Through Colombian Lenses:

Ethnographic and Conventional Analyses of Maternal Care and Their Associations with Secure Base Behavior

German Posada et al.
Purdue University

The infant-mother attachment emotional tie arises from interaction. Variation in infant-mother interaction histories should account for different outcomes in the quality of infant-mother attachment relationships (Ainsworth, 1969; Bowlby, 1982). Thus, infants in attachment relationships characterized by fluid exchanges and smooth interactions in which the baby's signals and communications are appropriately responded to by their caregivers are likely to be described as securely attached (e.g., Ainsworth, Stayton, & Bell, 1974; Bowlby, 1982). These infants are said to be confident in the caregiver's availability and responsiveness, and to be able to use the caregiver as a safe haven and as a base from which to explore their environment. On the other hand, infants in attachment relationships characterized by difficult and conflictive interactions in which the baby's signals and communications are not responded to satisfactorily, from the infant's point of view, are likely to be described as insecure.

A core aspect of Bowlby and Ainsworth's theory is concerned with the role of the main caregiver as a secure base from which an infant can organize his behavior, derive security, explore, and learn about the environment (e.g., Ainsworth, 1969, 1991; Ainsworth, Blehar, Waters, & Walls, 1978; Bowlby, 1982, 1988; Matas, Arend, Sroufe, 1978). In an effort to account for the different outcomes in the organization of infants' secure base behavior, Ainsworth focused on characteristics of mothers' caregiving during interactions with their baby. Based on her naturalistic observations of infant-mother exchanges in Uganda (Ainsworth, 1967) and Baltimore (e.g., Ainsworth et al., 1974), she proposed a conceptual model of early care that included four general characteristics of maternal

behavior: sensitivity-insensitivity, acceptance-rejection, cooperation-interference, and accessibility-ignoring (e.g., Ainsworth et al., 1974, Ainsworth et al., 1978). Because those characteristics were found to be highly inter-correlated, subsequent attachment research has referred to a caregiver's contributions to secure base relationships as "sensitivity."

Ainsworth's model of early care has served as the theoretical basis for empirical studies interested in investigating the factors that account for individual differences in infant's organization of secure base behavior (Thompson, 1998). In fact, most ensuing research on the associations between caregiving and attachment security has been based on her construct of sensitivity (de Wolff & van IJzendoorn, 1997; Thompson, 1998). Of course, the degree of similarity to Ainsworth's definition when assessing maternal sensitivity has varied from study to study with some investigators using a conceptualization close to Ainsworth's (e.g., Grossmann, Grossmann, Spangler, Suess, & Unzner, 1985) and some others using a notion removed from the one she offered (e.g., maternal self-efficacy as defined by her attribution style and mood state -Donovan & Leanitt, 1989).

To be sure, no study to date has come close to Ainsworth's Baltimore study as observations of infant-mother interactions are concerned. Ainsworth (Ainsworth et al., 1978) conducted extensive and frequent observations of infant-mother dyads at home, namely, she observed them from the time infants were 3 until they were 51-54 weeks old in intervals of 3 weeks, and her observations lasted between 3-4 hours each time. Most ensuing research has observed maternal behavior in contrived

situations, once and for periods usually lasting under 60 minutes, and has been conducted in Western industrialized countries (e.g., Canada, the United States, Germany, and Holland).

Overall, results indicate that maternal sensitivity is significantly, if moderately, related to attachment security in middle class samples (see de Wolff & van IJzendoorn, 1997 for a meta-analysis of 65 studies conducted; Thompson, 1998). Few studies have not found a significant association between the constructs (e.g., Fagot & Kavanagh, 1993; Seifer, Schiller, Sameroff, Resnick, & Riordan, 1996). However, de Wolff and van IJzendoorn (1997) estimated that 862 studies yielding null findings would be needed to reverse the conclusion that the two variables are significantly related. Those findings are remarkable especially in consideration of the fact that most studies, subsequent to Ainsworth's, have drastically reduced the window of observation time, and thus, perhaps, the representativeness of the phenomena being observed. The strength of Ainsworth's conceptualization of maternal care, infant secure base behavior, and the association between the two is in part due to the solid empirical grounding of her research (Ainsworth et al., 1978).

Attachment theory also suggests that the sensitivity-security link holds across different social contexts, situations, and cultures. Unfortunately, research work on these issues is scant and the hypothesis has not been thoroughly tested. Few studies have used infant-mother samples from populations other than those of middle-class Western industrialized countries. For example, regarding the association between the constructs in different social contexts Egeland and Farber (1984), Posada et al. (1999), Vaughn, Egeland, Sroufe, and Waters (1979), and Ward and Carlson (1995) have studied the issue in lower class sectors of the population. To date, only one study has systematically investigated the sensitivity-security link in both ordinary and emergency situations (Posada et al., 1999). Finally, some studies have been conducted in cultures other than those of Western industrialized countries; for instance, in Chile (Valenzuela, 1990, 1997), Colombia (Posada, Jacobs, Carbonell et al., 1999; Posada, Jacobs, Richmond et al., 2002), and Japan (Vereijken, Riksen-Walraven, & Kondo-Ikemura, 1997). Results reported in those studies lend support to the hypothesis. On the other hand, Nakagawa, Lamb, and Miyake (1992) reported no significant associations between the constructs in

Japan.

