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Attachment Behavior in Children Adopted Internationally

by

Sandra Niemann

DISSERTATION

Submitted in partial satisfaction of the requirements for the degree of

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Sandra Niemann

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Abstract

Attachment Behavior in Children Adopted Internationally

Sandra Niemann

University of California, San Francisco, 2009

The purpose of this cross-sectional study was to describe attachment behavior in international adoptees at six months postadoption, as well as the child and maternal factors affecting that behavior. Child factors included age at adoption, developmental status, history of care (length of care, number of preadoption placements, and quality of care), and stress level (basal salivary cortisol). The maternal factor assessed was the mother's attachment representations.

The convenience sample consisted of 22 adoptive mother-infant dyads from the greater San Francisco Bay Area. Assessment instruments included the Attachment Q-Set, Ages and Stages Questionnaire, History of Care Questionnaire, cortisol analysis, and the Adult Attachment Projective. The major descriptive findings were that 86% of the children were rated secure, with high and low secure groups differing primarily in attachment behavior that involved seeking physical contact with the mother. The factors affecting attachment behavior were analyzed through simultaneous multiple regression. Age at adoption, developmental status, length and quality of preadoption care, and maternal attachment representations were not significant predictors of child attachment status. The number of preadoption placements and the child's stress level did significantly predict attachment status, accounting for approximately 40% of the variance in attachment security. Number of preadoption placements uniquely contributed 14% of that variance ($p=.007$) while stress level uniquely contributed 12% ($p=.01$). Children who had fewer preadoption placements had higher attachment security. Similarly, children

who had lower stress levels had higher attachment security. Results suggest that consistency of preadoption care was more important than its length or quality. Further, the relationship between stress level and attachment security raises the possibility that a lower stress level functions as a protective factor for the developing attachment with the adoptive mother.

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Chapter 1: The Study Problem

Since World War II, Americans have viewed international adoption as a way to meet two fundamental needs—a parent’s desire to nurture offspring and a child’s desire for a permanent and loving home. Initially, this solution emerged to meet the needs of children made homeless during war or born to American soldiers on duty abroad, primarily in Korea and Vietnam. But by the early 1990s another wave of international adoption began, this time as a response to increasingly chaotic social conditions in Eastern Europe and the growing economic disparities between rich and poor countries. Adoptees of this third wave, now totaling over 40,000 annually worldwide, are primarily social orphans—children whose parents’ social and financial resources were too meager to extend to another child, or who were forced to give up their children due to national policies restricting family size. These parents either formally arranged for their children’s adoptions or surreptitiously abandoned their children, depending on their countries’ social practices and laws (Selman, 2006; van IJzendoorn & Juffer, 2006).

Statistics on the number of children adopted into the US were first published in 1990, and that year approximately 7,000 “orphans”—the visa status given to children adopted internationally—immigrated to the United States (US Department of State, 2008b). That number grew steadily until 2004, when it peaked at over 22,000 orphans. In the early years of the third wave, South Korea or Romania typically sent the most children to the US, but by 1995 the focus had shifted to China and Russia as the top sending countries, with South Korea and Guatemala competing for third place. Although there were periodic program reorganizations and policy changes that made either China or Russia the most sought after country for adoption, these four countries—China, Russia, Guatemala, and South Korea—have consistently accounted for 77% of

international adoptions in the US, with the remaining 23% spread among 17 countries (Selman, 2006; US Department of State, 2008b).

In 2005, however, the number of adoptions began declining sharply—a decline that has continued each year and is expected to continue in 2009 (Collins, 2008; Crary, 2008). Adoption researchers and agencies attribute the decline to a number of factors occurring simultaneously in the top sending countries—a major program reorganization in China that has restricted adoption eligibility and increased wait times from one to almost five years (Wingert, 2008); growing anti-American sentiment in Russia and South Korea, both of which now consider sending babies to the US a matter of national shame and actively discourage international adoption (Ma, 2008); and repeated charges of baby trafficking and corruption in Guatemala, making prospective parents wary of the program and finally resulting in a 2008 ban on adoptions from that country (Margolis, 2008). In addition, the newly ratified Hague Convention on Protection of Children and Co-operation in Respect of Intercountry Adoption (Hague Adoption Convention), which has provided needed oversight to the adoption process, appears to be lengthening wait times for participating countries (Margolis, 2008; US Department of State, 2008a). What has not changed, however, is the need for permanent care for the world's abandoned children: UNICEF estimates that there are 133 million orphans worldwide, including 46 million in sub-Saharan Africa and 72 million in Asia (2008). Since the number of orphans is so large—and since the social and political conditions that contribute to child abandonment continue to grow—it seems likely that the decline in international adoptions is a temporary phenomenon. What are needed are new adoption programs in areas of the greatest need—such as the rapidly growing program in Ethiopia, making it the fourth top

sending country in 2007 and 2008—that can connect needy children with prospective parents.

Attachment in Children Adopted Internationally

When international adoptees arrive in the US, they face a number of challenges due to their history of early neglect or suboptimal care. One key challenge—perhaps *the* key challenge, due to its implications for social and emotional health—is the development of an attachment to adoptive parents.

According to attachment theory (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969/1982), a child’s everyday experiences with caregivers determine the quality of the child’s attachment bond. When caregivers respond quickly and appropriately to a child’s signals, the child feels secure, knowing that her caregivers are available to meet her needs. But if her caregivers are unavailable or respond inappropriately, this sense of security is compromised. The conditions in preadoption care make this kind of responsiveness difficult, although the kind and quality of care vary widely between, and even within, sending countries. Some countries, like South Korea and Guatemala, have relied heavily on foster care but, overall, the trend since 1990 has been for increasing numbers of children to be institutionalized prior to adoption. In that year, for example, less than 60% of children adopted internationally had lived in an institution. But by 1998, over 80% had been institutionalized, most for at least 8 months (Hellerstedt et al., 2008). Whether children come from an orphanage or foster care, however, they often make several transitions prior to adoption. For example, children may move from orphanage to foster care as it becomes available; from a small regional orphanage to a larger, urban center that processes adoptions; or between sections of the

orphanage, as from a baby to a toddler room (with new caregivers). Thus, although it is difficult to make generalizations about this diversity of care, by the time children reach their adoptive home they have all experienced multiple caregivers and at least one major transition in care. These experiences have shaped international adoptees' expectations of their caregivers' availability and responsiveness—and these expectations, in turn, are brought into the adoptive home and the developing relationship with their new parents.

In addition to this history of care, several other factors may affect the quality of a child's attachment to adoptive parents. First, almost all children who begin attaching to parents at birth have developed an attachment by the end of the first year of life (Bowlby, 1969/1982). Adoptees, however, due to the legal processes required to verify relinquishment and abandonment (US Department of State, 2008a), are typically adopted into the US late in their first year or—even more commonly—in the second year of life. This means that adoptees begin the process of attachment to adoptive parents at a later chronological age than children born to biological parents—and, in many cases, after having already formed (and lost) an attachment to their preadoption caregivers. Further, many adoptees—especially those from orphanages—are developmentally delayed at adoption (Miller, 2005). This mix of older chronological age with developmental delay may affect the kind of attachment behavior children exhibit, especially in the early postadoption period. Second, there is a growing body of evidence that early adversity can affect a child's developing physiological systems, especially when adversity occurs during sensitive periods of development (O'Connor, 2003; Rutter, 2006). Much of this research has focused on the hypothalamic-pituitary-adrenocortical (HPA) stress response system, which develops throughout childhood and adolescence. In international adoptees,

research has shown that institutionalized adoptees can become hyper- or hyporesponsive to stress, and that these effects continue after the transition to an adoptive home (Gunnar, 2001; Kertes, Gunnar, Madsen, & Long, 2008). This altered responsiveness indicates that many adoptees may be compromised in their ability to cope with the highly stressful and abrupt transition to an adoptive home, as well as the development of a new attachment to adoptive parents. Finally, attachment theory posits that the mother's contribution to her child's attachment can be even more important than the child's contribution (Bowlby, 1969/1982). Indeed, research has demonstrated that a mother's attachment representations, i.e. the cognitive model underlying and influencing her thoughts and feelings about attachment, significantly affects her child's attachment security (Hesse, 1999; van IJzendoorn, 1995)—at least in part because these representations affect her responsiveness to a child's signals. Thus some mothers may find it difficult to respond appropriately to the heightened needs of at-risk infants, such as international adoptees, and consequently affect their developing attachment.

Purpose and Significance of the Study

This study is the first to examine the kinds of attachment behavior—and the maternal and child factors affecting that behavior—that international adoptees exhibit at six months postadoption. Specifically, this study examines maternal attachment representations and three child factors: age and developmental status at adoption, history of care, and stress response.

The significance of this study lies in the importance of infant attachment for later social and emotional development. In early childhood, researchers report that attachment security (either uniquely or in combination with other family and school

variables) predicts positive affect and compliance with parents in the second year of life (Frankel & Bates, 1990; Kochanska, 1995), more positive peer interaction at 3 years (McElwain, Cox, Burchinal, & Macfie, 2003), more social competence through preschool (NICHD, 2006) and less separation anxiety at age 6 (Dallaire & Weinraub, 2005). Attachment insecurity, in contrast, predicts emotional dysregulation at 24 months and 36 months, (NICHD, 2004) as well as behavior problems (Shaw & Vondra, 1995; Weiss & St. John-Seed, 2002). Longitudinal samples that have followed children into adolescence report similar findings: Those with a history of secure attachment demonstrate more social competence—for example, negotiating mixed-gender peer groups and informal leadership in social groups (Englund, Levy, Hyson, & Sroufe, 2000)—while insecure middle school children have difficulty sustaining friendships or shun contact with peers. In terms of psychopathology, Sroufe (2005) sums up his now 30 years of research with the Minnesota Study of Risk and Adaptation as follows: Insecure attachment patterns, while not pathological in themselves, are moderate risks for anxiety disorders and depression. In other words, children with this attachment history may be less resilient in the face of stressors, while security of attachment functions as a protective factor. The most extreme form of insecurity—disorganized attachment—however, is by itself a strong predictor of pathology, especially dissociation (Ogawa, Sroufe, Weinfield, Carlson, & Egeland, 1997).

In addition to these well-established outcomes in social and emotional domains, recent work, whose implications are still suggestive, shows that an infant's attachment security may also affect the developing brain. Animal models, for example, have shown that mother-infant interactions affect the production of neurotrophins needed

for infant brain function and the formation of synapses (Cirulli & Berry, 2003; Liu et al., 1997). Schore (2003) builds on these models to suggest that a secure attachment in human infants is essential for the optimal development of the right brain, which is dominant in the first three years of life. The right brain, along with the limbic system, is essential for regulating emotion and helping children develop strategies for coping with novelty and stress. Fonagy and Target (2005) take these ideas still further, positing that attachment security helps organize brain structures that “subserve social cognition” (p. 333), especially the capacity for mentalization—i.e. the capacity to see oneself and others as having minds motivated by thoughts and emotions. All these findings, then, point to the importance of attachment security to help inaugurate developmental pathways that contribute to a child’s future social and emotional development. While this is important for all children, it is especially so for children, like international adoptees, who are particularly vulnerable because of their early caregiving environment.

While knowledge of an international adoptees’ attachment behavior will be most useful for adoptive families, it also has special applicability for nurses. Unlike domestic adoptions, in which social workers are the health professionals most likely to interact with adopted children, advance practice nurses staff many of the 25 international adoption clinics in the US, taking primary roles in the new field of international adoption medicine. In areas not served by these clinics, nurse practitioners are likely to see adoptees in primary care and be consulted about attachment concerns. With our present knowledge, nurses are at a loss to know whether a child’s developing attachment is following a typical course for international adoptees or if early intervention is needed. This study is a first step in generating that knowledge and in helping international

adoptees embark upon positive developmental pathways—pathways that help mitigate or even ameliorate the effects of early adverse care.

Chapter 2: Conceptual Framework and Review of the Literature

What Is Attachment?

Although attachment is sometimes used broadly to refer to all aspects of the child-parent bond, its original articulation by John Bowlby (1969/1982) and Mary Ainsworth (1967) is more specific. For them, attachment—or, more precisely, the attachment behavioral system or ABS—is that aspect of the child-parent bond that motivates a young child to seek out her caregivers in times of stress. Like all behavioral systems, this system arose from evolutionary pressures for survival. Its specific function, however, is to protect the child from danger, thus helping ensure her reproductive fitness.

The ABS is composed of activating stimuli, a set goal, and behaviors that help a child achieve this goal. Activating conditions can be external stimuli—such as physical separation from the mother or a lack of responsiveness from her—or internal stimuli, such as experiences of illness or pain. The child then initiates attachment behavior, designed to reach the set goal of felt security, an internal state in which the child is assured of the caregiver's availability. Although attachment behaviors cease when the goal is attained, the ABS never completely shuts down. Rather, children always monitor the availability of their caregivers to some degree.

As an observable component of the ABS, attachment behavior—and the attempt to measure this behavior—has been a principle focus of attachment theory and research from the beginning. Identifying which behaviors count as attachment behaviors, however, can be complex. For example, Bowlby and Ainsworth pointed out that the same infant behaviors—such as signaling or following a caregiver—are used in the service of different behavioral systems. Further, behaviors seemingly unrelated to attachment—for example, continuing to play rather than seeking out a caregiver after separation—have

been identified as attachment behaviors because they are part of a strategy to meet attachment needs. In other words, there is nothing inherent in a behavior that makes it an attachment behavior—instead, these behaviors must be identified through the lens of theory. In this chapter, then, I first discuss two central tenets of the theory—(1) that attachment behavior is embedded in a behavioral control system, one that works in tandem with other behavioral systems, and (2) that attachment behavior has a cognitive component, shaped by the history of the caregiver/child relationship—as a conceptual framework for understanding attachment behavior and its measurement. I then turn to a review of the literature on attachment behavior—and the factors affecting such behavior—in children adopted internationally. Finally, the chapter ends with a summary of the current gaps in our understanding of attachment in this population.

Attachment Behavior and Behavioral Systems

In ethology, behavioral systems can be thought of as control systems because they help organisms maintain a kind of behavioral homeostasis with the environment. And in complex organisms that must adapt to multiple and shifting environmental conditions, behavioral systems often need to work together to achieve this homeostasis. Such is the case with the ABS: Bowlby (1969/82) envisioned this system as having close ties with two systems—the fear and exploratory system—while differentiating the ABS from a third system, the sociable system.

The relationship between the fear systems and the ABS is fairly straightforward. The fear system, which causes children to be frightened of certain stimuli, tends to activate the ABS, since a child seeks out her caregivers when external or internal events cause alarm. If the set goal of the ABS is achieved—i.e. the child feels assured of the caregiver’s availability—the ABS functions to deactivate the fear system. The

relationship between the exploratory system and the ABS is more complex. Here ABS activation often inhibits exploration, since the child is seeking proximity rather than venturing out into the environment. However, since the ABS never completely shuts down, its low-level activation actually facilitates exploration because the child knows—through continual monitoring of the caregiver’s whereabouts—that her caregiver is available if conditions become threatening. Although Bowlby had less to say about the sociable system, it becomes important for identifying what is *not* attachment behavior. This system is defined as one that encourages proximity to conspecifics and wariness toward those who are unfamiliar. While on the surface behaviors used in the service of the ABS and the sociable system may look similar (since both involve interaction with others), the activating and terminating conditions distinguish the systems. The sociable system tends to be activated when a child is feeling playful and secure in the availability of her caregivers, whereas the ABS is activated in an opposite type of situation—a time of stress or uncertainty about the caregiver’s whereabouts or ability to meet attachment needs.

Viewing attachment as a control system and, further, as a system with defined relationships to other behavioral systems, has at least three implications for understanding attachment behavior. First, to differentiate behavior that serves the ABS from behavior that serves other systems one must pay attention to contextual variables. If a child approaches her caregiver, for example, one must identify the activating conditions that stimulated the behavior and the terminating conditions that indicate the set goal has been reached in order to decide if the behavior is attachment or social behavior. Second, to adequately identify attachment behaviors one must take into account the level of

activation of the system. This is most salient in the “dynamic equilibrium” (Ainsworth, 1972) between the ABS and the exploratory system, where different levels of activation produce markedly different types of attachment behavior. The active proximity seeking that Bowlby emphasized occurs during periods of high activation, but more subtle forms—such as glancing back at the caregiver from afar in the midst of play, which occurs when ABS activation is low—also count as attachment behavior because their goal is to reassure the child of the caregiver’s presence. The term “secure base behavior” captures this range of attachment behavior and thus has become a kind of shorthand for expressing the connection between behavior expressed under different activating conditions. Third, since the ABS and the exploratory system are in dynamic equilibrium, a full understanding of attachment behavior must take account of exploratory behavior as well. Waters (1981), in fact, has suggested that the balance between these systems is so central to understanding a child’s attachment that it necessitates a shift in the unit of analysis—the researcher is no longer assessing attachment behavior alone but rather the *balance* between attachment and exploratory behavior.

The Cognitive Component of Attachment Behavior

The above look at the ABS is necessary for understanding the importance of context and relations between behavioral systems, but it can leave the erroneous impression that contextual variables and relationships are experienced afresh each time they are encountered. Bowlby’s concept of the internal working model (IWM), the underlying cognitive component of attachment behavior, helps correct this view.

Following Craik, Bowlby (1969/1982) thought that organisms who were able to construct mental models of their world—and then use these models to predict the consequences of alternative courses of action in a certain environment—would have an

evolutionary advantage over organisms who could not. Bowlby applied this idea of mental models to many aspects of mental life—not just attachment relationships—but he was, of course, most interested in the child’s representation of dyadic relationships with attachment figures (Bretherton & Munholland, 1999). Models of maternal-child interaction, he believed, arose from repeated, everyday caregiving interactions and included at least four aspects: (1) who the attachment figures were, (2) where they were, (3) their expected reactions in a given situation, and (4) how acceptable the child was in their eyes. During development the relative importance of these aspects would shift: in infancy, for example, the whereabouts of an attachment figure would predominate, but by the third birthday notions of availability or nonavailability would be less closely linked with the caregiver’s physical presence. What is clear at all stages, however, is that when the ABS is activated, the child is not simply responding to internal and external stimuli but is actively appraising the level of threat of those stimuli. This appraisal, moreover, is affected by how adequately his caregiver has responded to such situations in the past, and thus the likelihood that she will be available to help meet—in a more or less adequate way—attachment-related needs in the present.

