Children and their child care caregivers: profiles of relationships

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Abstract

One thousand three hundred and seventy-nine (682 girls) caregiver–child relationships were used to derive attachment behavior profiles. All of the children were enrolled in child care (72% in child care centers). Profile analysis was completed using five subscales of Attachment Q-Set items. Three profiles were replicated on randomly drawn subsamples, on center based and in-home based subsamples and on separate subsamples of toddler and preschool children. These profiles were labeled: difficult, avoiding and secure. Children in the secure profile had higher security scores than children in the difficult or avoiding profiles. Children in the avoiding profile appeared the most heterogeneous in attachment security. Children in the avoiding profile with high as opposed to low security scores were older and more likely to use the caregiver as a secure base, seek her for comfort and engage in positive negotiations. Observations conducted on the children with their caregivers provided external validity for the profiles. Children in the secure profile had the most adult involvement.

Keywords: Attachment; child care; teacher behaviors; attachment Q-set.

Children's organization of attachment behaviors towards their child care caregivers has been a productive strategy in increasing our understanding of the influences of child care experiences on children's formation of social relationships with others, particularly peers (Howes, Matheson, & Hamilton, 1994). In this prior work, relationship classifications were derived from the Attachment Q-Set (AQS) (Waters & Deane, 1985). The resulting classifications were conceptually similar to those derived for mothers in the Strange Situation (Howes & Hamilton, 1992a). Similar relations to those found between Strange Situation classifications and children's later behaviors with peers were found for this new classification scheme. The purpose of the current research is to extend this research on the classification of child-caregiver relationships by using a more differentiated conceptual basis for the profiles, the revised version of the AQS, and a sample with more heterogeneous child care arrangements.

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In the previous work relationship clusters for children and their child care caregivers were based on individual Q-Set items (Howes & Hamilton, 1992a; 1992b). Items were selected on the basis of their correlation with the security criterion of the AQS. Thus the conceptual base of the procedure was emotional security. In our current work we changed the conceptual base of the clusters to more closely fit differentiated constructs within attachment theory. Specifically we based our clustering on subscales of the AQS items rather then on the more general construct of security. By clustering subscales rather than individual items it is possible to classify profiles in terms of behavior organization as opposed to greater or lesser emotional security.

According to Bowlby (1973) children use attachment behaviors to maintain proximity with their caregivers. The organization of these behaviors can be used to infer the attachment organization of the child towards a particular caregiver (Ainsworth, Behar, Waters, & Wall, 1978; Bowlby, 1973). Following in this tradition we selected the constructs of using the caregiver as a secure base versus avoiding the caregiver and seeking comfort from the caregiver. These behaviors reflect the child's maintaining proximity to the caregiver, particularly when the attachment system is activated (Bowlby, 1973; Howes, Hamilton, & Althusen, 1993). These particular behaviors are most easily observed in younger children, ages one to three years. Bowlby (1973) suggests that older children, three to five years of age, move to a stage of goal-directed partnership in their organization of attachment behaviors. We use the constructs of positive negotiation, and negative negotiation to represent the construct of goal directed partnership (Howes, Hamilton, & Althusen, 1993). We expected children with high security scores to also use the caregiver as a secure base for exploration, to seek comfort from her, and to engage in relatively harmonious negotiations (Bretherton, 1985; Waters & Deane, 1985).

In both the Strange Situation and in previous work deriving clusters from the AQS (Howes & Hamilton, 1992a; Strayer, Verissimo, Vaughn, & Howes, 1993), attachment behavior organization falls into a secure classification and two insecure or anxious classifications. The secure classification represents emotional security or trust in the caregiver to, in fact, protect and care for the child. The insecure classifications represent different adaptations to lack of trust, avoidance and resistance. Based on this previous work we expected a similar number of clusters to emerge in our sample.

We based our current clusters on the 90-item version of the AQS (Waters, 1990). Previous work was completed on an older modified 65-item version. The 90-item AQS is an improvement over its earlier version in that the items are less redundant and more clearly written, increasing the reliability of the instrument. In addition by using all 90 items, rather than a reduced number we increased the reliability of our Q-sorts and the resulting profiles.

The current research extends previous research on attachment relationships with child care caregivers because child–caregiver relationships from several different kinds of child care arrangements were used. Previous research has focused on center based care (Goossen & van Ijzendoorn, 1990; Howes & Hamilton, 1992a). In the current work we included children cared for in in-homes as well as in centers. Home based child care, in our sample, was either care by a relative or by an unrelated caregiver, a licensed or unlicensed family day care provider. This change in sample is important because younger children tend to be cared for

in in-home based settings and attachment research has traditionally focused on infant and toddler age children.

