds in a flexible way. The caregiver knows the scaffolding and freedom of action the child needs to be able to solve a problem successfully. The child in turn dares to tackle problems slightly above its level of knowledge, because it is confident of the caregiver's ability to assist at the appropriate moment (Bretherton et al., 1979).

Such a point of view is in close agreement with the cultural-historical approach. For in the Soviet approach too, we find a strong emphasis on the caregiver-child dialogue with due attention to the sensitivity required from the caregiver towards the needs and signals of the child. A sensitive caregiver can effectively create a zone of proximal development in the cognitive domain (Van der Veer, 1985a) while at the same time, by reacting sensitively towards emotional signals, create a feeling of security in the affective domain. The question is to what extent caregivers, displaying enough sensitive responsiveness for a secure attachment relation with their child to develop, are later capable of showing similar sensitivity when instructing their child in complex problem-solving tasks.

In the cultural-historical tradition, this instructional ability is usually investigated using tasks slightly beyond the child's abilities. The caregiver, therefore, has to "scaffold" the problem-solving process - subdividing and simplifying the problem - so that the child will be able to find the solution relatively independently. For this to be possible, a flexible, "smooth" interaction between caregiver and child is required. The caregiver, of course, will carry the burden of the responsibility for a smooth task performance. He or she should be acutely aware of the child's zone of proximal development in the particular domain. Both the excessive curtailment of the child's freedom of action - by providing too much prompting or demonstrating the whole solution - and a "laissez faire" attitude - in which the child is given no more than superficial encouragement - should be avoided. As in the affective domain, one has to find the optimal balance between over- and understimulation. The second part of this study aims at investigating the question whether securely attached dyads will continue to show more balanced interactions during joint problem-solving three years later.

FIRST PART OF THE EMPIRICAL STUDY:  
ATTACHMENT AND RESILIENCY/CONTROL

*Design*

At 24 months of age (range: 23 to 25 months), 77 children and their mothers were tested using the Strange Situation procedure. About 50% of the mothers were working 15 hours or more per week outside the home; the rest of them were full-time homemakers (see Goossens, in prep.). Sixty-five of the 77 children participated in the follow-up study three years later. Parents and kindergarten teachers completed the Q-sort for ego-resiliency and ego-control, validated by Van Lieshout et al. (1983) for Dutch children between 4 and 12 years of age. In the laboratory, mother-child pairs had to complete four instructional tasks, which were videotaped. The children had to complete an IQ-test, the Leiden Diagnostic Test (Schroots, 1979). In the second part of this study the results of the instruction tasks and IQ-test are reported upon. Lastly, we collected data through interviews and a questionnaire on special events in the family which had taken place during the last three years. In the follow-up study, the mean age of the children was 64 months (range: 57-72 months).

*Subjects*

Only 16% of the subjects did not participate in the follow-up study. Because data on the "nonrespondents" were available from the first part of this longitudinal study, we tested the hypothesis that subjects refusing to participate did not constitute a specific subsample. Both groups, respondents and nonrespondents, were compared on the following variables: attachment classification, attachment behaviors, socio-economic status and sex. Differences in means on scales for attachment behaviors (see next paragraph) were tested through *t*-tests. No differences were found to be significant ( $p < .05$ ). The distributions of the children on attachment classifications (A+C; B1; B2+B3; B4) did not differ significantly ( $\chi^2 = .35$ );  $p = .95$ ). No differences were found with respect to socio-economic status and sex of the child. Therefore, it was concluded that "nonrespondents" did not constitute a specific selection from the original sample. The way in which this original sample was selected for participation in the study is described in detail elsewhere (Goossens, in prep.).

### *Procedure*

The Strange Situation procedure consists of eight episodes, the last seven of which should ideally last 3 minutes each. The first one is variable and usually takes less than 30 seconds. After some final instructions in this first episode caregiver and child are left in the playroom (episode 2). In episode 3, a stranger enters who after three minutes signals to the mother to leave (episode 4). In episode 5 the mother returns; she leaves again in episode 6. The stranger re-enters the room in episode 7, and in the last episode the mother returns once again. To assess the quality of the relationship, the behavior of the child is scored on six 7-point rating scales, which take into account the frequency, intensity, and latency of specified behavioral components. The scales are for proximity and contact seeking, maintenance of contact, resistance, avoidance, search behavior and distance interaction. The frequency of crying behavior and exploratory behavior is observed. The patterns of scores on the first 4 scales in the reunion episodes (5 and 8) leads to the classification of mother-child pairs in anxiously avoidant attachment (A), secure attachment (B), or anxiously resistant attachment (C). The three main groups (A, B, and C) may be further divided into various subgroups (A1, A2, B1, B2, B3, B4, C1, and C2). The securely attached group shows minimal resistant or avoidant behavior; these children are somewhat upset when their mother has left, but her return has an immediate calming effect. The children from the A- and C-groups deviate from this pattern. Some children avoid their returning mother (A), other children behave ambivalently, seeking contact but resisting the mother as well (C). The subcategories B1 and B4 have been called "marginal" groups, because their position in the classification system is not altogether clear (Ainsworth et al., 1978). B1-children show some resemblance to A-children, because of their tendency to slightly avoid the mother. B4-children have been called anxiously dependent (Van IJzendoorn et al., 1985; Sagi, Lamb, Lewkowicz, Shoham, Dvir & Estes, 1985). These children are very upset in the Strange Situation: they cry a great deal and show little exploration or playing behavior. They greet, however, their returning mother less ambivalently than C-children.