Although Bowlby left the concept of IWMs undeveloped, Ainsworth explored its implications for understanding attachment behavior and its origins in the caregiving relationship. In a short laboratory procedure called the Strange Situation, designed to activate the child’s attachment system, Ainsworth et al. (1978) found that by the end of the first year babies’ attachment behaviors tend to fall into three patterns associated with caregivers’ characteristic responses. In the *secure* pattern, a child seeks out her caregivers in times of stress, finds their presence comforting, and soon returns to play. This pattern

arises when the child's caregivers have readily responded to her attachment needs. In a second, insecure pattern, a child maintains proximity at a distance but avoids direct contact (*avoidant* attachment). This strategy arises when caregivers are generally unavailable to meet attachment needs, and the child responds by down-regulating the attachment system so that active proximity-seeking is unnecessary. In this way the child staves off the caregiver's expected rebuff, yet receives some solace from a (relative) proximity to the caregiver. In a third, also insecure pattern, a child signals or seeks out her caregivers but has difficulty being comforted because she is unsure of, and often angry about, her caregivers' responses (*ambivalent* attachment). In contrast to the avoidant pattern, this child up-regulates her attachment system, a strategy that increases the likelihood that her caregivers, who are typically inconsistent in meeting attachment needs, may indeed respond. A decade later Main and Solomon (1986) identified a fourth, disorganized pattern, so named because the child's attachment behavior shows no clear pattern—often due to the frightening or neglectful behavior of a child's caregivers (Hesse & Main, 2006). These patterns have now been assessed for over three decades and as numerous studies have demonstrated their continued validity, they remain a primary framework for understanding attachment in young children (for an overview, see Fonagy, 2000).

This cognitive and historical component of attachment behavior enlarges our understanding of that behavior in several important ways. First, just as the ABS needed to be understood in relation to other behavioral systems, individual attachment behaviors also need to be understood in relation to each other—that is, attachment behaviors need to be seen as part of an overall strategy or pattern that is used to achieve the goal of felt

security. Without this larger focus, individual behaviors—for example, the avoidance of a caregiver, or the anger expressed to a caregiver upon reunion—might be overlooked or erroneously interpreted. Second, the organization of attachment behavior introduces the element of attachment quality. That is, while evidence shows (Cicchetti & Toth, 1995; Marvin & Britner, 1999) that all children form attachments to their primary caregivers (even to abusive caregivers), those attachments yield different degrees of felt security. Strategies labeled insecure are what Main calls “conditional strategies” (1990), adaptive given the caregiving environment but also involving “suppression or manipulation” of basic attachment needs (p. 48). Third, viewing attachment behavior as arising from IWMs suggests that such behavior is likely to persist. As part of the characteristic dyadic interaction, attachment strategies would be incorporated into the IWM and thus help shape a child’s ongoing perceptions and expectations of attachment figures. This, in turn, predisposes the child to experience the world in particular ways: If models are constructed from repeated interactions with optimal caregivers, the child is predisposed to view new relationships through this positive lens. Interactions with less than optimal caregivers, however, may direct attention away from or encourage a child to misconstrue painful events, thus becoming an early form of defense.

Measuring Attachment Behavior

Two measures—the Strange Situation (SS) and the Attachment Q-Set (AQS)—are considered “gold standards” for assessing attachment behavior in young children (van IJzendoorn, Vereijken, Bakermans-Kranenburg, & Riksen-Walraven, 2004). Both measures assess the construct of attachment security and have been informed by (as well

as helped shape) the theoretical understanding of attachment behavior discussed above. They do, however, focus on different aspects of this behavior.

The Strange Situation or SS (Ainsworth et al., 1978; Ainsworth & Wittig, 1969) is a 20-minute video-taped laboratory procedure that assesses the attachment security of infants between 12 and 20 months. In this procedure infants experience eight increasingly stressful episodes designed to activate the attachment behavioral system, including an unfamiliar environment (the laboratory playroom), the arrival of a stranger, and two brief separations and reunions with a caregiver. Afterwards, raters code the infant's attachment behavior in four areas—proximity seeking, contact maintenance, proximity avoidance, and contact resistance—and then use these scales as the basis for assigning an attachment pattern. This pattern reflects the infant's overall organization of attachment behavior rather than the presence or frequency of any particular behaviors. Ainsworth's categories are considered valid between 12 and 18 months only (Ainsworth et al., 1978), but two other coding systems—the Cassidy-Marvin system (Cassidy & Marvin, 1992) and the Preschool Assessment of Attachment (PAA) developed by Crittenden (1994)—have been developed to extend use of the SS through the preschool period. The Cassidy-Marvin system retains the avoidant, ambivalent, and disorganized insecure categories but adds a fourth—insecure/other—for behavior that does not fit into other categories or is a mixture of them. The PAA retains this “insecure/other” category and adds two additional insecure categories: “defended/coercive” and “anxious depressed.” In a review of the psychometric properties of the SS, Solomon and George (1999) report that the SS has adequate construct and criterion-related validity, and that results are stable over time in ways that are consistent with attachment theory (see also Sroufe, 2005).

The Attachment Q-Set, Version 3.0 (Waters, 1987a) is a quite different approach to assessing attachment behavior in that it uses a natural setting, rather than a laboratory, and a continuous score, rather than a classification scheme, to identify a child's attachment security. This method consists of 90 statements describing children's behavior, each written on a separate card. Parents, or observers present in the child's home for a minimum of two hours, sort cards into equal-numbered piles, from those cards most characteristic of the child to those least characteristic. This sort is then compared to an "expert sort" describing a prototypically secure child (see Appendix B for the 90 items arranged in the expert sort order). The correlation between this prototypical child and the assessed child is the child's security score, with no cutoff between security and insecurity. The Q-Set is valid for children between 1 and 5 years, using the same items and sorting method for all ages. Reports on psychometric properties of the observer AQS have found adequate construct (Vaughn & Bost, 1999), criterion-related (van IJzendoorn et al., 2004) and cultural (Posada, Waters, Crowell, & Lay, 1995) validity, as well as stability over time (van IJzendoorn et al., 2004).

The strengths and weaknesses of each measure can be evaluated in light of the discussion of attachment behavior above. First, to assess the ABS as a control system, as well as a system in relation to other behavioral systems, the SS carefully scripts the context of the procedure to assure that the ABS is activated at different levels. This encourages a wide range of attachment behaviors and assures that all participants experience a similar range of activation. Further, the context as well as the balance between attachment behavior and exploratory behavior is emphasized in the coding, and thus becomes a key part of the decision to assign a child a particular pattern. The AQS, in

contrast, can be used in any natural setting, such as a home or park, so that context is likely to vary considerably across participants—even if all observations are conducted in the same type of environment, such as the home. While some of the items ask the observer to explicitly take context into account (e.g. “when mother sits with other family members or is affectionate with them, child tries to get mom’s affection for himself”), most do not, so it is up to the observer to consider this element in the sort. Further, in a natural environment, it is much less certain that the ABS will be activated at different levels or that those levels will be similar across participants. The Q-sort items also do not directly call attention to the balance between attachment and exploratory behavior; but since the procedure is a forced sort—where an observer must consider each item in light of all other items—the result indirectly addresses this balance.

Second, to address the cognitive dimension of attachment behavior, the SS directly looks at the organization of attachment behavior and thus its quality—the outcome of the coding, in fact, identifies the type of organization or attachment pattern. This strength of the SS is often undercut in practice, however, due to constraints of data analysis. The large samples needed to get adequate numbers of avoidant and ambivalent children (since these are 15% and 9%, respectively, of a typical population) means that these patterns are often collapsed into a secure/insecure split (Solomon & George, 1999; van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). Further, what initially appears to be a strength of the SS—the emphasis on attachment organization—may be so only in certain contexts. Ainsworth’s patterns were initially identified in a small sample of 23 middle-class dyads, and it is possible that they do not adequately represent the variety in more diverse samples (for example, see the results in samples of international

adoptees in the next section). The Q-Set does not directly address the organization of attachment behavior, since it yields a continuous security score. However, since it was developed a decade later than the SS, some items incorporate common behaviors shown in the SS by children of various attachment patterns. The item “wants to get down after signaling to be picked up,” for example, is most commonly shown by children classified as ambivalent. Further, the AQS’ lack of attention to the organization of behavior may be an asset in assessing new populations, where the SS categories may obscure dimensions of attachment behavior found in different conditions or degree of risk. Finally, both the SS and the Q-Set show the persistence of attachment quality over time (Belsky & Rovine, 1990; Waters, 1978) much as Bowlby predicted. That is, given similar caregiving, a child’s attachment security or insecurity tends to remain stable.

In conclusion, then, these different strengths and limitations of the SS and AQS should be taken into account not only in selecting a measure but, even more importantly, in the interpretation of results. Of particular note in this study is the possibility that SS categories may not adequately capture—and even obfuscate—the identification and interpretation of attachment behaviors in children adopted internationally.

Attachment Behavior in Children Adopted Internationally

Studies assessing attachment security in the third wave of international adoptees fall into 3 groups: (1) toddler and preschool samples of previously-institutionalized Romanian children adopted at various ages; (2) infant samples in which all children were adopted before their first birthday (most before 6 months of age) and who came from various countries of origin and forms of preadoption care; (3) studies comparing groups of adoptees with diverse backgrounds.

Studies of Romanian Adoptees

The two largest Romanian studies share certain similarities: they are longitudinal, assessing attachment security at two points several years apart, and they include two comparison groups. Chisholm et al.'s (1995) sample (n=121) consisted of 3 groups: those who had spent more than 8 months in an orphanage (RO) were compared with those who had been institutionalized less than 4 months (RC) and a non-adopted, Canadian-born group (CB) matched in age and sex with the RO group. At the first assessment, attachment security was measured with a modified AQS procedure, created by placing the 23 items with the highest and lowest loadings in the security sort in a Likert-scale questionnaire, which was then filled out by parents. The first assessment took place when adoptees were various ages (for the RO and CB groups, M=30 months, range 17-76 months; for RC, M=25, range 18-37 months) and had spent varying lengths of time in their adoptive homes (RO median=11 months, range=4-25; RC median=23 months, range=16-35). Results showed that children who had spent 8 months or more in an orphanage had significantly lower attachment security than those adopted early or raised by biological parents. The AQS items that contributed most strongly to the differences between RO and RC groups were those with both high and loadings on the security sort: RO children tended to score higher on items with low ratings in the security sort, whereas RC children scored higher on items with high security ratings. AQS items that contributed most to differences between RO and CB groups, in contrast, were those typical of children with ambivalent attachments (e.g. "wants to be put down, and then fusses or wants to be picked right back up"). In the second assessment (Chisholm, 1998), all children had been with their adoptive families at least 26 months. This time, attachment security was assessed in two ways—the same parent questionnaire used

previously, and a videotaped separation/reunion episode based on the SS and coded with the PAA system. Results of the parent questionnaire showed that RO children scored significantly higher on attachment than in the first assessment, and there were no significant differences in attachment security between groups. But in the videotaped assessment, RO children showed significantly less attachment security (37%) than either RC or CB children (66% and 58%, respectively). Further, approximately 33% of children in the RO group received atypical classifications compared to 4% of the RC group and 7% of the CB group.

The English and Romanian Adoptees Study Team (O'Connor et al., 2003; M. Rutter et al., 2007) also divided their sample (n=111) into 3 groups based on length of institutionalization, with slightly different cut-offs (<6 months and 6-24 months of orphanage care) and a control group of children adopted domestically in the United Kingdom before 6 months of age. In the first assessment (O'Connor et al., 2003), children were 4 years old and had been in their adoptive homes at least 2 years. Data from a modified SS (shortened to 5 episodes and used at home rather than in the laboratory) and coded with the Cassidy-Marvin system showed no significant differences between groups in typical forms of insecurity—i.e. in avoidant, dependent (also called ambivalent), and disorganized categories. There were, however, significant differences in the number in each group classified as secure or insecure/other: in the 6-24 month group, almost 35% received a secure rating and over 50% an insecure/other rating; in the <6 month Romanian group, 40% were rated secure and almost 35% insecure/other; and in the UK adoptee group, 55% were secure and about 15% insecure/other. Common behaviors that led to the insecure/other classification included “extreme forms of emotional

overexuberance, nervous excitement, silliness, coyness, and excessive playfulness more typical of a much younger child” (p. 33). In this first assessment, then, Romanian adoptees were less likely to be securely attached and more likely to show atypical forms of insecurity. Two years later (M. Rutter et al., 2007) the Romanian children were assessed again, this time as one group. At this time, 63% were rated secure, 16% insecure, and 21% disorganized or insecure/other. Researchers noted, however, that even children rated secure showed atypical forms of attachment behavior.

A third, cross-sectional study (Marcovitch et al., 1997) assessed 56 Romanian adoptees, divided into 2 groups according to whether they had experienced <6 months (Home) or \geq 6 months (Institution) of orphanage care. Children were 3 to 5 years old at the time of the assessment; the length of time in the adoptive home was not reported but since the mean age at adoption was 6.5 (Home) and 28.3 (Institution) months, many children had been in the adoptive home for several years. In contrast to the results from the longitudinal studies reported above, these researchers found no significant differences between Home and Institution groups in attachment security in the four classifications (disorganized and insecure/other categories were combined in this analysis). The authors did, however, find significant differences between the adopted group as a whole and a sample of healthy 4-year-olds from another of their studies: The adopted group had less secure attachment than the comparison group (30% vs. 42%) and more ambivalent (25% vs. 3%) and disorganized/insecure/other (42% vs. 10%) attachment, while avoidant attachment was completely absent in the adoptee group yet comprised over 30% of the comparison group. Researchers expressed surprise at the lack of difference between

Home and Institution groups and suggested that their “classification system [did] not adequately capture attachment phenomena in this sample” (p. 17).

Taken together, these studies further our understanding of attachment security in institutionalized adoptees from severely deprived environments but also raise some assessment issues. Consistent findings are that (1) adoptees who have been institutionalized at least 6 months are more likely to have an insecure attachment than non-institutionalized children and (2) adoptees with insecure attachments are more likely to have atypical forms of insecurity. More mixed results are found for children institutionalized <6 months: O’Connor et al. report a higher percentage of insecure attachment and Chisholm (1998) a similar percentage of insecure attachment when compared with normative samples. Marcovitch et al. shed no light on this inconsistency, since researchers combined the Home and Institution groups in the comparison group analysis. Equally important with these findings on attachment security, however, are the methodological issues raised about assessment in this population. The discrepancy between parent report in the AQS and trained observer ratings of the separation/reunion episode (Chisholm, 1998) suggests that parent report may be insufficient for capturing the subtleties of attachment behavior in these children. Moreover, the large number of children receiving an atypical insecure classification in assessments derived from the SS suggests that these categorical assessments do little to illumine what may be unique features of attachment behavior in international adoptees.

Early Adoption Studies

Studies of infants adopted before their first birthday, most before 6 months of age—and all from less severely depriving environments than Romanian adoptees—tell a different story than the Romanian samples. Juffer & Rosenboom (1997) and Stams et al.

(2002) assessed samples from 3 countries—Sri Lanka, South Korea, and Columbia—in which most of the children had been adopted between 3 and 4 months of age and received various kinds of pre-adoption care (time with birth parents, and foster and orphanage care). When children were assessed in the SS at 12 months using a 3-way classification scheme, researchers found that the percentage of securely attached infants was comparative with normative samples. For example, Stams et al. (n=146) found that 75% were securely attached, 22% avoidantly attached, and 2% ambivalently attached. Juffer & Rosenboom (n=80) report almost identical findings, with 74% secure, 24% avoidant, and 2% ambivalent; further, when the SS was repeated at 18 months, there was 68% stability in the classifications. Von Londen et al. (2007) assessed children (n=70) from 5 countries—the majority from Taiwan and China, and lesser numbers from South Korea, Columbia, and Ethiopia—who were slightly older at adoption (M=5.5 months; range 1.5-12 months) and who were all institutionalized for at least some of the pre-adoption period. Children were assessed in the SS at a mean age of 14 months (range 12.5-18.5), this time with a 4-way classification scheme including the disorganized pattern. Results revealed a similar secure/insecure distribution (61% secure) as normative samples but a higher distribution of disorganized children (35% vs. 15% in normative samples). Force classified in the disorganized group, however, were 8 children initially classified as “unattached” or “cannot classify” since they failed to demonstrate characteristics of the disorganized pattern. Instead, these children showed flat affect or failed to differentiate between the mother and the stranger.

Findings from these early adoption studies are difficult to interpret due to the inconsistent use of the D classification. In the von Londen et al. sample, the somewhat

older age at adoption and the fact that all children had been institutionalized might account for the high percentage of disorganized classifications. But two points need to be kept in mind. First, the 8 children who were force classified as D may have been exhibiting atypical forms of insecurity, akin to that found in the Romanian samples, or they may still have been in the process of forming an attachment. If these 8 children were removed, the disorganized group would constitute 24% of the sample—still higher than normative samples but less markedly so. Second, if the D classification had been used in the earlier studies, the percentage of children in each attachment pattern may have less closely resembled normal distributions.

Studies Comparing Groups of Adoptees

Two studies have compared attachment security in groups of adoptees, differing either in country of origin or in form of preadoption care. Bartel (2005) compared adoptees from Asia (China and South Korea, n=130) and Eastern Europe (Russia and Romania, n=112) using Chisholm's (1995) modified parent AQS procedure. All the children were between 1 and 6 years at assessment; the age at adoption and the length of time in the adoptive home were not reported. Attachment security did not differ significantly between groups, with Asian adoptees scoring a mean of 3.71 on a 5-point scale and Eastern European adoptees scoring 3.72. Millham (2003) compared adoptees (n=31) who had been institutionalized with those who had not. Adoptees from both groups came from China, Russia, and Vietnam and were adopted at a median age of 9 months (range = 1 week to 4 years). The median age at assessment was 5 years (range = 2.5 to 16.5 years). Millham also used Chisholm's modified parent AQS procedure (even though the AQS is valid only until 60 months and half of the sample exceeded this age).

The sample mean for attachment security was 4.18, with no significant difference between groups.

All together, the disparate findings on the percentage of securely attached children in these three groups of studies suggest that international adoption in itself does not put a child at risk for attachment insecurity. Rather, factors that differentiate these samples—such as age at adoption and the duration and quality of preadoption care—need to be examined to account for the differences in attachment status.

Factors Affecting Attachment Behavior

The factors that affect attachment behavior have been studied almost entirely in children who begin to attach to their biological mothers from birth. Some of the key factors—and the differences between international adoptees and this normative population—are summarized below. In cases where there is little or no research literature on international adoptees, results from studies of children from atypical caregiving environments—such as children living in orphanages, children adopted domestically out of orphanages in other countries, and children in US foster care—have been included.