In order to externally validate our relationship categories we used security scores derived from the AQS and observations of adult involvement and caregiving. In a wide range of studies AQS security scores with mothers and alternative caregivers are associated with children who establish positive relationships with both caregivers and other members of their social world. Security scores derived from the AQS relate in theoretically predictable ways to Strange Situation attachment classifications (Valenzuela & Lara, 1987; Vaughn & Waters, 1990), caregiving quality and sensitivity (Howes & Hamilton, 1992a; Pederson, Moran, Sitko, Campbell, Ghesquire, & Acton, 1990; Silverman, 1990), parenting stress (Nakagawa, Teti, & Lamb, 1992; Pederson et al., 1990), and experimentally induced social support (Jacobson & Frye, 1991).

The intensity of adult involvement with the child has been used to validate attachment behaviors directed to the adult in child care research because each adult in child care typically cares for more than one child. In this situation an adult caregiver could neglect one child in the press of managing the care of many children. High teacher involvement is associated with attachment security (Anderson, Nagle, Roberts, & Smith, 1981; Howes & Hamilton, 1992a). Specific caregiving behaviors, such as harsh discipline, are often associated with particular attachment behavior profiles (Ainsworth, Blehar, Waters, & Wall, 1978). Therefore as further validation of the profiles we observed specific caregiving behaviors of the adult as well as adult involvement.

A second goal of the current work was to better understand the meaning of avoiding behavior in child care. In some child care contexts some children appear quite independent of the caregiver. They may spend their time playing with peers or involved with meaningful activities, never appearing to need the teacher. If nothing activates the attachment system during the observation, e.g., falling off the slide and going to the teacher for comfort, these children could be simultaneously classified as avoiding and as socially competent. In the earlier work on attachment profiles children classified as avoidant tend to have caregivers rated as detached and low in involvement, suggesting disturbances in the adult–child relationship rather than a preference for peer or solitary activity (Howes & Hamilton, 1992a). This ambiguity in the meaning of behavior is comparable to the questions raised by the association of the Strange Situation avoidant classification of mother–child relationships with maternal employment (Clarke-Stewart, 1990, Belsky & Braungart, 1991). Researchers have debated whether the behavior of these children is best characterized as independent or avoidant.

Methods

Sample

Our sample consisted of 1379 (682 girls) caregiver–child pairs. Children were only seen with one caregiver and caregivers were seen with no more than two children. All children were enrolled at least 20 hours per week in child care and had been cared for by the caregiver for at least 2 months prior to our observations. Children ranged in age from 10 to 70 months (M = 34.07, SD = 15.67). Forty-eight percent of the children were African-American, 48% European-American,

6% Latino and 2% Asian-American. Fifty-three children were cared for by relatives in the relative's home, 334 were cared for in family day care homes, and the remaining 986 in child care centers. A subsample of 840 children cared for in child care centers and 357 children cared for in in-home child care (family child care or relative care) participated in the caregiver–child observations. Forty-percent of this child care center subsample was enrolled in child care centers serving low income children (family income less than $20,000).

When there was more than one adult present in a child care center we asked the director of the center to identify the child's primary caregiver. If after an hour of observation, another caregiver rather than the primary caregiver appeared to be the one to whom the child directed attachment behaviors we began our observations over again with the newly-identified primary caregiver.

Child care quality in the sample varied from poor to good, but not excellent. The Early Childhood Environment Rating Scale (ECERS) or its infant–toddler equivalent (Infant Toddler Environment Rating Scale – ITERS) (Harms & Clifford, 1980; Harms, Clifford & Cryer, 1986) was used to rate child care centers. The Family Day Care Environment Rating Scale (FDCERS) (Harms & Clifford, 1980) was used to assess the quality of family day care homes. These are seven point rating scales with a 3 indicating a barely adequate quality, a 5 indicating good quality, and a 7 indicating excellent quality. ECERS scores averaged 4.25 (SD = 1.01, range = 1.30 to 6.51). ITERS scores averaged 3.93 (SD = 1.28, range = 1.50–6.57). FDCERS scores averaged 3.56 (SD = 1.09, range = 1.14–6.78). There were no sex or ethnic difference in ECERS scores. Centers serving low income children had lower ECERS scores than centers serving higher income children (t (810) = 2.41, $p < .02$; M (low) = 4.13; M (high) = 4.33). There were no sex, ethnic, or income differences in ITERS scores. Latino children were enrolled in child care with lower FDCERS scores than African-American or European-American children (F (3,354) = 13.95, $p < 01$, Scheffe = .05; (M(L) = 2.71; M(A-A) = 3.90; M(E-A) = 3.83).

