

8. TODDLER'S SECURITY OF ATTACHMENT STATUS

The development of attachment relationships between children and parents is one of the most important aspects of socioemotional development in the infancy to toddler period. Although most major theories of socioemotional development have contributed to our understanding of parent-child relationships, attachment theory has become the predominant paradigm over the past 2 decades and has generated a large volume of research. This chapter provides a brief overview of attachment theory, a discussion of possible attachment measures, and the decision to develop a brief attachment measure for the Early Childhood Longitudinal Survey, Birth Cohort (ECLS-B). This is followed by a description of the Toddler Attachment Sort-45 Item (TAS-45) and its place in the direct child assessment. The TAS-45 obtains rich data, and the variables obtained are discussed and summarized at the end of this chapter.

8.1 Overview of Attachment Theory

Attachment is the deep emotional bond that forms between a young child and the parents and forms the basis for the child's development of a sense of security. When a young child feels secure, he or she is more likely to explore the environment freely, returning to the parent for comfort when distressed. Researchers have shown (Waters et al. 1995) that the effects of early attachment are enduring, even into adulthood.

Children's formation of secure attachments with caregivers is a hallmark of socioemotional growth and development in the infancy to toddler period (Lamb 2000; Main 2000). According to attachment theorists (Bowlby 1969, 1973, 1980), the attachment relationship has its roots in the earliest months of life, in what is called the *indiscriminate social responsiveness phase*. This theory claims that babies are born with a repertoire of *pre-programmed* signals that elicit care from and closeness with caregivers, usually the mother or father, or both. These attachment behaviors are those that promote the child's safety and survival and include crying, grasping, clinging, smiling, vocalizing (e.g., cooing), reaching, and crawling. In return, the parents are highly motivated to engage in reciprocal attachment behaviors that are geared to relieve the causes of distress, such as picking up the child, cuddling the child, providing comfort, and soothing the child and to perpetuate the positive aspects of the interaction, such as smiling, eye-gazing, talking, etc.

Through repeated interactions, the parents' sensitivity and responsiveness help the baby develop more mature and better organized neural control mechanisms, and therefore gain greater self-regulatory capacities. Associated with this is the emergence of what has been called *stranger anxiety*, which marks the child's emerging ability to recognize specific individuals and differentiate them from the parents. A preference for interacting with the parents over strangers is the hallmark of the second phase, called *discriminating sociability*, which typically occurs by the age of 7 months. During this second phase, the young child's emotional bond with the parent(s) increases and deepens as perceived needs are met by an emotionally available caregiver. An important characteristic of this phase is that the young child develops a sense of trust in the parent, who can be depended on to respond appropriately to the child's signals.

The third phase of the development of an attachment relationship extends from about 7 months through 2 years and is the focus of the TAS-45. The hallmark of this phase is the emergence of a specific attachment style and formation of a secure base. Attachment style is an important development because it becomes internalized into a working model of the self and of the self in relationship with others. That internalized working model, in turn, is carried forward into adult life and can become core belief systems about the world.¹ The formation of secure attachments in early life is somewhat like a protective factor in that the child is able to use the parent as a secure base from which to explore novel stimuli in the environment freely, acquire a sense of self-confidence and adaptability to new and challenging situations, and to focus sustained attention without interruption from anxiety or anger. According to Grossmann (Grossman, Grossman, and Zimmerman 1999), "secure attachment provides the best-known psychological precondition for tension-free playful exploration."

Insecure attachment arises when the parents (or other primary caregivers) are not emotionally available to the child, lack affection for the child, or are unable to interpret the needs of the child, and, therefore, are unable to comfort the distressed child. There are generally two types of insecure attachment that have been recognized by researchers over the past 2 decades: the *ambivalent attachment style* (also known as anxious/resistant) and the *avoidant attachment style* (Lamb 2000; Main 2000).

Ambivalent attachment results when parents are inconsistent and unpredictable with the child, responding sensitively sometimes and not at other times. As a result, the child cannot trust the parent's availability. This often shows up at extreme distress when separated from the parent and inability

¹ For example, a child who is responded to sensitively and effectively will experience him/herself as worthy of care and will experience the world as a benevolent place, whereas a child whose needs are not consistently met (or whose needs are thwarted) will conclude that he/she is not worthy of care and that life is unhappy and uncomfortable.

to be comforted by the parent upon reunion. Such children also manifest anxiety about moving away from the parent to explore the environment, leading to a lack of independence.

Avoidant attachment arises when parents are outwardly rejecting and respond to the child with hostility or indifference. Children with this style are at risk of growing up to avoid others and deny their own needs. Such children may look independent to others but in actuality they appear independent because they have not learned to depend on others (Lamb 2000; Main 2000).

In the past 2 decades, researchers have found evidence for a disorganized/disoriented style of attachment that seems to result when parents are outwardly abusive toward the child or simply neglectful. According to researchers, children with this style seem to be a blend of both the avoidant and ambivalent attachment styles. Hypersensitive to perceived abuse, such children may appear to become confused or disoriented in the presence of the parent, trying one moment to please the parent and the next moment displaying anger to or rejection of the parent (Main 2000).

In sum, researchers have identified four common styles of attachment:

- Attachment Style A: Avoidant;
- Attachment Style B: Secure;
- Attachment Style C: Ambivalent (also called anxious/resistant); and,
- Attachment Style D: Disorganized/disoriented.

The attachment literature is fairly clear about the distribution of the three main types of attachment styles, secure (the “B’s”), avoidant (the “A’s”) and ambivalent (the “C’s”). Researchers working with separate data sets and in different cultures have generally found that most children (about 85 percent) can be classified into one of these three main styles. Of those, in general, approximately 60 percent of children can be categorized as B, securely attached, approximately 20 to 25 percent can be categorized as A, avoidant, and approximately 10 to 15 percent can be categorized as C, ambivalent in their attachment (Ainsworth et al. 1978). Furthermore, the shape of this distribution is similar across cultures, although specific percentages of A’s and C’s may vary (van IJzendoorn and Sagi 1999, p. 729). In addition, in the United States, approximately 15 percent of children are difficult to classify into one of these three styles. Main and Solomon (1986), have characterized these children as having a

“disorganized/disoriented” attachment style, characterized by a lack of a coherent attachment strategy for interacting with the parent.

Children’s security of attachment in the first 2 years has been systematically related to variations in maternal caregiving behavior and to children’s subsequent outcome measures. Secure attachment is related to higher cognitive and social functioning, higher levels of self-esteem, better peer skills, and greater *ego-resilience* (i.e., a personality strength that enables an individual to develop an adaptive self that responds flexibly to novel situations; Block and Block 1980) during toddlerhood. Moreover, attachment classifications of children are consistently correlated with maternal responsiveness, competence, and maternal self-confidence. Attachment security has also been linked to more positive marital adjustment and other qualities of the marital relationship, and to levels of social support provided to the parent by family members and friends (Hazan and Zeffman 1999; Feeney 1999). Thus, the nature and degree of the child’s attachment seems to be important not only as precursor to the child’s later socioemotional development but also as an indicator of the quality of the parent-child relationship that contributes to individual differences in growth trajectories.