Age and Developmental Status

Although the propensity to form an attachment is present from birth, a child's attachment to her caregivers develops in three phases during the first year of life (Bowlby, 1969/1982). The first stage, called “pre-attachment,” lasts from birth to 8-12 weeks; during this time infants orient, signal, and respond to their mothers and other people in much the same way, even though they are capable of discriminating their primary caregivers through sounds and smells. In the second phase of “attachment in-the-making,” babies direct an expanding repertoire of attachment behaviors to their regular caregivers but typically remain social with everyone; this phase lasts until a baby is

between 6 and 9 months. Then, in the third phase of “clear-cut attachment,” children develop strong preferences for their caregivers, organizing their behavior around these preferred figures. Since this phase requires two cognitive skills that develop in the second half of the first year—the ability to distinguish means and ends and to mentally represent the caregiver, even when absent—true attachment cannot occur until sometime between 7 and 12 months. Attachment is then remarkably persistent, although the quality of the attachment bond—i.e., the level of security the child derives from it—may change (Waters, Weinfield, & Hamilton, 2000; Weinfield, Sroufe, & Egeland, 2000).

International adoptees follow a different developmental trajectory in attaching to their adoptive parents. First, due to the ever-tightening restrictions for verifying child abandonment, most adoptees do not arrive in the US until late in the first year of life—and often in the second year of life—and thus begin the process of attachment at an older age (Hellerstedt et al., 2008). Second, many international adoptees are developmentally delayed at adoption (Miller, 2005), which makes their chronological and developmental ages discrepant in at least some domains. Although it seems likely that these factors might affect the kind of attachment behavior adoptees exhibit and the pace at which their attachment develops, this has not been supported by research. Individual studies looking at the relationship between age on arrival and attachment security in international adoptees all report insignificant findings, even though assessing a wide age range at adoption. The fact that Stams et al. (2002) and van Londen et al. (2007) found no relationship between these variables is not surprising, since most children were adopted before 6 months. However, Chisholm et al. (1995) also failed to find a relationship within groups in their Romanian sample, even though children in the RO group ranged from 8 to

68 months at adoption. These findings receive additional support from a recent study of children adopted domestically out of institutions in Portugal (Verissimo & Salvaterra, 2006), where age at adoption did not predict attachment security even though children ranged between 3 weeks and 47 months at adoption. But a recent meta-analysis (van den Dries, Juffer, & van IJzendoorn, 2008) examining attachment security in domestic and international adoptees of various ages ($n=722$)—including children, adolescents, and adults—found a large effect ($d=.80$) when comparing groups adopted before and after 12 months of age. Those adopted before 12 months of age were as securely attached as their non-adopted peers, whereas those adopted after 12 months were not. Neither age at assessment nor type of adoption—i.e. domestic or international—were significant moderators. The discrepancy between these meta-analytic results and the individual studies cited above is puzzling and can be interpreted in at least two ways: (1) that age at adoption is important in some types of samples but not others, and (2) that individual studies lacked the power to detect this relationship.

Studies examining the second factor—the relationship between developmental status and attachment security in international adoptees—report more mixed findings. Bartel (2005) found that children with fewer health and developmental problems (assessed through parents' retrospective report on whether a child was malnourished or underweight at adoption, had a disease, had difficulty with gross motor development, or had other health or developmental problems) were more securely attached than those with more problems. However, Judge (2004) and O'Connor et al. (2003), both assessing their samples with a Denver developmental screening measure, found that delay at adoption did not predict attachment security. Interestingly, however, Judge reported that

developmental delay at the time of assessment (3-13 months later) did make a difference in the child's attachment status. In a similar vein, Van Londen (2007), using the Bayley Scales of Infant Development to assess mental and motor development at a mean of 8.7 months postadoption, found that secure children tended to have higher mental development, whereas disorganized children had lower mental and motor scores. Thus these studies, though small in number, agree that developmental delay at adoption does not predict attachment security, while delay that persists (sometimes as long as 13 months) does affect the child's attachment status. It is not known, however, whether this delay results from preadoption care or from other factors.

History of Care

Much of Bowlby's early career (1973) focused on the importance of a child's history of care in facilitating or compromising a child's attachment security. In studying children separated from their parents—either relatively short-term separations due to hospitalization of the mother or child, or more long-term separations during World War II—Bowlby found that almost all children showed marked distress at separation, some so much that they withdrew from the environment or hardly seemed to recognize their mothers upon reunion (but did recognize their fathers). Children who suffered only short-term separations gradually resumed their attachment behaviors, but children with longer or repeated separations were more likely to show marked detachment. This was due, Bowlby theorized, to the way prolonged separation shaped the child's internal working model, making it more difficult to trust the parent upon return. More recently, attachment researchers have continued this work on the effects of a child's caregiving history on attachment status with studies of children living in atypical caregiving environments, such as orphanages and foster care. An earlier study on orphanage care in the UK (Tizard

& Tizard, 1971), where caregiver ratios were 3:1 but caregivers were discouraged from forming intimate relationships with the children, had found that children did not form selective attachments in institutional care. Two new studies, however, report that selective attachments did form but were primarily insecure (and sometimes showed additional anomalies). Vorria et al. (2003) used the SS to compare 86 infants in a Greek orphanage with 41 infants living with their families and attending low quality day care. Although the institutional infant/caregiver ratio varied between 4:1 to 6:1—and caregivers were encouraged to develop a close relationship with at least one infant, who then was considered that child's "mother"—overall the institutional care was described as "extremely low quality" (p. 1216). SS results showed that in the institutionalized group, 24% had secure attachments, 2.5% avoidant, 7.6% ambivalent, and 66% disorganized, while in the daycare group, 41% were secure, 9.4% avoidant, 25% ambivalent, and 25% disorganized. Zeanah, Smyke, Koga, and Carlson (2005) also used the SS to compare 95 children in Romanian orphanages with 50 children from Bucharest living with their families. These orphanages all had high child-caregiver ratios and three shifts of caregivers per day, such that a child might see 17 different caregivers per week (Zeanah et al., 2003). In addition to the SS, researchers assigned an "attachment formation rating" to each child, from 1 (no attachment behavior) to 5 (clear signs of an avoidant, secure, ambivalent, or disorganized pattern). Results showed that in the institutionalized group (who were assessed with their favorite caregivers, as determined by staff consensus), 19% were secure, 3.2% avoidant, 0% ambivalent, 65.3% disorganized, and 12.6% unclassifiable, whereas in the control group, 74% were secure, 4% avoidant, 0% ambivalent, 22% disorganized, and 0% unclassifiable. Further, in the control group 100%

received a 5 in attachment formation, showing evidence of a clear attachment pattern, compared with only 3.2% of the institutionalized group. The authors conclude that “even when the [institutionalized] children had discernible attachment patterns, the patterns appeared to be anomalous or incompletely developed” (p. 1024). Results from infants and young children in US foster care, however, give a quite different picture. Two studies on infants report from 55% (Stovall-McClough & Dozier, 2004) to 67% (Cole, 2005) security, while a study including both infants and preschoolers reported approximately 50% security (Ponciano, 2002). Those reporting disorganized and “cannot classify” categories found percentages higher than normative samples, from 28.3% (Cole, 2005) to 30% (Stovall-McClough & Dozier, 2004). Taken together, then, results of the orphanage and foster care studies show that children in foster care demonstrate considerably more attachment security than those in institutional settings, though the incidence of disorganized/cannot classify attachment patterns is higher than normative samples in both caregiving environments. These findings are limited, however, by the small number of studies as well as by the uniformly low quality of care in the institutional settings, leaving open the possibility that higher quality institutions would facilitate more attachment security.

This work on attachment in orphanages and foster care is relevant for international adoptees because it suggests that they are likely to have formed a selective attachment—however insecure—to their pre-adoption caregivers. And, following attachment theory (Bretherton & Munholland, 1999), this attachment pattern should reflect the child’s internal working model and thus influence the formation of a new attachment to adoptive parents. To date, only one longitudinal study (Vorria et al., 2006)

has assessed the quality of a child's attachment relationships before and after (domestic) adoption. This study used the sample from the Greek orphanage and the community control group described above to compare attachment security in infancy (in the orphanage) and at 4 years (in the adoptive home) within and between groups. In this sample, all the orphanage children had been adopted after approximately 2 years of institutional care. Attachment was assessed in two ways: with the AQS and the Attachment Story Completion Task (ASCT) that looks at attachment representations rather than attachment behavior (Bretherton, Ridgeway, & Cassidy, 1990). Stories are coded for story resolution, narrative coherence, and avoidance, as well as for prosocial, negative, and atypical themes. Surprisingly, results from the AQS showed that children who had been securely attached in infancy showed less security to their adoptive mother approximately 3 years later than did those who were insecurely attached in infancy; the same held true for children in the control group. However, because no association was found between these two ages in either group when assessed with the ASCT, the authors conclude that "no safe conclusions can be drawn regarding security of attachment in infancy and security at age four" (p. 1251). When attachment was analyzed between groups, institutionalized and community groups continued to show significant differences in their attachment security. On the AQS, previously institutionalized children received a mean score of .50 while comparison children received a mean score of .60; on the ASCT, adopted children received lower scores for story resolution, narrative coherence, and prosocial themes, as well as higher scores on avoidance.

Since so few researchers have access to information about an international adoptee's pre-adoption care—much less measures of pre-adoption attachment security—

studies have used other indices to assess that history. In institutionalized samples, length of institutionalization has been used, with van Londen et al. (2007) reporting insignificant findings in their early adopted sample and the Romanian samples reporting significant differences in attachment security between groups. One exception to these findings was a study by O'Connor et al. (2003), in which length of institutionalization was associated with higher rates of atypical insecurity but not with ordinary kinds of insecurity (including the disorganized pattern). Only three studies (Juffer & Rosenboom, 1997; O'Connor et al., 2003; van Londen et al., 2007) have attempted to assess history of care in other ways. These studies use health or weight on arrival, assessed through the parents' retrospective report, as the measure of care. In each case, the relationship between this measure and attachment security was insignificant. Somewhat surprisingly, international adoption researchers have not considered the number of preadoption placements a child has as an indicator of preadoption care, although this factor has been examined in studies of children in, or adopted out of, foster care. In cross-sectional studies of school-aged children, Leathers (2002) reported a significant correlation ($p < .01$) between number of placements and attachment to the foster family in a sample of 199 children, while Russell (2002), in a much smaller sample of 12, found no correlation between these variables—although ad hoc analysis revealed a significant correlation between underlying disorganized content in the doll play (the attachment measure) and multiple placements. In two studies of young children with prenatal substance exposure, Chew (1998) reported no significant differences in attachment security between multiple and stable placement groups of foster care children ($n=36$), while Nielsen (2008), in a two-year longitudinal study of children adopted out of foster care ($n=62$), reported a trend toward significance

at the last of 3 assessments, indicating that more placements contributed to lower attachment security over time.

At present, then, it is difficult to draw conclusions about the effects of history of care on attachment security in international adoptees, due to the limited number of studies that have assessed this factor. It does, however, seem likely that institutionalization >8 months—especially if the institutional care is of low quality—predicts lower rates of attachment security and higher rates of at least certain types of insecurity than more typical caregiving contexts.

Stress Level (Basal Salivary Cortisol)

Investigations of the relationship between a child's stress level and attachment behavior are relatively new and rely heavily on animal models. Work with rat pups, for example, has shown that contact with the mother early in life deactivates the hypothalamic-pituitary-adrenocortical (HPA) system, a system that plays a central role in the mammalian stress response. This deactivation protects the rat pup's developing brain from the adverse effects of high levels of glucocorticoids that are secreted during stress. But if the pup is separated from the mother, the pup's HPA-axis will again become reactive (Caldji et al., 1998; Hofer & Sullivan, 2001; Suchecki, Rosenfeld, & Levine, 1993). While somewhat inconsistent, research on human infants indicates that they also experience a buffering of the HPA axis if they receive consistent, sensitive care. All of the seven studies of stress reactivity (either to the Strange Situation or another novel event) and attachment security, for example, show that levels of cortisol (the glucocorticoid secreted in humans and a measure of a child's stress response) in secure infants fail to rise in response to a stressor, whether or not the infants show behavioral distress (Gunnar, Brodersen, Nachmias, Buss, & Rigatuso, 1996; Gunnar, Mangelsdorf,

Larson, & Hertzgaard, 1989; Hertzgaard, Gunnar, Erickson, & Nachmias, 1995; Nachmias, Gunnar, Mangelsdorf, Parritz, & Buss, 1996; Spangler & Grossman, 1993; Spangler & Schieche, 1998; van Bakel & Riksen-Walraven, 2004b). In contrast, in five out of the seven studies (Gunnar et al., 1996; Hertzgaard et al., 1995; Nachmias et al., 1996; Spangler & Grossman, 1993; Spangler & Schieche, 1998) at least one insecure classification showed elevated cortisol reactivity to a stressor, although behavioral inhibition moderated this relationship in two of the studies—i.e. only inhibited insecure children showed cortisol elevations—and in another moderated the relationship for avoidant but not ambivalent babies (Spangler & Schieche, 1998), with the latter showing elevations based on attachment classification alone. Far less work has been done on the relationship between basal salivary cortisol levels and attachment security. In the studies above, two (Gunnar et al., 1989; Spangler & Schieche, 1998) assessed basal levels in addition to stress reactivity, but the relationship with attachment security was not significant. Baseline measures taken in the doctor's office or laboratory prior to experiencing the stressors, however, have shown a relationship with attachment security: Gunnar et al. (1996) reported that baseline cortisol values, averaged from 3 well baby visits in the first year of life, predicted attachment security at 18 months, while Spangler and Schieche (1998) found a significant relationship between baseline cortisol levels in ambivalent babies prior to the SS. But since researchers in the latter study had also sampled basal levels at wakeup prior to the laboratory baseline—and these basal levels were not associated with attachment—Spangler and Schieche interpreted the association between baseline values and attachment security as a reaction to the laboratory environment. Thus while there has been limited work on basal salivary cortisol levels

and attachment security, research on stress reactivity shows that insecurity, particularly if a child is also behaviorally inhibited, heightens the child's adrenocortical response. And while we presently lack knowledge about the effects of increased cortisol on the human brain, it appears likely that consistent exposure to increased cortisol can make the HPA-axis hypo- or hyper-responsive, making it more difficult for children to cope effectively with internal and external stressors (Gunnar, 2006).

International adoptees, especially those who have been institutionalized prior to adoption, are unlikely to have experienced the buffering of the HPA-axis that comes from high quality care. In contrast to the studies in low risk populations, international adoption researchers have focused more on basal salivary cortisol levels than on stress reactivity. Findings from the five studies thus far, however, are somewhat mixed. Two samples of institutionalized children (Bruce, Kroupina, Parker, & Gunnar, 2000; Gunnar, 2001) showed aberrations in HPA axis functioning regardless of time in the adoptive home. Gunnar's sample of 6 to 12-year-old Romanian children had been in their adoptive homes 6.5 years but were adopted at various ages and thus experienced different amounts of institutional care. Twenty-two percent of the children who spent more than 8 months in an orphanage had markedly elevated basal cortisol levels (>2 SD above the mean) compared to control groups of Romanian children adopted early (institutionalized 4 months or less) or a non-adopted group. Further, the longer children had been in orphanage care, the higher their cortisol level. Although the authors acknowledge that the differences could have been caused by genetic factors, prenatal factors, or stressors in the family, the fact that there were no significant differences in cortisol level between the early adopted and comparison group made this less likely. Bruce et al. (2000) assessed

basal levels of 28 post-institutionalized children in the early postadoption period, at 2 and 8 months postadoption. Adopted between the ages of 4 and 18 months, these children came primarily from Russia and China where deprivation is considered less severe than in Romania. Results showed that the adopted group had lower mid-morning levels and higher bedtime levels—i.e. a flattened diurnal pattern—compared to an American-born control group.

Although these two studies suggest that institutionalization affects HPA axis regulation regardless of the level of deprivation experienced, results from Kertes et al. (2008) and Wismer Fries (2008) suggest that we cannot generalize about the stress response of international adoptees but must look to their preadoption care. In Kertes et al., children had experienced some combination of time with birth parents, foster care, and institutionalization prior to adoption; children were between 7 and 11 when assessed and had been in their adoptive homes at least three years. Results showed that only those adoptees whose growth was below World Health Organization (WHO) norms at adoption had altered basal levels (higher morning cortisol and a larger diurnal decrease by bedtime) three years later. This suggests that deprivation severe enough to stunt growth, rather than institutionalization per se, affects HPA axis regulation. Wismer Fries et al. (2008) compared basal levels and reactions to a stressor (playing a computer game while sitting on the lap of a parent and an unfamiliar adult) in 18 children who had been adopted from Russian and Romanian orphanages and a non-adopted control group. At assessment, children were 4-5 years old; the adopted group had lived in their adoptive homes about 3 years, after an average of 16.6 months (range 7-42 months) of institutionalization. The researchers reported no differences in basal levels between

groups, but within the institutionalized group there were small differences due to severity (but not length) of neglect. The largest effects, however, came in reaction to the stressor: Although there were no differences between groups after sitting on the lap of an unfamiliar adult, adopted children showed greater reactivity after sitting on the lap of a parent than did control children. Further, within the adopted group those with more severe neglect showed greater reactivity.

Gunnar et al. (2009) attempts to address these discrepancies by examining individual differences in adoptees' response to their preadoption care. In this study of basal levels and stress reactivity, adoptees from Asia, Latin America, and Russia/Eastern Europe (n=86) were divided into two groups based on early life stress (ELS): those in the moderate ELS group had been adopted at <8 months and had spent <2 months in an institution, while those in the severe ELS group had been adopted at ≥ 12 months and been institutionalized $\geq 75\%$ of their preadoption lives. Surprisingly, results showed no differences in basal levels between the severe ELS and the non-adopted comparison group, while basal levels in the moderate ELS group were lower. The ELS groups were further differentiated, however, by the presence of severe growth delay at adoption (shown by approximately one-third of the moderate ELS group and two-thirds of the severe ELS group), delay that could suggest more severe preadoption conditions than captured by the ELS groupings or individual differences—i.e. more responsiveness to those conditions. In this analysis, the absence of severe growth delay was as important as ELS group for predicting lower HPA axis activity after adoption. This study, then, was a first step in differentiating the role of external conditions in preadoption care and individual responsiveness to that care. In addition, the researchers offered a new

interpretation of low cortisol levels in at-risk populations. Previous work with international adoptees (Bruce et al., 2000; Kertes et al., 2008) and in other at-risk populations (Fernald, Burke, & Gunnar, 2008) has interpreted lower levels as evidence of hypocortisolism and a type of HPA dysfunction. This study leads to the opposite conclusion—that lower levels may indicate resilience rather than vulnerability. Researchers point out, however, that whether these lower levels are a cause or consequence of resilience remains an open question.