The children enrolled in in-home child care arrangements were younger than children cared for in child care centers (t (1377) = 15.49, $p < 001$; M (in-home = 24.72); M (center = 37.15). There was also a significant association between form of child care and race of child ((2) = 172.32). Latina children were more likely to be enrolled in in-home (69%) as opposed to center (31%) child care. African-American children were more likely to be enrolled in center (84%) than in in-home (16%) child care. Fifty-six percent of the European-American sample was enrolled in center and 44% in in-home child care.

Procedure

Attachment Q-Set. The AQS can be used by either caregivers who sort and record their perceptions of their child's behavior in relation to themselves or by trained, independent observers. We used trained, independent observers because we were not interested in the caregiver's perception of the child but in the child's attachment behavior organization. In our pilot work AQS security scores derived from child care caregivers; sorts were more highly correlated with caregiver education and length of time with the child than they were with observed child and caregiver behaviors.

In our study observations lasted a minimum of two hours. The observer

watched as the child and caregiver pursued normal activities in the child care setting. Following the observation the observer completed the 90-item Attachment Q-Set. If an item was not seen during the observation it was placed in the middle pile. For no item was the modal score 5, which would have indicated that the item was usually placed in the middle pile.

Observers were trained to an 85% exact agreement criterion on each item prior to data collection. Inter-observer reliability checks were conducted throughout data collection. median inter-observer reliability was Kappa = .83 (range Kappa = .80 to .92).

Adult involvement and caregiving. An observer observed each child and caregiver for two hours in the child care setting. During this period the observer coded four 5-minute time samples of the social behavior of the child. The time samples were spaced evenly throughout the observation period. Each 5-minute time sample was broken into 15 20-second intervals. Within each 20-second interval the child's proximity to the adult was coded. The child was considered to be in proximity if he or she was within three feet of the adult. If the child was in proximity, the adult–child interaction was rated.

Interobserver reliability on the adult–child interaction measures was established to an 82% agreement (agreements/agreement + disagreements) for all behaviors in an interval prior to data collection. Inter-observer reliability was re-established at monthly intervals throughout the entire period of data collection. Median reliability scores from these reliability checks ranged from kappa = .85 to kappa = .93 (median = .89).

Measures

Security score. To obtain security scores the raw scores from the AQS were correlated with the criterion scores provided for security by Waters. The correlation coefficients are the children's security scores. A higher score indicates greater security.

Attachment behavior subscales. If children are secure with adult caregivers we expect them to use the caregiver as a secure base for exploration, to seek comfort from her, and to engage in relatively harmonious negotiations (Ainsworth, *et al.*, 1978; Waters & Deane, 1985). We created five subscales of Q-Set items to correspond to these classic attachment behavior constructs (Howes, Hamilton, & Althusen, 1993). These subscales are summarized in Table 1.

Adult involvement Scale. The adult involvement scale (Howes & Stewart, 1987) was used to rate the intensity of adult–child involvement. This scale has six levels ranging from (1) ignoring the child; (2) routine caregiving in which the caregiver provides routine care, e.g., blowing nose; (3) minimal caregiving when the caregiver talks to or touches the child in order to discipline the child, to answer direct requests for help, or to give verbal directives with no reply encouraged to more responsive caregiving; (4) answering the child's social bids in a positive but brief manner; (5) extending and elaborating the child's social bids, and, finally; (6) intense caregiving including holding or hugging the child to provide comfort, engaging the child in prolonged conversation or playing interactively with the child.

Composite scores were created from the frequency counts of adult involvement. *Total time near adult* was the sum of all intervals in which the child was within

three feet of the caregiver. *Percent ignore* was the percent of intervals in which the child was within three feet of the caregiver and ignored by her regardless of the child's behavior. *Percent directive caregiving* was the percent of intervals in which the child is within three feet of the adult and the adult involvement is routine or minimal. *Percent elaborated caregiving* was the percent of intervals in which the child is within three feet of the adult and the adult involvement is simple responsive, elaborative, or intense.