Including a measure of children’s attachment in the ECLS-B 2-year data collection fits well with the use of the Nursing Child Assessment Teaching Scale (NCATS) at 9 months and the Two Bags Task at 2 years, both of which measure characteristics of parent-child interaction (e.g., parental sensitivity, children’s engagement cues, and positive regard for the parent) that are associated with attachment formation and other outcomes, such as developmental status, vocabulary growth, and self-regulation skills. Because the ECLS-B is the first national study to follow children from infancy to school age, the addition of an in-depth measure of attachment greatly enhances the validity of the data and the usefulness of the findings. Many research studies, including large-scale national studies, such as the Early Head Start national evaluation, the Comprehensive Childcare Development Project, and the National Institute of Child Health and Human Development (NICHD) Early Child Care Study have included measures of attachment spanning the age range of 12 months through 3 years.

The two most common assessments of attachment appropriate for use with children at about 2 years of age are the Strange Situation (Ainsworth et al. 1978), a complex laboratory-based situation not suitable for the ECLS-B, and the Attachment Q-Sort (AQS) (Waters and Deane 1985), which was developed as an alternative to the Strange Situation. The TAS-45 which was adapted from the AQS, describes children’s attachment security, dependency, and sociability on the basis of observations made in the home. The advantages of the AQS include observations done in naturalistic settings and its

applicability in a range of countries, such as China, Colombia, Germany, Israel, Japan, Canada, Norway, and the United States (Posada et al. 1995).

However, the AQS has 90 items and uses a Q-sort procedure, a methodology that has been used in psychological research for several decades (Block 1961) but which is new to survey research. A Q-sort can be used to measure a wide range of characteristics, such as personality traits, consumer preferences, and preschooler behavior problems. In a traditional Q-sort, items are printed on a card (the size of a business card), one item per card. The individual completing the sort then reviews each card and places it into one of several piles. One pile might be for items characteristic of a construct, another pile for items that are not characteristic of that construct, and a third pile of items that are neutral (neither characteristic nor uncharacteristic). The individual then does a second layer of sorting to further define the items into those that are highly characteristic, characteristic, somewhat characteristic, neutral, somewhat uncharacteristic, uncharacteristic, and highly uncharacteristic.

Researchers usually place limitations on the final placement of items into piles so that, for example, the distribution of items in piles should resemble a normal distribution or should be a flat distribution with equal numbers of items in all piles. This adds a layer of complexity to the sorting procedure and requires additional time to work through the details of taking items out of fuller piles and finding places for them in smaller piles, without compromising the description of the object of measurement.

Although it was deemed important to include a measure of attachment in the 2-year data collection of the ECLS-B, neither the Strange Situation nor the AQS was appropriate for application in a large-scale field setting. A third study, the Study of Early Child Care, had included a set of 40 questions about children's separation and reunion behaviors when they are dropped off and picked up from day care. The measurement of children's separation and reunion behaviors is frequently considered a proxy measure of children's status of attachment. However, at the time of the design of the 2-year data collection, the results of this set of items were not yet publicly available. This set of 40 separation and reunion questions was tested for use in the ECLS-B during early rounds of cognitive testing during the design phase of the parent interview. This cognitive testing showed that this set of questions took respondents about 10 minutes to complete during a parent interview that was already too long and, therefore, was not feasible for the ECLS-B at 2 years.

Dr. Brian Vaughn of Auburn University, a Technical Review Panel (TRP) member, recommended contacting a noted authority in attachment research, Dr. John Kirkland of Massey University. Dr. Kirkland was asked to explore the possibility of developing a shortened AQS for the 2-year ECLS-B data collection. Using AQS datasets acquired from researchers in many different countries, Dr. Kirkland and his colleague Dr. David Bimler had been using Multidimensional Scaling and facet cluster analysis to identify the AQS items that obtained the best information possible about children's security of attachment.

Dr. Kirkland's work to develop a shortened version of the AQS, the TAS-45, is described in the next section, followed by a brief description of how the TAS-45 was administered in the context of the home visit at 2 years. The items included in the TAS-45 and the related variables on the data file are then summarized, as well as the training procedures used to train field staff and the procedures used to maintain reliability during the data collection year. A key indicator for the validity of the TAS-45 would be variability with demographic variables and with such outcome measures as children's Bayley Short Form—Research Edition (BSF-R) mental and motor scale scores. For this reason, the final section includes a table of TAS-45 classifications for the total sample and for the major demographic grouping variables.

8.2 Development of the TAS-45 Items and Adaptation to a Laptop Application

The AQS (Waters and Deane 1985) is a 100-item measure that is Q-sorted into 9 piles. A revised version published in 1995 (Waters 1995) has 90 items, only 45 of which were redundant with the 1985 version, for a total pool of 145 unique items. Each item is a description of children's behaviors with the mother under stressful circumstances, such as when a friendly stranger is in the room. The AQS uses the Q-sort procedure that was described above. In a research context, the AQS requires at least 3 hours of in-home observation of a child before completing the sort. Sorting 100 items into 9 piles can take up to another 45 minutes to complete.

There were several constraints on the administration of an attachment assessment in the ECLS-B (i.e., limited time available for the home visit, the need to reduce interviewer and respondent burden, and the need to include simple measures that do not require extensive training of interviewers) that made use of the AQS unfeasible. In contrast, interviewers in the ECLS-B needed to complete a measure of attachment in less than 10 minutes on the basis of observations made during the 90-minute home visit. Therefore, the shortened and procedurally streamlined version was developed, the TAS-45,

which had 45 items that were sorted into four piles, with roughly equal numbers of items sorted into each pile. To further streamline the procedure for the 2-year ECLS-B, a laptop application of the sorting procedure was developed. This laptop application was completed by the interviewer after the home visit was completed. Because the home visit was in the range of 2 or more hours, the interviewer had ample opportunity to observe the child behaviors covered in the TAS-45.