Maternal Attachment Representations

Although Bowlby (1969/1982) believed that variations in infant behavior (e.g. the amount of time spent sleeping or crying, or other behaviors resulting from prenatal or perinatal difficulties) could influence the mother's responses, he believed that "what the mother brings to the situation...is far more complex," and thus more influential, than what the infant brings (p. 342). Ainsworth (1967) offered the first formulation of the mother's contribution when she identified maternal sensitivity—defined as an awareness of the child's signals, an accurate interpretation of these signals, and a prompt and appropriate response—as the primary factor leading to a secure infant pattern. When observing mother-infant interaction at home, Ainsworth et al. (1978) found a strong association ($r=.78$) between maternal sensitivity and secure attachment. A subsequent meta-analysis (DeWolff & van Ijzendoorn, 1997) found a more modest association ($r=.24$), which the researchers interpreted as affirming the importance of sensitivity yet demonstrating the need for a "multidimensional approach" when studying the parenting antecedents of attachment security.

Main, Kaplan, and Cassidy (1985) attempted to locate the source of the mother's contribution at a more conceptual level—originally called the caregiver's 'state of mind

with respect to attachment” and now more generally referred to as adult attachment representations. These representations originate in the caregiver’s attachment experiences in her own childhood, representations that, by adulthood, are organized into a conceptual and affective framework that shape her processing of thoughts and feelings about attachment. In the Adult Attachment Interview (AAI), the first measure designed to assess these representations, mothers fall into one of four categories based on their appraisal of their attachment history: (1) *autonomous* mothers value attachment needs and have resolved attachment issues from their childhood, (2) *dismissing* mothers tend to idealize their parents but discount the importance of attachment in their childhood, (3) *preoccupied* mothers show angry involvement with childhood attachment figures and have difficulty separating their history from the current situation, and (4) *unresolved* mothers have difficulty talking about attachment issues in an organized way, often due to a history of trauma or abuse (Hesse, 1999). The mother’s AAI classification, in turn, powerfully predicts her infant’s attachment behavior in the Strange Situation—in part because the mother’s representations influence her responsiveness to her infant’s signals and thus the child’s developing attachment (van IJzendoorn, 1995).

Since internationally adopted infants come into the adoptive home with heightened attachment needs, the mismatch between those needs and a mother with a dismissing, preoccupied, or unresolved state of mind is likely to have an even greater effect on attachment behavior than it would for low-risk infants. Thus far, however, research on international adoptees (in the few studies where maternal factors are assessed) has focused on maternal sensitivity or commitment to the parental role rather than attachment representations. Two of the early adoption studies described previously

(Juffer & Rosenboom, 1997; van Londen et al., 2007) report similar and somewhat surprising results: that maternal sensitivity was not associated with attachment security. Both groups of researchers hypothesize that it was the way sensitivity was measured (a short free-play episode in the former study and a more structured play episode in the latter, both rated with Ainsworth's 9-point scales) that caused this null finding. Chisholm et al. (1995) used the parent attachment subscale of the Parenting Stress Index (PSI) to assess commitment to the parental role in the three groups of their Romanian sample (never adopted, adopted early, and institutionalized ≥ 8 months). Parents in the three groups demonstrated comparable levels of commitment, yet only in the most deprived group were the parents' scores negatively associated with attachment security in their children. The researchers postulated that while the parental commitment to the child may have been "good enough" to foster security in less deprived children, it was insufficient for children with longer periods of institutionalization. Maternal attachment representations have been assessed, however, in a few studies of children adopted domestically or in foster care. Dozier et al. (2001) assessed 50 foster mothers with the AAI when their foster infants were between 12 and 24 months. Although infants had been with their foster mothers various lengths of time, entering care sometime between birth and 20 months, there was a 72% correspondence between caregivers' attachment classification and infant attachment classification in the SS, a finding that approximates that found in biologically intact dyads. Further, this finding was seen for early- as well as late-placed foster infants. Verissimo & Salvaterra (2006) used an assessment of maternal secure-base scripts to examine the relationship between maternal attachment representations and the AQS scores of 106 infants adopted out of orphanages. These

children had been adopted between 3 weeks and 47 months of age; at assessment, they were between 10 and 69 months and had lived in their adoptive homes between 6 and 69 months. Yet even with this variability, authors report that secure base script scores predicted attachment security. Thus although the number of studies is small, these findings suggest that maternal attachment representations may be a better predictor of attachment security in international adoptees than maternal sensitivity, as has been shown in biologically intact dyads.

Gaps in Knowledge

Although we lack knowledge about many issues concerning children adopted internationally, previous evidence suggests three important areas needing further study: (1) the degree to which international adoptees show secure versus insecure attachment behavior, (2) the attachment behavior of international adoptees in the early post-adoption period, when an attachment may still be forming, and (3) the factors that may affect their attachment behavior.

Attachment Behavior in International Adoptees

To date, all studies on attachment security in international adoptees have used either the SS (with Ainsworth's coding system or a classification system for older toddlers and preschoolers) or parent report on a modified form of the AQS. This raises at least three issues. First, studies that used the SS without the disorganized category may be of limited use since, on the basis of theory, we would expect higher rates of disorganization in international adoptees, especially those who have been institutionalized. If this category were assessed, the similarity between normative samples and the early adoption group might disappear. Second, studies that used the disorganized category report opposite findings: two (Marcovitch et al., 1997; van Londen et al., 2007)

report higher percentages (35-42%) of disorganized children than in normative samples while O'Connor et al. report *no* children with a disorganized pattern—a striking finding given the severe deprivation in this Romanian sample. A finding that unites both sides of this opposition, however, is that when disorganized and insecure/other categories are differentiated, a significant number of children cannot be classified. As mentioned, this suggests that the SS categories do not sufficiently capture important differences in attachment behavior in international adoptees, both those adopted late and from severely depriving environments and those adopted before 12 months from less deprived environments. Thus, just as the disorganized category was identified when researchers attempted to replicate Ainsworth's work in larger, more at-risk populations (Solomon & George, 1999), the SS may have limited usefulness for international adoptees until new patterns are identified. Third, studies using the AQS have relied on a shortened version (for which no psychometric testing was done) and on parent report. In a recent meta-analysis of the AQS, van IJzendoorn (2004) concluded that reliability and validity of the parent and observer AQS differed sufficiently and that only the latter could be considered “in the same league with the SS” (p. 1204). Thus we need studies of internationally adopted children that can diminish the difficulties raised by the SS and yet use the most robust form of the AQS. This study will be the first to use the observer AQS on a sample of internationally adopted children.

A second gap in our knowledge of international adoptees' attachment behavior stems from the fact that all studies have assessed that behavior after a mean of 8 to 48 months postadoption; moreover, in all but one study (Juffer & Rosenboom, 1997) there is considerable variability (frequently a range of 1-2 years) in how long children within a

sample have been in their adoptive homes. Thus we have little knowledge of early attachment behavior in international adoptees, yet the importance of this early period has been demonstrated by researchers studying other atypical populations. Stovall-McClough and Dozier (2004; Stovall & Dozier, 2000), for example, have examined the development of new attachments in children in foster care and shown that most, but not all, infants developed a predominant pattern of attachment behavior within two months of placement, while Fisher and Kim (2007) found that attachment behavior continued to develop over the first year. The situation of foster care infants resembles that of many international adoptees, in that foster infants are beginning a new attachment at a later age, are subject to early disruptions in care, and make a sudden transition to out-of-home care. Still, foster infants have spent their earliest months in a family setting, however maladaptive, whereas most international adoptees come from institutions. In a situation more closely resembling that of international adoptees, Dontas, Maratos, Fafoutis, and Karangelis (1985) assessed 15 infants, 7 to 9 months of age, who were adopted domestically out of a high-quality Greek institution that practiced “multiple mothering” (p. 137). These infants were assessed with their favorite nurse prior to meeting their adoptive mothers and then at the end of a 2-week transition period, in which adoptive parents had spent the entire day at the institution with their child. Results showed that infants received significantly higher scores in a modified SS with their adoptive mothers after just two weeks than they did with their favorite nurse. While this study suggests that internationally adopted children may form attachments early in the postadoption period, most adoptees in the US are adopted at an older age and from moderately depriving environments, which may affect their early attachment behavior. The current study

addresses this gap by examining attachment behavior in a sample of children adopted late in the first year or in the second year of life and by assessing them at the same time point in the early postadoption period. Such knowledge will be helpful not only in understanding how quickly children form selective attachments postadoption but also for interpreting the results of previous studies. Previous studies that report significant numbers of “unclassifiable” children using the SS have interpreted these findings as aberrant behavior of already-attached children. Instead, some of these children may be in the process of forming an attachment.

Factors Affecting Attachment Behavior in International Adoptees

As described above, studies of the relationship between age at adoption and attachment status report insignificant findings, while van den Dries et al.’s (2008) meta-analysis on domestic and international adoptees found a significant association between these variables. These discrepant results indicate that the effect of age at adoption needs further clarification. This study adds to our knowledge by assessing the relationship between age at adoption and attachment security in the early postadoption period. With regard to the effect of developmental status on attachment security, previous studies reported insignificant effects when delay was present at adoption but significant associations when that delay persisted. However, since children in these studies had been in their adoptive homes for various lengths of time (range: 2.9 to 14.2 months), we do not yet know when this delay becomes significant for attachment status. This study adds to our knowledge by assessing all children’s developmental status at the same time postadoption.

International adoptees are a highly diverse group in terms of their preadoption care. At present, we know most about children from two extremes of preadoption

environments—the severely deprived Romanian adoptees and the much less deprived (and early adopted) samples from South Korea, Columbia, and Sri Lanka, where foster care or time with birth parents is common. In the early adopted samples, two studies (Juffer & Rosenboom, 1997; van Londen et al., 2007) assessed the association between health on arrival and attachment security, with insignificant findings. In the severely deprived samples, all assessed the relationship between length of institutionalization and attachment security; as reported above, this finding was significant in two out of the three samples. None of these studies attempted to assess the quality of institutional care or the number of preadoption placements, although one (2003) used weight at entry to the UK to assess nutritional deprivation and found no relationship to attachment security. However, Johnson (2000) reports that height may be as important, or even more important, an indicator of deprivation than weight—and that anthropometric data may be a sign of psychosocial, rather than nutritional, deprivation. In his study of the health status of Romanian adoptees, Johnson reported that their growth patterns resemble those found in two types of psychosocial short stature, a condition associated with emotionally depriving caregivers. In Type I, the infant shows a general failure to thrive, with height, weight, and head circumference all below age-appropriate norms. In Type II, height per age is primarily affected, while weight for height is normal or above normal. Most recently, this second growth pattern has been found in a sample of 164 international adoptees (Kertes et al., 2008) who experienced various kinds of preadoption care. Twenty-six percent of the sample was 2.5 standard deviations below the mean for height, while weight for height was normal or above normal. Importantly, 80% of those in the most growth delayed group lived in institutions prior to adoption. In light of these

findings, the present study attempts to address two gaps in the literature: (1) the lack of knowledge of how a child's history of care affects attachment behavior at 6 months postadoption and (2) the limited assessment of history of care in studies thus far. To correct the latter, this study will use (1) parent report to assess the quality of preadoption care (including social interaction, physical and mental stimulation, physical neglect, and physical and sexual abuse), the length of time spent in each form of preadoption care, and the number of preadoption placements; and (2) anthropometric data (height, weight, and head circumference) from the first and most recent medical visits in the US.

As mentioned above, studies on the stress response in international adoptees have shown HPA-axis dysregulation—either basally or in response to a stressor—particularly if early neglect was severe. None of these studies, however, examined the relationship between adoptees' cortisol levels and their attachment security. In contrast, this study examines the contribution of the child's stress response to attachment behavior at 6 months post adoption. At this point, children have recently made a major transition to another culture and caregiving environment, and may still be forming an attachment to adoptive parents.

Finally, although studies of domestically adopted children and children in foster care have indicated that maternal attachment representations are significantly associated with a child's attachment behavior, to date this variable has not been assessed in samples of internationally adopted children. Further, studies of international adoptees that have looked at maternal factors have examined these factors—such as sensitivity and parental commitment—when children have been in the adoptive home various lengths of time. In Chisholm et al. (1995) (1995), children had been living with adoptive parents from 4 to

35 months, and thus children in the sample were likely in quite different stages of forming an attachment. In Juffer and Rosenboom (1997), children were assessed after 8-10 months in the adoptive home, but this sample had been adopted at a mean age of 7-16 weeks and thus were forming an attachment at an age more closely resembling biologically intact dyads. This study, in contrast, will be the first to look at attachment representations in mothers of internationally adopted children. Further, this study will do so at a fixed time point in the early postadoption period, when children are likely to be in a similar stage of the attachment process.

In summary, the present study addresses these gaps in knowledge by describing attachment behavior at six months postadoption, as well as examining the differential effects of child and maternal factors upon attachment behavior. In addition, this study adds to the literature on international adoptees by studying a sample that has not yet been assessed—children adopted late in the first year or second year of life from moderately depriving environments.

The study's aims are to:

1. Describe the types of attachment behavior children exhibit at six months postadoption.
2. Determine the association between potential predictors of attachment.
3. Determine the degree to which the child's age and developmental status, history of care, and stress level (basal salivary cortisol level) contribute to attachment behavior at six months postadoption.
4. Determine the degree to which the mother's attachment representations contribute to a child's attachment behavior at six months postadoption.

Chapter 3: Methodology

Design and Procedures

In this cross-sectional study of adoptive infant-mother dyads, the dependent variable is attachment security. The five independent variables are the mother's attachment representations, and the child's age at adoption, developmental status, history of care, and stress level (basal salivary cortisol).

Data were collected at two home visits in the sixth month postadoption. Prior to the first visit, the mother was sent questionnaires on her child's development, behavior, and history of care prior to adoption, as well as a sociodemographic questionnaire; these questionnaires were returned to the researcher at the first visit. During the visit, the dyad was first observed for two hours to assess the child's attachment behavior. The mother was then instructed on how to collect saliva samples from her child. At the second visit, mothers completed a projective test assessing their attachment status and returned the saliva samples to the researcher. Mothers who lived more than a one hour drive from San Francisco were visited once, with the observation, projective test, and instructions on collecting cortisol completed in the same visit. Saliva samples were returned by mail.

Sample

This convenience sample consisted of 22 infant-mother dyads living in the greater San Francisco Bay Area. To determine sample size, a power analysis was conducted using Statistical Calculators 2.0 (Soper, 2005). The effect size was based upon data available for (1) the dependent variable of attachment security in the population of international adoptees and (2) two independent variables for which the most data exist—age at adoption and maternal attachment representations. For the dependent variable,

Chisholm et al.'s (1995) study comparing attachment security in Romanian adoptees and a non-adopted control group yielded an effect size of $d=.53$, a medium effect according to Cohen (1988). For the independent variables, effect sizes reported in two meta-analyses were used: van den Dries (2008) reported an effect of .80 for the relationship between age at adoption and attachment security, based on an analysis of 17 studies ($n=722$) using observational measures of attachment security, while van IJzendoorn (1995) reported a combined effect size of $r=.48$ in 9 studies ($n=548$) assessing the relationship between mothers' attachment representations as assessed by the AAI and their infants' attachment classification. Both these meta-analytic results are large effects according to Cohen. With a large effect size, an alpha of .05, and power of .80, 39 participants were needed for the sample. With a medium effect size, 84 participants were needed. Since it was not possible to recruit this size sample during the 12-month recruitment period, this study is viewed as exploratory, providing preliminary data to guide future research.

Inclusion Criteria for Mothers

To be included in the study, mothers were required to be at least 21 years old, English speaking, and the primary caregiver for their children. Only mothers were included in the sample because they are almost always the child's first attachment figure, and limiting the sample to mothers reduced the degree of heterogeneity and potential confounds.

Inclusion and Exclusion Criteria for Infants

Only infants between 6 and 30 months of age at adoption were included in the sample. This was to ensure that children were at least 12 months old at assessment, when children are considered developmentally capable of forming an attachment. Children older than 30 months at adoption (36 months at assessment) were excluded because,

according to Bowlby (1969/1982), the first years in a child's life are a sensitive period for forming an attachment. Although individuals form attachments throughout life, a secure attachment to the mother is usually more difficult after three years of age.

Infants who were identified as having serious special needs by the adoption agency were excluded, since these needs may affect the child's ability to form an attachment.

Recruitment

Participants were recruited from three sources: (1) the International Adoption Clinic at Children's Hospital, Oakland, California; (2) Bay Area adoption agencies, and (3) Bay Area adoptive parent groups (such as Families with Children from China) that provide information and support to families adopting internationally. Descriptions of the study were mailed or emailed to prospective parents by the clinic, adoption agency, or parent group. In all, 40 mothers responded to recruitment efforts; of these 18 were not eligible for the study for the following reasons: the child was >30 months at adoption, the family lived >3 hours from the Bay Area, a father was the primary caregiver, or the adoption had taken place >6 months previously or would take place after the recruitment period ended. The remaining 22 mothers and their infants enrolled in the study, and there was no attrition in the sample.

Human Subjects Approval

Human subjects' approval (Expedited Review #H1274-31514-01) was obtained from the Committee on Human Research at the University of California, San Francisco. Informed consent of the mothers was obtained by mail prior to the first visit.

Variables and Measures

Sociodemographics

Sociodemographic Questionnaire. The Sociodemographic Questionnaire (see Appendix A) contained questions on maternal age, ethnicity, education, and income, siblings' ages and adoption status, and the child's birth country and age at adoption. This questionnaire was mailed to the mother, who completed it prior to the first visit.

Attachment Behavior

Attachment Q-Set (AQS). The AQS (Waters, 1995) assesses the quality of secure base behavior in a natural setting (most often the home). As described in chapter 2, the AQS consists of 90 statements describing children's behavior, each written on a separate card, that are used to assess the attachment security of children between 1 and 5 years of age. The researcher observed for a minimum of 2 hours and then sorted cards into 9 equal-numbered piles, from those cards most characteristic of the child to those least characteristic. This sort was then compared to an "expert sort" describing a prototypically secure child (see Appendix B for the 90 items arranged in expert sort order). The correlation between this prototypical child and the assessed child was the child's security score, with no cutoff between security and insecurity.