Caregiving behaviors. Several additional behavior codes were used in the child care center samples to describe caregiving. These were: *positive initiations* – the number of intervals in which the caregiver smiled, vocalized or touched the child; *positive responses* – the number of intervals in which the caregiver responded in a positive manner to a social bid from the child; *positive management* – the number of intervals in which the caregiver verbally intervened, redirected the child, or reminded the child of the rules for behavior; *negative management* – the number of intervals in which the caregiver raised her voice, spoke in a harsh manner, threatened the child or physically hurt the child; *language play* – the number of intervals in which the caregiver played verbal imitative or rhyming games or read one on one with the child.

Results

Identification of Behavioral Profiles

We used MacQuenn's k-means clustering method (QUICK cluster, SPSS, 1990) to identify attachment behavioral profiles. The five attachment behavior subscales were used in the cluster procedure. Subscale scores were standardized before clustering because the positive negotiation scores were skewed to the right and the difficult negotiation scores to the left.

The replicability of three to five clusters was studied by comparing the clusters extracted from the whole sample with the corresponding number of clusters extracted from four random subsamples of the subjects. The highest replicability was obtained for three rather than four or five clusters. Within k-means clustering replicability is obtained by comparing the pattern and magnitude of variable scores in the final cluster centers. The child care center and home based (relative care and family day care) samples were then clustered separately and again the highest replicability was found for three clusters.[1]

The three identified behavioral profiles are shown in Table 2. Profile one (n = 253) was characterized by low avoidance, high difficult negotiation, and low positive negotiation behaviors. It was labeled difficult. Profile two (n = 683) was characterized by high avoidance, low secure base, and low comfort seeking behaviors. It was labeled avoiding. Profile three (n = 443) was characterized by low avoidance, high secure base and high comfort seeking behaviors. It was labeled secure.

Comparison of Demographic Compositions of Attachment Behavior Profiles

A four-way-frequency analysis was performed to develop a hierarchical loglinear model of demographic compositions of attachment behavior profiles. Two dichotomous variables were analyzed: sex of child and age group, that is under three years old or three years or older. Two three-item categories were used:

Table 1. AQS Items Included in Subscales

Descriptor	Items	Subscales Classic attachment behaviors	Chronbach alpha	Mean (SD)	Range
Secure Base			.67	4.45 (1.61)	1.0–8.60
	Item 14	'When child finds something new to play with he carries it to caregiver or shows it to her from across the room'			
	Item 21	'Child keeps track of caregiver's location when he plays around the child care setting'			
	Item 36	'Child clearly shows a pattern of using the caregiver as a base from which to explore'			
	Item 80	'Child uses caregiver's facial expressions as a good source of information when something looks risky or threatening'			
	Item 90	'If caregivers moves very far, child follows along and continues his play in the area she has moved to'			
Avoidance			.74	5.50 (1.47)	1.5–8.63
	Item 5	'Child is more interested in people than in things' (reversed)			
	Item 25	'Child is easy for caregiver to lose track of when she is playing out of her sight'			
	Item 29	'At times, child attends so deeply to something that she doesn't seem to hear when people speak to her'			
	Item 35	'Child is independent with caregiver. Prefers to play on her own; leaves caregiver easily when she wants to play'			
	Item 43	'Child stays closer to caregiver or returns to her more often than the simple task of keeping track of here requires' (reversed)			
	Item 59	'When child finishes with an activity or toy, she generally finds something else to do without returning to caregiver between activities'			
	Item 76	'When given a choice, child would rather play with toys than adults'			
	Item 88	'When something upsets the child she stays where she is and cries'			

Seeks Comfort		.77	5.17 (1.68)	1.17–9.0
Item 11	'Child hugs or cuddles against caregiver without her asking or inviting him to do so'			
Item 28	'Child enjoys relaxing in caregiver's lap'			
Item 44	'Child asks for and enjoys having caregiver hold, hug and cuddle him'			
Item 53	'Child puts his arms around caregiver or puts his hand on her shoulder when she picks him up'			
Item 64	'Child enjoys climbing all over caregiver when she picks him up'			
Item 71	'If held in caregiver's arms, child stops crying, and quickly recovers after being frightened or upset'			
Positive Negotiation		.77	6.68 (1.76)	1–9
Item 18	'Child follows caregiver's suggestions readily, even when they are clearly suggestions rather than orders'			
Item 19	'When caregiver tells child to bring or give her something, he obeys'			
Item 32	'When caregiver says "No" or punishes him, child stops misbehaving (at least that time). Doesn't have to be told twice'			
Item 41	'When caregiver says to follow her, child does so'			
Difficult Negotiation		.67	3.81 (1.92)	1.0–9.0
Item 38	'Child is demanding and impatient with caregiver. Fusses and persists unless she does what he wants right away'			
Item 54	'Child acts as if he expects caregiver to interfere with his activities when she is simply trying to help with something'			
Item 74	'When caregiver doesn't do what child wants right away, he behaves as if she were not going to do it at all'			