Two observers independently scored 22 randomly selected videotaped Strange Situations. The interrater reliability, computed with Pearson's *r*, was good: for proximity in the two reunion episodes, .77 and .91 respectively; for maintaining contact .95 and .97; for resistance .88 and .92; for avoidance .86 and .91. On the basis of these interactive scales, the children were classified as A, B, or C group

children. The interrater agreement for this step was 95.5%; for the subcategories 91.5%. The scores on these scales and the classifications were derived from Goossens (in prep.). The interrater reliability for the scales in the other episodes and for "search" and "crying" ranged from .73 to .97. Agreement for exploratory manipulation was 78%. These scales and the behavioral patterns were scored by the first author. The stability and validity of the procedure for 24 month-old children is described elsewhere (Goossens, Van IJzendoorn, Tavecchio, & Kroonenberg, 1985; 1986).

*The CCQ.* Block and Block (1980) designed the California Child Q-sort to be completed by teachers and other caregivers. Van Lieshout et al. (1983) constructed a Dutch version of the Q-sort, the "Nijmegen California Kinder Sorteertest" (NCKS), and validated the instrument for Dutch children from 4 to 12 years of age. Parents, teachers or other caregivers sort 100 behavioral descriptions, written down on cards, into nine categories, from "strikingly absent" to "strikingly present". Except for the middle category, which should contain 12 cards, all categories contain 11 cards after sorting. In distributing the cards, the sorter is comparing the items, not the children. The resulting distribution is thereupon correlated with two profiles, constructed by Block and Block (1980): one profile of a child with high ego-resiliency, and one profile of a child with weak ego-control. The correlation coefficient is the score on ego-resiliency and ego-control, ranging from -1.0 tot +1.0. Van Lieshout et al. (1983) report excellent reliability and validity for the Dutch version of the CCQ.

In this study, we asked both parents and the kindergarten teachers to sort the CCQ (the children attended different kindergartens). The sorting was done individually, scores on ego-resiliency and ego-control were computed by Van Lieshout and his colleagues at the University of Nijmegen. Scores of father and mother were added: in analyzing the data, we worked with the variables "ego-resiliency" and "ego-control" as scored by the parents. Although the scores of mother and father are not highly correlated (.51 in the case of resiliency, and .70 in the case of control), and although only a modest score for consensus between both parents could be computed (.54), we think that the combined parental score is probably more reliable than the separate variables (Waters, Noyes, Vaughn, & Ricks, 1985). For that matter, the separate variables correlate very highly with the parental variables: correlations vary from .86 to .92. Besides scores on ego-resiliency and ego-control, a variable "optimal ego-control" was constructed. First the mean was subtracted from the scores on ego-control, after which absolute values were computed. Therefore, low values on the variable "optimal ego-control" indi-

cate optimal control, and high values point to weak or strong control (see Van Lieshout et al., 1983).

## RESULTS

The relation between early childhood attachment and later ego-resiliency and ego-control has been studied on the level of attachment classifications, as well as on the level of attachment behaviors. Several studies have indicated that attachment classifications only partially mirror behavioral differences of children in the Strange Situation (Lamb et al., 1985). The classifications are often comparable to a bed of Procrustes, into which not all information about attachment behaviors can be fitted. The separate behaviors, however, throw some light on the activation of the attachment system: For example, "antithetical" attachment behaviors, such as avoidance and resistance, point to anxious attachment feelings. In the next paragraph, therefore, results on the relation between classifications and ego-resiliency and ego-control are reported. The same will be done for the relation between attachment behaviors and ego-resiliency and ego-control.

### *Attachment classification and resiliency/control*

To analyze the data we had to reduce the number of subcategories from eight to four:

- A1+A2+C1+C2 is the anxiously attached group, consisting of 8 girls and 6 boys;
- B1 is the "marginal group" of securely attached children showing some avoidant behavior (11 girls and 7 boys);
- B2+B3 is the "normative group" of securely attached children (10 girls and 9 boys);
- B4 is the anxiously dependent group, consisting of 6 girls and 8 boys.

We analyzed the data, using 2x4 analyses of covariance, with Sex and Classification as factors, and Socio-Economic Status as covariate. The ANCOVA's on resiliency (as perceived by the parents and the kindergarten teachers) did not show any significant effect of classification. Securely and anxiously attached children did not differ significantly in ego-resiliency. The results showed, however, a rather strong effect of the factor "sex of the child": girls display more resiliency than boys.

In the eyes of the parents, girls are more optimally controlled as well, but no differences were found between the four attachment classifications. The ANCOVA on optimal control, as perceived by the kindergarten teachers, resulted in a significant Sex by Classification interaction ( $F(3,47)=3.3$ ;  $p=.03$ ; see Table 1).

Table 1  
The relation between Optimal Control (as perceived by the kindergarten teachers) and attachment quality<sup>1</sup>

Variable	Optimal Control		
Factor	$\bar{X}$	s.d.	n
Girls			
A/C	.261	.214	5
B1	.198	.149	11
B2/B3	.095	.093	9
B4	.112	.138	6
Boys			
A/C	.109	.114	6
B1	.163	.074	5
B2/B3	.216	.135	8
B4	.234	.169	6
Total	.172	.142	56

<sup>1</sup> ANCOVA with attachment quality and sex of child as factors, and SES as covariate (n=56)

According to the kindergarten teachers, anxiously attached girls indeed show less optimal ego-control. Anxiously attached boys, however, show optimal control. Dependently attached B4 boys are regarded as least optimally ego-controlled, while B4 girls, together with B2 and B3 girls, appear to be most optimally controlled. Because of missing data, only 56 children are involved in Table 1.

#### *Attachment behaviors and resiliency/control*

Because our number of subjects did not allow the inclusion of

all variables in the multiple regressions, the following scales were selected: "proximity seeking and contact maintaining" (a combination of "proximity seeking" and "contact maintaining"), "avoidance", and "resistance". "Crying behavior" and "exploratory manipulation" are included as well. Lastly, sex of child and working status of the mother appeared to be the most relevant background variables. These variables were used as predictors in multiple regression analyses with backward selection. Criteria were scores on resiliency and control.

In Table 2, the results of the regression on ego-resiliency (as perceived by the parents) can be found.

