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HOW B IS B4? ATTACHMENT AND SECURITY OF DUTCH CHILDREN IN AINSWORTH'S STRANGE SITUATION AND AT HOME[1]

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Summary.—Ainsworth's Strange Situation is a procedure for determining the quality of the attachment between caregivers and young children. This procedure, developed in the United States, has here been applied to a Dutch sample of 66 mother-child pairs. In doing so, the stability, reliability, and validity of the instrument have also been investigated. The instrument was validated by means of a questionnaire for the mothers concerning the feelings of (in-)security their children experience in everyday separations.

'Attachment' is the term for a relatively durable affective relationship between a young child and one or more specific persons with which it interacts regularly. Children attached to a caregiver will try to remain in his direct vicinity, in particular at moments of sadness, fatigue, tension, and fear. In more or less unfamiliar surroundings—a new play area or when visiting strangers—the attachment figure is the secure base from which the environment is explored and usually this person provides a sufficient feeling of security for the child to play freely. The attachment theory of John Bowlby (1971, 1975, 1980) provides an empirically well-grounded description and explanation of the way in which children develop affective relations with their parents and other caregivers, and how they react to separation from or loss of someone they love.

Ainsworth's Strange Situation is a much used operationalization of attachment (Ainsworth, *et al*, 1978). The Strange Situation is a standardized observation procedure designed to assess the quality of attachment. The procedure is based on two crucial assumptions. (a) Unfamiliar surroundings, encounters with strangers and being left alone by the mother are assumed to be stressful events that will elicit attachment behaviour. (b) The return of the caregiver will relieve the stress in children with a secure attachment but not in children with an anxious attachment. The Strange Situation consists of eight episodes the last seven of which should ideally last 3 min each. The first one is variable and usually takes less than 30 sec. After some final instructions (Episode 1)

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caregiver and child are left in a strange environment (Episode 2). In Episode 3 a stranger enters who after 3 min. signals to the mother to leave (Episode 4). In Episode 5 we witness the return of the mother who leaves again in Episode 6. The stranger re-enters the room in Episode 7, and in Episode 8 the mother returns once again. To assess the quality of the relationship, the behaviour 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 behaviour, and distance interaction. The pattern of the scores on these scales, and especially the scores on the first four scales in the return Episodes 5 and 8, then leads to a final assessment in terms of A- (anxiously avoidant), B- (secure), or C- (anxiously resistant) children, which may further be divided up into subgroups (A1, A2, B1, B2, B3, B4, C1, C2).

Ainsworth and her colleagues report a satisfactory to good extent of interscorer agreement for both the interactive behaviour and the classification. The stability of the results for the Strange Situation during a 2-wk. period proved not very satisfactory: 57% of the group of 23 children appeared to remain in the same category (Ainsworth, *et al.*, 1978, p. 222). Connell (1977) and Waters (1978) found a greater stability of the classification over a 6-mo. period, 80.9% and 96% corresponding classification, respectively; Thompson, Lamb, and Estes (1982) and Vaughn, *et al.* (1979), on the other hand, found disappointing stability over a 6-mo. period, 53% and 62%, respectively. This was attributed to significant changes in caregiving arrangement for the children with unstable attachments. As yet, little research has been done on the validity of the Strange Situation, in particular on the relation between the behaviour of the child in the laboratory and its home situation. Ainsworth, *et al.* report on research with 23 mother-child pairs in which behaviour was observed in the home and conclude that the Strange Situation has a satisfactory "ecological" validity (p. 136).

In the study discussed here, an attempt has been made to determine the reliability and the validity of the Strange Situation for a Dutch sample. The validity was investigated by checking to what extent the Strange Situation results correspond to the degree to which the child feels secure in the more or less strange, potentially threatening situations it is likely to encounter in everyday life. On 12 4- and 5-point rating scales, mothers were asked to indicate to what extent the child displays fear, anxiety, or sorrow in contacts with relative strangers, in daily separations and in unfamiliar surroundings (see Appendix). In a preliminary study with 140 parents, a first version of this 'Perceived Security' scale proved to be homogeneous and reliable (Cronbach's alpha: .84; see Tavecchio, Van IJzendoorn, & Hubbard, 1983).