Criterion-related validity of the AQS was established previously by relating security classifications in the Strange Situation with AQS scores. In a meta-analysis (van IJzendoorn et al., 2004), the combined effect size relating the observer AQS to the SS was $r = .31$ (increasing to $.42$ if raters observed for >3 hours). The AQS has also demonstrated adequate construct validity by showing expected correlations with maternal sensitivity and maternal attachment representations (Eiden, Teti, & Corns, 1995; Posada, Waters et al., 1995), as well as social competence with peers (van IJzendoorn et al.,

2004). Posada et al. have demonstrated the cultural validity of the AQS in a study assessing children from seven countries, including those in Asia, North and South America, Europe, and the Middle East (Posada, Gao et al., 1995). Inter-observer reliability for the AQS ranges from .72 to .95 (Solomon & George, 1999; Waters & Deane, 1985). After training to use the AQS for this study, two researchers observed five children, with inter-rater reliability across children ranging from .73 to .96 (M=.83).

In the current study, two components were added to the AQS to create a more complete database from which to complete the sort (for a similar procedure, see Weiss & St. Jonn-Seed, 2002). First, during the observation mothers were asked to leave the room for 4-5 minutes, without telling the child that they were going or when they would return; the researcher noted the child's level of distress at separation and behavior upon reunion. During the separation, the researcher attempted to play with the child. Second, mothers filled out a questionnaire consisting of the 90 items in the AQS, rating each item between 1 ("very unlike" the child) and 9 ("most like" the child); categories 4-6 were described as "neither like or unlike" the child. This questionnaire was used as additional information when completing the sort for items that could not be observed during the visit (for example: "Child often cries or resists when mother takes him to bed for naps or at night"). There has been no psychometric testing of these added components. All sorts were completed within 24 hours after the observation.

Age at Adoption

A continuous score of the child's age in months at adoption was used in the analysis.

Developmental Status

Ages and Stages Questionnaire (ASQ). The ASQ (Bricker & Squires, 1999) is a screening tool to detect developmental delays during the first five years of life. Parents fill out 30-item questionnaires that cover five areas—communication, gross motor, fine motor, problem solving, and personal-social. Professionals then convert parent responses of “yes,” “no,” or “not yet” to points and compare the score in each area to cutoff points 2 standard deviations below the mean (these cutoff points were derived from combined samples of risk and non-risk children). Scores above the cutoff point indicate typical development while those below indicate that some action, such as referral or follow up, should be taken. The ASQ has received extensive psychometric testing. Criterion-related validity with other standardized assessments has ranged from 76% to 91%, with an overall agreement of 84%. The measure’s ability to identify typically developing children (specificity) was 86% overall and its ability to identify delayed development (sensitivity) was 72% overall. Test-retest reliability was assessed by having 175 parents complete identical questionnaires 2 weeks apart and resulted in 94% agreement between responses. Inter-rater reliability was assessed by comparing the classifications by 112 parents with two examiners, with 94% agreement between classifications. An excerpt of the ASQ can be found in Appendix C.

In this study the ASQ (both individual subscales and total score) was used to describe the sample and to determine if delay that persisted at the sixth month postadoption affected attachment security. The ASQ was mailed to the mother, who completed it prior to the first visit.

Anthropometric data. Mothers recorded their children’s height, weight, and head circumference at the first postadoption medical visit in the US and at the most recent

medical visit. The percentile for each anthropometric measure was determined by the researcher. In this study anthropometric data were used (1) to further describe the sample and (2) as an indicator of psychosocial neglect (Johnson, 2000; Kertes et al., 2008)

History of Care

History of Care Questionnaire. The History of Care Questionnaire was created by the researcher for this study. In this questionnaire, the mother reported the kinds of preadoption care her child experienced—birth parent(s) care, foster care, and institutional care—and the length of time in each form of care. She also reported her assessment (on a 3-point scale) of five areas of preadoption care: the amount of caregiver interaction, the amount of affection and warmth from those caregivers, the amount of physical and mental stimulation, the quality of overall physical care, and the presence of harsh punishment or abuse. The resulting history of care score had three parts: (1) a length of care score, comprised of the number of days in each form of care; (2) a quality of care score, comprised of the sum of the mother's responses to five areas of care listed above (with a higher score indicating better quality care); and (3) a placement score, comprised of the number of preadoption placements a child experienced. A placement was defined as a change in the kind or location of care (e.g. moving from birth parent to orphanage care, or from one orphanage to another), unless there was no change in caregiving (e.g. moving to foster care in the home of the child's orphanage caregiver was not counted as a new placement).

The History of Care Questionnaire was mailed to the mother, who completed it prior to the first visit. See Appendix D for a copy of the questionnaire.

Stress Level (Basal Salivary Cortisol)

Basal salivary cortisol level. Cortisol is a measure of hypothalamic-pituitary-adrenocortical (HPA) system function, a system that plays a central role in the body's response to stress. Although originally measured in blood serum, cortisol is now standardly measured in saliva because the procedure is non-invasive (Neu, Goldstein, Gao, & Laudenslager, 2007). To increase reliability, child saliva samples were collected by the mother on three consecutive days, between 9 and 11 am. The mother placed two absorbent swabs in the child's mouth for 1 minute, moving them around to collect as much saliva as possible. She then placed the swabs in a tapered vial (labeled with time and date) and stored them in the freezer until the three samples were collected. Vials were mailed to the laboratory and stored at -20 degrees C until assayed. These collection, storing, and mailing procedures do not affect cortisol levels (Clements & Parker, 1998; Donzella, Talge, Smith, & Gunnar, 2008). Samples were assayed at the biochemical laboratory of the University of Trier using a time-resolved fluorescence immunoassay. Saliva samples were centrifuged at 2000 g for 10 minutes, which resulted in a clear supernatant of low viscosity. Cortisol levels were determined employing a competitive solid phase time-resolved fluorescence immunoassay with fluoroimetric end point detection (DELFLIA). 96-well-Maxisorb microtiterplates were coated with polyclonal swine anti-rabbit immunoglobulin. After an incubation period of 48h at 4°C plates were washed three times with washbuffer (pH=7.4). In the next step the plates were coated with a rabbit anti-cortisol antibody and incubated for 48h at 4°C. Synthetic saliva mixed with cortisol in a range from 0-100nmol/l served as standards. Standards, controls (saliva pools) and samples were given in duplicate wells. 50µl of biotin-conjugated cortisol was added and after 30min of incubation the non-binding cortisol / biotin-conjugated cortisol

was removed by washing (3x). 200µl europium-streptavidin (Wallac, Turku, Finland) was added to each well and after 30 minutes and 6 times of washing 200µl enhancement solution was added (Pharmacia, Freiburg, Germany). Within 15 min on a shaker the enhancement solution induced the fluorescence which can be detected with a DELFIA-Fluorometer (Wallac, Turku, Finland). With a computer-controlled program a standard curve was generated and the cortisol concentrations of the samples were calculated. The intra-assay coefficient of variation was between 4.0% and 6.7%, and the corresponding inter-assay coefficients of variation were between 7.1% -9.0%.

Each sample was analyzed in duplicate, and unexpected high or low values were re-analyzed. For this study, the mean of the 3 samples was used in the analysis.

Cortisol Collection Day Questionnaire. Factors such as sleep, eating, teething, the use of medicines, a change in routine, and daily stresses can affect the integrity of salivary cortisol readings (Egliston, McMahon, & Austin, 2006). While mothers were instructed to avoid sampling on days when a child was experiencing a change in routine or more daily stresses than usual, avoiding changes in the timing of sleep or feeding, or the presence of medicines or teething are not always practical. To obtain information about factors that may have affected cortisol results, mothers filled out a brief questionnaire on each of the three collection days and returned the questionnaire with the saliva samples. See Appendix E for a copy of the questionnaire.

Maternal Attachment Representations

Adult Attachment Projective (AAP). The AAP (George, West, & Pettem, 1997) consists of eight simple line drawings, seven of which depict scenes—such as separation, illness, and death—that are designed to activate the attachment system. For each picture, participants are asked to construct a story, describing what is happening in the picture,

what led up to the scene in the picture, what the character(s) are thinking or feeling, and what will happen next. Although the pictures function as projective stimuli, the format for administering the AAP combines projective and interview techniques, with the interviewer choosing from a list of standardized probes to elicit a complete story for each picture. After the audiotape has been transcribed, coders evaluate three aspects of the stories—content, discourse, and defensive processes—and then assign the individual one of four classifications: *Secure (F)* individuals construct stories in which they are confident that attachment figures can alleviate distress; *dismissing (Ds)* individuals discount the importance of attachment figures or themes in their stories; *preoccupied (E)* individuals have difficulty deciding on a story or construct stories that are incoherent or contain passive or helpless characters; and *unresolved (U)* individuals construct stories in which difficult themes, like danger and abandonment, are never worked through.

The AAP was designed to assess attachment representations in a more efficient and cost-effective manner than the Adult Attachment Interview. The AAP has shown criterion-related validity (George & West, in press) with the Adult Attachment Interview, with 90% agreement between the four attachment groups ($\kappa=.84$), as well as discriminant validity, with no significant differences among attachment groups on verbal intelligence or social desirability. Test-retest reliability, in which the AAP was administered 12 weeks after the original administration, was 84% ($\kappa=.78$) among the four attachment groups, while inter-rater reliability ranged from 85% to 90% ($\kappa=.79-.85$). In this study, the researcher administered the AAP at the second visit, and the transcribed audiotapes were coded by Carol George, co-author of the AAP. Dr. George

was blind to all other information about study participants. For an example of an AAP drawing, see Appendix F

Data Analysis

Analyses were conducted in three steps. First, descriptive statistics and frequencies were run to describe the sociodemographic characteristics of the sample and to check for normality in key variables. Second, relationships between the dependent and independent variable were computed in three ways: (1) Pearson or Spearman rho correlation coefficients were computed to determine preliminary relationships between the continuous independent variables and the child's attachment security score; (2) t-tests were computed to determine the significance of the dichotomous independent variable, number of preadoption placements, to attachment security; (3) Kruskal-Wallis tests were computed to identify differences in attachment security scores for children with mothers having autonomous, dismissing, preoccupied, and unresolved states of mind. In addition, potential confounds were assessed in two ways: first, by computing correlations, t-tests, Fisher's Exact Tests, and phi and Cramer's V tests between key variables and all demographic variables (the mother's age, ethnicity, education, marital status and family income, as well as the child's gender, ethnicity, birth country, and presence of siblings) and, second, by computing correlations and t-tests between daily cortisol values and conditions that might have affected those values, such as minutes since awakening, timing of food or milk consumption, or atypical distress or routine on collection day. Finally, those variables with the most significant correlations to the AQS score—developmental status, number of preadoption placements, and stress level—were entered

into a regression equation, to see how these variables might work together to contribute to the variance in attachment security. All analyses used an a priori alpha level of .05.

Chapter 4: Results

This chapter presents the study results in three parts: (1) a description of the mothers and children comprising the sample, (2) the testing of statistical assumptions, and (3) the preliminary and final analyses.

Description of the Sample

Sociodemographic Characteristics

Eighteen mothers (82%) were Caucasian, three were Asian (Chinese, Filipino, and Indian) and one was Hispanic. The average age of the mothers was 42 years (SD=4.77, range 33-51 years) and 82% were married. All mothers were well educated, possessing at least a college degree, with 68% also completing graduate or professional school. Family income was high, with all families earning at least \$76,000 per year and 55% earning more than \$150,000 per year.

The majority of the children in the sample was female, and the average age at adoption was 13 months (SD=5.35; range 6-30 months). The children came from 9 different countries (68% from six Asian countries, 14% each from Africa and Central America, and 5% from Russia/Eastern Europe). Exactly half of the children had an older sibling, with 41% having one sibling and 9% two or more siblings. Eighteen percent of these siblings had been adopted internationally and 12% domestically.

Sociodemographic characteristics of these 22 mother-infant dyads are summarized in Table 4.1.

Table 4.1

Frequencies and Percentages for Sociodemographic Variables (n=22)

| Variable | N | Percentage |
|------------------------------------|----|--------------|
| Mother's age: mean (SD) | | 41.77 (4.77) |
| 30-34 | 2 | 9.1% |
| 35-39 | 5 | 22.7% |
| 40-44 | 7 | 31.8% |
| 45-49 | 7 | 31.8% |
| >50 | 1 | 4.5% |
| Mother's ethnicity | | |
| Hispanic or Latina | 1 | 4.5% |
| Asian | 3 | 13.6% |
| White or Euro American | 18 | 81.8% |
| Mother's education (highest level) | | |
| College | 7 | 31.8% |
| Graduate School | 11 | 50.0% |
| Professional School | 4 | 18.2% |
| Marital Status | | |
| Single | 3 | 13.6% |
| Married | 18 | 81.8% |
| Partnered Relationship | 1 | 4.5% |
| Family Income | | |
| \$76,000 – 100,000 | 3 | 13.6% |
| \$101,000 – 150,000 | 7 | 31.8% |
| > \$150,000 | 12 | 54.5% |
| Child's Gender | | |
| Girls | 16 | 72.7% |
| Boys | 6 | 27.7% |
| Child's Age at Adoption: mean (SD) | | 12.82(5.35) |
| 6 – 12 months | 13 | 59.1% |

| Variable | N | Percentage |
|-----------------------|---|------------|
| 13-18 months | 7 | 31.8% |
| 19-24 months | 1 | 4.5% |
| 25-30 months | 1 | 4.5% |
| Child's Birth Country | | |
| China | 6 | 27.3% |
| Vietnam | 4 | 18.2% |
| Ethiopia | 3 | 13.6% |
| Guatemala | 3 | 13.6% |
| Taiwan | 2 | 9.1% |
| Other | 4 | 18.2% |
| Child's Siblings | | |
| 1 sibling | 9 | 41.0% |
| 2-4 siblings | 2 | 9.1% |

Age at Adoption

There was one outlier >2 SD above the mean for the child's age at adoption, with the rest of the scores falling within 2 SD above and below the mean.

Developmental Status

Ages and Stages Questionnaire. Almost all the mothers in this sample verbally commented to the researcher that their children had been delayed in at least some domains at adoption but that they were "catching up" with their peers. Overall, results in the 5 domains assessed in the Ages and Stages Questionnaire confirmed this view. Out of a possible score of 60 in each domain, sample means were as follows: communication, 40.9 (SD=16.23), gross motor skills, 55.9 (SD=6.84), fine motor skills, 49.6 (SD=12.5); problem solving, 48.4 (SD=9.58); and personal social, 46.6 (SD=6.43). All of these means were above the screening cutoff and thus indicated that, on average, children in the

sample were showing typical development. There were, however, children who fell below the cutoff in each area except gross motor skills: 32% fell below the cutoff in communication, 14% in fine motor skills, 9% in problem solving skills, and 5% in personal social skills. The greatest variability, as indicated by the large standard deviation, was found in communication skills.

Anthropometric data. At the first medical visit, the mean percentile (SD) for the children's height was 26.86% (25.35), weight was 15.63 (20.76), and head circumference was 31.0% (30.63). By the most recent medical visit—which varied between 14 and 33 weeks postadoption due to the routine scheduling of primary care visits—these percentiles had risen to 33.77% (23.48) for height, 24.86% (23.69) for weight, and 39.89% (30.30) for head circumference. Since there were 4 children with missing values for head circumference at the most recent medical visit, these missing values were estimated by (1) computing the percent change between medical visit one and two for the sample with complete data (=4%) and (2) adding 4% to the head circumference at the first medical visit for those children with missing values at the most recent medical visit.

These percentile means were influenced by several children with high anthropometric measures. A more telling statistic may be that 10 children (45%) had at least one anthropometric measure below the 3rd percentile at either the first or most recent medical visit. At the first visit, 2 fell below the 3rd percentile for height, 7 for weight, and 5 for head circumference. At the most recent medical visit, 3 fell below the 3rd percentile for height, 2 for weight, and 2 for head circumference. At this visit, one child fell below the 3rd percentile for height for the first time. Due to the several children with high

anthropometric measures, median measures were used in subsequent analyses of anthropometric measures.

History of Care

Children in this sample had spent time with birth parents, in foster care, and in orphanage care. While 23% had experienced only foster or orphanage care, most received several forms of care: 32% received birth parent and orphanage care (time with birth parents ranged from 3 days to 1 year), 14% received foster and orphanage care, 9% received birth parent and foster care, and 14% received all these forms of care. Sixty-eight percent of the sample had 1 placement while 32% had ≥ 2 preadoption placements. The mean number of days spent in birth parent care was 54.05 (SD=107.60), in foster care 146.57 (SD=220.27), and orphanage care 180.33 (SD=160.34). Since the days in birth parent, foster, and orphanage care clustered around certain numbers, an ordinal scale was created to better reflect the data. The five levels used for each length of care variable were 1-30 days, 31-100 days, 101-200 days, 201-300 days, and >300 days.

Three mothers had insufficient information to answer all five questions for the quality of care score. One mother omitted one question, and two mothers omitted two questions. In the questionnaire with one omitted question, the missing value was replaced with the average of the remaining four questions. Questionnaires missing two questions were counted as missing data. Overall, mothers rated their child's care as being above average to good in quality. On a 3-point scale (with 3 as the best care), the mean of the mothers' ratings were as follows: amount of contact with caregivers, 2.7 (SD=.73); amount of affection and warmth from caregivers, 2.7 (SD=.57); amount of physical and mental stimulation, 2.3 (SD=.69); overall physical care, 2.2 (SD=.80); and absence of harsh punishment or abuse, 2.9 (SD=.29). There were two outliers >2 SD below the

mean in quality of care, with the rest of the scores falling within 1 SD above and below the mean. There was a significant difference, however, in the ratings between mothers whose children were in foster or orphanage care as their primary form of care, with foster care rated as higher quality care, $t_{18} = 1.831$, $p = .05$. Mothers' ratings, of course, contain unmeasured biases on the part of the parents or those that described care to the families. As described in chapter 2, a less subjective measure of quality of psychosocial care may be anthropometric data. In this sample one child fell below the 3rd percentile in weight, height, and head circumference at the first medical visit. For the sample as a whole, the mean for both height and weight-for-height at the first medical visit fell within 1 SD below the mean, using WHO standardized scores (World Health Organization, 2006).

Stress Level (Basal Salivary Cortisol)

The original mean cortisol level, averaged over 3 days, was 9.47 nmol/l (SD=16.56), with a range from 0.20 to 60.41 nmol/l. Two values were outliers—one >2 and another >3 SD above the mean, while the rest of the sample fell between 1 SD above and below the mean.

Eighteen of the twenty-two participants completed the cortisol samples. Of the four who did not, one declined at the beginning of the study and three were unable to complete the samples due to noncompliance or illness. These four participants were excluded from the regression analysis (see below) since this statistical test requires complete data for all participants. There were no significant differences in attachment security between those who did and did not complete cortisol sampling.

Maternal Attachment Representations

Results of the Adult Attachment Projective revealed that only 3 mothers (14%) received a secure classification. The majority of mothers were insecure, receiving either a dismissing (31.8%), preoccupied (27.3%), or unresolved (27.3%) classification.