Table 2  
Multiple regression on ego-resiliency (as perceived by the parents) with sex of child, working status of the mother, and attachment variables as predictors<sup>1</sup>

Predictors	Ego-resiliency (parents)			
	$\beta$	T	p	$r_p$
1. Sex	-.36	-3.1	.003	-.38
2. Avoidance	-.37	-2.7	.01	-.34
3. Crying	-.42	-3.1	.003	-.38

$R=.52$ ;  $R^2=.28$ ;  $F(3,56)=7.1$ ;  $p=.0004$

<sup>1</sup> n=60; the procedure is backward selection of predictors ( $p=.10$ )

Negative attachment behaviors, such as crying and avoidance, point to less resiliency three years later. Avoidant behavior, in particular, is almost exclusively shown by anxiously attached children. Crying behavior is also shown by dependently attached (B4) children. The correlation with sex of child points to boys having less resiliency than girls. The partial correlations, indicating the strength of the relation with resiliency controlled for the other predictors, show the magnitude of the effects. These are relatively large taking into consideration the time span between measurement of attachment behaviors and of resiliency. In this way 28% of the variance was explained.

Separate regressions for boys and girls - leading, of course, to a relatively unfavorable ratio between subjects and variables - show that avoidant behavior is a good predictor of low resiliency in girls. For boys, crying behavior and working status of the mother appear to be good predictors of the same criterion. Boys, then, seem to be more context dependent than girls.

Results of regressions on ego-control are more complex. Both extremes of the variable "ego-control" are unfavorable: Neither weak nor strong ego-control seem to be a stimulating condition for solving problems and relating to peers. The optimum probably lies in the midrange. A positive score on ego-control points to weak control, a negative score indicates strong control. Apart from that, bivariate scattergrams of attachment behaviors and control did not show curvilinearity. In Table 3, the outcomes of the regression on ego-control (sorted by the parents) are described.

Table 3

*Multiple regression on ego-control (as perceived by the parents) with sex of child, working status of mother and attachment variables as predictors<sup>1</sup>*

Predictor	Ego-control (parents)			
	$\beta$	$T$	$p$	$r_p$
1. Exploration	-.38	-2.4	.02	-.30
2. Avoidance	.30	2.1	.04	.27
3. Resistance	-.37	-2.6	.01	-.33

$R=.39$ ;  $R^2=.15$ ;  $F(3,56)=3.3$ ;  $p=.03$

<sup>1</sup>  $n=60$ ; the procedure followed is backward selection of predictors ( $p=.10$ )

From Table 3, it can be derived that avoidance in the Strange Situation predicts weak control three years later, while exploratory manipulation and resistance covary with strong control. Fifteen percent of the variance of ego-control is predicted by three variables: exploration, avoidance and resistance. These results contradict the hypothesis that resistant attachment goes with weak control and avoidant at-

tachment with strong control (Arend et al., 1979). In the last paragraph of this chapter, this contradiction will be discussed.

The results of the regression on ego-control are most remarkable for the subgroups of girls. In Table 4, the results of the regression analysis for girls are shown.

Table 4

*Multiple regression on ego-control for girls (as perceived by the parents) with working status and attachment variables as predictors<sup>1</sup>*

Predictor	Ego-control			
	$\beta$	<i>T</i>	<i>p</i>	$r_p$
1. Exploration	-.44	-2.4	.02	-.40
2. Avoidance	.59	3.5	.002	.54
3. Resistance	-.59	-3.6	.001	-.55

$R=.63$ ;  $R^2=.39$ ;  $F(3,30)=6.4$ ;  $p=.002$

<sup>1</sup>  $n=34$ ; backward selection of predictors ( $p=.10$ )

From Table 4, it can be derived that 39% of the variance is predicted by the above mentioned attachment behaviors: exploration, avoidance and resistance. The partial correlations are relatively high, and point in the same direction as found in the total sample. Exploration and resistance go with strong control, while avoidance is related to weak control. For boys, the regression on ego-control shows no significant effects. In this respect, girls appear to be more "predictable" than boys.

Regressions on ego-resiliency and ego-control (both as sorted by the kindergarten teachers) did not produce significant results. In the regression on optimal control (sorted by the parents), attachment variables do not play a significant role. Only background variables, like sex of child (partial correlation:  $r_p=.37$ ) and working status of the mother ( $r_p=.28$ ), contribute significantly to the prediction. Girls appear more optimally controlled than boys; children of full-time homemakers are more optimally controlled than children of working mothers (working 15 hours per week or more outside the home). Regressions in both subgroups - girls and boys - yielded more or less equivalent results.

In attachment theory, it is supposed that quality of attachment remains stable, provided that social context for parent and child is relatively continuous. Divorce, illness, etc., could be factors contributing to discontinuity in the child's adaptiveness to developmental tasks. Selecting the subjects ( $n=46$ ) who did not experience such disrupting events (according to information obtained through interviews and a questionnaire), the pattern of correlations between attachment and Q sort variables does not change radically. The results show a tendency towards somewhat stronger correlations, indicating more continuity, but the changes are rather small. Because of the stable group's limited size, repeating the multivariate analyses would considerably reduce the reliability of the outcomes.

## SECOND PART OF THE EMPIRICAL STUDY: ATTACHMENT AND INSTRUCTION

### *Procedure*

As mentioned above, all subjects from the first part of this study were presented four instructional tasks and an intelligence test.