Despite these findings offering initial support to the cross-cultural generality of the sensitivity-security hypothesis, the data gathered in different cultures is absurdly small (van Ijzendoorn & Sagi, 1999) and questions of central importance remain unanswered. For instance, the key issue of whether Ainsworth's conceptualization of caregiving quality (i.e., sensitivity) arises from descriptions of infant-mother interactions, and is appropriate to characterize early care in other contexts and cultures remains. In order to solve questions pertaining to the generality and cultural specificity of early care quality and its associations with attachment security, we need to investigate how quality of care is expressed in other contexts, whether Ainsworth's definition of caregiving quality is reproducible in those contexts, and whether there are salient aspects of early care quality other than those emphasized so far by the theory. In few words, we need to study the correspondence between culturally specific manifestations of caregiving and the construct of sensitivity as per attachment theory.

Second, more research is needed to clarify the cross-cultural generality of the sensitivity-security link. Specifically, we need to investigate the associations between culturally specific manifestations of caregiving and the organization of children's secure base behavior when interacting with their caregivers. To be clear, the fact that the association between sensitivity and security appears to hold in different cultures in the few studies conducted so far is by no means an indication that there are no context related or culture specific differences in the manner in which maternal and child behavior are exhibited.

Caregiving behavior, as well as child behavior, is context sensitive. Thus, Posada and colleagues (1999) reported differences in the way maternal sensitivity was expressed in ordinary and emergency situations. In that study, for example, sensitive mothers of sick children exhibited more physical contact and increased monitoring of the child's environment, making sure the child was comfortable, than sensitive mothers of healthy children. The specific context and circumstances surrounding the child-mother dyad influence specific behavior exhibited. From an infant's point of view what matters is that his signals are responded to appropriately. Issues of function should not be confounded with issues of expression. The sensitivity-security link may hold across

contexts and cultures, while, simultaneously, differences in the way caregiver' sensitivity is behaviorally expressed may exist. Different manifestations of sensitive care do not necessarily challenge the generality of the sensitivity-security link.

Third, methodological issues in cross-cultural studies of child-mother attachment relationships remain for the most part unresolved and need to be addressed. Specifically, the validity of assessment tools employed with middle-class Caucasian samples in Western industrialized countries needs to be investigated and worked out in different cultures and contexts. This is necessary to make sure that the information gathered with such methodologies supports the kind of interpretations it does in contexts where those methods were developed. Data gathered without validity checks for the research tools used may provide an indication of how the phenomena under study behaves, but information obtained that way cannot be conclusive until we make sure is culturally meaningful. Thus, failure to provide empirical support for theoretically predicted relations in different cultures when using non-validated instruments or procedures might index a methodological rather than a theoretical problem.

Based on those considerations and in order to address them, the present study observed and described maternal caregiving behavior at home in a culture different from that of a North American middle-class. We conducted a naturalistic observational investigation of infant-mother dyads in Bogotá, Colombia. Rather than using Ainsworth's conceptualization and scales (i.e., sensitivity-insensitivity, acceptance-rejection, cooperation-interference, and accessibility-ignoring; Ainsworth et al., 1978) or any other measure that assesses maternal sensitivity as per attachment theory (e.g., the Maternal Behavior Q-Set, MBQS; Pederson & Moran, 1995), as the primary means to assess caregiving behavior, the study undertook an open-ended observational-descriptive approach to maternal behavior during infant-mother interactions at home.

Although observational research on early care in naturalistic settings is scant, perhaps because of its high time and effort consuming features, it is necessary if we want to gather information that addresses the issues aforementioned. The use of pre-established measures is certainly economical and useful. Yet, open observations in naturalistic environments are needed to describe and

characterize (cultural) context specific manifestations of caregiving, and ultimately, solve questions concerned with commonalties and differences in the provision of care in different contexts, and the cross-context generality of the associations between caregiving and attachment security outcomes. This argument is hardly new. Ainsworth herself, time and again (e.g., Ainsworth, 1990, 1991; Ainsworth & Marvin, 1995), emphasized the importance and necessity of going back to doing naturalistic observational research in the study of the child-mother relationships.

The study also investigated the associations, if any, of those indigenous descriptions of maternal early care with descriptions of mothers' behavior collected with established methodologies (i.e., the MBQS). Finally, we investigated whether indigenous descriptions of maternal early care were related to descriptions of infants' secure base behavior organization obtained independently at home.

Method

Participants

Participants in the study were 30 infant-mother dyads from a middle-class background in Bogotá, Colombia. Dyads came from Sector 3 (out of 6 sectors), a middle-class sector of the population (DANE, 1991). Subjects were contacted through a health, housing, and education provider with whom the families were associated. All children were healthy, from a non-clinical population, and came from intact families (i.e., infants lived with both parents). Mothers declared themselves as the infant's principal caregiver.

There were 13 boys and 17 girls, between 6 and 11 months of age at the time of the first visit. Infants had as an average one sibling (range = 0 to 4 siblings). Mothers' ages ranged from 23 to 39 years (mean = 31.3), and their education level ranged from incomplete high school to having a university degree (1 mother did not complete high school, 8 had a high school degree, 7 had a technical degree, and 14 had a university degree). Fathers' ages ranged from 25 to 44 years (mean = 35.1), and their education ranged from incomplete high school to a university degree (1 father did not complete high school, 6 had a high school degree, 5 had a technical degree, and 18 had a university degree).