On theoretical grounds, it can be argued that the relationship between the

Strange Situation and the Perceived Security scale is such that the A-children and the B1-, B2-, and B3-children will score higher on the scale for Perceived Security than B4 and C-children, who will display more manifest fear, sorrow, and anxiety in potentially threatening situations. This seems to be a rather inconsistent assumption; the anxiously attached A-group is not assumed to score lower than the securely attached group, while the B4-group is also given a special status. Characteristic for the A-children, however, is their seemingly unruffled behaviour during and after separation from the mother: they show little fear or sorrow and a stranger is seemingly more than capable of assuaging any fears they may display (Ainsworth, *et al.*, 1978, p. 59). Only in subtle ways do these children display any stress in their behaviour. It is unlikely that the Perceived Security scale will discern such subtle differences. The children in the subgroups B1, B2, and B3 are securely attached to their caregivers and do not display much unusual behaviour when separated from their mothers, etc. Only some B3-children are likely to be a bit unhappy but the return of the attachment figure will quickly provide relief here. On the other hand, the B4 child is very much affected by the Strange Situation. It seems fearful and cries a lot, and also displays resistant behaviour towards the attachment figure, resembling in this respect the C-children, who are even more resistant. Ainsworth calls the B4-group a "borderline"-group who are temporarily classified as a B-group but very much resemble the C-group as well: the definitive placement of the B4-group shall have to be determined in later studies with the aid of external criteria (Ainsworth, *et al.*, 1978, p. 251). The C-children are anxious-resistant because, after the return of the attachment figure, they both avert contact and seek proximity simultaneously; during the Strange Situation, C-children appear very frightened and unhappy and clearly demonstrate "maladaptive" behaviour. It may therefore be assumed that this group, along with the B4-group, will score lowest on the Perceived Security scale.

Method

For 66 parental pairs with at least 1 child approximately 2 yr. old (55 children were 24 mo., the youngest was 23 and the oldest 25 mo.), attachment and Perceived Security were measured with the help of the Strange Situation and the scale shown in the Appendix. The age of the mothers participating in the study averaged 31 yr. (minimum 21, maximum 38 yr.), all but one were married and had an average of close to 2 children. The socio-economic status of the mothers participating was determined according to an occupational index currently used in the Netherlands (ITS-Beroepen Klapper; Van Westerlaak, *et al.*, 1975), in which the occupational level is scored on a scale extending from unskilled labour (1) to high-level and academic occupations (6). This group averaged 3.5 ($SD = 1.3$). The study group was part of a larger group of participants (fathers, mothers, children) involved in the study of the in-

fluence of mothers' working outside the home on the attachment of the child. One of the authors, Goossens, is preparing a dissertation on this subject.[2]

The 62 videotaped records of the Strange Situation (four of the recordings proved unusable due to technical failure) were scored on four interactive scales during two reunion episodes, 5 and 8. Two observers scored independently of one another on 22 randomly selected mother-child pairs; the intercoder reliability, calculated with the aid of Pearson *r*, was good; for seeking proximity in Episodes 5 and 8 $r = .77$ and .91, respectively; for maintaining contact .95 and .97, respectively; for resistance .88 and .92, respectively; for avoidance .86 and .91, respectively. On the basis of these interactive scales and episodes, it proved quite possible to classify the children. The intercoder agreement for the classification was 95.5%; for the subgroups 91% ($n = 22$). A preliminary study of 9 mother-child pairs showed that the stability of the classifications can be considered exceptionally high: during a period of 1 mo., all children remained in the same main group; only one changed subgroups.

Much training is desired to carry out the Strange Situation assessments. The fact that the coders agree with each other or that the data are stable is not a guarantee for assessing quality of attachment. Therefore, 'inter-investigator' reliabilities were computed between the coders in our study and in the German study of Grossmann, *et al.* (1981) who possessed tapes scored by Main and Weston, and by German coders trained by Main and Weston. Pearson 'inter-investigator' coefficients for the four interactive scales ranged from .77 to .96 (lowest $n = 15$). The percentage of agreement at the nominal level of classification was 94% for each coder (Goossens & Swaan, 1983).

With the aid of a homogeneity analysis (see Hubbard, Van IJzendoorn, & Tavecchio, 1982), the Perceived Security scale was optimalized ($n = 66$); it proved necessary to recode some items to prevent non-monotonicity. In the following paragraph, the results of the homogeneity analysis are discussed.

RESULTS

As was the case with the preliminary study, it now also proved possible to optimalize the scale for Perceived Security without extensive alterations. In Table 1 are shown results of a homogeneity analysis according to the Program HOMALS (Gifi, 1981). The results of a first homogeneity analysis of the original 12-item scale showed that Item 12 had a discrimination measure of .10 and therefore had to be removed. There were also instances of non-monotonicity with a number of items, so that recoding was necessary. The definitive scale (Cronbach's alpha: .84) provides a simple total score. In the group of 66 mothers, the mean is 28.4, the standard deviation 5.2.