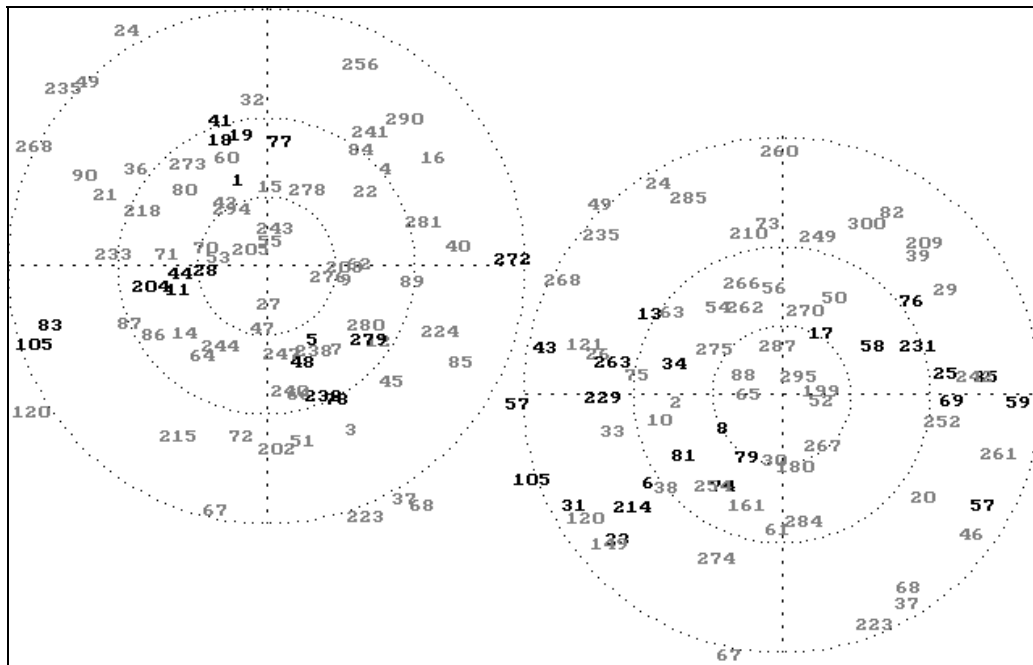
The work to develop the TAS-45 proceeded on four fronts: identifying the best subset of AQS items to include in a shortened version; shortening the Q-sorting procedure by reducing the number of piles in the final level of placements; fashioning a laptop application to reduce burden to respondents and interviewers; and identifying an additional subset of six items that would best capture the disorganized style of attachment. Based on research, it was expected that 10-15 percent of children in the United States would fit in the disorganized style of attachment category. These disorganized style children will require a greater proportion of social services due to such issues as failure to thrive (Ward, Lee, and Lipper 2000), externalizing behavior (e.g., conduct disorder) problems (Greenberg, DeKlyen, Speltz, and Endriga 1997; Speltz, Greenberg, and DeKlyen 1990) and internalizing (e.g., depression) problems (Moss, St. Laurent, and Parent 1999). Therefore, it is important for the first national study of child development to obtain information that allows for the identification of children with disorganized attachment styles, in keeping with the study's goal of obtaining comprehensive information about children's experiences and characteristics.

8.2.1 Identifying the Core Attachment Items

Attachment researchers in the United States, Colombia, Japan, Germany, Israel, Canada, and Norway provided Dr. Kirkland with several hundred subjective Q-sort datasets. Dr. Kirkland then used multidimensional scaling (MDS), followed by facet cluster analysis on these datasets to map all the items from the AQS (i.e., the 100-item version from 1985 and the 90-item version from 1995 [minus the redundant items]). To oversimplify, imagine a map of the United States with one AQS item residing in New York City, another in Seattle, another in Boston, etc. MDS measures the distances between the items and locates them on a map. Then further imagine a number of items centered around New York City at varying distances from each other, and so on. Facet cluster analysis then identified the points of congregation (or centers, e.g., New York City) where items characteristic of a dimension are clustered. As a result of the MDS analyses the locations of the items and their points of congregation (or centers) formed a three dimensional rendering outcome from the MDS space and was roughly spherical.

The map itself provides a frame upon which these subjective data are spread and interpreted. Psychologically meaningful nodes are revealed in the map as points labeled *hotspots*, described by surrounding items. As a result, instead of X possible dimensions (where X = number of items) specifying a person's location on the map, it becomes possible to display a particular person's subjective sort-data as a profile, by calculating weights for each salient hotspot. Typically there are fewer than 10 useful hotspots. Further, once hotspots have been established, it is possible to create alternate forms of any instrument, providing an equivalent number of items are available in the immediate vicinity of each hotspot. With specific regard to the ECLS-B, this meant that if an item was not feasible for the field setting, it could be easily replaced with another item from the same hotspot. In exhibit 8-1,² each item is represented by its original AQS item number.

Exhibit 8-1. Map of the 145 unique Attachment Q-Sort items



With the redundant items eliminated, Dr. Kirkland mapped the remaining 145 items into eight clusters, or dimensions, which could be said to describe attachment behaviors: comfortably cuddly, cooperative, enjoys company, independent, attention-seeking, upset by separation, avoids others/not sociable, and demanding. From these 145 items, a subset of 39 of the items with the strongest associations to the eight dimensions, with approximately four to six items per dimension, were selected. (The 39

² This exhibit was prepared by the developer of the TAS-45, Dr. John Kirkland of Massey University, Palmerston North, New Zealand, in 1999.

selected items are highlighted in boldface in exhibit 8-1.) As work progressed through field testing, it was found that some of these items needed to be replaced by other items from the same hotspot due to difficulties with wording, observability in the field or difficulties for interviewers.

Representative items from the 39 selected items include the following (a complete list of TAS-45 items can be found in appendix B):

- When mother asks child to do something, child understands what she wants (may or may not obey).
- When child cries, cries loud AND long.
- A social child who enjoys the company of others.
- Turns away from friendly adult strangers (i.e., the interviewer) if they come too close.
- If asked, lets friendly adult strangers (i.e., the interviewer) hold or share toys.

Abbreviating the number of items in the sort was a first step toward making the TAS-45 feasible for administration in the field. Another step was to shorten the procedure and streamline it so that interviewers untrained in attachment theory and research would be able to complete the task reliably and in a reasonable amount of time.

8.2.2 Shortening the Q-Sort Procedure

To complete the full AQS, the sorter begins with a stack of 100 or 90 cards depending on the version used, one item printed per card. The sorter reads through the cards on a first pass and sorts them into three piles; those that apply, those that do not apply, and those that are in the middle, meaning the sorter is not yet sure or has insufficient evidence to place it anywhere else. The sorter then re-sorts each pile twice more so that on the last step there are 9 piles of items that range from “highly characteristic” of the child to “highly uncharacteristic” of the child. The items are either distributed evenly across piles or according to an algorithm based on the normal curve (e.g., 18 cards in the middle pile), tapering down to 5 cards in each outermost pile.

This type of sorting procedure would not have been feasible for the ECLS-B because it would take too long for respondents to sort and count, sort and recount, etc. An alternative method advocated by Dr. Kirkland was the Method of Successive Sorts (MOSS) (Block 1961), in which the sorter

begins by sorting the items into two piles, the *applies pile*, and the *not-applies pile*. Each pile is then re-sorted in turn to produce a total of eight piles ranging from *applies most* to *applies least*. The MOSS procedure also has the advantage that it is not necessary to monitor how many cards are in each pile. However, even the MOSS procedure was too time-consuming for the ECLS-B. To remedy this problem, Dr. Kirkland conducted analyses that determined that sorting to the second level (e.g., to a total of four piles ranging from “almost always applies” to “rarely or hardly ever applies” to the child [with a fifth pile as a holding place for the *undecideds*]), was sufficient to obtain reliable data. Correlations between the four- and nine-pile solutions for each item ranged from 0.95 to 0.99. Therefore, it was decided to use the two-step, four-pile sorting procedure, because it was feasible for the field setting of the ECLS-B.