Procedures

Maternal caregiving and infant secure-base behavior were observed at home. Mothers were

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approached by members of the research team who invited them to participate in the study. If they agreed to participate, the study was explained in greater detail and a first home visit was scheduled. A total of 8-9 two-hour home visits were conducted per family. Maternal behavior was observed during 6-7 home visits. Two additional 2-hour home visits were conducted per family to observe infants' secure base behavior. All home visits were unstructured such that mothers were told to go about their activities as they would normally. Observers were allowed to interact naturally with both mother and infant (i.e., conducted participant observations, Spradley, 1980) during the visits.

Early maternal care was described in two ways. First, pairs of observers conducted 4-5 extensive unstructured observations (2-hour visits) of child-mother interactions. Mothers were observed during caregiving routines, namely, they were observed while feeding, cleaning, tending to their babies' signals, and playing with their infants, as well as putting the infant to bed for naps. Infants were 6-11 months of age when these observations were conducted. Observers took notes during the visits and, immediately after the visits ended, they created detailed transcripts that described maternal caregiving behavior observed during mother-infant interactions. Second, different pairs of observers conducted 2 more home visits. Maternal behavior was observed again during caregiving routines, and after the visit, observers provided independent description of mothers' behavior with the Maternal Behavior Q-Set (Pederson & Moran, 1995). One of the observers for the second of those two home visits was new. There was only one home visit for two families due to scheduling difficulties.

In addition to those visits, sets of two observers, different from the ones who conducted the open-ended visits to observe maternal behavior, conducted two 2-hour visits to observe infants' secure base behavior at home, when babies were about one year old (infants' average age at the time of the first attachment assessment was 13.1 months, range = 8 - 24 months). After each visit, observers, independently, provided a description of infants' behavior using the Attachment Q-Set (Waters, 1995). One of the observers for the second child home visit was new. There was only one home visit for four families due to scheduling difficulties.

Assessment

Maternal caregiving behavior. To organize the open-ended information collected about maternal

behavior during interaction with her infant, the second and third authors read and analyzed the transcripts. Following Strauss (1987) and Spradley's (1980) ethnographic methodology, they developed a system of categories or domains of maternal caregiving behavior. More specifically, the transcripts were initially read and a first coding was conducted in which broad themes of maternal care were identified (open-coding, Strauss, 1987). A second detailed reading was done to refine, discover, and specify domains and sub-domains (domain analysis, Spradley, 1979, 1980; grounded theory, Strauss, 1987). Ultimately, the idea was to characterize maternal caregiving by developing culture-sensitive categories of behavior based on the information gathered through participant observations of mothers interacting with their infants. Thus, domains of maternal caregiving behavior were determined inductively.

Nine domains or categories regarding maternal care were identified for this sample. These resulting domains or categories are presented below in the Results section. Subsequently, in order to score the transcripts on each of the identified domains, we developed rating scales with 1 and 7 as anchoring points (Alzate, Carbonell, Posada, & Bustamante, 1999). The uneven points of the scales (i.e., 1, 3, 5, and 7) were clearly defined and research assistants scored each mother on each of the categories by rating her transcripts of the home visits[1]. The assistants scoring the transcripts about maternal behavior were different from the observers who conducted any of the other visits for either mothers or infants' behavior. Mean inter-rater agreement across categories was .95 (range = .73 - 1.00). In addition to the score for each of the scales, a composite score reflecting the overall quality of maternal caregiving was calculated for each mother by averaging her scores across the identified domains. Both the scale and the composite scores were used for analyses.

In addition to the previous description and assessment of maternal caregiving, two 2-hour home visits were conducted to observe and describe maternal care with an established descriptive technique (i.e., the Maternal Behavior Q-Set, MBQS, Pederson & Moran, 1995). The MBQS has 90 items based on Ainsworth's conceptualization of early care. Data in support of its validity has been reported elsewhere (e.g., Moran, Pederson, Pettit, & Krupka, 1992; Pederson & Moran, 1995; 1996; Pederson, Gleason, Moran,

& Bento, 1998; Pederson et al., 1990). Two members of the Colombian research team first translated the q-set into Spanish. Then, to check on the accuracy of the translation, each item was blindly translated back into English and revised if the meaning of the item was not correct.

As in the previous case, maternal caregiving behavior was observed in everyday circumstances at home. Independent sets of two observers conducted two 2-hour separate visits to observe mothers' behavior at home. Observers were trained in the use of the q-set. Training consisted first of learning and discussing the meaning of the items in the q-set. Then, observers conducted about 5 observations and descriptions of infant-mother interactions at home with the q-set, and their descriptions were compared to those of an expert. An observer was considered trained when he or she obtained inter-observer reliability of at least .70 in three consecutive q-descriptions.

Each observer provided a description of mothers' behavior. Following q-methodology (Block, 1978), observers initially divided the 90 items into 3 piles, "characteristic," "neither characteristic nor uncharacteristic," and "uncharacteristic." Subsequently, the three piles were further subdivided into 9 piles of 10 items each ranging from 9 "most characteristic" to 1 "most uncharacteristic." The pile number in which an item was placed was the rating for that item. Mean inter-observer reliability (calculated from the agreement between the q-descriptions for each visit) was .85 (range = .66 - .97). Disagreements (items placed more than 3 piles apart), if any, were resolved via discussion. The four descriptions were averaged into a composite description, and a global maternal sensitivity score was obtained by correlating that composite description with a criterion sort that describes an optimally sensitive mother (Pederson & Moran, 1995). The correlation between these two descriptions is a mother's sensitivity score.