### *The instructional tasks*

Mother-child pairs were requested to solve four tasks. The mother was asked to instruct her child (if necessary) as she and her child were accustomed to. The whole problem-solving process was videotaped. The four tasks were Duplo, Logics, Butterdish and Wiggly. In the Duplo task, the child had to build a construction using a photograph of the desired end result as a model (Duplo is Lego for young children). Logics consists of a series of five pictures, which, if laid down next to each other in the right order, form a coherent story. The Butterdish is a series of round boxes of different sizes which fit together only when turned upside down (because of the protruding bottom of each box). The task for the child is to fit the boxes together in such a way as to form one compact box (having the size of the largest box). Finally, the Wiggly block is a wooden cube which has been cut up to produce nine pieces of irregular form. The child has to reconstruct the original cube (De Zeeuw, 1971). The four tasks were presented to the child in the above mentioned order, corresponding to

the supposed level of (ascending) task difficulty. Mean time for reaching the solution in the tasks was 153, 117, 139, and 447 seconds. To prevent unduly frustration in the Wiggly task, the maximum amount of problem-solving time was fixed at 10 minutes.

### *Observation scales*

Various observation scales were developed for the analysis of the behavior during the tasks. In the Duplo, Logics and Butterdish tasks, nine observation scales were used. In general, they were 7-point scales. The mother's contribution to the emotional atmosphere was measured using 3 scales (extent of smiling and laughing of the mother; sum total of positive and negative remarks; degree of physical distance she kept). The mother's instructional or tutorial behavior was also judged through 3 scales (number of good prompts and hints; number of concrete interventions like pointing; speed of intervention, if the child was performing suboptimally). The interaction between mother and child was determined through 2 scales: frequency of total interaction and frequency of inadequate interaction. The latter scale was meant to register possible frictions between the mother and her child. The child, for instance, may ignore the mother's hints and prompting, or mother and child may be trying to solve the task independently, without paying attention to each other's efforts (this happened frequently during the difficult tasks). Finally, the child's ability was estimated on a 7-point scale. All behaviors were rated independently by two observers and the mean interobserver reliability was .83, .82, and .84 for Duplo, Logics and Butterdish respectively. Several new observation scales were developed for the Wiggly task. Retained were the 3 scales measuring the emotional climate during problem-solving. The scale measuring the number of good hints and the scale judging the degree of inadequate interactions were also retained. The remaining scales were, for various reasons, not adequate for the Wiggly task. The number of concrete interventions by the mother, for instance, was invariably high, thus making the scale for these behaviors of little value. It was therefore decided to develop 8 new scales, all measuring specific aspects of the problem-solving behavior in the Wiggly task. The first 6 scales were designed to measure the mother's tutorial behavior in this specific task. (How many times the mother explains that the part of the block under consideration is a corner piece; How many times she points out that it is a lateral side; How many times she shows that a piece of the block can be rotated along the longitudinal axis; How many

times for the latitudinal axis; How frequently she explains the advantage of sorting the pile of pieces; How many times she points out the specific form of a certain piece of the Wiggly block). The other two scales were intended to register the events when a child lost interest in the task. This could happen due to frustration, fatigue or because the task was too tedious (Is the child actively participating in the problem-solving process; Is the mother trying to lure her child back into task performance). Finally, the mother's competence in this task was estimated. All scales were rated independently by two observers, and the average interobserver reliability was .85.

### *The Leiden Diagnostic Test*

The children had to individually solve several subtests of this test for cognitive performance. The combination of the selected subtests is considered by the constructors to be an effective and reliable means of measuring independent cognitive performance (Schroots & Van Alphen de Veer, 1976). The subtests were "Block patterns", "Word span", "Pointing out pictures", "Repeating sentences", and "Comprehension". The subtest "block patterns" is intended to test the visual channel and, according to the test constructors, taps the following cognitive functions: pattern perception, matching, analysis, synthesis, reasoning, and eye-hand coordination. The subtest "word span" is aimed at the auditory channel and measures the level of the following cognitive functions: attention and immediate memory for word sequences. "Pointing out pictures" is aimed at both the auditory and the visual channel and the corresponding functions are attention, memory for word sequences, and matching. The subtest "repeating sentences" taps the auditory channel with the functions: attention and immediate memory for sentences. Finally, with the subtest "comprehension" we were able to measure the auditory channel and the functions: question comprehension, reasoning, and productive language ability. This is the smallest set of subtests covering all possible psychological functions. According to the test constructors it can also be used to compute a reliable IQ score. For details of the scoring procedure, we refer to the test manual (Schroots & Van Alphen de Veer, 1976).

## RESULTS

*The instructional tasks*

First, we will draw attention to the instructional tasks. As a first step in the data analysis, we checked whether the observation scales were in some meaningful way interconnected. If, indeed, they would form coherent clusters, then the data could be taken together without loss of information. A first principal component analysis (varimax rotation) resulted in an unequivocal 5-factor solution. The first four factors each represented one instructional task, while the fifth factor apparently represented the general emotional atmosphere, as becomes clear from the fact that only observational scales measuring the emotional climate during the task loaded on this factor. As only the emotional climate factor was a general factor, a principal component analysis was done for each of the instructional tasks separately. For the Duplo and Logics tasks, a simple 2-factor solution emerged (see Table 5 and Table 6). The first factor clearly represents the instructional variables, while the second factor stands for the emotional climate during task performance.

Table 5  
*Principal components analysis for the Duplo task*

Factor	1	2	Communa- lity
Variable			
Smiling of mother <sup>1</sup>	-	77	60
Posture of mother	-	79	66
Number of good prompts	84	-	72
Concrete interventions	75	-	60
Frequency of interaction	79	37	76
Inadequate interactions	72	-41	69
Skill of child	-82	-	68
Eigenvalue	3.25	1.46	
% variance	46.4	20.8	

<sup>1</sup> See text for a description of the scales

Table 6  
Principal components analysis for the Logics task

Factor	1	2	Communa- lity
Variable			
Smiling of mother <sup>1</sup>	-33	74	66
Number of good prompts	85	-	78
Frequency of interaction	39	78	76
Inadequate interaction	78	-	62
Skill of child	-88	-	78
Eigenvalue	2.38	1.22	
% variance	47.5	24.4	

<sup>1</sup> See text for a description of the scales

It is evident from the factor loadings, however, that giving instructions to the child is not altogether favorable. It involves many frictions between mother and child, as can be seen from the loadings of the scale for inadequate interactions. The factor analysis of the Wiggly and Butterdish tasks resulted in a different picture. It is true that again the simple two factor solution is found (see Table 7). This time, however, many instructions do not involve a high level of inadequate interaction between mother and child.