8.2.3 The 39-Item TAS in the 18-Month Field Test

The 4-pile, 39-item version of the TAS (TAS-39) was tested during the May 2001 18-month field test. Two TAS-39 sorts were obtained. One was completed by the interviewer immediately after the home visit. The other sort was completed by the parent while the interviewer administered the BSF-R to the child. The interviewer instructed the parent about how to complete the sort before beginning the BSF-R.

The parent-completed sort was obtained in 74 percent of cases and the interviewer-completed sort in 98 percent of cases. The rate of 25 percent noncompletion by parents was higher than expected and was probably due to multiple issues. For one, parents who were unable to read the items and follow the instructions were unable to complete the TAS-39. For parents with poor reading skills, it was difficult to understand the subtleties of some items. Other parents had difficulty following the written instructions on the sorting sheet (a laminated sheet that provided an illustration of the sorting procedure accompanied by written instructional boxes). Finally, some parents did not complete the sort because they were so engrossed watching the child complete the BSF-R that they neglected to complete the TAS-39. On the basis of the field test, it was decided to drop the parent-completed sort.

The following variables were derived for each child separately for the parent-completed sort and for the interviewer-completed sort: the eight hotspots and the traditional A-B-C classifications. On the basis of attachment research using the Strange Situation (typically used from 12-18 months of age), the attachment literature is fairly clear about the distribution of the three main types of attachment styles, secure (the B's), avoidant (the A's) and ambivalent (the C's). Researchers working with separate datasets

and in different cultures have in general found that approximately 60 to 70 percent of very young children can be categorized as securely attached (the B's), approximately 20 to 25 percent can be categorized as avoidant (the A's), and approximately 10 to 15 percent can be categorized as ambivalent in their attachment (the C's).

The distribution of children across attachment categories that resulted from the interviewer-completed sorts was generally in line with research findings in the attachment literature. For this reason it was concluded that interviewers could observe and sort children's attachment behaviors successfully, as summarized in table 8-1. However, the distribution shows fewer securely attached children and a slightly higher frequency of avoidant children.³ This is probably due to simple differences between the samples of subjects typically recruited in an academic research setting (i.e., upper middle class, White parents, with high levels of education) with the nationally representative sample of the ECLS-B field test.

Table 8-1. Percentage distribution of children's attachment classifications obtained by interviewer-completed TAS-39 sorts in the 18-month field test: 2001

Attachment classification	Expected distribution ¹	Interviewer-completed sort
A (avoidant)	20	28
B (secure)	70	58
C (ambivalent)	10	14

¹ Expected distribution is based on "Strange Situation" procedures typically done at 12 to 18 months and scored by trained observers. n=617
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 18-month field test, 2001.

8.2.4 Identifying the Subset of Disorganized Items

Simultaneous with the 2001 field test, Dr. Kirkland acquired additional datasets from researchers investigating the disorganized style of attachment and subjected these data to a meta-analysis in order to map the items characteristic of the disorganized/disoriented attachment style. While estimates of the proportion of young children who exhibit the disorganized/disoriented style of attachment behavior suggest that the percentage of children in this category is far from negligible (by one account ranging from 14 percent in middle-class, nonclinical North American groups to 24 percent in low socioeconomic samples; Lyons-Ruth and Jacobvitz 1999), an accurate estimate based on a large scale, nationally representative sample has never been obtained.

³ A chi-square test comparing the expected and observed distributions of children across the attachment classifications indicates that the observed and expected distributions are significantly different from one another ($\chi^2 = 42.15$, degrees of freedom = 2, $p < .05$.)

Children with this attachment style show a disorganized response to the parent, especially when distressed. For example, a child may freeze in fear when approaching the parent as if torn between wanting contact but fearful of the parent's response. Researchers believe that this disorganized style is highly associated with negative outcomes. Disorganized children, who some researchers estimate to be from 10 to 15 percent of children, place heavy demands on special education, community, and mental health services. Because this population is of particular concern with regard to policy planning and implementation, it was important that the ECLS-B capture information on this attachment classification. Dr. Kirkland's analyses determined that an additional six items would be sufficient to identify disorganized children who were not easily classified as avoidant, secure, or ambivalent.

From an initial pool of 42 items characterizing the disorganized attachment style, Dr. Kirkland, again using multidimensional scaling and facet cluster analysis of aggregated datasets, narrowed the selection to 12 items that were strongly associated with the disorganized style. Many of the D items would have been difficult for field staff to observe, either because of their subtlety or because of the distress they may cause to the observer (e.g., disoriented and finds it hard to focus when near mother, or, stiffens up when held by mother). Such observations could be distressing if an interviewer recognizes the implications of such behaviors for the child's well-being. Working with Westat staff, these 12 items were reviewed with an eye toward objectivity and feasibility in the field, and a final set of 6 disorganized items was identified and added to the original TAS-39.

Representative items that characterize the disorganized style include the following:

- Comes to mother to give her toys but will not touch or look at her.
- Goes all floppy (limp) when held by mother.
- Suddenly aggressive toward mother for no reason (e.g., hits, slaps, pushes, bites mother).
- Generally cranky or grouchy when with mother.
- With mother, child suddenly switches mood. For instance, goes from being nice to mean, or calm to upset (crying, afraid, angry), or gets upset and then goes blank.
- Looks dazed and unsure (e.g., stares blankly, or freezes in an unusual position for a few seconds).

In sum, a 45-item TAS was designed that can be completed with just 4 piles (plus 1 for unsure) that obtains reliable data in about 10 minutes by field interviewers on the basis of approximately 90 minutes of observation. Once these items were identified, Westat child development staff worked with Dr. Kirkland to make sure that the items were observable in the context of the home visit, that the difficulty of the language used for the items was at about the sixth to eighth grade level, and that field staff could be trained to observe the target behaviors.

8.3 TAS-45 Protocol in the 2-Year Data Collection

The TAS-45 is an observational measure that was completed by the interviewer after the completion of the home visit. From the point of view of the respondent during the home visit, the TAS-45 was virtually invisible. It was completed entirely by the interviewer on the basis of observations made during the home visit, particularly during the direct child assessments. The interviewer completed the sort on the laptop application that was built into the Child Observation section of computer-assisted personal interview (CAPI), which only became available to the interviewer if the direct child assessments had been completed. In the Child Observations, the interviewer first completed the Interviewer Observations about the child's behavior during the BSF-R and then completed the observations about the child's home environment. Upon completion of these two sets of items, the interviewer was prompted to complete the TAS-45. The results of each sort were stored on the interviewer's laptop in an ASCII data file and transmitted back to the home office during routine transmittal calls. There was no need, therefore, to have the TAS-45 data entered by computer-assisted data entry staff at the home office.

8.4 TAS-45 Variables: Hotspots and Traditional Classifications

The advantage of the TAS-45 is that it generates a rich set of data. Researchers who simply want to be able to classify children according to their predominant style of attachment can use the A-B-C and D classification, X2TASCLS. This is the most well-known and widely used attachment measure and is sufficient to examine the association of various predictors with children's status of attachment as an outcome variable.