Infants' secure base behavior. Infant's organization of secure base behavior was described with the Attachment Q-Set (AQS, Waters, 1995). The AQS was created for use with infants and preschool children and it has 90 items (Cicchetti, Cummings, Greenberg, & Marvin, 1990; George & Solomon, 1999; Waters & Deane, 1985). This instrument allows researchers to directly describe and assesses the organization of attachment behavior in naturalistic settings, such as homes and playgrounds. Its validity has been documented in various studies (e.g., Park & Waters, 1989; Pederson & Moran, 1996; Vaughn & Waters, 1990; Waters & Deane, 1985). Specifically in Colombia, the validity of the AQS has been supported in three different studies (Posada et al., 1995, 1999, 2002).

Independent sets of two observers conducted two separate visits to observe infants' secure base behavior at home. Observers were trained in the use of the AQS. Training with this q-set followed the same procedures described before for the MBQS. Similarly, each observer provided a description of an infant's behavior by following the same procedure described above. The end result consisted of the 90 items placed in 9 piles of 10 items each ranging from most characteristic to most uncharacteristic. Mean inter-observer reliability (calculated from the agreement between the q-descriptions for each visit) was .82 (range = .71 - .92). Disagreements (items placed more than 3 piles apart), if any, were resolved via discussion. The four descriptions were averaged into a composite that was used as the q-description of an infant's secure base behavior.

A global security score for each child was obtained by correlating that composite description with a security criterion sort that describes the hypothetically secure child (Waters, 1995). The correlation between these two descriptions is a child's security score. This score was used to investigate the association between the organization of infants' secure base behavior and quality of maternal caregiving. Also, because this was an exploratory study, we investigated the relations between specific aspects of infant behavior, as assessed by each of the AQS items, and the overall quality of maternal care.

Results

The presentation of findings is divided into two parts. The first, is concerned with a qualitative analysis of the open-ended information gathered regarding maternal caregiving behavior conducted for the purpose of organizing and systematizing such information. The second part is concerned with quantitative analyses of the relations between the different domains of maternal care found, maternal sensitivity as per attachment theory, and infants secure base organization.

Characterization of maternal early care. The first aim of the study was to determine how quality of care is expressed in a cultural context other than

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that of a North American middle-class group. Extensive open-ended observations and descriptions of maternal caregiving during infant-mother interactions at home were conducted. Following ethnographic methodology, a domain analysis of transcripts created to describe maternal caregiving (see assessment section above) rendered nine categories of maternal behavior, two of them with two sub-categories[2]. Those categories were: 1) Promptness of response, 2) response effectiveness, 3) behavioral consistency, 4) balance between responding to the baby and other demands, 5) balance between physical caregiving and social interaction with the baby, 6) enjoyment of interaction, 9) interactive harmony, 8) issues related to physical contact: a) frequency, and b) quality, and 9) issues related to verbal communication: a) frequency, and b) diversity of functions in maternal verbal communications,.

Promptness of response refers to the time interval that occurs between the mother's identification of the infant's signals and her response. On one extreme some mothers respond immediately or promptly most of the time, on the other extreme some mothers rarely respond promptly allowing infant's cries and negative signals to appear and/or intensify; their response was very delayed.

Maternal response effectiveness refers to the degree of adjustment and appropriateness of a mother's response when interacting with her infant in terms of satisfactory outcomes as observed in the infant's behavior and emotional expressions. On one side, some mothers adjust their response to their infants' demands most of the times, and satisfactory outcomes on the infant's behavior (smiles, vocalizations, placid emotional tone) are observed. On the other side, some mothers exhibit very little adjustment and effectiveness in responding to their baby as demonstrated by the infant's behavior (i.e., crying, whining, tantrums; if the infant was calm to begin with, he protested when mother intervened).

Consistency in maternal behavior alludes to the coherence and stability of a mother's behavior and emotional expression within and across interaction episodes (e.g., feeding, bathing, playing with infant, putting him to bed). On one side, some mothers exhibit coherent and stable behaviors and emotional expressions during most of the situations and interactive routines observed. On the other side, some mothers are very frequently inconsistent when responding to the baby and exhibit contradictory behavioral and emotional manifestations (e.g.,

sudden and strong changes in emotional reactions during interaction).

Balance between responding to the baby and to other demands refers to a mother's ability to turn her attention and respond to the infants' needs and signals, as well as to other household, family (e.g., relatives), and social (e.g., visitors) demands. On one hand, some mothers are able to balance their attention to the baby's needs and signals and other demands most of the times. On the other hand, some mothers exhibit an absence of such a balance, and in most occasions, when pressed by other demands, do not respond to the infant's signals.

Balance between physical caregiving and social-emotional interaction with the baby refers to a mother's ability to attend and respond to both the physical aspects (e.g., changing diapers) and the social-emotional aspects of caregiving (e.g., smiling, playing, and interacting with the baby). On one end, some mothers balance both aspects of caregiving most of the times. On the other end, some mothers exhibit an absence of such a balance, and most of the times, they focus on the task itself without interacting much with the baby.