The Butterdish problem, being more difficult than the Duplo task and less difficult than the Wiggly problem, occupies an intermediate position. A 3-factor solution can easily be interpreted (see Table 8).

As in the tasks mentioned above, the factor for the emotional climate (factor 2) also emerges. The third factor is the same factor as found in the Duplo and Logics tasks, representing the instruction scales - this time, however, without the loadings of the scales "concrete interventions" and "inadequate interactions". In this rather difficult task, apparently, instruction for the first time acquires an unequivocally positive character, a picture which is confirmed by the results for the even more difficult Wiggly task. Finally, the "concrete interventions" and "inadequate interactions" now load on the first factor. It seems that during this task, mother-child frictions are mainly caused by the mother's concrete interventions.

Table 7  
Principal components analysis for the Wiggly task

Factor	1	2	Communa- lity
Variable			
Skill of mother	65	-	43
Smiling/laughing of mother	-	58	36
Evaluative remarks by mother	-	63	41
Mother's posture	-	74	59
Number of good prompts	91	-	84
Mother's pointing out:			
Corner pieces	57	-	39
Lateral sides	70	-	49
Rotation along longitudinal axis	53	35	40
Rotation along latitudinal axis	56	-	37
Advantage of sorting pieces	53	-	29
Specific form of pieces	-	-	14
The child's task involvement	44	50	44
Inadequate interaction	62	51	65
Eigenvalue	4.09	1.71	
% variance	31.4	13.2	

Table 8  
Principal components analysis for the Butterdish task

Factor	1	2	3	Communa- lity
Variable				
Smiling of mother	-	78	46	82
Evaluative remarks	-76	-	-	60
Mother's posture	-	76	-	68
Number of good prompts	-38	-	70	66
Concrete interventions	77	36	-	75
Speed of intervention	-	-	79	64
Frequency of interaction	-	74	53	89
Inadequate interaction	78	-	-	65
Eigenvalue	2.73	1.85	1.10	

It can thus be concluded that the factor structures (and the correlation matrices not shown here) of the instructional tasks are readily interpretable. The Duplo and Logics task can be grouped together. In both tasks a simple factor structure is found, indicating a positive relation between the instruction factor and the number of mother-child frictions. This seems to imply that much instruction during these relatively simple tasks is not without its drawbacks. A different picture emerges from the Butterdish and Wiggly tasks. Here inadequate interactions are not solely related to instructional behaviors.

Refraining from further interpretations at this moment (see the discussion paragraph), it can be concluded that the information of the observation scales can be condensed considerably. On these grounds it was decided to use the following combined scales in all further analyses (see Table 9).

Table 9  
*Combined scales used in further analyses (on the basis of factor loadings)*

New scale	Old scales
General atmosphere	= summation of the scales for smiling in all four tasks
Wiggly atmosphere	= smiling + evaluative remarks + posture
Duplo instruction	= prompts + concrete interventions + frequency of interaction + inadequate intervention
Logics instruction	= prompts + frequency of interaction + inadequate interventions
Butterdish instruction	= prompts + speed of intervention
Butterdish concrete contribution	= evaluative remarks + concrete interventions + inadequate interventions
Wiggly instruction	= skill of mother + prompts + inadequate interventions

For all tasks, it was recorded whether the mother-child dyads attained a solution, and if so, what the solution time required was.

#### *Attachment classification and instruction*

The next step in the data analysis was to establish the relationship between the newly constructed combined scales and the attachment data found in the first part of this study. The possible link between early childhood attachment and later problem-solving behavior was investigated both on the level of attachment classifications and on the level of attachment behaviors. Because the C-category consisted of only 4 children, the A and C groups were combined. Further, the normative groups B2 and B3 were also combined, resulting in four classes, viz., A+C; B1; B2+B3; and B4. The class variable was used as a factor in two-way covariance analyses, taking sex of child as the second factor and using various covariates. The various combined scales, mentioned above, served as a criterion.

The ANCOVA with emotional climate as criterion produced only one significant effect: sex ( $F[1,53]=7.3$ ;  $p=.009$ ). For girls, the average score on the emotional climate scale is considerably lower than for boys if age is taken as a covariate. Apparently, the emotional atmosphere during this type of instruction tasks in general cannot be predicted by attachment classifications found three years before. Another picture emerges if an ANCOVA is done, taking the atmosphere during the Wiggly task as a criterion and the LDT score as a covariate (a positive correlation between these two variables had been found). A significant main effect for class is found ( $F[3,48]=3.0$ ;  $p=.039$ ). During this difficult task the anxiously attached children from the A/C group apparently work in a less favorable climate as compared to the other groups. It seems that during the often frustrating conditions of the Wiggly task, mothers of these children create a less encouraging atmosphere than mothers of other children. This does not mean that anxiously attached children will automatically perform worse on the Wiggly task. It is true that an ANCOVA with sex and class as factors and solution time as dependent variable will result in a significant class effect ( $F[3,56]=3.2$ ;  $p=.028$ ). Inspection of the averages, however, learns that this effect is caused by the A/C group and B2/B3 group taking more time than the other two groups. It was to be expected that the anxiously attached group would need more time. Surprisingly enough, however, they are joined in this respect by the securely attached children, generally seen as

forming the "optimal" or "normative" group. The ANCOVA's with the other combined scales as criteria did not result in significant effects. This means that on the level of attachment classifications, the relationship between attachment as measured at two years of age and behaviors during instructional tasks three years later is limited.