Table 2. Profiles of Attachment Behaviors

	Profiles		
	Difficult	Avoiding	Secure
Subscales			
Secure base	−.68	−1.05	2.45
	(4.29)	(3.23)	(5.95)
Avoidance	−.93	1.79	−2.13
	(5.48)	(6.36)	(4.18)
Seeks comfort	.43	−1.13	1.86
	(5.24)	(4.30)	(6.64)
Positive negotiation	−3.07	.33	.46
	(4.15)	(6.23)	(7.27)
Difficult negotiation	2.37	−.75	−1.09
	(6.19)	(3.45)	(2.87)

Note: Numbers in tables are standardized scores. Raw scale scores are in parentheses. 1 indicates very uncharacteristic, 9 indicates very characteristic.

attachment profile (difficult, avoiding, or secure) and race (African-American, European-American, or Latino). There were too few Asian-American children to include them in the analysis. All two- and three-way contingency tables provided expected frequencies in excess of five.

A hierarchical log-linear analysis was performed on these data using a backwards elimination procedure to select a model that included all first-order effects, five of the six possible two-way associations and one of the four possible three-way associations. The model had a likelihood ratio chi-square (15) = 22.43, $p = .10$, indicating an acceptable fit between observed frequencies and expected frequencies generated by the model. A summary of the model with results of tests of significance (partial likelihood ratio chi-square) and cell percentages appears in Table 3.

African-American children under three years of age were less likely than African-American children three years and over to be classified as avoiding and more likely to be classified as secure or difficult. European-American children under three years of age were less likely than European-American children three years and over to be classified as avoiding or difficult and more likely to be classified as secure. Latino children under three years of age were less likely than Latino children three years and over to be classified as avoiding and more likely to be classified as secure.

A series of significant two-way effects help explain this three-way interaction. While more African-American children in the sample were over three years than under three years of age, there were more European-American and Latino children under three than over three years of age. More children three years and older were classified as avoiding than as difficult or secure. Children under three years of age were more equally distributed among the profiles. Children in the avoiding profile (M age = 38.98 months) were older than children in the secure (M age = 27.29 months) and difficult (M age = 32.48 months) profiles. (F (2,1356)

Table 3. Summary of Hierarchical Loglinear Model of Demographic Characteristics of Children with Different Attachment Profiles

Effect	Partial association chi-square		Percent in cell		
First order effects:					
Age	.42				
Sex	.01				
Race	552.34**				
Profile membership	222.21***				
Second-order effects:					
Age by profile	85.53**		Difficult	Avoiding	Secure
		Under 3	21%	39%	40%
		3 and over	20%	64%	16%
Race by profile	27.68**		Difficult	Avoiding	Secure
		African-American	20%	60%	17%
		European-American	17%	47%	36%
		Latino	22%	33%	45%
Sex by profile	22.81**				
		Girls	19%	47%	34%
		Boys	22%	55%	23%
Age by race	45.40**		African-American	European-American	Latino
		Under 3	42%	63%	75%
		3 and over	58%	37%	25%
Third-order effects:					
Age by race by profile	22.68**		Difficult	Avoiding	Secure
		Under 3			
		African-American	27%	46%	27%
		European-American	13%	37%	50%
		Latino	21%	31%	48%
		3 and over			
		African-American	16%	68%	16%
		European-American	22%	62%	16%
		Latino	25%	40%	35%

** $p < 01$

= 84.63, $p < 01$; Scheffe = .05) and children in the difficult profile were older than children in the secure profile (Scheffe = .05).

There was also a significant two-way effect for profile and sex. Boys were more likely to be classified as avoiding than girls. No statistically significant associations were found between sex and age, between sex, age and profile classification, between sex, age and race, or between sex, race, and profile classification.

Using just the center care sample we examined associations between family income level and profile classification using a chi-square. There was no significant association.