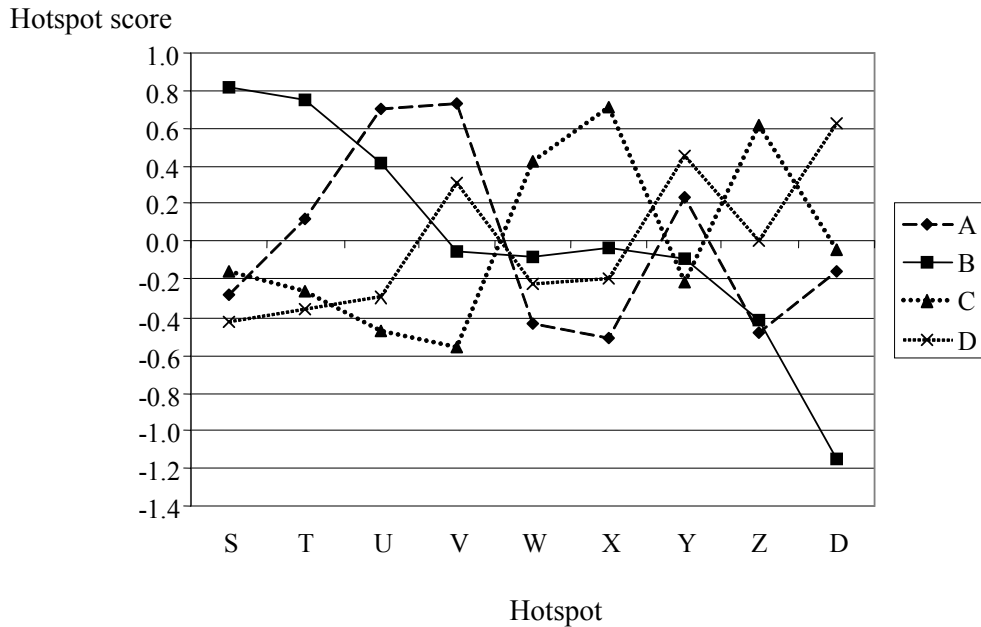
Each item in the TAS-45 has a hotspot weight that represents the contribution of the item to the total score for that hotspot. The closer an item is to the center of a cluster, the greater its weight. Conversely, the more distant an item is from the center of a cluster, the smaller the weight. These weights form a continuous scale from some maximum value for items immediately adjacent to that hotspot, down to 0 for irrelevant ones. The weights are easily calculated in a computational spreadsheet. Briefly, this spreadsheet consists of a column for each hotspot, containing constants derived from the earlier meta-analysis of the aggregated datasets obtained from several different attachment researchers. The item placements from a particular sort is followed by multiplying each item's entry in the spreadsheet by a value for that row, which is simply the number of the pile to which the corresponding item was assigned (ranging from applies most to applies least). The products are totaled down the columns, producing a set of nine hotspot scores (i.e., the weighted sum of the items in the hotspot), which can be plotted as a line-graph that illustrates an individual's profile of attachment behaviors. Minor refinements to this process take into account missing data and items not used in the sort.

On the basis of an individual's hotspot scores, a profile can be plotted that characterizes the individual's attachment style. The developer of the TAS-45 identified the three types of hotspot profiles that are associated with the dominant classification types. Children's profiles on the hotspots were then classified into the four types by using the correlation of the child's profile with the ideal profiles and assigning the classification with the highest correlation (provided that the correlation was greater than $|r| = 0.40$). In those cases where there was no correlation greater than $r = 0.40$, Euclidean distance between the child's profile and the ideal profiles was used with assignment of the classification determined by the shortest distance. The confidence level, X2TASCNF, described in more detail below, is an indicator of how confident the analyst can be that the assigned classification is the best description of the child's attachment style.

Each of the four different styles has a characteristic profile. The four profiles are shown in figure 8-1⁴: one is classified as attachment style B, secure; one as A, avoidant; one as C, ambivalent; and one as D, disorganized. This highlights the importance of the profile of the hotspot scores, in determining the classification.

⁴ This figure was prepared by the developer of the TAS-45, Dr. John Kirkland of Massey University, Palmerston North, New Zealand, in 2005.

Figure 8-1. Characteristic profiles of typical attachment styles: Attachment Type B, secure (solid line), Attachment Type A, avoidant (dashed lines), Attachment Type C, ambivalent (dotted line), and Attachment Type D (small-dotted line)



Key: S = Warm and cuddly
 T = Cooperative
 U = Enjoys company (sociable)
 V = Independence
 W = Attention seeking
 X = Upset by separation
 Y = Avoids others
 Z = Demanding, angry
 D = Moody, unsure, unusual

In figure 8-1, the darker solid lines illustrate Attachment Type B, secure, which is high on warmth, cooperativeness, and sociability, and low on separation distress and avoidance of others. Attachment Type A, avoidant, is illustrated by the dashed lines, which are high on sociability and independence but low on warmth and cooperativeness. Attachment Type C, ambivalent, is low on sociability and independence and high on attention-seeking and separation distress. Attachment Type D, disorganized is high on the disorganized behaviors and somewhat high on avoidance and independence and low on the more sociable behavior. The hotspots and their descriptions are summarized in table 8-2.

The TAS-45 is extremely rich with respect to the data obtained. Consistent with the traditional attachment classifications, the TAS-45 is able to generate the classical A (avoidant), B (secure), and C (ambivalent) categories consistent with the categories obtained from the original Strange Situation, to which the D (disorganized) category is added.

Table 8-2. Variable names and descriptions for the TAS-45 hotspots, traditional classification types, TAS classification confidence score, and traditional AQS security and dependency scores obtained in the 2-year ECLS-B data collection: 2003–04

Variable name	TAS-45 name	Description of construct
Hotspots		
X2TASHS1	TAS Hotspot 1: Warm, cuddly	Child actively seeks and enjoys physical affection with the parent, whether or not child is distressed. The score ranges from -1 to 1, with a 1 meaning that the child engages in warm and cuddly behavior quite often and -1 meaning that the child rarely, if at all, engages in such behaviors.
X2TASHS2	TAS Hotspot 2: Cooperative	Child is compliant and cooperative with parental requests and suggestions. The score ranges from -1 to 1, with a 1 meaning that the child often displays cooperative behavior in interaction with the parent and a -1 meaning that the child rarely, if at all, displays such cooperation.
X2TASHS3	TAS Hotspot 3: Enjoys company	Child is sociable and enjoys the company of others. The score ranges from -1 to 1, with a -1 meaning that the child rarely, if at all expresses enjoyment when in the company of others and a 1 meaning that the child often approaches others and enjoys interacting with others.
X2TASHS4	TAS Hotspot 4: Independence	Child is independent and self-sufficient, explores freely. The score ranges from -1 to 1, with 1 meaning that the child is often independent and self-sufficient and -1 meaning that the child rarely, if ever, engages in independent activity.
X2TASHS5	TAS Hotspot 5: Attention seeking	Child needs to be center of parent’s attention; child demands attention. The score ranges from -1 to 1 with 1 meaning that the child often demands the parent’s attention and -1 meaning that the child rarely demands attention.
X2TASHS6	TAS Hotspot 6: Upset by separation	Child becomes upset when mother is out of sight; child is inconsolable without mother. The score ranges from -1 to 1 with 1 meaning that the child is very easily upset by any separation from the mother and -1 meaning that the child does not become upset when the mother moves out of sight or leaves the room
X2TASHS7	TAS Hotspot 7: Avoids others	Child prefers inanimate objects; avoids people; is slow to warm up to strangers. The score ranges from -1 to 1, with 1 meaning that the child frequently avoids other individuals and prefers to focus on inanimate objects (e.g., toys) and -1 meaning that the child rarely, if ever, engages in such avoidant behaviors.