Testing of Statistical Assumptions

In preparation for computing correlation coefficients and multivariate regression, data were examined to see if they met the assumptions of normality, linearity, constant variance, and independence. After the regression model was specified, residuals were examined to further check these assumptions.

Normality

In exploratory analyses, normality of the AQS score and potential predictors was first checked qualitatively through histograms. The degree of skewness was then calculated, with results ≥ -1 or ≤ 1 for all variables except age at adoption (skewness=1.58), days in birth parent care (skewness=1.67), days in foster care (skewness=-1.16), quality of care (skewness=-1.60), and stress level (skewness=2.62). After winsorizing those variables with outliers >2 SD above or below the mean (see “Constant Variance” below), skewness was reduced to: age at adoption, .289; history of care, -1.52, and stress level, 1.0. After the regression was run, skewness of the residuals was checked and found acceptable. Skewness of studentized residuals, the most conservative estimate and the most appropriate for this small sample, was .593.

Linearity

Initial scatter plots of the AQS scores and potential predictors showed no evidence of a curve, indicating that the variables were linearly related. Normal

probability plots of the regression residuals further supported this assumption, with residuals falling near the regression line.

Constant Variance

As described above, three predictors had outliers >2 SD above or below the mean: age at adoption, history of care, and stress level. Outliers were winsorized (Tukey, 1977) to the closest value within 2 SD of the mean. Resulting scatter plots of the dependent variable and all predictors showed random scatter, thus supporting the assumption of common variance.

After the regression was run, the assumption of constant variance was checked qualitatively by examining box plots and normal probability plots of the studentized regression residuals, which showed no outliers. In quantitative analysis, standardized residuals ranged from -1.67 to 2.41, studentized residuals from -1.92 to 2.70, Cook's Distance from .00 to .62, and the Centered Leverage Value from .05 to .18 (the acceptable range for the Leverage statistic in this sample was $\leq .33$).

Independence

Observations of the dependent variable and predictor variables were independent. Participants came from 10 different adoption agencies or internet listserves, and lived in 13 cities throughout the San Francisco Bay Area. Two of the participants had traveled in the same parent group to adopt their children but were recruited separately to the study and were in infrequent contact during the study.

Results: Preliminary Analyses

Aim One

The purpose of aim one was to describe the types of attachment behavior children exhibited at six months postadoption. In this sample, AQS scores ranged from .18 to .72,

with a mean of .48 (SD=.16). In samples of middle class intact families assessed with the observer AQS, approximately 1/3 of children fall below .30; thus Everett Waters, author of the AQS, recommends using .30 as the cut-off for security (personal communication, October 30, 2008). Using the same cut-off for this sample, 19 children (86%) were securely attached to their adoptive mothers and 3 children (14%) were insecurely attached.

To further describe attachment behavior, the sample was split at the median to create low and high secure groups. Groups were then compared for the insecure items (those ranked one or two in the AQS security sort) and secure items (those ranked eight or nine in the security sort) that most contributed to group differences. As shown in Table 4.2, groups differed on one insecure item (with a trend toward significance in two additional items) and on three secure items (with a trend toward significance in three additional items).

Table 4.2

Attachment Security Items Contributing to Low/High Secure Group Differences

Insecure Items (on which the low secure group scored higher)

Item #54: Child acts like he expects mother to interfere with his activities when she is simply trying to help him with something. $t(12.929) = 2.17, p = .05$.

Item #34: When child is upset about mother leaving him, he sits right where he is and cries. Doesn't go after her. $t(20) = 1.84, p = .08$.

Item #88: When something upsets the child, he stays where he is and cries. $t(20) = 1.84, p = .08$.

Secure Items (on which the high secure group scored higher)

Item #11: Child often hugs or cuddles against mother without her asking or inviting him to do so. $t(13.81) = -2.43, p = .03$.

Item #14: When a child finds something new to play with, he carries it to mother or shows it to her from across the room. $t(20) = -3.282, p = .004$.

Item #28: Child enjoys relaxing in mother's lap. $t(15.72) = -2.55, p = .02$.

Item #42: Child recognizes when mother is upset. Becomes quiet or upset himself. Tries to comfort her; asks what is wrong, etc. $t(20) = -1.82, p = .08$.

Item #44: Child asks for mother to and enjoys having her hold, hug, and cuddle him. $t(16.122) = -1.86, p = .08$.

Item #53: Child puts his arms around mother or puts his hand on her shoulder when she picks him up. $t(14.08) = -1.87, p = .08$.

Finally, to check for potential confounds, correlations and t-tests were computed to determine if the child's attachment security differed by sociodemographic variables or the number of research visits. None of these tests were significant.

Aim Two

Aim two examined the degree to which the child's age and developmental status, history of care, and stress level (basal salivary cortisol) contribute to attachment behavior at six months postadoption.

To determine the most relevant child variables to enter into the regression model, Pearson or Spearman rho correlations and t-tests were computed between the child's attachment security and the following predictors: age at adoption, developmental status (total score of the Ages and Stages Questionnaire), history of care variables (length of each type of preadoption care, number of preadoption placements, and quality of care), and stress level (basal salivary cortisol).

One of the predictor variables (stress level) was moderately associated with attachment security, as shown in Table 4.3.

Table 4.3

*Correlations Between Child's Attachment Security and Predictor Variables
(n=22 unless specified)*

| Variable | Correlation Coefficient |
|--------------------------------------|-------------------------|
| Age at Adoption | .176 |
| Developmental Status (ASQ) | .289 |
| History of Care | |
| Days in Birth Parent Care (n=14)+ | .023 |
| Days in Foster Care (n=10)+ | -.202 |
| Days in Orphanage Care (n=16) | .130 |
| Quality of Care (n=20)+ | .046 |
| Stress Level (Mean of 3 Days) (n=18) | -.339 |

+Spearman rho correlations. All other correlations are Pearson correlations.

Results of t-tests to determine whether there were significant differences in attachment security between children who had 1 or ≥ 2 preadoption placements were as follows:

$$t(20) = 1.166, p = .257.$$

Table 4.4 shows the correlations among predictor variables.

Table 4.4

Correlations Between Predictor Variables

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|------|------|------|-------|-------|-------|
| 1. Age at Adoption (n=22) | | .335 | .467 | .611 | -.039 | -.205 | -.065 |
| 2. Developmental Status (n=22) | | | .253 | .571 | -.315 | .340 | -.038 |
| 3. Length of Care: Days in Birth Parent Care (n=14)+ | | | | .000 | -.397 | -.122 | -.242 |
| 4. Length of Care: Days in Foster Care (n=10)+ | | | | | -.803 | .059 | .165 |
| 5. Length of Care: Days in Orphanage Care (n=16) | | | | | | -.141 | .595* |
| 6. Quality of Care (n=20)+ | | | | | | | .041 |
| 7. Stress Level (n=18) | | | | | | | |

*Correlation significant at the .05 level

+ Spearman rho correlations. All other correlations are Pearson correlations.

There were five moderate associations and four large associations between predictor variables. Moderate associations included the following: age at adoption and developmental status, age at adoption and days in birth parent care, developmental status and days in orphanage care, developmental status and quality of care, and days in birth

parent care and days in orphanage care. Large associations included age at adoption and days in foster care, developmental status and days in foster care, days in foster care and days in orphanage care, and days in orphanage care and stress level.

Table 4.5 shows the results of t-tests between the dichotomous predictor, number of preadoption placements, and other predictor variables.

Table 4.5

t-tests Between Number of Preadoption Placements and Predictor Variables

| Variable | Group Status Mean | | t-test |
|---------------------------|-------------------|---------------|--------|
| | 1 placement | ≥2 placements | |
| Age at Adoption | 11.67 | 13.57 | -1.03 |
| Developmental Status | 238.67 | 242.86 | -.29 |
| Days in Birth Parent Care | 1.56 | 2.40 | -1.04 |
| Days in Foster Care | 4.00 | 3.75 | .253 |
| Days in Orphanage Care | 4.40 | 2.17 | 6.02 |
| Quality of Care | 2.59 | 2.76 | -1.135 |
| Stress Level | 6.05 | 2.57 | 2.27* |

*Correlation significant at the .05 level

There was one significant t-test between number of preadoption placements and stress level.

To check further for potential confounds, correlations, t-tests, Fisher Exact Tests, and phi and Cramer's V tests were computed between predictor variables and (1) the sociodemographic variables listed in Table 4.1 and (2) the number of research visits. None of these tests were significant. Correlations between a child's stress level and potential confounds from sampling (minutes between awakening and the sample, food or

milk within one hour of the sample, unusual routine or atypical distress on sampling days) were also computed. Again, none of these tests were significant.

Aim Three

Aim three examined the degree to which the mother’s attachment representations contributed to a child’s attachment behavior at six months postadoption. Mean ranks of the Kruskal-Wallis test (see Table 4.6) showed that the distribution of attachment security between the four AAP classifications was not significant ($X^2(3) = .789, N=22, p=.852$). Mothers of the three insecure children were represented by each insecure AAP classification—i.e. one mother was dismissing, one preoccupied, and one unresolved.

Table 4.6

Kruskal-Wallis Mean Ranks for Four AAP Classifications and Mean AQS Score

| AAP Classification | N | Mean Rank | Mean AQS Score |
|--------------------|---|-----------|----------------|
| F (Secure) | 3 | 12.00 | .48 |
| Ds (Dismissing) | 7 | 9.71 | .44 |
| E (Preoccupied) | 6 | 12.50 | .50 |
| U (Unresolved) | 6 | 12.33 | .50 |

Results: Final Analyses

Preliminary analyses in Table 4.5 indicated that there was no relationship between maternal attachment representations (AAP) and children’s security of attachment (AQS), so this maternal variable was not entered into the regression model.

Although none of the correlations in Table 4.3 were statistically significant due to the small sample size, the two predictors with the highest correlation coefficients—developmental status and stress level—were entered into an exploratory regression model. The dichotomous predictor, number of preadoption placements, was also entered

since it had the third lowest p value of the predictors. The goal of this exploratory analysis was to assess the strengths of the three predictors while controlling for the other independent variables in the model. The optimum combination of these three predictors accounted for approximately 38% of the variance and the model was significant ($F_{(3,14)} = 4.524, p = .02$). However, only two predictors made significant contributions to the model: number of preadoption placements ($p=.014$) and stress level ($p=.016$). There were no problems with multicollinearity.

Thus the final model included two predictors: number of preadoption placements and stress level. The optimum combination of these predictors explained approximately 40% of the variance ($F_{(2, 15)} = 6.602, p = .009$) as shown in Table 4.7.

Table 4.7

Regression Model for Contribution of Child Stress Level and Number of Preadoption Placements to Attachment Security (n=18)

| Model | R | R Square | Adjusted R Square | Std. Error | F | df1 | df2 | Sig. |
|-------|------|----------|-------------------|------------|-------|-----|-----|------|
| 1 | .684 | .468 | .397 | .12501 | 6.602 | 2 | 15 | .009 |

In this model both predictors made a significant, unique contribution to attachment security (see Table 4.8), with number of preadoption placements making the largest contribution. Number of preadoption placements independently accounted for 14% of the total variance in attachment security ($p=.007$), controlling for stress level. Stress level independently accounted for 12% ($p=.011$) of the variance in attachment security, controlling for the number of preadoption placements. Since both regression coefficients were negative, this meant that as the number of preadoption placements decreased, attachment security increased, controlling for stress level. Similarly, as stress level

decreased, attachment security increased, controlling for number of preadoption placements.

Table 4.8

Coefficients for Predictors in Final Regression Model (n=18)

| Variable | B | Std. Error | Beta | Sig. | Sr ² | CI for B |
|----------------------------------|-------|------------|-------|------|-----------------|----------------|
| Number of Preadoption Placements | -.215 | .068 | -.648 | .007 | .35 | -.360 to -.070 |
| Stress Level | -.023 | .008 | -.598 | .011 | .30 | -.039 to -.006 |

Summary of Findings

The main findings of this study were:

1. Using the .30 cutoff for security recommended by E. Waters for low risk samples, the majority of children at six months postadoption were securely attached to their adoptive mothers.
2. The child's age at adoption and developmental status, as well as the mother's attachment representations, did not predict attachment security at six months postadoption.
3. The child's stress level (basal salivary cortisol) and history of care (specifically, the number of preadoption placements) predicted attachment security at six months postadoption. These two factors explained approximately 40% of the total variance in attachment security as measured by the Attachment Q-Set.

Chapter 5: Discussion

Sample Characteristics

The sociodemographic characteristics of the mothers in this sample were similar to those found in other studies of internationally adopted children—i.e. adoptive mothers are typically Caucasian, married, middle or upper middle class, and well educated (Chisholm et al., 1995; Hellerstedt et al., 2008; Stams et al., 2002). Adopted children, however, have shown greater variability across samples. This sample resembled previous studies assessing attachment security (Chisholm, 1998; Chisholm et al., 1995; Juffer & Rosenboom, 1997; Marcovitch et al., 1997; O'Connor et al., 2003; Michael Rutter et al., 2007; Stams et al., 2002; van Londen et al., 2007) in having a greater number of girls than boys. But the sample differed in age at adoption and birth country. Samples in previous studies typically demonstrated a large age range (e.g. 4-64 months) or were comprised of children adopted at < 6 months. In this sample all but one child were adopted between 6 and 19 months, thus at an age when children typically begin to consolidate their attachment behavior around a few preferred caregivers. Previous samples have been comprised of children from a single country (Romania) or with a majority ($\geq 71\%$) adopted from 2 countries. In this sample nine countries were represented, with the most represented country accounting for approximately 27% of the sample. This variability is important for assessing the diversity in international adoptees since preadoption circumstances—for example, the percentage of children who are institutionalized—vary considerably between countries.

Quality of preadoption care also differed from previous studies. In those samples, Romanian children had experienced severe deprivation prior to adoption, while those from the other sending countries—China, Columbia, Ethiopia, Russia, South Korea, Sri

Lanka, Taiwan, and Vietnam—reported more moderate deprivation. In the non-Romanian samples, all but two were comprised of children adopted at <6 months, thus limiting their exposure to adverse care. Children in the current sample spent over twice as long in what appears to be moderately depriving preadoption care. Anthropometric data from the first medical visit in the US suggests that some children were malnourished prior to adoption, an interpretation supported by the fact that mothers rated “overall physical care” lowest in the quality of care score. But mothers rated psychosocial care, (“amount of contact with caregivers” and “amount of affection and warmth from caregivers”) highly, and these ratings were also supported by anthropometric data—i.e. by the fact that only one child fell below the third percentile in all measures (weight, height, and head circumference) at the first medical visit and that standardized scores for height and weight-for-height both fell within 1 standard deviation below the mean. As described in chapter 2, psychosocial neglect has been associated with low scores in all three anthropometric measures or a discrepancy between height and weight-for-height—i.e. normal or above normal weight and below normal height. Thus the quality of preadoption care in this sample may be tentatively described as moderately depriving for physical care, with a lesser degree of deprivation in psychosocial care.

Finally, as mentioned in chapter 2, all but one previous (early adoption) study has assessed children’s attachment security with varying lengths of time in the adoptive home, often a range of 1-2 years. In this study, all children had been in their homes—and thus developing a relationship with their adoptive mothers—for the same length of time.

Attachment Behavior

Children in this study appeared to be exhibiting comparable—and sometimes greater—attachment security than children assessed with the AQS in low and high risk samples. In the low risk samples Waters used to derive the .30 cutoff for security, for example, 67% were rated secure compared with 86% of the current sample. A more useful comparison, however, would be the sample means of high risk groups. Here, domestic adoptees in Portugal (Verissimo & Salvaterra, 2006) and Greece (Vorria et al., 2006), almost all of whom were institutionalized before adoption, provide the best comparison since the full AQS has not been used to assess international adoptees. The current sample mean of .48 fell between these two European studies, which reported means of .39 and .50, respectively. In both European samples, however, children had been in their adoptive homes an average of about 2.5 years. While little is known about the length of time it takes to develop an attachment after international adoption, the 6 months experienced by the current sample is a relatively short time—especially when children have been institutionalized or experienced multiple preadoption placements. Thus it is possible that secure attachment behavior in the current sample, given consistent caregiving, might increase over time. Support for this idea comes from a sample of US foster care children, where children in the treatment group continued to show increases in secure attachment behavior throughout the first year post placement (Fisher & Kim, 2007). Since adoption is a “natural experiment” (Rutter, Pickles, Murray, & Eaves, 2001), the treatment group would be the closest comparison group to international adoptees. Overall, then, children in this sample appear to be doing well in attaching to their adoptive mothers.

Since this is the first study to assess attachment behavior at six months postadoption, a primary aim was to describe the kinds of behavior children exhibit when the attachment bond is relatively new or still in the process of forming. In examining the individual AQS items that most differentiated the high/low secure groups, a fairly consistent picture of the high secure group emerges. Six of the nine items differentiating groups involved physical contact or seeking out the mother. High secure children appear to ask for and enjoy (or be comforted by) physical contact with their adoptive mothers, both in times of low arousal (Items 11, 28, 44, and 53) and high arousal (Items 34 and 88) of the attachment behavioral system (ABS). Further, secure children exhibited behaviors that showed “affective sharing” (Item 14) and empathy (Item 28). In his explanation of AQS items, Waters (1987b) remarked that secure children are “virtually the only ones who show [affective sharing] in the Strange Situation,” thus lending further support to the children’s secure rating. Overall, the six items depict children who not only enjoy interacting—and being in close physical contact—with their adoptive mothers, but also children who are emotionally attuned to their caregivers.

The picture that emerges from the low secure group can be interpreted in at least two ways, depending on whether one assumes (1) that children in that group have formed an attachment to their adoptive mothers or (2) that at least some children are still in the process of developing that bond. In the first interpretation, children in the low secure group are differentiated from their high secure peers by their ambivalent attachment behavior. Both secure and insecure items contribute to this interpretation. Low scores on the four secure items describing physical contact, for example, indicate that these children refrain from physical contact when the ABS is minimally activated. While not in

itself ambivalent behavior, Waters (1987b) suggests that lack of contact is important because it indicates a child is less likely to seek contact when under stress (Waters, 1987b). This is, in fact, exactly what the insecure items show: Items 34 and 88 depict a child who, when upset, signals the mother by crying but does not actively seek her out. These are “passive” behaviors that would be scored “contact resistance” in the SS and thus contribute to the child’s ambivalent classification (Waters, 1987b). Item 54, the third insecure item differentiating groups, fills out the picture still further, since mothers of ambivalent infants have been described as “relatively unavailable in many contexts” but also “directly interfering with their infants’ exploration” (Cassidy & Berlin, 1994, p. 975). This item depicts a child who expects just such interference—even when it is not warranted—most likely because his exploration or autonomy has been repeatedly thwarted in the past. Finally, the interpretation of ambivalent attachment makes theoretical sense given the children’s preadoption care. In their review of the ambivalent pattern, Cassidy & Berlin (1994) noted that babies who experience neglect (as an extreme form of caregiver unavailability) would be expected to have higher rates of ambivalent attachment and, further, that home observations show mothers of ambivalent infants “occupied with routines” (p. 975). Orphanage care is characterized by both these phenomena: it has been described as “benign neglect” (Ames, 1990) and orphanage caregivers, of necessity, must focus on routines to get the job done. In such situations, it makes sense for babies to up-regulate their attachment system in hopes of receiving a bigger share of the limited caregiving resources. At adoption, children may carry these behaviors—and the internal working model underlying them—into the new attachment relationship with the adoptive mother.