#### *Attachment behaviors and instruction*

If we carry on to the level of attachment behaviors, some relations can be found, but they do not really clarify the picture. The results are given below of a multiple regression analysis on the emotional climate scale, with attachment behaviors, age, sex, SES and IQLDT as predictors (see Table 10).

Table 10  
Multiple regression on general atmosphere with attachment behaviors, age, sex, SES, and IQLDT as predictors

Predictor	General Atmosphere			
	$\beta$	<i>T</i>	<i>p</i>	$r_p$
IQLDT	.23	2.0	.05	.25
Avoidance	-.25	-2.1	.04	-.26
Age	.22	1.8	.08	.23

$R=.42$ ;  $R^2=.18$ ;  $F(3,58)=4.15$ ;  $p=.01$

From this analysis on the micro level it can be seen that the attachment behavior "avoidance" is the only predictor to appear from the regression equation. Much avoidance behavior in the Strange Situation (typical for children from the A-group) is negatively related to scores on the emotional atmosphere scale. However, as we saw before, this tendency does not manifest itself on the level of attachment classifications. The same regression on the emotional atmosphere scale during the Wiggly task did not result in significant predictions.

The multiple regressions on the instruction scales do not provide a clear picture. Significant predictions for instruction during Logics and for concrete interventions during the

Table 11  
Multiple regression on instruction (Duplo) with back-  
ground- and attachment variables as predictors

Predictor	Instruction (Duplo)			
	$\beta$	$T$	$p$	$r_p$
Avoidance	-.39	-2.6	.01	-.32
Proximity/Contact	-.27	-1.8	.08	-.23
R=.33; $R^2=.11$ ; $F(2,57)=3.4$ ; $p=.04$				

Butterdish task were not found. For the other instruction scales, significant regression equations were found. The multiple regression for instruction during Duplo is to be found in Table 11.

It appears from Table 11 that avoidance covaries with instructions during the Duplo problem. More proximity and contact seeking also seems to predict less instruction during this task. The multiple regression for instruction during the Butterdish problem is depicted in Table 12.

Table 12  
Multiple regression on instruction (Butterdish) with  
background- and attachment variables as predictors

Predictor	Instruction (Butterdish)			
	$\beta$	$T$	$p$	$r_p$
IQLDT	-.22	-1.73	.09	-.22
Crying	.32	1.91	.06	.25
Proximity/Contact	-.43	-2.54	.01	-.32
R=.38; $R^2=.14$ ; $F(3,56)=3.14$ ; $p=.03$				

It is clear from Table 12 that, apart from the IQ back-ground variable, crying, proximity and contact seeking are the

attachment behaviors, which, to some extent, predict instructional variables during task performance in the Butterdish task three years later. Proximity and contact seeking are the strongest predictors and the relation is the same as found when analyzing instruction during Duplo: the more intense the proximity and contact seeking, the less instruction is given during the problem-solving process. For "crying" the relation is exactly the other way around: the more the child has been crying in the Strange Situation, the more instruction is given during the task. Finally, a regression analysis for instruction during the complex Wiggly task results in the following picture (see Table 13).

Table 13  
Multiple regression on instruction (Wiggly) with background- and attachment variables as predictors

Predictor	Instruction (Wiggly)			
	$\beta$	$T$	$p$	$r_p$
Avoidance	.32	2.1	.04	.27
Crying	.40	2.6	.01	.34
R=.35; $R^2=.12$ ; $F(4,54)=3.79$ ; $p=.03$				

It can be seen from Table 13 that crying, as with the Butterdish task, contributes to the prediction: the more the child has been crying during the Strange Situation, the more instruction it will receive during the difficult Wiggly task. The same holds, but to a somewhat lesser extent, for "avoidance": the more frequent the avoidant behavior of the child, the more instructions it will receive from its mother three years later while struggling with the most difficult Wiggly task.

It can be concluded, therefore, that on the level of attachment behaviors, instructional variables during Duplo, Butterdish, and Wiggly can be predicted to some degree. "Avoidance", "crying", and "proximity/contact seeking" are responsible for these predictions. In various regression equations "crying" and "proximity/contact seeking" are related in the same way to the criterion. More crying implies more instructions, both for the Butterdish task and for the Wiggly

task. More proximity/contact seeking, however, means less instruction, both for the Duplo problem and for the Butterdish problem. The "avoidance" behavior poses some problems: more avoidance is related to less instruction during Duplo, but at the same time it is related to more instruction during the Wiggly problem. This is counterintuitive considering the fact that much instruction during the Duplo task is probably not very adequate, but highly necessary during the very difficult Wiggly task. The anxiously attached behavior "avoidance" here appears to be related to the number of adequate instructions the child receives.

## DISCUSSION

### *Attachment and resiliency/control*

The expectation that, on the level of attachment classifications, secure attachment is connected with a larger degree of resiliency and a more optimal control has only partly been confirmed. It is only for the anxiously attached girls that we find markedly less optimal control, as compared to securely attached girls (cf. Lafreniere & Sroufe, 1985). The opposite picture, however, was found for boys. The expected relation of attachment class with resiliency did not emerge at all. Two-year-old children, classified as anxiously attached, will not differ three years later from children otherwise classified as regards ego-resiliency. The results, therefore, show hardly any continuity in the capacities for adaptation. On the contrary, they seem to point to plasticity and flexibility in early childhood and strongly suggest a critical attitude towards sweeping statements about the long term effects of the early mother-child bond. Of course, the child is the center of a whole network of attachments. Perhaps measurement of the quality of these emotional bonds would have revealed more continuity (Van IJzendoorn, Tavecchio, Goossens, & Vergeer, 1985). For it is quite conceivable that relations with other persons than the mother may have had a compensatory effect.

Nevertheless, there is continuity on the level of attachment behaviors. Children showing much avoidance or crying in the Strange Situation, for instance, are bound to have less ego resiliency three years later. This finding coincides with the results found by Sroufe (1983) and by Van Lieshout et al. (1983). The latter found strong correlations between crying - especially in the playroom - and ego resiliency.