Enjoyment of interaction alludes to positive maternal emotional manifestations during interaction with her infant. These manifestations are usually mutual and the baby participates in those positive exchanges; each member of the dyad seems to feed off the other's delight and good feelings. This delight can be observed through smiles, eye-to-eye contact, and playful behavior. Some mothers frequently participate in exchanges with their babies during which mothers evince enjoyment through their smiles, eye-to-eye contact, playful behavior, and positive vocalizations. On the other hand, some mothers rarely evince enjoyment; on the contrary, most of her emotional manifestations show some tension, feelings of discomfort, and/or reproach of the baby.

Interactive harmony refers to maternal caregiving behavior that responds to infant's behavior and contributes to the synchrony and flow of infant-mother interaction. On one side, some mothers actively contribute to harmonious infant-mother interactions, by taking into consideration their babies' initiatives and "negotiating" their babies' desires and their own goals in ways that both get accomplished. In a word, these mothers are respectful of their babies' initiatives most of the times. On the other hand, some mothers do not contribute to harmonious interactions, they restrict

their infants' initiatives, and maternal goals predominate upon the infant's desires; there is no "negotiation." Most of child-mother exchanges are characterized by conflict and most situations are resolved unsatisfactorily at least for one of the members of the dyad.

The physical contact domain is concerned with infant-mother bodily contact during interactions and it has two categories, frequency and quality of physical contact. Frequency of physical contact refers to how often there is maternal physical contact when in interaction with her infant. On one hand, some mothers frequently establish physical contact; on the other hand, some mothers establish very little physical contact when interacting with their infants. Quality of physical contact refers to the adequacy and appropriateness of maternal physical contact as judged by the infants' expression of satisfaction when contact is established; both, maternal and infant initiated physical contact occasion were included in this sub-domain. On one side, some mothers provide their infants with appropriate physical contact as judged by the infant's response (e.g., smiles, positive vocalizations, and/or calming down if upset, when contact is provided). On the other hand, some mothers provide their infants with unsatisfactory physical contact most of the time; in most of the interactions that involve physical contact, the infant is unsatisfied in that he or she cries, whines, and/or avoids or rejects physical contact.

Finally, the domain related to verbal communication refers to a mother's use of oral language when interacting with her infant, and it also has two categories, frequency and diversity of functions of maternal verbalizations. Frequency of verbalizations refers to the quantity of verbal interactive communications in child-mother interactions. Thus, some mothers frequently use verbal communications during their interactions with their infants. Some other mothers exhibit a very low frequency of verbal communication; that is, few verbalizations accompany their actions when interacting with their infants. Diversity of functions in maternal verbalizations refers to the different uses of verbal language and to whether mothers acknowledge their infants as active or passive interlocutors. For instance, language can be used to announce, ask, explain, inform, praise, demand, set limits, reproach, and reprimand among others. On one hand, some mothers exhibit great diversity in their use of verbal communications during most of their interactions with their babies. They acknowledge their babies as active interlocutors. On the other hand, some mothers frequently show a very limited range in the use of verbal language when interacting talking to their infants. Most of the time, these mothers use language in restricted ways and its communicative function usually is limited to order, reprimand, and reproach their babies. These mothers seem to perceive their infants as passive interlocutors.

Thus, ethnographic analyses of information obtained in naturalistic open-ended observations of mother-infant interactions at home rendered nine domains of caregiving behavior. Those domains allowed researchers to characterize maternal early care in the sample studied, and were use for subsequent analyzes.

Early maternal care and the organization of secure base behavior. The second aim of this report was to study the associations between the domains of maternal behavior detected, maternal sensitivity as assessed by the MBQS, and the organization of infants' secure base behavior, as assessed by the AQS. Descriptive statistics for each of the maternal behavior domains and infants' secure base behavior are presented in Table 1. The mean score for the overall quality of maternal behavior scale was 5.66 and the standard deviation was 1.17 (range = 1.63 to 6.97). Mean scores for the specific domains ranged from 5.47 to 5.94 and their standard deviations ranged from 1.05 to 1.47. Mean score for maternal sensitivity was .71 and the standard deviation was .15 (range = .13 to .88). This mean is comparable to the average scores reported in studies with middle class samples (e.g., Pederson & Moran, 1995, 1996). The mean score for infants' security was .46 with a standard deviation of .20 (range = -.18 to .68). This average is also comparable to that reported in other studies of middle class samples (e.g., Park & Waters, 1989). Associations among domains of maternal caregiving behavior are presented in Table 2. All domains of maternal behavior were highly and positively inter-correlated. Correlation indices ranged from .57 to .92.

Insert Tables 1 & 2 about here

The scores on the different domains were compared to the MBQS maternal sensitivity scores derived. The scores for the overall quality of

maternal behavior were positively and significantly associated with maternal sensitivity scores derived from the MBQS, $r = .55$, $p< .01$. Similarly, each of the categories of caregiving behavior was positively and significantly related to global MBQS maternal sensitivity scores (see Table 3); correlation indices ranged from .40 to .66.

Insert Table 3 about here

A main goal of the study was to investigate the relations between the categories of caregiving behavior determined inductively and the organization of secure base behavior. At the level of overall scores, that is, the total scores for maternal caregiving and security score for infants, a Pearson correlation index indicated that the constructs are positively and significantly associated $r = .61$, $p< .001$. The higher the overall quality of care score a mother obtained, the higher her infant's security score. All specific domains of maternal care were significantly related to attachment security (see Table 4). Correlation indices ranged from .33 to .76. The relations between specific aspects of infant behavior (AQS items) and the overall quality of maternal care are presented in Table 5. In total, 28 items of infant behavior were found to be significantly correlated with quality of maternal care.