[2]See F. A. Goossens, The quality of the attachment relationship of two-year-old children of working and non-working mothers and some associated factors. (Dissertation in preparation, Univer. of Leiden)

TABLE 1

HOMOGENEITY ANALYSIS OF PERCEIVED SECURITY SCALE

Item	Category Quantifications				Discrimination measure (D)
	1	2	3	4	
1*	8	−.1	−.8		.26
2*	1.9	.2	−.7		.59
3	1.2	.6	−.1	−.5	24
4*	1.8	−.1	−.6		.54
5*	1.5	.3	−.5		.47
6	1.6	1.1	.2	−.7	.45
7	1.0	.5	−.1	−8	.29
8†	1.0	.1	−7	−1.4	.40
9	1.8	1.3	−.2	−.6	.55
10*	2 0	3	−.3	−.5	.45
11†	1.5	.2	−.6	−.9	.49
eigenvalue					.43
n					66

*The original Categories 1 and 2 have been combined.
†The original Categories 3 and 4 have been combined.

To our knowledge, this is the first time a report has been written on the application of the Strange Situation in the Netherlands. Without wishing to suggest that our results can provide a normative distribution of Dutch children over the different attachment qualities, we have placed the frequency distribution in Table 2 next to that of the American studies of Ainsworth and her colleagues, and of the German study of Grossmann, *et al.* (1981). The American and German studies concern 1-yr.-olds.

The strongly deviating percentage of A-children in the German study of Grossmann, *et al.* (1981) is not found in this Dutch study. The Dutch distribution much more closely approaches the distribution found in the American study.

In a preliminary study no significant sex and age differences in interactive scores of 12-, 18-, and 24-mo.-old children were found.[2] The absence of age

TABLE 2

FREQUENCY DISTRIBUTION (PERCENTAGES) OF ATTACHMENT QUALITIES IN SEVERAL DIFFERENT STUDIES

Attachment-quality	Ainsworth, *et al.* (1978) (1-yr.-olds)	Grossmann, *et al.* (1981) (1-yr.-olds)	This study (2-yr.-olds)
A (anxious-avoidant)	22	49	19
B (secure)	66	33	79
C (anxious-resistant)	12	12	2
unclassifiable		6	
N	106	49	62

differences is in line with Bowlby's postulate concerning the onset of cognitive competence for seeing things from other peoples' point of view. Several other authors used the Strange Situation with 2-yr.-old and even older children (Blehar, 1974; Roopnarine & Lamb, 1978; Ragozin, 1980).

Our assumption concerning the validity of the Strange Situation results was tested by means of a one-way analysis of variance of three groups of attachment scores with the score on the optimalized Perceived Security scale as dependent variable. The three groups were compiled on the basis of expectations with respect to their behaviour in everyday situations. As we stated, to the mothers concerned the A-group (in Ainsworth's terminology: anxious avoidant) will hardly seem different from the B1, B2, and B3 group, while the "borderline" group B4 will display many similarities with the C-group. The three groups are, therefore, A1+A2, B1+B2+B3, B4+C. In Table 3 are shown the results of the analysis of variance.

TABLE 3

ONE-WAY ANALYSIS OF VARIANCE OF THREE GROUPS ON PERCEIVED SECURITY SCORE

Group	*N*	Perceived Security Scores		*F*	*p*
		M	*SD*		
A1, A2	12	29 5	6.0		
B1, B2, B3	37	29.4	4.6	7.05	.001
B4, C	13	23.5	5.4		
Total	62	28.2	5.5		

Post hoc comparisons of the averages of the three groups with the assistance of the so-called "multiple-range test" (applied due to the mutual dependence of the groups) show the groups A1+A2 and B1+B2+B3 differ from group B4+C significantly but not from one another. The nature of that difference indicates that the B4+C group scores considerably "less secure" than the two other groups, which seem to be indistinguishable with respect to "Perceived Security."

In trying to answer the question which aspects of the Strange Situation procedure correspond most with the Perceived Security score, two multiple regressions of the four interactive scales as scored in the two reunion episodes (5 and 8) were computed (see Table 4).

The scores on the interactive scales in Episode 5 explained about 21% of the variance of the Perceived Security scale. The interactive behaviour in the most stressful reunion Episode 8 explained only about 10% of the variance. This episode did not seem to elicit the same behaviour in children as is perceived in potentially threatening daily life situations. In Episode 5 less intense prox-

TABLE 4

MULTIPLE REGRESSION OF FOUR INTERACTIVE BEHAVIOURS IN TWO REUNION EPISODES ON PERCEIVED SECURITY

	r	R	R^2	p	β
Reunion Episode 5					
Contact maintenance	−.35	35	.12	.005	−.35
Avoidance	.00	.38	.14	.01	−.15
Proximity seeking	−.32	.44	.20	.005	−.36
Resistance	.02	.45	.21	.01	.10
Reunion Episode 8					
Contact maintenance	−.32	.32	.10	.01	−.32

Note.—Maximum $p = .50$; $n = 62$.

imity seeking and contact maintenance seemed to correlate with greater security as perceived by the mothers. Resistant and avoidant behaviour hardly seemed to explain any variance of the Perceived Security scale.