See note at end of table.

Table 8-2. Variable names and descriptions for the TAS-45 hotspots, traditional classification types, TAS classification confidence score, and traditional AQS security and dependency scores obtained in the 2-year ECLS-B data collection: 2003–04—Continued

Variable name	TAS-45 name	Description of construct
Hotspots—Continued		
X2TASHS8	TAS Hotspot 8: Demanding, angry	Child is quick to become angry to get own way, e.g., if parent is unresponsive; is quick to cry; is slow to stop crying. The score ranges from -1 to 1, with 1 meaning that the child becomes angry and demanding if the parent does not respond to the child’s requests immediately and -1 meaning that the child rarely, if ever, becomes angry when the parent does not respond immediately.
X2TASHS9	TAS Hotspot 9: moody, unsure, unusual	Child displays unusual behaviors, has quick mood changes; looks confused or dazed. The score ranges from -2 to 2 on this variable. A score of 2 means that the child has demonstrated one or more unusual behaviors, such as hitting the mother for no apparent reason, going limp when held by the mother, or rapidly changing from one mood (e.g., calm) to another (e.g., rage) for no apparent reason. A score of -2 means that the child did not demonstrate any of these behaviors.
Traditional Classification Scores		
X2TASCLS	TAS Classification: A, B, C, or D	Classic security of attachment categories, consistent with “Strange Situation” measure. Attachment Type A, avoidant Attachment Type B, secure Attachment Type C, ambivalent (sometimes called anxious/resistant) Attachment Type D, disorganized
X2TASCNF	TAS Confidence in classification	Measure of confidence in X2TASCLS, it measures the distance between the individual’s attachment profile and the closest prototypical A-B-C profile. The shorter the distance, the more confidence in the classification (however, the higher the value of X2TASCON, the more confidence we can have in the classification.

See note at end of table.

Table 8-2. Variable names and descriptions for the TAS-45 hotspots, traditional classification types, TAS classification confidence score, and traditional AQS security and dependency scores obtained in the 2-year ECLS-B data collection: 2003–04—Continued

Variable name	TAS-45 name	Description of construct
Traditional Classification Scores—Continued		
X2TASSEC	TAS Security Factor Score	This is the traditional Security factor score obtained by the AQS and is obtained in the same method by using published criterion sorts for the Security construct (Waters and Deane 1985). The combination of Security scores and Dependency scores in relation to each other also points to the traditional classification type. A low (or minus) security score and high dependency score suggest Attachment Type C, ambivalent; A low security (or minus) score plus a low (or minus) dependency score suggest Attachment Type A, avoidant; and a high (positive) security score and low (negative) dependency score suggest Attachment Type B, secure.
SECurity and DEPendency Scores		
X2TASDEP	TAS Dependency Factor Score	This is the traditional Dependency factor score obtained by the AQS and is obtained in the same method by using published criterion sorts for the Dependency construct (Waters and Deane 1985).

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 2-year data collection, 2003–04.

There is also a classification confidence (X2TASCNF) score that indicates to the analyst how well each child’s classification summarizes the hotspot scores. X2TASCNF ranges from 0 to 1. A high value (closer to 1) indicates that the assigned attachment classification is the best descriptor for that individual’s hotspot profile. A low value (closer to 0) indicates that a particular child’s hotspot profile is less well captured by the classification, or that the profile blends two classifications, one only slightly more than the other. A confidence value in the range of 0.30 or lower would be an indication to review the individual child’s pattern of hotspot scores to examine whether the classification is the best description or whether the hotspot profile suggests an alternative classification. The decision based on the confidence level is not whether or not to eliminate cases with low confidence scores, but whether to use the classification score X2TASCLS, or the hotspot scores, or use the hotspot scores in addition to the classification. For example, there is a small subset of cases in which X2TASCNF is in the region of 0.30 to 0.35 and in which the assigned classification is Attachment Type D, disorganized. The confidence level is low for these cases because they seem to be equidistant between the profiles for Attachment Type B, secure, and Attachment Type D, disorganized.

In those cases where the value of the confidence score is low, another alternative is to investigate using the Security (X2TASSECC) and Dependency (X2TASDEPC) scores instead of the TAS attachment classification. These scores are traditionally obtained by researchers using the AQS and are factor scores. The security score indicates the child's ability to use the adult as a secure base. The dependency score is an indication of clinginess to the parent. Both of these scores range from -1 to 1, with scores closer to -1 indicating low ability to use the adult as a secure base (the security score), or low clinginess (the dependency score). These scores can each be used on their own to examine concurrent associations, for example between security and exploratory competence, or dependency and fearfulness. Because -1 is a valid score for these two variables, the conventional use of reserve codes to indicate missing data does not apply to these variables, so that only -9 is used to indicate missing data for these variables.

In addition, the TAS-45 generates scores for the nine hotspots (or clusters) described in table 8-3, which are characteristics used to create the profiles of children's attachment styles. The hotspots provide more detailed information about children's attachment behaviors than just the classifications or the security and dependency scores. The traditional classifications were derived from observations of children's behaviors during the Strange Situation (Ainsworth, Blehar, Waters and Wall, 1978), which is a laboratory-based situation designed to elicit attachment behaviors from children aged 12 to 18 months. The hotspots obtain information that captures the greater repertoire of children's attachment behavior at 2 years, as well as information on more age-appropriate behaviors.

While the hotspot scores are used to create profiles of attachment style, it is recommended that analysts use the traditional attachment classifications when examining issues related to attachment. Researchers who are not interested in investigating attachment, per se, would be able to use children's scores on a hotspot to examine associations between the various hotspot domains and children's outcome measures. For example, a researcher interested in exploring the development of children's social competence could examine associations between the hotspots, such as "Enjoys company," and measures of social functioning in subsequent data collections. As another example, a researcher could examine the associations between X2TASH52, cooperative, and subsequent outcome measures of adjustment to school. The hotspot values on the data file are linear and ordinal. Strictly speaking, they are proportionate in nature and not of the "classic" Likert-type. The range of values for the hotspot variables is from -1 to 1, although the range for hotspot 9 is between -1 and 2 because the developer of the TAS-45 wanted this hotspot to be more sensitive than the others because of its diagnostic importance for indicating possible problems in the attachment system of the parent and child.