Insert Tables 4 & 5 about here

Discussion

Based on her unique and influential studies of infant-mother dyads in Uganda (Ainsworth, 1967) and Baltimore (Ainsworth et al., 1978), Ainsworth proposed that the quality of maternal care an infant receives is associated with the organization of that child's secure base behavior from which his security can be inferred. Further, she specifically proposed that a mother's sensitivity to her infant's signals, accessibility, acceptance, and cooperation with her infant's behavior are conducive to an infant's developing trust in her availability and responsiveness when needed. In brief, good quality of maternal care is related to an infant's developing security.

Furthermore, attachment theory proposes that the association between quality of early care (i.e.,

sensitivity) and infant attachment security holds across a variety of situations, contexts, and cultures. After all, Ainsworth conceptualized the construct of maternal sensitivity based on her research experiences with a rural sample in Uganda and a middle-class sample in the United States.

We undertook the task of exploring the appropriateness of attachment theory conceptualization of early care in a cultural context different from the one research has used for the most part. This is important in view of recent challenges to the theory conceptualization of early care that have questioned the generalization to other non-Western cultures of constructs and methods attachment researchers employ (e.g., Rothbaum, Weisz, Pott, Miyake, & Morelli, 2000). Thus, rather than starting with the definition provided by the theory, we collected open-ended descriptions of mothers' behavior when in interaction with their infants at home in a middle class sector of Bogotá, Colombia. The interactions included feeding situations, changing diapers, bathing the infant, dressing him, playing games, and putting the infant to bed for naps. Based on those descriptions we inferred domains of maternal behavior that allowed us to organize the information gathered and characterize how mothers interacted with their infants.

The domains inductively obtained from the sample studied (i.e. promptness, effectiveness, consistency, balance between responding to the baby and other demands, balance between physical caregiving and social interaction with the baby, enjoyment of interaction, interactive harmony, frequency and quality of physical contact, and frequency and diversity of functions in maternal verbal communications) conceptually correspond to much of Ainsworth's conceptualization of quality of early care.

Thus, issues related to promptness and effectiveness of mothers' responses are part of Ainsworth definition of maternal sensitivity, balance between responding to the baby and other demands is clearly related to the concept of accessibility, enjoyment of interaction is associated with issues of maternal feelings about interacting with her infant (i.e., acceptance), and participation in harmonious interactions is related to cooperation with an infant's ongoing behavior (Ainsworth et al., 1978). Other domains of maternal behavior that arose from our observations are concerned with issues of balancing the physical task of caregiving

and interacting socially with the baby, and frequency and quality of physical contact during interactions. Although not necessarily the same, they are related to aspects of caregiving referred to by Ainsworth (Ainsworth et al., 1978). Specifically, Ainsworth assessed issues related to close bodily contact such as duration of pick-up episodes, affectionate pick-ups, abrupt interfering pick-ups, tender careful holding, inept holding, routine holding, pick-ups and put-downs, and face-to face interactions.

It is clear, from the results obtained, that Ainsworth's conceptualization of early care seems to correspond and, in that sense, appropriate to describe mothers' behavior during the first year of an infant's life in this sample of middle-class Colombian dyads. Our findings, regarding the characterization of maternal early care in a middle-class Colombian sample, demonstrate a clear relation to those of Ainsworth (Ainsworth et al., 1978).

In addition, results also highlighted another domain of maternal behavior during infant-mother interactions: verbal communication. Specifically, the sub-domains of frequency of verbalizations and diversity of functions in maternal verbalizations when speaking to her baby were found to be salient features of mothers' behavior when describing infant-mother exchanges during the first year of life.

In addition to being characteristic aspects of maternal caregiving during infant-mother interactions, interesting individual differences in mothers' verbalizations directed towards their infants, both in frequency and diversity, were found. Some mothers made up and sustained small "dialogs" with their babies. Those dialogs were related to both their own activities and the infant's signals and behavior. Thus, mothers announced activities to their babies; explained why they do things; asked about, commented, and expanded upon their babies' behavior and feelings; informed them about people and events in the room; praised their babies for what they do (eat, smile, reach, give things); identified/labeled people, objects, activities (e.g., mom, baby, daddy, ball, and crawling); demanded ("do not pull mom's hair" do not throw things, be gentle"), reproached, and reprimanded their babies.

It is obvious that mothers were not expecting an articulated verbal response from their infants, and yet, some of them created small "conversations" during which they seemed to construe their infant as an active interlocutor, as a separate individual, whose "perspective" is voiced through his mother, when she provided "baby answers" based on the child's signals and facial expressions (e.g., in bathing the baby, when water ran down the baby's face and he vocalized some discomfort and moved his head from side to side, a mother said "ughh, I don't like this water on my face, mom" and then she continued "I know, I know, you don't like it, and mom is going to get you out of here soon, dress you up, and you are going to look like the nicest mommy's boy").

Some other mothers exhibited a more restricted use of language both in terms of frequency and diversity of verbalizations. These mothers tended to speak to their babies less and also, when they did, they frequently used language to demand, reproach, and reprimand their infants. Their babies seemed not to be considered active interlocutors; as a mother put it "what should I talk to him for, if he doesn't understand."