Ego-control can also be predicted on the basis of the

attachment behaviors measured three years before, but to a somewhat lesser degree. In this case, the attachment behaviors "exploration", "avoidance", and "resistance" must be taken into consideration. The prediction is especially strong for the subgroup of girls. This finding is in agreement with the greater context dependency for boys found by, for instance, Rutter (1979), and confirmed by Van Lieshout et al. (1983), and Lafreniere and Sroufe (1985). One also finds in the relevant literature many results indicating a greater fragility in this age period for the strong sex (e.g., Lewis, Feiring, McGuffog & Jaskir, 1984).

It is true that the present analysis shows a peculiar pattern: resistance covaries with strong ego-control; avoidance, however, implies weak ego-control. Assuming that avoidance represents anxiously avoidant attachment and resistance points to an ambivalent resistant attachment, it can be predicted, on the basis of research done by Arend et al. (1979), that avoidance corresponds to strong ego-control and resistance corresponds to weak control. Taking into account the not very controlled behavior of C-children in the Strange Situation, as compared to the seemingly stolid and overcontrolled behavior of A-children, this seems - at first sight - quite a plausible supposition. For it is C-children who give free course to their emotions: they cry a great deal and are desperately looking for the mother during the separation episodes. A-children, on the other hand, seem to concentrate exclusively on the toys, and even seem to ignore the mother when she returns, although psychophysiological studies have shown that these children are at least as upset as the C-children (Ainsworth et al., 1978).

But appearances are deceptive here. There is a great difference in overt behavior - not in the underlying emotions - between the home situation and the laboratory situation. Ainsworth et al. (1978) indicate that A-children at home cry approximately as much as the C-children and thus seem to have the same poor ego-control. They furthermore point to differences within the A- and C-groups. C2-children, in particular, are very passive in the home situation, and A2-children seek much less the proximity of the mother when she returns than the A1-children. Although these intra-group differences have not been tested statistically (due to the small numbers of the subjects), they should make us cautious. For the intra-group differences may enter the picture when measuring ego-resiliency and ego-control which are based on behavior shown at home or in kindergarten.

Indications for a less obvious hypothesis than that of Arend et al. (1979) can also be found in Sroufe et al. (1983). They report that during activities involving larger groups and

during play, it is avoidantly attached children in particular who seek social help; resistantly attached children, on the other hand, show more involvement in smaller groups, especially if the teacher initiates the interactions. The latter fact points to the children's docility, which is a typical result of strong ego-control. Also from teachers' descriptions, the C-children emerge as being somewhat reserved, while avoidantly attached children come to the fore if the stress does not exceed a certain level. A-children tend to withdraw to some quiet corner of the playground or classroom, when hurt or disappointed (Sroufe et al., 1983). Such behavior seems to coincide exactly with behavior typical for weak ego-control. One of the items used to measure the degree of ego-control is, for example, "reacts disproportionately to slight frustrations".

From our qualitative study, in which 8 children were being observed in the classroom for half a year, the C-children indeed emerge as strongly controlled, unobtrusive toddlers, whereas A-children show little control. Although the data have not been analyzed to a sufficient degree, a first reading of the observers' reports strongly suggest that the C-children are rather reticent. The observers report having trouble in making out these children, due to their apparent reluctance to express their feelings. C-children are on good terms with their classmates and are rarely involved in quarrels with other children. They tend to show little spontaneity in their contacts, however, and do not take the initiative, tending to join the others in their activities. The description of A children tends towards the opposite direction, which is of some significance, as the observers were unaware of the hypothesis put forward here. The anxiously avoidant children belong to the clearly "visible" part of the group. They are likely to have problems with their classmates, for instance, when interesting materials are being handed out. A-children are not well prepared to share "their" materials and may react aggressively in such a situation.

Against the background of these descriptions of passive compliant C-children and dominant, but quickly frustrated A-children, our findings gain credibility. It is quite conceivable that the A and C-children's behaviors inside and outside the laboratory are each other's mirror images, while still having the same underlying structure of anxious attachment. For both groups this underlying structure results in less adequate adaptation as compared to securely attached children.

Lafreniere and Sroufe (1985) formulated a hypothesis which may hold for A-children. They suggest that these children develop resistant and aggressive behaviors as the result of

their having a resistant and emotionally inaccessible mother. C-children, on the other hand, may have become convinced that even conspicuous attachment behaviors like crying, etc., do not help in making their source of security more accessible. They may also follow the example of their rather passive (Belsky, Rovine, & Taylor, 1984) caregivers, and exchange their vain attempts to attract attention for a passive and reserved role.

#### *Attachment and instruction*

The results of the second part of this follow-up study indicate the following mother-child interaction pattern during instructional tasks. The mother will create a certain atmosphere, no matter what the task and no matter what the instructions. Some mothers are very encouraging and empathetic during all joint problem-solving, others show a more neutral or negative attitude. This general atmosphere characterizes the mother-child relation during the situation created by the investigators. The main question was whether this general atmosphere can be predicted by the quality of the mother-child attachment relation as measured three years earlier. The question had to be answered in the negative, and, in fact, sex of the child turned out to be the best predictor. On average, the atmosphere between mother and child is worse for girls. Such a result will not surprise, of course, the followers of the Viennese magician, but to the nonbeliever it poses a serious problem.

It was possible, however, to predict the atmosphere on the basis of the attachment behaviors. A multiple regression analysis shows that in particular "avoidance", typical for A-children, plays a role here. A clearer picture emerges if we concentrate exclusively on the difficult Wiggly task. It is found that anxiously attached children have to solve the problems in a less benevolent atmosphere. During the Wiggly task, mother and child face quite difficult problems (as shown by the fact that only 59% of the mother-child pairs found the solution), which has a negative effect on the anxiously attached group. It seems that under these stressful circumstances, the mother-child interplay has still not reached the optimal level.