8.5 TAS-45 Training, Certification, and Quality Control

It was important that that all trainees received consistent training to ensure the reliable interpretation of children's behaviors and that trainees continued to be reliable during the year of data collection to prevent *coder drift* or a change over time in how information is collected. For example, due to fatigue, a shift in perspective that accrues from experience, or simply forgetting of the coding instructions, the individual relaxes the coding standards so that reliability of coding is compromised. The TAS-45 items needed to be presented as objectively and consistently as possible to make sure that interviewers all recognized the same behaviors. To address both of these challenges a computer-based training (the TAS CBT) was designed by Dr. Kirkland and his colleague Andrew Drawneek, for the 2-year national training.

A key consideration of the design of the TAS CBT was that trainees NOT be introduced to the theory behind attachment security. This decision was made for two reasons. First, field staff do not have extensive backgrounds in child development and it would be time-consuming to present attachment theory. Training time would be better spent training them to recognize the behaviors they would see during home visits than in understanding the underlying theory imperfectly, at best. Rather, field staff was told that the TAS-45 focused on the kinds of behaviors children use to obtain the kind of care they want and need. Second, it was necessary to minimize the potential for bias on the part of the field staff who may have become distressed when observing behaviors that they knew had negative implications for the child. Field staff may be less willing to recognize the behaviors identified in the TAS-45 items if they think they are indicative of future difficulties or pathology. Therefore, the TAS CBT focused on learning to recognize the TAS-45 items, to understand the subtle differentiations between items, and to describe the children's behaviors using the items.

As mentioned earlier, the TAS CBT was designed to train interviewers on the TAS-45, thereby providing them with the skills to complete the sorting procedure quickly and efficiently. The TAS CBT was loaded onto enough laptops so that each trainee could complete the TAS CBT prior to arriving at training. The laptops with the TAS CBT were sent to trainees several weeks before the scheduled training so that they could complete the TAS CBT prior to arrival at training. The TAS CBT was accompanied by a 20-page hard-copy manual that presented a general overview of concepts and the items included in the sort, described the sorting procedure, provided hard-copy examples of the sorting procedure, and explained the modular approach of the TAS CBT.

The TAS CBT had three modules, which the trainees had to complete in order. At the end of each module, the trainee completed a brief quiz. The quiz had to be passed at a minimum of 80 percent in order for the trainee to advance to the next module. If the trainee did not pass the quiz, that module needed to be redone until a passing score was achieved. The 80 percent minimum for passing was considered adequate by Dr. Kirkland. Based on his experiences conducting attachment research, 80 percent agreement at the item level would assure adequate reliability for the measure as a whole.

The goal of the first module was to familiarize trainees with the 45 items and to familiarize them with the click-and-drag technique for moving items into the placement piles. The module concluded with an exercise in which the trainee sorted the items into their proper categories.

Module 2 had two goals. One goal was to familiarize trainees with the more subtle differences between items. Trainees' success on this module was assessed with an odd-one-out exercise in which three items at a time were presented on the screen, and the trainee had to indicate which one of the three was least like the others.

The second goal of this module was to familiarize trainees with the sorting procedure. Three brief written vignettes (provided also in hard copy) were presented on the laptop, which the trainee read and then completed a sort for by clicking and dragging each item, placing it into the pile that best described the child in the vignette. For example, the trainee could place an item, such as "Cries loud AND long," into the pile characterized as "most like" the child.

The third module included videoclips of three children, each of whom typified one of the three main styles of attachment: secure, avoidant, and anxious/resistant. In order to sensitize trainees to the secure base behaviors that children use to maintain proximity with the mother, and to the behaviors that enable children to leave their mothers to explore the environment, the first videoclip was silent. This served to highlight the behavioral aspects of children's attachment styles without the distraction of the dyad's conversation. The remaining videoclips had full audio.

Because this methodology was new, the construct required good observational skills that rely on familiarity with the items, and the sorting procedure required practice, a 2-hour block of time was reserved at the national training for trainees to repeat this entire three-module training package. Attendance at this session was mandatory. During this mandatory session, trainees were encouraged to

ask questions and discuss any difficulties they were having. Therefore, trainees had a minimum of 5 hours of training on the TAS-45, 2 hours at training, and an average of at least 3 hours at home.

Upon completion of the national training, results of the module quizzes were downloaded from each trainee's laptop. These results were in the form of a flat ASCII file that was then sent to the developer of the TAS-45, who then calculated agreement rates by comparing the trainees' results with standardized results obtained from graduate and undergraduate students who were studying attachment theory and who were known to be reliable on the TAS-45. The key measure of reliability was the agreement rate for the final videoclip in module three. The average agreement rate for the ECLS-B field staff was 82 percent, which exceeded the 80 percent minimum.

After national training, videotapes of a simulated child assessment portion of the home visit were sent to field staff. They were instructed to watch the videotape and then complete a sort based on the child behaviors they observed. The profiles from these sorts were then compared with profiles that were obtained by the developer of the TAS-45.

The videotapes that interviewers watched were made by three members of Westat's Child Development staff who made simulated home visits to several volunteer mother-child pairs. During these home visits, one staff member administered the entire direct assessment protocol while the other staff member videotaped it. Upon return to the home office, these two individuals reviewed the tape and did a preliminary TAS-45 sort to try to identify one child from each of the major attachment classification types: Attachment Type A, avoidant; Attachment Type B, secure; and Attachment Type C, ambivalent. It was deemed important to assess interviewers' reliability across the classifications, because it was hypothesized that some attachment behaviors (e.g., the behaviors associated with the secure classification) may be more salient than others, for example, the avoidant style, making it easier to complete a sort for those classifications.

Copies of each of the three selected videotapes were then sent to Dr. Kirkland at Massey University. He and his students (who were studying attachment theory) then completed sorts to classify the attachment types of the children in the videotapes and developed prototype profiles for each of the children. These prototype profiles were then used to evaluate the reliability of the ECLS-B interviewers based on how well their sort profiles for each child resembled these prototypical profiles.

The first videotape, sent out 3 months after the national training, was of a child classified by Child Development staff as an Attachment Type B (securely attached). Three months later, the second videotape, of a child classified as an Attachment Type C (ambivalent), was sent to interviewers. The third videotape, of a child classified as an Attachment Type A (avoidant), was sent out approximately 8 months into the data collection. It was intended that all four attachment types be included in the reliabilities. However, it proved impossible to identify and recruit a child who could be classified as an Attachment Type D (disorganized). Therefore, reliability on Type D could not be obtained.

After each reliability videotape was sent out to the Westat interviewers, they were instructed to complete the reliability quality control form for the BSF-R first and then rewind the tape and view it again, this time paying attention to the child's attachment domain behaviors. They then completed the TAS-45 and returned the results to the Westat home office.

The result of each completed sort was then transmitted in an ASCII data file to Dr. Kirkland to obtain reliabilities for each interviewer. Results of these reliability checks showed that some attachment styles are easier, and, therefore, more reliable, to sort than others. As was expected, Attachment Type B (secure) was the most reliable, with interviewers averaging 88 percent agreement with the prototypical profiles. Because the majority of children can be classified as secure, it is particularly important that they be sorted reliably. On the second videotape, that showed a child classified as Attachment Type C (ambivalent), interviewers averaged 83 percent agreement with the prototypical profiles. On the third videotape, that showed a child classified as Attachment Type A (avoidant), the agreement rate was only 75 percent, which is a bit low. Avoidant behaviors were difficult for the interviewers to recognize because many avoidant behaviors also resemble independence. Overall, however, interviewers averaged 82 percent agreement on the three reliability videotapes, which the developer of the TAS-45 considered acceptable.