These individual differences in verbalizations are an important avenue of inquiry for they may impact the ways children come to organize their communication patterns within attachment relationships and their attachment related representations. Thus, they also seem particularly relevant in understanding the intergenerational transmission of attachment patterns, a salient topic during the past 15 years. In fact, these sub-domains were significantly related to infants' security. It has been documented elsewhere (e.g., Bretherton, 1995; Bretherton, Ridgeway, & Cassidy, 1990; Cassidy, 1988; Main, Kaplan, & Cassidy, 1985) that secure children are significantly more open to acknowledging both positive and negative feelings both regarding attachment relationships and self, and that they offer more constructive narratives when solving attachment scenarios than insecure children. It is possible that those individual differences in children's narratives (that determine their attachment classification) are associated with patterns of maternal behavior and communication during interactions with their children.

Salatas and colleagues (e.g., Salatas, Cunliffe, & Guttmann-Steinmetz, 2001; Salatas, Rodriguez, & Ridgeway, 1998) have underscored the importance of studying the co-constructive process of attachment related narratives. The findings presented here emphasize their point and provide initial empirical support for such a process in a naturalistic setting. Further, they might suggest that

the co-construction of narratives can begin much before infants are able to produce them on their own. The beginnings may be found in child-mother exchanges occurring during the first years of life. This certainly is an important area to pursue in order to help disentangle the issues surrounding the formation and maintenance of attachment representations.

In sum, most of the domains of maternal behavior inductively found in this study correspond well with those identified by Ainsworth. In addition, a domain concerned with maternal verbal communications emerged as salient when characterizing infant-mother exchanges. This domain seems potentially important in the context of recent inquiries into the development of children's narratives and attachment representations.

The second goal of this study was to investigate the associations between the domains of maternal behavior inferred from our open-ended observations, maternal sensitivity as assessed by the MBQS, and the organization of infants' secure base behavior, as assessed by the AQS. Results indicated that scores on the overall quality of maternal care and maternal sensitivity scores were positively and significantly related. Each individual domain of caregiving was also positively and significantly associated with maternal sensitivity scores. This comparison allowed us to check for the correspondence between both assessments of maternal behavior quality. Findings indicate that the construct of maternal sensitivity as per attachment theory and as assessed by the MBQS (Pederson & Moran, 1995) provides a culturally valid assessment of quality of early care in this sector of the population in Colombia. The evidence presented supports the notion that maternal sensitivity is not a construct exclusively relevant to middle class samples of Western industrialized countries, but applicable to other populations. Of course, more research with samples from different cultural and social backgrounds is needed.

Results also suggest that the MBQS is an economical and valid measure to tap the quality of caregiving behavior in this cultural context. On the other hand, the scales of maternal behavior reflecting the various domains inferred inductively were necessary to study maternal behavior afresh, and they are useful to specify the construct of early maternal care in the particular cultural context where they were derived.

Analyses of the association between quality of maternal care and organization of secure base behavior as summarized by the security scores indicated that the constructs are significantly and positively correlated. This result supports the hypothesis about the cross-cultural generality of the link between the quality of early care and attachment security; that is, it holds in groups other than those representing white middle-class North American. It is worth noting that the robust size of the association found between the general quality of care and attachment security may be due to the extensive observations of maternal care and infant secure base behavior, and the likely representative sampling of both kinds of behavior we obtained. Yet, this is not to say that there are not context specific characteristics in the implementation of infant-mother relationships. Elsewhere (Posada, et al., 1999; Posada et al., 2002) we have illustrated the context and situation specificity of maternal behavior.

Also, all domains of maternal behavior inferred from naturalistic observations were significantly related to infants' organization of secure base behavior. The more mothers were prompt, appropriate, and consistent when responding to their infants, the more balance they exhibited between responding to their babies and other demands, and between performing the physical aspects of caregiving and interacting socially with their infants, and the more mothers enjoyed their interactions and contributed to harmonious exchanges with their babies, the more secure their infants were. Also, the more physical contact and the more satisfying experiences of such contact mothers provided their infants with, and the more they talk to their children and use language in a variety of ways, the higher their infants' security scores were.

Summarizing, mothers' quality of caregiving was found to be significantly related to infants' organization of secure base behavior. Recently, questions about the cross-cultural generality of the sensitivity-security link and the context specificity of early maternal care, as attachment outcomes are concerned, have been at the center of a debate (Chao, 2001; Gjerde, 2001; Kondo-Ikemura, 2001; Posada & Jacobs, 2001; Rothbaum, 2002; Rothbaum et al., 2000, 2001; van Ijzendoorn & Sagi, 2001; Waters, 2002). Some authors (e.g., Rothbaum et al., 2000, 2001) have argued that the construct of maternal sensitivity and the sensitivity-security association itself, as conceptualized by attachment theory, may only be appropriate for samples from Western industrialized societies. After all, it is in those societies were most of the

research on attachment relationships has been produced. Their point is well taken, and certainly the field is in need of studying the phenomena under consideration in different contexts in their own right, and with measures that have been validated in those particular contexts. This study directly addressed those issues and provided evidence that does not support their assertion.