The second interpretation, in which at least some low secure children are viewed as not-yet-attached, also focuses on the child's lack of initiative in seeking out the mother in times of low and high arousal of the ABS. But these behaviors would not be seen as arising from an insecure working model for four reasons. First, when examining the number of items distinguishing the high/low secure groups, there are twice as many secure as insecure items, and the secure items are more highly significant. This suggests that the low secure group scores were more influenced by a lack of secure attachment behavior than by the presence of insecure behaviors. Put differently, although low secure children are less secure than their high secure peers, they do not appear to have a consolidated insecure attachment and may thus still be in the process of forming an attachment. (Item 14, described above as seen only in secure children in the SS, is specific example of this phenomenon. This item is a strong indicator of security but its absence does not indicate insecurity (Waters, 1987). Thus the fact that low secure children scored differently on this item says more about their lack of security than their insecurity.) Second, it is noteworthy that Item 71 ("If held in mother's arms, child stops crying and quickly recovers after being frightened or upset")—the one item involving physical contact that did not differentiate groups—received the fourth highest p-value ($=.36$) of the top 20 items in the security sort. This suggests that the high/low secure groups did not differ in their ability to be comforted by the mother *when she initiated the physical contact*. Children classified as ambivalent, in contrast, typically remain distressed after contact. Third, preliminary evidence from US foster care indicates that ambivalent behavior may be associated with the transition to a new caregiving situation. In the only study that has assessed attachment behavior in newly-placed children for a

full year (Fisher & Kim, 2007), researchers found that ambivalent behaviors declined in both the treatment and control group over time—the only type of attachment behavior to do so. This suggests that at least some ambivalent behaviors are transitory, triggered more by the transition than by an insecure working model. The fourth reason supporting the interpretation of attachment-in-the-making is more conjectural. Since items differentiating the high/low secure groups cluster around one kind of behavior—that involving physical contact, especially the initiation of contact—while other kinds of secure base behavior failed to differentiate groups, it is possible that behavioral inhibition could be influencing the AQS score. For such children, the fact that they almost certainly have had less physical contact with their preadoption caregivers (if institutionalized) than normative populations—and are likely to be held less during the early months of attachment formation due to the older age at which they begin this process—may mean it takes longer for them to initiate and enjoy physical contact, and to express it as part of the attachment bond.

In summary, then, attachment behaviors in the low secure group may reflect ambivalent attachment or attachment-in-the-making, in which the attachment has developed sufficiently that a child signals her caregivers when distressed but does so in a passive rather than an active way. Until further studies more fully delineate attachment behavior in the early postadoption period, one interpretation cannot be definitively chosen over the other.

Associations Between Potential Predictors of Attachment

Preliminary correlations and t-tests between potential predictors of attachment indicated that the length of care variables (i.e. days in birth parent, foster, and orphanage

care)—although showing small or no associations with attachment security—were important for a child’s developmental status and stress level. Turning first to developmental status, the longer a child spent in orphanage care the lower the child’s developmental status, while the opposite was true for non-institutional (birth parent or foster) care. This was the case even though the strong, positive associations between age at adoption and days in birth parent or foster care indicated that, on average, children in these two forms of care were older at adoption and thus had more exposure to preadoption care. Further, the positive association with developmental status was over twice as large for days in foster care as for days in birth parent care. Possible reasons for this larger association were that (1) on average, children spent over three times as long in foster care as they did in birth parent care, and (2) none of the children received birth parent care only, while 23% of the sample received foster care alone. Turning next to stress level, the distinction between institutional and non-institutional care was again apparent when looking at the associations between stress level and days in birth parent and orphanage care (with the association between days in foster care and stress level too small to interpret). Days in orphanage care was associated with higher stress levels, while the opposite was true for days in birth parent care. This difference received further support from t-tests showing that stress levels went down as the number of preadoption placements went up. Since 71% of children who had ≥ 2 preadoption placements moved from orphanage into foster care, those with fewer placements had more exposure to institutional care.

Taken together, then, these associations between potential predictors indicate the importance of the length of time spent in various forms of preadoption care for constructs

other than attachment security. It is of note that these differential effects of preadoption care remained six months after adoption, even though 68% of the sample received a combination of institutional and non-institutional care.

Factors Affecting Attachment Behavior

Number of Preadoption Placements

Children experiencing fewer placements had higher attachment scores than children who experienced more placements, controlling for stress level. Since this was the only history of care variable that predicted attachment security, consistency of care appeared to be more important than kind of care or quality of care in fostering children's attachment.

The fact that the number of preadoption placements accounted for the most variance in attachment security is of particular interest since, as mentioned in chapter 2, the number of placements has been ignored in international adoption research to date, even while receiving much attention in the foster care literature. In foster care, however, the implications of this finding are more straightforward than in international adoption. That is, the relationship between multiple placements and lower attachment security in foster care makes intuitive and theoretical sense, since it involves fewer separations from primary caregivers in the same kind of family setting. But in international adoption, consistency often means staying in an institution rather than moving into a family setting. Thus it is especially important to remember the context in which this finding occurred: (1) Children in this sample were relatively young at adoption, thus their exposure to institutional care was limited as well; (2) All children, even those with lower quality of care scores, received at least average quality institutional care; (3) Children were assessed in the early postadoption period, when preadoption transitions may exert greater

influence on attachment security than after a longer time in the adoptive home. Therefore, these findings may not apply when adoptees experience less optimal care or even comparable quality care for longer periods.

But these findings do raise important questions about how to weigh the risks and benefits of different aspects of preadoption care. The debate thus far has focused on length and quality, and this lens appears too narrow. Clearly more research is needed—both research that assesses consistency in addition to length and quality, and longitudinal research that assesses the impact of these variables on children’s attachment trajectories after adoption.

Stress Level (Basal Salivary Cortisol)

In the current sample, results showed that children with lower basal salivary cortisol levels exhibited more secure attachment behavior, while those with higher levels exhibited more insecure behavior.

This link to attachment security provides an opportunity to expand the analysis of stress levels in children adopted internationally. In the current sample, that analysis began by comparing basal stress levels in adoptees with those in normative samples. Since there is no “standardized ‘normal range’” (Jessop & Turner-Cobb, 2008, p. 11) for cortisol values, the comparison relied on two studies of healthy, middle-class children aged 13 and 18 months (Gunnar et al., 1989; van Bakel & Riksen-Walraven, 2004a), with reported mid-morning means of 7.23 and 15.85 nmol/l, as well as a third study (McCarthy et al., 2009) of children aged 4-10 years reporting a mean of 6.23. (Due to the lack of studies reporting mid-morning values for young children, the 7.23 figure is a baseline value in a study of stress reactivity, which was taken immediately upon arrival at the laboratory and thus should not be affected by the relatively slow-acting HPA

system.). In comparison, the current sample mean of 4.89 could be interpreted in three ways: (1) as within normal range, since this range has not yet been established, (2) as hypocortisolism, and (3) as resilience (i.e. an HPA axis made more efficient in the face of manageable early life stress, as suggested by Gunnar et al. (2009)). Although there is no way to definitively decide between these interpretations, the fact that lower cortisol values predicted higher attachment security lends support to the first and third interpretations—and raises the question of the possible mechanisms supporting this level of function. To date, the international adoption literature has focused almost exclusively on preadoption care as the source of regulation and dysregulation after adoption (Bruce et al., 2000; Gunnar, 2001; Gunnar et al., 2009; Kertes et al., 2008; Wismer Fries et al., 2008). Following this approach, one possibility for the current sample is that preadoption care was “good enough” to support typical regulation or to foster resilience. But there are several possibilities for postadoption influence as well. First, expanding upon the interpretation of “good enough” preadoption care, HPA regulation at adoption may function as a protective factor that facilitates the developing attachment with the adoptive mother. This relationship, in turn, could foster increased HPA regulation through the buffering effects of responsive care (Gunnar & Donzella, 2002; Vazquez & Levine, 2005). It is also possible that the HPA axis was able to recover from a (somewhat) dysregulated state prior to adoption, due to the developing attachment with the adoptive mother. Support for possible dysregulation at adoption comes from the strong, positive correlation between basal stress levels and days in orphanage care—as well as the fact that 45% of the sample showed severe growth delay in at least one anthropometric measure at the first or most recent medical visit postadoption. Thus although these

interpretations must remain suggestive, it is noteworthy that the data provide support for the effects of pre and postadoption influence. Ideally, future research will continue to broaden the scope of inquiry by assessing basal stress levels and attachment security longitudinally, beginning immediately after adoption, in order to better understand the differential contribution of these two caregiving environments.

Results from this study can also be seen as complementing those in the studies of stress reactivity and attachment classification described in chapter two (Gunnar, 1989; Gunnar et al., 1996; Hertzgaard et al., 1995; Nachmias et al., 1996; Spangler & Grossman, 1993; Spangler & Schieche, 1998; van Bakel & Riksen-Walraven, 2004b). There, the most consistent finding was that securely attached children failed to show elevations in cortisol during the Strange Situation, regardless of whether they showed behavioral distress. In contrast, the most consistent finding regarding insecure children was that the combination of insecurity and behavioral inhibition was associated with increased adrenocortical reactivity. In a similar vein, the current study showed that lower basal cortisol levels predicted more secure attachment behavior. Further, in the interpretation of attachment behavior in the low secure group described earlier in this chapter, it was suggested that behavioral inhibition (as indicated by AQS items) could be motivating the lack of physical contact with the mother. If this interpretation is correct, then in this sample higher cortisol levels may be associated with a tendency toward behavioral inhibition, again similar to the stress reactivity literature. One difference, however, is that the interpretation offered above was used to suggest that behavioral inhibition—rather than an insecure internal working model—was influencing attachment behavior, whereas in studies of stress reactivity it is the combination of the two that is

important. Those studies, like all studies on attachment, assume that some kind of internal working model of attachment is in place, and thus there is no parallel for the effects of inhibition in children who are still forming an attachment. Thus we presently lack knowledge about whether behavioral inhibition could be a sufficient cause of insecure attachment behavior in such cases or whether inhibition must work in tandem with an insecure working model.

Maternal Attachment Representations

Two findings concerning maternal attachment representations were unexpected: (1) the high percentage of mothers (86%) rated insecure, as well as the distribution of those insecure classifications, and (2) the lack of concordance between maternal and child attachment security. Each of these factors is discussed in turn.

In comparing the current sample with other populations, the percent insecure was found comparable to some non-normative groups while the distribution of insecure classifications appeared unique to this study. Turning first to meta-analytic findings of more than 200 studies assessing adult attachment representations with the Adult Attachment Interview (AAI), researchers reported that 43% of mothers from normative samples were insecure, while the percent insecure in at-risk samples (predominantly low SES) and clinical samples was markedly higher—70% and 79%, respectively (Bakermans-Kranenburg & van IJzendoorn, 2009). Other non-normative samples showed percentages of insecure participants both above and below the normative values: 23% for Italian parents of domestically adopted children (Santona & Zavattini, 2005), 57-60% for foster care mothers (Odipo, 2002; Stovall-McClough & Dozier, 2004); 86% for middle class, first generation immigrants from Europe who had been in the US an average of 30 years and 77% for the middle class, native Californian comparison group (van Ecke,

Chope, & Emmelkamp, 2005); and 85% for young adult adoptees (Paperny, 2003). The current study thus markedly departs from the most similar population cited—that of parents of domestically adopted children—but reports similar or only slightly higher percentages of insecure participants than other samples. The almost uniform distribution in the current sample was different from both the meta-analytic findings and the individual studies, however. That is, in studies from all groups except foster care mothers, one insecure classification predominated, ranging from 43-50% of the sample. This was the unresolved classification in the clinical and immigrant groups, the dismissing category in native Californians, and the preoccupied group in the adult adoptees. Studies of foster mothers differed in reporting almost equal percentages of dismissing and unresolved participants but resembled all groups (except adult adoptees) in reporting a small percentage of preoccupied participants (range = 0-13%). In the current sample, in contrast, 27% of mothers were preoccupied and all insecure classifications were within 5 percentage points of one another.

One possible explanation for these findings could be the distinguishing characteristic of mothers in this sample—i.e. the experience of mothering a newly adopted child from another country. This experience is both similar to, and different from, parenting domestically adopted children. Santona & Zavatini (2005) list four factors affecting the transition to domestic adoptive parenting: (1) a history of infertility (for most women); (2) a lengthy institutional evaluation process; (3) uncertainty about when the adoption will take place; and (4) additional parenting responsibilities after the adoption, such as coming to terms with aspects of the child's history that may not have been disclosed, as well as understanding the unique physical and psychological needs of

adopted children. These factors are all present—and all but the first is magnified—in the transition to parenting an internationally adopted child. International adoption, for example, involves the institutional practices of a second, foreign country in addition to US procedures; adopting a child one has never met, typically at least 6 months of age; having little or no medical information about the child or knowledge of preadoption care, even while knowing the child comes from a high-risk group; and traveling to the birth country where language and cultural barriers must be negotiated simultaneously with the transition to parenting. Thus it is possible—although adult attachment representations are considered fairly stable, even across major life transitions such as marriage (Crowell, Treboux, & Waters, 2002) and motherhood (Rothschild, 1996)—that the cumulative stressors of mothering an internationally adopted child shift at least some mothers from a previously secure to an insecure classification, or from one insecure classification to another. The uniform distribution in insecure classifications still needs explaining, however. For adoptive mothers, the loss associated with infertility would suggest that the unresolved category should be overrepresented. Yet it was underrepresented (4%) in the domestic adoption study and no higher than the other insecure classifications in the current sample. Clearly, then, more research is needed to better understand the factors that may influence attachment representations in this population.

There is also the possibility that recruitment and the context for administering the AAP in this study may have influenced the results. This study used a convenience sample and thus may have appealed to adoptive mothers who were especially interested in telling their story. According to AAP author Carol George, such participants are more frequently found in the preoccupied and unresolved categories (personal communication, May 10,

2009). Even more relevant, perhaps, is that the AAP was administered directly after the mothers were interviewed about their adoption experience (an interview that was not part of this dissertation research). It is possible that this juxtaposition affected mothers' perceptions of the content of the AAP drawings, heightened their emotional response or anxiety, or motivated them to offer more personal comments in their responses than would have occurred in a more neutral context.

If some of the AAP classifications are misclassified, then the lack of concordance between maternal and child attachment security is at least partially explained. But if the classifications are correct, then this discrepancy still needs explanation. Here, the possibilities stem from the lack of explained variance between maternal and child attachment security shown in meta-analytic studies. In these studies, research on the AAI has shown a 75% concordance between maternal and child attachment using a secure-insecure split (van IJzendoorn, 1995). Half of this could be explained by chance alone, thus the AAI explains 25% of the variance and other factors must account for the remainder. A number of possibilities for explaining this remainder have been identified, although most have received less research attention than adult attachment representations. The possibilities include (1) couple attachment and marital quality (Cowan & Cowan, 2009; Dickstein, Seifer, & Albus, 2009); (2) parenting representations, which stem from a different motivational system than the attachment behavioral system (George & Solomon, 2006; Mayseless, 2006); (3) maternal sensitivity and observed parenting behavior (Adam, Gunnar, & Tanaka, 2004; DeWolff & van Ijzendoorn, 1997; Peck, 2003; Slade, Aber, Belsky, & Phelps, 1999), which are only partially explained by attachment representations; and, more generally, (4) healthy family functioning (Belsky,

1999). Since none of these variables were assessed in this study, their applicability remains speculative. But it is certainly possible that these factors, along with the strengths typically found in adoptive families (older, well-educated parents with adequate resources) may have helped create a family environment conducive to secure attachment in the adopted child—even when the mothers themselves were classified insecure.

Limitations of the Study

This study has a number of limitations. First, this was a convenience sample from the San Francisco Bay Area and may not be representative of the diversity in the population of internationally adopted infant-mother dyads. Second, the study was limited by the small sample size, resulting in a lack of power to detect aspects of the children's attachment behavior or the factors affecting that behavior. Third, as mentioned above, the AQS was designed to assess attachment security in children who have already formed an attachment. Since the children in this sample had been in their adoptive homes for only six months, it is possible that some of the children were still in the process of forming an attachment to their adoptive mothers. Fourth, parents have limited knowledge of their child's preadoption care, and thus their responses on the History of Care Questionnaire may have unmeasured biases. There was also no psychometric testing of this measure.

Implications for Future Research

These study findings suggest areas for future research in each of the topics discussed above. First, attachment behavior of children adopted internationally needs to be assessed longitudinally throughout the first year after adoption, to see if and how this behavior continues to develop. Of particular interest is whether attachment security continues to increase and ambivalent behavior decrease in the second half of the first year

after adoption. Second, temperament needs to be assessed to better understand the relationship between behavioral inhibition and attachment behavior in children who are forming a new attachment at an older age. Third, to determine the extent to which findings from the current study can be generalized to the larger population of international adoptees, the number of preadoption placements needs to be assessed in samples that differ in preadoption adversity and length of preadoption care—and in children with differing amounts of time in the adoptive home. Fourth, to better understand the influence of pre and postadoption care on HPA regulation, basal stress levels need to be assessed immediately after adoption and throughout the first year. At the same time, the responsiveness of the mother’s care and the child’s attachment security need to be assessed for their contribution to resilience in the HPA axis after adoption. Finally, when designing studies to assess maternal attachment representations, researchers should pay close attention to the context in which the AAI or AAP is administered. These studies need to include additional variables—such as couple attachment, maternal sensitivity, parenting and caregiving representations, or family functioning—to identify factors that may influence children’s attachment security after adoption.