8.6 TAS-45 Results in the 2-Year National Data Collection

How well the TAS-45 performed in the 2-year national data collection can be determined by longitudinal associations between TAS-45 scores and key outcome measures, such as the BSF-R and, ultimately, school readiness. In addition, longitudinal associations between attachment precursors, such as NCATS scale scores, and 9-month BSF-R scores, with the TAS-45 at 2 years and with the 2-year BSF-R will identify developmental inequalities associated with emotional functioning and well-being.

Simple descriptives for the hotspot scores are presented in table 8-3 and the frequency distributions for the four types of attachment (A-B-C-D) are presented in table 8-4. In addition, associations between the TAS-45 and the BSF-R and Two Bags Task are summarized in appendix A.

Table 8-3. Weighted means and standard deviations for TAS-45 hotspot scores in the 2-year ECLS-B data collection: 2003–04

Variable name	Hotspot description	Mean	Standard deviation
X2TASHS1	Warm and cuddly	0.30	0.30
X2TASHS2	Cooperative	0.39	0.34
X2TASHS3	Enjoys company	0.21	0.39
X2TASHS4	Independent	0.16	0.31
X2TASHS5	Attention seeker	-0.08	0.24
X2TASHS6	Upset by separation	-0.14	0.24
X2TASHS7	Avoids others, does not socialize	-0.01	0.27
X2TASHS8	Demanding, angry	-0.13	0.25
X2TASHS9	Moody, unsure, unusual (disorganized)	-0.59	0.52

NOTE: The sample size for the hotspot scores is 8,750 cases (rounded to the nearest 50). All data weighted using the child weight, W2C0.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 2-year data collection, 2003–04.

Table 8-4. Weighted percentage distribution for the four types of attachment (variable X2TASCLS [traditional classification scores]) in the 2-year data collection of the ECLS-B: 2003–04

Classification type	Percent
Attachment Type A, Avoidant	16.27
Attachment Type B, Secure	61.12
Attachment Type C, Ambivalent	8.91
Attachment Type D, Disorganized	13.46

NOTE: The sample size for the percentage distribution is 8,750 cases (rounded to the nearest 50). All data weighted using the child weight, W2C0.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 2-year data collection, 2003–04.

As mentioned in section 8.1, a general finding in the attachment literature is that approximately 55 to 65 percent of children can be classified as Attachment Type B (secure), which is consistent with the results of the ECLS-B. Another approximately 15 to 20 percent are classified as Attachment Type A (avoidant), again consistent with the results of the ECLS-B. Generally, between 10 and 15 percent are classified as Attachment Type C (ambivalent); in the ECLS-B the percentage of children classified as Type C fell outside this range, at 9 percent. To date there have been no large-scale studies of a nationally representative sample that have investigated the prevalence of children classified as Attachment Type D (disorganized). However, the research literature suggests that approximately 5 to 15

percent of children would be classified as having this type of attachment. The percentage identified as disorganized in the ECLS-B is consistent with this.

Table 8-5 presents descriptive information (weighted percentages) about the TAS-45 attachment classifications for the total sample and by the key demographic grouping variables.

Table 8-5. Weighted percentages of attachment classifications for the total sample and by key demographic grouping variables in the 2-year data collection: 2003–04

Variable	Traditional classification of attachment type			
	A (Avoidant)	B (Secure)	C (Ambivalent)	D (Disorganized)
Total sample	16.27	61.12	8.91	13.46
Mother's race/ethnicity ¹				
White	14.64	65.32	8.02	12.02
Black	23.58	52.87	7.99	15.57
Hispanic, race specified	16.22	57.13	11.81	14.83
Hispanic, no race specified	7.83	50.70	12.41	29.07
Asian	13.40	61.72	11.92	12.96
Native Hawaiian/Pacific Islander	22.48	63.20	5.51	8.81
American Indian/Alaska Native/ More than 1 race	22.25	49.14	8.35	17.25
	17.80	53.87	5.27	23.06
Poverty status				
Below poverty threshold	20.12	51.58	10.85	17.45
At or above poverty threshold	15.27	63.92	8.40	12.41
Child's race/ethnicity ¹				
White	14.31	65.70	8.08	11.91
Black	24.41	51.95	8.03	15.61
Hispanic, race specified	15.99	57.83	10.27	15.90
Hispanic, no race specified	16.66	56.88	12.84	13.62
Asian	13.64	61.70	12.22	12.44
Native Hawaiian/Pacific Islander	26.82	62.91	4.17	6.11
American Indian/Alaska Native	21.79	49.53	9.14	19.55
More than 1 race	17.61	58.99	6.65	16.74

See notes at end of table.

Table 8-5. Weighted percentages of attachment classifications for the total sample and by key demographic grouping variables in the 2-year data collection: 2003–04—Continued

Variable	Traditional classification of attachment type			
	A (Avoidant)	B (Secure)	C (Ambivalent)	D (Disorganized)
Child's age at assessment				
21 months and under	27.80	39.04	2.93	30.23
22–23 months	13.40	63.82	8.92	13.86
24–25 months	16.45	60.71	9.14	13.69
26–27 months	18.53	61.84	7.75	11.88
28 months and over	15.68	65.60	7.26	11.47
Child's sex				
Male	17.88	54.94	9.71	17.47
Female	14.67	67.89	8.11	9.33
Birth weight				
Normal	16.24	61.68	8.75	13.34
Low	17.72	56.79	10.55	14.95
Very low	14.48	53.69	14.18	17.66
Mother's education				
8th grade and under	16.03	63.18	10.28	10.52
9th–12th grades	18.67	50.76	11.28	19.29
High school diploma or equivalent	17.48	59.57	8.85	14.10
Vocational/technical program	14.19	64.98	8.49	12.34
Some college	16.52	62.30	8.58	12.79
Bachelor's degree	14.63	66.98	7.32	11.07
Graduate or professional school, no degree	11.70	77.50	3.12	7.68
Master's degree	9.62	78.23	7.61	4.55
Doctorate or professional degree	15.60	61.92	7.70	14.78

See notes at end of table.

Table 8-5. Weighted percentages of attachment classifications for the total sample and by key demographic grouping variables in the 2-year data collection: 2003–04—Continued

Variable	Traditional classification of attachment type			
	A (Avoidant)	B (Secure)	C (Ambivalent)	D (Disorganized)
Mother's age (in years)				
19 and under	16.68	48.63	11.38	23.31
20–29	18.06	57.79	9.24	14.91
30–39	14.62	65.53	8.48	11.37
40 and over	14.57	64.68	8.68	12.06

¹ Race categories exclude Hispanic origin unless specified.

NOTE: The child weight W2C0 was applied to produce these statistics.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 2-year data collection, 2003–04