Further examination of the association between attachment behavior profile and age

Because the avoiding profile was consistently more closely associated with older children then younger children we examined whether the profiles were appropriate for both younger and older children. Using the k-means clustering method we separately clustered children under three years of age and three years and older. The same three clusters were identified for each age group. The identified behavior profiles for each age group are in Table 4.

Table 4. Profiles of Attachment Behaviors in Older and Younger Children

	Profiles		
	Difficult	Avoiding	Secure
n			
under three	146	290	276
three or over	204	374	69
Subscales			
Secure base			
under three	.02	−.46	1.01
three or over	−.84	−.76	.18
Avoidance			
under three	−.19	.52	−.81
three or over	−.35	.68	−.02
Seeks comfort			
under three	.33	−.30	1.15
three or over	−.73	−.70	−.24
Positive negotiation			
under three	−1.33	.31	.31
three or over	.40	−.85	.43
Difficult negotiation			
under three	1.35	−.33	−.54
three or over	1.66	.45	−.37

Note: Numbers in tables are standardized scores

We used multivariate analysis of variance to compare subscale scores for the two age groups and different attachment behavior profiles. There was a significant multivariate interaction between profile and age group (F (10,2700) = 4.02, $p <$ 05). Secure base subscale scores were similar for older and younger children in the avoiding and secure profiles but not in the difficult profile (F (2,1351) = 5.42, $p <$ 005; Scheffe = .05). Younger children in the difficult profile had higher secure base scores than older children in the difficult profile. Difficult negotiation subscale scores were similar for older and younger children in the difficult and avoid-

ing profiles but not in the secure profile (F (2,1351) = 3.98, $p < 02$; Scheffe = .05). Younger children in the secure profile had lower difficult negotiation scores than older children in the secure profile.

There was a significant multivariate main effect for age group (F (5,1349) = 36.90 $p < 002$). Younger children had higher secure base F(1,1351) = 11.84, $p <$ 001) and seeks comfort (F (1,1351) = 169.60, $p < 001$) scores. This is consistent with our expectation that younger children would be more likely to demonstrate these behaviors. As expected there was a significant multivariate main effect for profile (F (10,2700) = 369.75, $p < 001$). Children in the avoiding profile had higher avoiding scores than children in the difficult profile who had higher avoiding scores than children in the secure profile (F (2,1351) = 276.66, $p < 001$; Scheffe = .01). Children in the secure profile had higher secure base (F (2,1351) = 303, $p <$ 001; Scheffe = .01), seeks comfort (F (2,1351) = 352.37, $p < 001$; Scheffe = .01), and positive negotiation (F (2,1351) = 525.93, $p < 001$; Scheffe = .01) scores than children in the avoiding and difficult profiles. Children in the difficult profile had higher difficult negotiation scores (F (2,1351) = 503.56, $p < 001$; Scheffe = .01) than children in the avoiding and secure profile.

Comparison of attachment security of the attachment behavioral profile clusters

In order to examine relations between the attachment behavior profiles and attachment security, the security criterion scores for each cluster were compared. These are presented for each age group in Table 5.

Children in the secure cluster had higher security scores than children in the two other clusters (F (2,1354) = 450.30, $p < 0001$; Scheffe = .01). Children in the avoiding cluster had higher security scores than children in the difficult cluster (Scheffe = .01). Younger children had higher security scores than older children (F (2,1354) = 10.39, $p < 0001$). There was no interaction between age group and attachment profile. There were similar patterns in the child care center and in-home child care samples.

Previous work with the AQS has assumed, based on research with the Strange Situation (Ainsworth, *et al.*, 1978), that approximately 65% of a sample will be secure. In several samples of mother–child relationships assessed with the AQS 65% of the sample has had security scores of .33 or .35 or greater (e.g. see Park & Waters, 1989). Accordingly a .3 or .35 security score has been used to divide the sample into secure and insecure groups. With a child care caregiver sample we can not assume that 65% of the children will be securely attached. Moreover in the current sample 65% of the relationships have security scores of .15 or higher, considerably lower than the .33 to .35 score used in maternal samples. Based on the profile analysis approximately one-third of the sample has secure relationships with caregivers. Thirty percent of the current sample has security score of .37 and higher. Since .37 is closer in magnitude to the .33 to .35 scores used in prior work we used this cut-point to further examine the association between attachment security and the attachment behavior profiles.

Less than ten percent of the children in the difficult and secure profiles were mis-classified as either secure (difficult profile) or insecure (secure profile) using the .37 cut-point for secure-insecure. In contrast, 28% of the children (22% of the child care center children and 36% of the in-home children) in the avoiding profile had security score of .37 or higher.