Clinical Implications

Since this study is the first to assess attachment security of international adoptees at six months postadoption, the following clinical implications remain suggestive until confirmed by further research. First, the finding that most children were securely attached at six months postadoption indicates that a “wait and see” approach to concerns about a child’s developing attachment may be inappropriate. Instead, parents need to be

encouraged to seek help and begin intervention if the child's attachment behavior is not emerging and continuing to develop in the early postadoption period. Second, clinicians who care for international adoptees should include the number of preadoption placements in a patient history, aware that this may be a risk factor for insecure attachment. Further, while preadoption conditions are largely in the hands of foreign governments or agencies, there are areas where this finding can affect practice. In some sending countries, for example, US adoption agencies have opened their own orphanages, thus giving the agency considerable control over preadoption conditions. Instituting policies such as caregiver continuity—where caregivers move with the children from infants to toddler rooms—or housing children in multi-age “families” where they remain until adoption—would reduce the number of transitions and thus foster attachment security. Similar procedures could be instituted by private foundations or organizations that run programs within government-run orphanages. Third, the association between stress level (basal salivary cortisol) and attachment security can help expand understandings of attachment within the adoption community—from a predominantly psychological construct to one that includes neuroendocrinology. Although from its inception attachment theory has encompassed this wider view, adoptive parenting magazines and websites typically present a more narrow, psychological view. The finding regarding children's stress level does, however, give empirical grounding to advice currently given by adoption professionals—i.e. to provide a calm, structured family environment in the early postadoption period. Finally, the finding that many adoptive mothers may have insecure attachment representations suggests the need for pre and postadoption support for adoptive families. This can help prevent mothers who begin the adoption process with

secure attachment representations from moving into an insecure classification due to the stresses of adoption or promote other factors—such as couple attachment, marital quality, and healthy parenting representations—that can foster a child’s attachment security even when the mother herself has an insecure attachment.

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Appendix A

SOCIODEMOGRAPHIC QUESTIONNAIRE

Mothers: Please answer the following questions about yourself:

What is your age _____?

What is your ethnicity/race? Please check all that apply:

- | | |
|--|--|
| <input type="checkbox"/> Hispanic or Latina | <input type="checkbox"/> American Indian/Alaska Native |
| <input type="checkbox"/> Asian | <input type="checkbox"/> Native Hawaiian or Other Pacific Islander |
| <input type="checkbox"/> Black or African American | <input type="checkbox"/> White or Euro American (Caucasian) |

What is the highest level of school you have completed?

- | | |
|--|--|
| <input type="checkbox"/> Elementary school | <input type="checkbox"/> Middle school |
| <input type="checkbox"/> High school | <input type="checkbox"/> College |
| <input type="checkbox"/> Graduate school | <input type="checkbox"/> Professional school |

What is your total family income?

- | | |
|---|--|
| <input type="checkbox"/> <\$50,000 | <input type="checkbox"/> \$51,000-75,000 |
| <input type="checkbox"/> \$76,000-100,000 | <input type="checkbox"/> \$101,000-150,000 |
| <input type="checkbox"/> >\$150,000 | |

Are you: Single Married In a partnered relationship

Do you have other children? If so, please list:

| Name | Age | Gender | Adopted? (y/n) |
|------|-----|--------|----------------|
| | | | |
| | | | |
| | | | |

Please answer the following questions about your child:

Country of child's birth: _____

Child's age at adoption: _____ months

Child's gender: female male

At your child's **first** visit to a healthcare provider in the US, what was her/his

Weight: _____ pounds _____ percentile (if known)

Height: _____ inches _____ percentile (if known)

Head circumference: _____ cm _____ percentile (if known)

Date of health care visit: month _____ day _____ year _____

At your child's **most recent** visit to a healthcare provider, what was her/his

Weight: _____ pounds _____ percentile (if known)

Height: _____ inches _____ percentile (if known)

Head circumference: _____ cm _____ percentile (if known)

Date of visit: month _____ day _____ year _____

Date you returned to the US with your child: month _____ day _____ year _____

Appendix B

ATTACHMENT Q-SET SECURITY SORT

| AQS Item No. | Item | Placement in Security Criterion |
|--------------|--|---------------------------------|
| 21 | Child keeps track of mother's location when he plays around the house. Calls to her now and then; notices her go from room to room. Notices if she changes activities. | 8.8 |
| 36 | Child clearly shows a pattern of using mother as a base from which to explore. Moves out to play; returns or plays near her; moves out to play again, etc. | 8.8 |
| 71 | If held in mother's arms, child stops crying and quickly recovers after being frightened or upset. | 8.8 |
| 18 | Child follows mother's suggestions readily, even when they are clearly suggestions rather than orders. | 8.5 |
| 41 | When mother says to follow her, child does so. (Do not count refusals or delays that are playful or part of a game unless they clearly become disobedient.) | 8.5 |
| 58 | Child puts his arms around mother or puts his hand on her shoulder when she picks him up. | 8.5 |
| 60 | If mother reassures him by saying, "It's OK" or, "It won't hurt you," child will approach to play with things that initially made him cautious or afraid. | 8.5 |
| 80 | Child uses mother's facial expressions as a good source of information when something looks risky or threatening. | 8.5 |
| 90 | If mother moves very far, child follows along and continues play in the area she has moved to. | 8.3 |
| 42 | Child recognizes when mother is upset. Becomes quiet or upset himself. Tries to comfort her; asks what is wrong, etc. | 8.2 |
| 1 | Child readily shares with mother or lets her hold things if she asks to. | 8.0 |
| 70 | Child quickly greets his mother with a big smile when she enters the room. (Shows her a toy, gestures, or says, "Hi, Mommy.") | 8.0 |
| 14 | When child finds something new to play with, he carries it to mother or shows it to her from across the room. | 7.8 |
| 15 | Child is willing to talk to new people, show them toys, or show them what he can do if mother asks him to. | 7.7 |

| | | |
|-----|--|-----|
| 19 | When mother tells child to bring or give her something, he obeys. (Do not count refusals that are playful or part of a game unless they clearly become disobedient.) | 7.7 |
| 44 | Child asks for mother to and enjoys having her hold, hug, and cuddle him. | 7.7 |
| 77 | When mother asks child to do something, he readily understands what she wants. (May or may not obey). | 7.7 |
| 11 | Child often hugs or cuddles against mother without her asking or inviting him to do so. | 7.5 |
| 28. | Child enjoys relaxing in mother's lap. | 7.5 |
| 85 | Child is strongly attracted to new activities and new toys. | 7.5 |
| 32 | When mother says "no" or punishes him, child stops misbehaving (at least at that time). Doesn't have to be told twice. | 7.2 |
| 47 | Child will accept and enjoy loud sounds or being bounced around in play if mother smiles and shows that it is supposed to be fun. | 7.2 |
| 55 | Child copies a number of behavior or ways of doing things from watching mother's behavior. | 7.0 |
| 64 | Child enjoys climbing all over mother when they play. | 7.0 |
| 66 | Child easily grows fond of adults who visit his home and are friendly to him. | 7.0 |
| 9 | Child is lighthearted and playful most of the time. | 6.5 |
| 22 | Child acts like an affectionate parent toward dolls, pets, or infants. | 6.5 |
| 40 | Child examines new objects or toys in great detail. Tries to use them in different ways or to take them apart. | 6.5 |
| 88 | When child is bored, he goes to mother looking for something to do. | 6.5 |
| 86 | Child tries to get mother to imitate him or quickly notices and enjoys it when mom imitates him on her own. | 6.5 |
| 89 | Child's facial expressions are strong and clear when he is playing with something. | 6.5 |
| 5 | Child is more interested in people than in things. | 6.3 |
| 27 | Child laughs when mother teases him. | 6.4 |
| 49 | Runs to mother with a shy smile when new people visit the home. | 6.3 |
| 4 | Child is careful and gentle with toys and pets. | 6.2 |
| 12 | Child quickly gets used to people or things that initially made him shy or frightened him. | 6.0 |

| | | |
|----|---|-----|
| 48 | Child readily lets new adults hold or share things he has, if they ask him to. | 6.0 |
| 87 | If mother laughs at or approves of something the child has done, he repeats it again and again. | 5.8 |
| 46 | Child walks and runs around without bumping, dropping, or stumbling. | 5.7 |
| 62 | When child is in a happy mood, he is likely to stay that way all day. | 5.5 |
| 16 | Child prefers toys that are modeled after living things (e.g. dolls, stuffed animals). | 5.2 |
| 45 | Child enjoys dancing or singing along with music. | 5.2 |
| 73 | Child has a cuddly toy or security blanket that he carries around, takes to bed, or holds when upset. (Do not include bottle or pacifier if child is under 2 years old.) | 5.2 |
| 68 | On the average, child is a more active type person than mother. | 5.0 |
| 84 | Child makes at least some effort to be clean and tidy around the house. | 5.0 |
| 8 | When he is upset or injured, child will accept comforting from adults other than mother. | 4.8 |
| 37 | Child is very active. Always moving around. Prefers active games to quiet ones. | 4.8 |
| 39 | Child is often serious and businesslike when playing away from mother or alone with his toys. | 4.7 |
| 48 | Child stays closer to mother or returns to her more often than the simple task of keeping track of her requires. | 4.7 |
| 51 | Child enjoys climbing all over visitors when he plays with them. | 4.7 |
| 24 | When mother speaks firmly or raises her voice at him, child becomes upset, sorry, or ashamed about displeasing her. (Do not score high if child is simply upset by the raised voice or afraid of getting punished.) | 4.5 |
| 72 | If visitors laugh at or approve of something the child does, he repeats it again and again. | 4.5 |
| 78 | Child enjoys being hugged or held by people other than his parents and/or grandparents. | 4.5 |
| 7 | Child laughs and smiles easily with a lot of different people. | 4.3 |
| 29 | At times, child attends so deeply to something that he doesn't seem to hear when people speak to him. | 4.3 |
| 35 | Child is independent with mother. Prefers to play on his own; leaves mother easily when he wants to play. | 4.8 |

| | | |
|----|--|-----|
| 20 | Child ignores most bumps, falls, or startles. | 4.2 |
| 57 | Child is fearless. | 4.0 |
| 67 | When the family has visitors, child wants them to pay a lot of attention to him. | 4.0 |
| 82 | Child spends most of his playtime with just a few favorite toys or activities. | 4.0 |
| 52 | Child has trouble handling small objects or putting small things together. | 3.8 |
| 59 | When child finishes with an activity or toy, he generally finds something else to do without returning to mother between activities. | 3.8 |
| 17 | Child quickly loses interest in new adults if they do anything that annoys him. | 3.5 |
| 50 | Child's initial reaction when people visit the home is to ignore or avoid them, even if he eventually warms up to them. | 3.5 |
| 8 | When child cries, he cries hard. | 3.3 |
| 26 | Child cries when mother leaves him at home with baby-sitter, father, or grandparents. | 3.3 |
| 58 | Child largely ignores adults who visit the home. Finds his own activities more interesting. | 3.2 |
| 76 | When given a choice, child would rather play with toys than with adults. | 3.2 |
| 13 | When the child is upset by mother's leaving, he continues to cry or even gets angry after she is gone. | 2.7 |
| 23 | When mother sits with other family members or is affectionate with them, child tries to get mom's affection for himself. | 2.7 |
| 56 | Child becomes shy or loses interest when an activity looks like it might be difficult. | 2.7 |
| 31 | Child wants to be the center of mother's attention. If mom is busy or talking to someone, he interrupts. | 2.5 |
| 10 | Child often cries or resists when mother takes him to bed for naps or at night. | 2.3 |
| 30 | Child easily becomes angry with toys. | 2.3 |
| 69 | Rarely asks mother for help. | 2.3 |
| 6 | When child is near mother and sees something he wants to play with, he fusses or tries to drag mother over to it. | 2.2 |
| 25 | Child is easy for mother to lose track of when he is playing out of her sight. | 2.0 |
| 63 | Even before trying things himself, child tries to get someone to help him. | 2.0 |

| | | |
|-----|--|-----|
| 2 | When child returns to mother after playing, he is sometimes fussy for no clear reason. | 1.8 |
| 61 | Plays roughly with mother. Bumps, scratches, or bites during active play. (Does not necessarily mean to hurt mom.) | 1.8 |
| 65 | Child is easily upset when mother makes him change from one activity to another. (Even if the new activity is something the child often enjoys.) | 1.8 |
| 81 | Child cries as a way of getting mother to do what he wants. | 1.8 |
| 54 | Child acts like he expects mother to interfere with his activities when she is simply trying to help him with something. | 1.5 |
| 74 | When mother doesn't do what child wants right away, he behaves as if mom were not going to do it at all. (Fusses, gets angry, walks off to other activities, etc.) | 1.5 |
| 33 | Child sometimes signals mother (or gives the impression) that he wants to be put down and then fusses or wants to be picked right back up. | 1.3 |
| 34 | When child is upset about mother leaving him, he sits right where he is and cries. Doesn't go after her. | 1.2 |
| 38 | Child is demanding and impatient with mother. Fussing and persists unless she does what he wants right away. | 1.2 |
| 75 | At home, child gets upset or cries when mother walks out of the room. (May or may not follow her.) | 1.2 |
| 88 | When something upsets the child, he stays where he is and cries. | 1.2 |
| 79. | Child easily becomes angry at mother. | 1.0 |

Appendix C

AGES & STAGES QUESTIONNAIRE, 2ND EDITION (EXCERPT)

| | | | |
|--|-----|-----------|---------|
| Communication | | | |
| 1. Does your child name at least three items from a common category? For example, if you say to your child, “Tell me some things that you can eat,” does your child answer with something like, “Cookies, eggs, and cereal”? Or if you say, “Tell me the names of some animals,” does your child answer with something like, “Cow, dog, and elephant”? | Yes | Sometimes | Not yet |
| Gross motor | | | |
| 1. Does your child catch a large ball with both hands? You should stand about 5 feet away and give your child two or three tries. | Yes | Sometimes | Not yet |
| Fine motor | | | |
| 1. Does your child put together a six-piece interlocking puzzle? (If one is not available, take a full-page picture from a magazine or catalog and cut it into six pieces. Does your child put it back together correctly?) | Yes | Sometimes | Not yet |
| Problem solving | | | |
| 1. When you say, “Say five eight three,” does your child repeat <i>just</i> these three numbers in the correct order? <i>Do not repeat these numbers.</i> If necessary, try another series of numbers and say, “Say six nine two.” Your child must repeat just one series of these numbers to answer “Yes” to this question. | Yes | Sometimes | Not yet |
| Personal-social | | | |
| 1. Does your child serve herself, taking food from one container to another using utensils? For example, can your child use a large spoon to scoop applesauce from a jar into a bowl? | Yes | Sometimes | Not yet |

Appendix D

HISTORY OF CARE QUESTIONNAIRE

1. Please list the type(s) of care your child received before adoption (e.g. time with birth parents, foster care, orphanage care, etc.):

2. How many days did your child live

with birth parent(s): _____

in foster care: _____

in an orphanage: _____

3. Circle the number that best describes your child's interaction with his/her caregivers before adoption:

| 1 | 2 | 3 |
|--|---------------------------------------|--|
| Contact limited to routine physical care (e.g. bottles propped, diapers changed on schedule) | Some interaction beyond physical care | Frequent contact with the same consistent caregivers |

Comments _____

4. Circle the number that best describes the amount of physical and mental stimulation your child received from his/her caregivers:

| 1 | 2 | 3 |
|----------------------------------|--------------------------|------------------------------|
| Minimal or no toys or activities | Some toys and activities | Numerous toys and activities |

Comments _____

5. Circle the number that best describes your child's overall physical care before adoption:

| 1 | 2 | 3 |
|--|--|--|
| Insufficient amount of <i>one</i> of the following: nutritious food, clothing, or medical care | Adequate nutritious food, clothing, and medical care | More than adequate nutritious food, clothing, and medical care |

Comments _____

6. Circle the number that best describes any harsh physical punishment or abuse your child may have experienced before adoption:

| 1 | 2 | 3 |
|--|--|--|
| I'm fairly certain my child was physically abused (e.g. harsh physical discipline such as slapping, painful spanking, or whipping) | I suspect my child may have been physically punished or abused | I am confident my child was not physically punished or abused. |

Comments _____

7. Circle the number that best describes the affection and warmth your child may have experienced from his/her caregivers:

| 1 | 2 | 3 |
|--|--|---|
| I think my child had little or no warmth and affection from caregivers | I think my child had some warmth and affection from caregivers | I think my child had lots of warmth and affection from caregivers |

Comments _____

Appendix E

CORTISOL COLLECTION DAY QUESTIONNAIRE

Please fill out this questionnaire for each of the 3 days you collect saliva (spit) from your child:

Date of saliva/spit collection: Month _____ Day _____ Year _____

Time of saliva/spit collection: _____ AM

Is your child teething? Yes _____ No _____

When did your child last awaken from sleep? _____ AM

When did your child last eat? _____ AM

When did your child last drink milk? _____ AM/PM

Is your child on any medicines? Yes _____ No _____

If yes, please list:

Before collecting your child's saliva/spit today, was your child's daily routine:

Much like other days _____ Different from other days _____

If different from other days, please describe:

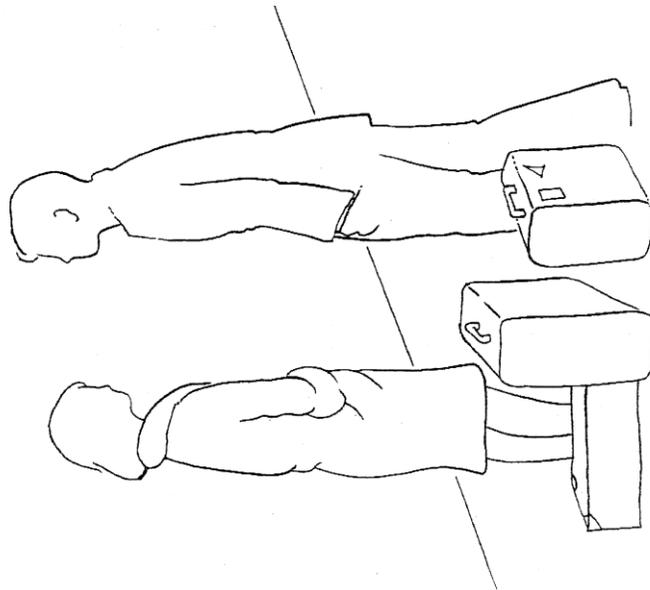
Did your child show any atypical distress (e.g. more crying or agitation than usual) this morning?

Yes _____ No _____

If yes, please describe:

Appendix F

ADULT ATTACHMENT PROJECTIVE (SAMPLE DRAWING)

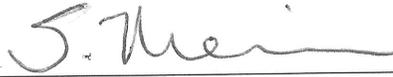


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Author Signature

11-25-09

Date