Shifting our attention to the other instruction tasks, supposedly very important for the child's cognitive development, we find the following picture. Much instruction involves a great deal of mother-child friction during the relatively simple Duplo and Logics problem. This ceases to be the case when mother and child are solving the difficult Butterdish and

Wiggly problems. Instructions are well received there. We submit that the giving of many instructions during the relatively simple tasks is simply a suboptimal procedure, the child being quite competent in these tasks on its own. A lot of instruction then implies a severe limitation of the child's freedom in acting, which certainly does not enhance his or her problem-solving abilities. In other words: the tasks are situated entirely within the zone of actual development of the child, and thus there is no need for the mother to create a zone of proximal development by means of instruction. Not so for the Butterdish problem, and especially the Wiggly problem. For these unknown and difficult tasks, the child has not yet developed a feeling of competence, the less so as for nearly all children the task is beyond their zone of actual development. The child, then, is dependent on sensitive tutorial assistance for successful problem-solving to be possible. It is hardly surprising that instructions meet with less resistance here. The mother's instructions are instrumental for task completion and therefore do not involve an enhanced number of inadequate interactions.

It is found that instructional behavior cannot be predicted by attachment classifications, neither for difficult problems, nor for simple problems. The multiple regression analyses on the basis of attachment behaviors do not yield an unequivocal picture. For instance, avoidance - an important indicator of anxious attachment - involves more instruction during the complex Wiggly task, but less instruction during the rather simple Duplo task. Mothers of securely attached children, then, definitely do not give better instructions than mothers of anxiously attached children. This points to the fact that sensitivity towards cognitive abilities and potentials is clearly different from sensitivity in the affective-emotional field. This was also borne out by the factorial structure for the various instructional tasks. The relation between affective-emotional development and cognitive development therefore, cannot be explained in a straightforward way by referring to a single, general sensitivity of the mother. The cognitive interplay between mother and child cannot be predicted on the basis of the affective dialogue measured three years before. Relating mother-child performance to needed problem-solving time, does not improve things. Attachment class emerges as a significant predictor only for the Wiggly task, which was due (as mentioned above) to the fact that both the anxiously attached group and the securely attached group were slow in solving the problem as compared to the B1- and B4-groups. Quite unexpectedly the anxiously attached children were not inferior to the normative B2/B3-group.

## CONCLUSIONS

Two aspects of the continuity hypothesis were investigated in this study: in the first part we looked at the child's internal representations or "personality"; in the second part we focused on the mother-child interactions (the pedagogical context).

If ego-resiliency and ego-control can be considered to be building blocks of the child's personality - reflecting its way of dealing with difficult social and nonsocial problems - then the results of the first part of this study show that attachment behaviors are of considerable value in predicting personality development. Negative attachment behaviors, such as crying and avoidance, point to less resiliency three years later. Children who showed much resistant behavior and exploratory manipulation in the Strange Situation show strong control; children demonstrating much avoidant behavior show less control three years later. One suspects, of course, that the caregiver's behavior and personality play a role here. Resistant and avoidant children may imitate their caregivers, for instance. Nevertheless, irrespective of this contextual factor, the degree of continuity is quite large. Attachment quality indeed seems to crystallize into a relatively stable personality trait as regards ego-resiliency and ego-control.

In the second part of this study, aimed at mapping out the relation between attachment and instruction, an attempt was made to account for the quality of the pedagogical context. The way the mother creates the atmosphere during the problem-solving process was established. Further, we registered her tutorial interventions. These appeared not to be systematically related to attachment as measured three years earlier. Instructions turned out to be independent of the emotional atmosphere during problem-solving. It appeared that cognitive instruction and social-emotional context form two orthogonal dimensions. We have no grounds, therefore, to assume some sort of general sensitivity for both the affective and the cognitive domain. Neither is it obvious, taking into account the independence of emotional atmosphere and cognitive instruction, to assume a relation between attachment and instruction. This does not exclude, however, continuity in the affective domain. Indeed, we found some continuity between attachment and atmosphere during the most difficult, and therefore most frustrating Wiggly task. Much avoidant behavior in the Strange Situation will predict a negative atmosphere here. Anxious attachment in general was related to a negative atmosphere. On the other hand, caregivers who show sufficient responsiveness in the Strange Situation to develop a secure attachment relation

with their child are found to instruct their children in a better atmosphere. In this sense they are more responsive than parents of anxiously attached children. The cognitive level of their instructions, however, is not necessarily higher.

We conclude, therefore, that both hypotheses on continuity were to a certain extent confirmed by our experimental findings. Attachment appears one of the factors determining the child's personality, probably because it leads to relatively stable internal representations of the self, the caregiver, and the relation between the self and the caregiver. Furthermore the relation between attachment and atmosphere seems to point to the caregiver's responsiveness being relatively constant, at least for the cognitive domain. This may mean that continuity in early childhood development is determined by two factors: first, the crystallization of internal representations as regards the ability of solving social and non-social problems; second, the caregiver's stability in affective responsiveness.

Note:

1. In writing this chapter we made use of the following articles:
  - Van IJzendoorn, M.H., & Van Vliet-Visser, S. (1986). Gehechtheid, ego-veerkracht en ego-controle. Een longitudinale studie [Attachment, ego-resiliency and ego-control. A longitudinal study]. *Kind & Adolescent*, 7, 77-90.
  - Van der Veer, R., Van IJzendoorn, M.H., & Van Vliet-Visser, S. (1986). Gehechtheid en cognitie. Een longitudinaal onderzoek naar de relaties tussen affectieve en cognitieve ontwikkeling in de voorschoolse periode [Attachment and cognition. Exploratory research on the relationship between emotional and cognitive development in preschool]. *Pedagogisch Tijdschrift*, 11, 289-298.

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