Table 5. Comparisons of Security Scores of Children with Different Attachment Behavior Profiles

	Profiles		
	Difficult	Avoiding	Secure
Sample			
Total sample			
security score			
mean	.004	.21	.44
SD	.25	.16	.18
Under three			
mean	.03	.23	.46
SD	.27	.17	.17
Three or over			
mean	−.93	.22	.41
SD	.20	.16	.16
Child care center			
security score			
mean	.003	.19	.41
SD	.21	.18	.20
In-home care			
security score			
mean	.02	.22	.49
SD	.30	.19	.14

To further examine differences within the avoiding profile the children with security score above and below .37 were compared. Children in the avoiding profile with security scores equal to or higher than .37 were older than children with lower scores (t (681) = 2.36, $p < 02$; M (higher scores) = 39.20; M (lower scores) = 35.73)). There were no sex or race differences between the two groups within the avoiding profile.

Children in the avoiding profile with security scores equal to or higher than .37 also had higher avoiding scores (t (6681) = 12.52, $p < 01$) than children in the profile with lower security scores. Children in the avoiding profile with security scores of .37 or higher had higher seeks comfort (t (199) = 7.06, $p < 01$), and positive negotiation (t (681) = 5.64, $p < 01$) scores than children in the profile with lower security scores.

Comparison of Caregiving Behaviors Associated with Each Attachment Behavior Profile

In order to externally validate the attachment profiles we compare caregiving behaviors experienced by children in the three attachment behavior profiles. These comparisons were completed separately by child care form as somewhat different measures were collected in each subsample.

Child care centers. Preliminary analyses indicated that caregiving behaviors in the child care center subsample varied by age and sex of the child and by the population served (high or low income). However, for the purposes of this paper we are not interested in variations associated with child demographics only the attachment behavior profiles. Therefore we used multivariate analysis of covariance (age, sex, and population served as covariates) to compare caregiving behaviors associated with each attachment behavior profile. The first analysis compared time spent near adult and adult involvement when the child was close by. There was a multivariate main effect for behavior profile (F (8,1664) = 2.56, p = .009). Descriptive statistics and univariate F tests are in Table 6. Children in the avoiding profile experienced more directive caregiving than children in the difficult or secure profiles (Scheffe = .05). Children in the secure profile experienced more elaborated caregiving involvement than children in the difficult or avoiding profiles (Scheffe = .05).

Table 6. Comparison of Caregiving Behaviors of Children with Different Attachment Behavior Profiles

	Profiles			
	Difficult	Avoiding	Secure	F-test
Child care centers				
Adult involvement				
Percent time near	.49	.47	.44	1.27
Percent ignore	.36	.31	.29	2.03
Percent directive	.18	.25	.17	4.68**
Percent elaborated	.46	.44	.54	3.87*
Caregiving				
Positive initiations	3.03	2.91	3.39	.35
Positive responses	4.41	3.58	4.35	.02
Positive management	3.46	4.56	4.06	1.89
Negative management	1.69	1.18	.41	3.17*
Language play	1.12	2.74	2.18	4.27**
In home care				
Adult involvement				
Percent time near	.56	.45	.74	19.93**
Percent ignore	.23	.23	.19	1.02
Percent directive	.34	.25	.20	4.17*
Percent elaborated	.43	.52	.61	6.78**

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

We also compared frequencies of caregiving behaviors using a multivariate analysis of covariance. There was a significant multivariate main effect for attachment behavior profile (F (10,1662) = 1.94, p = .04). Descriptive and univariate statistics are in Table 6. Children in the secure profile received less negative management than children in the avoiding and difficult profile (Scheffe = .05).

Children in the secure and avoiding profiles were more often involved in language play than children in the difficult profile (Scheffe = .01).

In home care. We used the same analytic strategy with the in-home care sample as the child care center sample except that we did not use population served as a covariate. Comparisons of adult involvement are found in Table 6. There was a multivariate main effect for attachment behavior profile (F (8,636) = 7.70, p = .001). Children in the secure profile spent more time near the adult than children in the avoiding or difficult profiles (Scheffe = .01). Children in the difficult profile had more directive caregiving than children in the avoiding profile who had more than children in the secure profile (Scheffe = .05). Children in the secure profile engaged in more elaborate adult involvement than children in the avoiding and difficult profiles (Scheffe = .01).