DISCUSSION

In this study, indications were found for the ecological validity of the Strange Situation. This procedure, developed in the United States, appears not only to produce reliable and stable results in the Dutch context but also to elicit behaviour in children comparable to their behaviour in corresponding everyday, possibly stressful situations. Though the Strange Situation only allows for a relatively short period for the observation of behaviour in unfamiliar surroundings (Bronfenbrenner, 1979, p. 19), mothers appear to make similar observations during their intensive contact with the child in many different everyday situations. Fear, sorrow, and other feelings of restlessness among the B4 and C-children, which may be expected on the basis of their behaviour in the Strange Situation, are also perceived by their mothers. Especially in Episode 5 children showed interactive behaviour that corresponds with their Perceived Security score. The most threatening Episode 8 seems more atypical in this respect. However, mothers do not appear capable of expressing on the Perceived Security scale the subtle indicators of an avoidant attachment. This scale makes no distinction between seemingly undisturbed and unruffled behaviour (avoidant attachment) in stressful situations, and behaviour which demonstrates trust in the accessibility of the attachment figure (secure attachment). It is possible that this is due in part to the limited sensitivity mothers of A-children display for signals from the child (Ainsworth, *et al.*, 1978, p. 300). Indications of an approach-avoidance conflict in the children are not noticed or not seen as being negative.

The position of the B4 group has been discussed by several authors. Connell (1977) found indications of a large affinity between B4 and C (p. 136); Hazen and Durrett (1982) also believed that the B4-group and the C-group

should be integrated (p. 753). Originally, Bell (1970) suggested creating the B4-category when three children of her group of 33 appeared to react much more fearfully to the Strange Situation than the rest of the B-children, while their mothers seemed to be sufficiently sensitive. In the behaviour of B4-children there appeared to be remnants of fear acquired during a more or less serious separation and they appeared—slowly—to be recovering from it (Ainsworth, *et al.*, 1978, p. 246). However, it is questionable whether calling a child securely attached is justified when the mother is relatively sensitive but, for whatever reason, has been physically inaccessible for some time. In attachment theory, physical inaccessibility is also a determinant of anxious attachment (Bowlby, 1975). It appears not entirely correct to classify children in the B4 subgroup solely on the basis of the mother's behaviour. In the Strange Situation, B4 and C2 children display the least search-behaviour during separation in comparison to the other groups. Ainsworth and her colleagues themselves found that of all the groups, B4, C1, and C2 explore the least, certainly during and after the second separation, and they cry the most both during and after separation episodes. Our study also demonstrates the great difference between B4 and the remaining B subgroups, and it would seem logical to emphasize more clearly than in the past the "borderline" character of the B4 subgroup. To determine definitively in which category this subgroup actually belongs, it is desirable that further research should be done into the behaviour of B4-children outside the Strange Situation.

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APPENDIX

THE PERCEIVED SECURITY SCALE

1. Imagine that you and your partner take a few days holiday. During this time, your child stays with friends. Would your child be homesick for you?
   1 = not at all 2 = a little 3 = considerably 4 = a great deal
2. How frightened is your child usually in surroundings unfamiliar to it?
   1 = very frightened 2 = somewhat frightened 3 = a little frightened 4 = not at all frightened
3. Can you indicate how frightened your child usually is of being alone?
   see question 2
4. Does your child move freely in unfamiliar surroundings?
   1 = very freely 2 = somewhat freely 3 = not very freely 4 = not at all freely
5. Is your child out of sorts when you return after having been absent for a half an hour?
   1 = no change noticeable 2 = a little change noticeable 3 = change rather noticeable 4 = change very noticeable
6. Is your child out of sorts when you return after an absence of an hour or two?
   see question 5
7. Is your child out of sorts when you return after a day's absence?
   see questions 5 and 6
8. How unpleasant does your child find it to be left alone in surroundings unfamiliar to it?
   1 = very unpleasant 2 = somewhat unpleasant 3 = makes no difference 4 = not particularly unpleasant 5 = not at all unpleasant
9. How shy is your child usually with strangers visiting you at home?
   1 = not shy at all 2 = not particularly shy 3 = somewhat shy 4 = very shy
10. How quickly does your child usually feel at ease with strangers visiting you at home?
    1 = immediately 2 = after 5 minutes 3 = after 15 minutes 4 = after an hour 5 = not at all
11. Does your child enjoy being left alone for a half hour with a visitor it does not know?
    1 = very much 2 = somewhat 3 = makes no difference 4 = not very much 5 = not at all
12. How often is your child frightened?
    1 = very often 2 = fairly often 3 = occasionally 4 = (hardly) ever