Misclassified children in the avoiding profile

To further examine heterogeneity in the avoiding profile the caregiving behaviors of correctly (security score less than .37) and incorrectly classified (security scores greater than or equal to .37) children in the avoiding profile were compared. Avoiding children in both child care settings with high security scores experienced more elaborated caregiving than avoiding children with low security scores (Child care centers: F (1,491) = 3.77, $p < 05$, M (high) = .33, M (low) = .25; In home: F (1,113) = 9.57, $p < 01$, M (high) = .25, M (low) = .15). Avoiding children with high security scores in child care centers experienced less negative management than avoiding children with low security scores (F (1,491) = 3.73, $p < .05$, M (high) = .24, M (low) = 1.36). Avoiding children with high security scores in in-home care were less often ignored than avoiding children with low security scores (F (1,113) = 4.08, $p < 05$, M (high) = .15, M (low) = .26).

Discussion

Three profiles of attachment behavior emerged from the profile analysis of child–caregiver relationships: difficult, avoiding, and secure. These profiles were replicated in the child care center and home based child care subsamples. This indicates that child–caregiver relationships in the two types of care have similar conceptual bases despite differences in the context of care. The context and demands of caregiving in child care centers and homes may appear quite different. Indeed, some child care advocates have argued that center care is professional or institutional while home based care is home-like and intimate. Despite these organizational differences the child–caregiver relationships developed in these settings are built on similar behavioral constructs.

Two of the three newly created profiles, avoiding and secure, are conceptually identical to the profiles derived earlier using an earlier version of the AQS and only center based child–caregiver relationships. The third profile, difficult, although not identical is conceptually similar to the earlier ambivalent profile. Both the ambivalent and difficult profiles are characterized by demanding and distressed social interaction and a disinclination to use the adult as a secure base.

The profiles based on the earlier version of the AQS and the 90-item version are similar despite changing both data collection procedures and the conceptual basis for clustering. In the current analysis we reduced the amount of observation

time for each relationship from eight to two hours, and from two observers each making two observations to one observer making a single observation (Howes & Hamilton, 1992b). These changes were made for pragmatic reasons. It is expensive and time consuming to conduct the longer observations. However, we were concerned that the change in procedure could negatively influence the validity of the profiles. The results of the current analysis suggest these changes did not unduly interfere with the resulting clusters. However there still may be other drawbacks to the changes. Limiting the observation period means that the assessment of the quality of the relationship is influenced by such contextual features as whether the caregiver was unusually busy or the child unusually tired. A single observation provides an assessment of the relationship as it was at that moment in time, but is not as reliable an assessment as one would be if it were derived from repeated observations of the child and caregiver.

The derived profiles are also conceptually similar to the Strange Situation profiles. Children in the difficult profile appear similar to the children classified as C in the Strange Situation. Both the children classified as A in the Strange Situation and children classified in the avoiding profile do not use the caregiver as a secure base or seek comfort from her while they both avoid the caregiver. Children classified as B and in the secure profile seek comfort, use the caregiver as a secure base and engaged in positive negotiations with the caregiver.

These conceptual similarities support the notion that the profiles captured children's attachment behavior organization around alternative caregivers in child care settings. Further research will be needed to determine whether these profiles predict conceptually relevant behaviors such as social competence with peers in a similar manner to Strange Situation behaviors and the earlier profiles (Ainsworth, *et al.*, 1978; Howes, Matheson & Hamilton, 1994).

Differences in adult involvement and caregiving among the three profiles provides concurrent external validity for the profiles. As expected caregivers were more involved with the children in the secure profile than they were with the children in the avoiding and difficult profiles.As predicted the avoiding profile contained the most heterogeneous grouping of children. While almost all the children in the difficult profile had low security scores and almost all the children in the secure profile had high security scores, over one-quarter of the children in the avoiding profile had relatively high security scores. These avoiding children with high security scores received more high level involvement from caregivers than avoiding children with low security scores. This suggests that while most children classified as avoiding do not receive emotional security from caregivers, some of these children may be unusually independent, seeking out the caregiver only when they need her.

Future work using these attachment behavior profiles must consider the age of children being classified. As predicted younger children engaged in more comfort seeking behaviors than older children. Furthermore, children in the avoiding profile were older than children classified as secure or difficult and children with high security scores mis-classified as avoiding were older than avoiding children with low security scores. This indicates both attachment behavior profile classifications and security scores must be considered when examining the attachment security of preschool age children with their child care caregivers.

Note

1. The clusters also replicated using hierarchical clustering as well as k-means clustering.

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