It is important to note that a strength of the study was the fact that researchers, observers, and coders were indigenous to the context where the study took place. Even so, a note of caution is necessary for this cannot guarantee an unbiased perspective in the conceptualization of the different domains of maternal behavior. Certainly, the authors are acquainted with attachment theory and this knowledge may have influenced their inductive conceptualization process when looking at the transcripts of the visits. Also, the sample size is relatively small and further replication of the study is necessary, as well as a validation of the domains of maternal behavior presented here in different samples. We have indeed begun to conduct such research, and in a preliminary study we have found corroborating evidence regarding the association between quality of maternal care, as assessed by the scales presented here, and maternal sensitivity; an initial independent assessment in 47 infant-mother dyads indicates that both variables are significantly related, $r = .64$, $p < .01$ (Carbonell, Plata, Posada, & Alzate, 2002).

Finally, it is important to comment on the dyadic nature of the construct of maternal sensitivity and the characterization of maternal caregiving behavior presented. Earlier we noted that although we refer to domains of maternal caregiving, they were evaluated in consideration of the infants' response to their mothers' behavior. The quality of maternal care (i.e., sensitivity) and infant behavior are intricately related. Inasmuch as attachment security has been construed to reflect the quality of a particular infant-mother relationship (that includes the history of dyadic interactions, characteristics of both the child and the mother, and the situation surrounding the dyad, e.g., Bowlby, 1982; Sroufe & Waters, 1977) and, in that sense, to be a dyadic construct, so is maternal sensitivity.

Ainsworth defined sensitivity as the ability to be alert to and interpret correctly a baby's signals and communications, respond to them promptly and appropriately (Ainsworth et al., 1974). Clearly, that ability is likely to be impacted by how clear a baby signals, the tempo of the baby, and how easy to satisfy the baby is. The baby's behavior during interaction has an effect on a mother's behavior.

We do not consider maternal sensitivity to be a trait-like characteristic. To be clear, characteristics of the mother are likely to influence her behavior during interactions with her infant, as much as a child's characteristics influence his responses during interactions with his mother. But sensitivity refers to how mothers behave during interactions with their infants, and so, her behavior is also influenced by the specific history of interactions with that infant, by her child's behavior and characteristics, and by the specific circumstances surrounding the pair. Sensitivity does not reside within a caregiver; a caregiver is (in)sensitive in a relationship. Sensitivity and security are dyadic constructs in that they occur in the context of specific attachment relationships.

In brief, the information presented supports the generality of the conceptualization of early care offered by attachment theory. The construct of sensitivity appears to be applicable in the middle class Colombian sample studied. In addition, findings illustrate the relevance of further exploring infant-mother interactions as important new domains of those relationships may be come to the forefront. Thus, results indicated that mothers' frequency and diversity of verbalizations when interacting with their infants may be important aspects to consider when studying attachment relationship issues. Also, they illustrate that the use of methods that allow researchers to uncover new relevant topics is essential. Finally, results support the hypothesis of the sensitivity-security link in cultures different from those in middle-class Western industrialized societies.

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Footnotes

1 The complete scales are available from any of the authors. An example of one of the scales, "diversity of functions in maternal verbalizations," follows:

Score = 7.   High diversity in use of verbal language; baby as an active interlocutor: Most of the infant-mother interaction episodes (i.e., 90%) are characterized by mother's diverse use of verbalizations. Mother's talks to and recognizes her bay as an active interlocutor, thus, she provides him with explanations and information; also she praises, asks questions, makes announcements of activities, sets limits, reproaches, reprimand, accompanies her actions with verbalizations.

Score = 5.   Moderate diversity in use of verbal language: Many times (i.e., 70%) infant-mother interaction episodes are characterized by mother's diverse use of verbal language that recognize the infant as an active interlocutor. She provides him with explanations and information, praises the infant, asks him questions, makes announcements of activities, sets limits, reproaches, reprimand, accompanies her actions with verbalizations.

Score = 3.   Limited diversity in use of verbal language: Few (i.e., 30%) infant-mother interaction episodes are characterized by diverse use of verbal language. Most of the times, mother uses language in a restricted fashion and its communicative function is usually limited to give orders, reproach, and reprimand the baby. The mother seems to perceive her infant as a passive interlocutor.

Score = 1. Very Limited diversity in use of verbal language: Very few (i.e., 10%) infant-mother interaction episodes are characterized by diverse use of verbalizations on the mother's part. Most of the times, the mother uses language in a restricted fashion and its communicative function is usually limited to give orders, reproach, and reprimand the baby. The mother definitely seems to perceive her infant as a passive interlocutor.

2 Even though we refer to these categories as domains of maternal behavior, it is important to note that they all are intricately related to infants' interactive behavior. Thus, in scoring the transcripts using those categories, infants' responses were key in determining the specific score of the maternal behavior category in question.

Table 1
Descriptive Statistics

	Mean	sd	Range
Overall quality of care	5.66	1.17	1.63 -- 6.97
Specific domains of early care:			
1) Promptness of response	5.81	1.14	2.50 -- 7.00
2) Response effectiveness	5.67	1.25	2.00 -- 7.00
3) Behavioral consistency	5.94	1.09	2.50 -- 7.00
4) Balance between responding to the baby & other demands	5.47	1.41	1.50 -- 7.00
5) Balance between physical care & social interaction with baby	5.47	1.47	1.00 -- 7.00
6) Enjoyment of interaction	5.72	1.41	1.00 -- 7.00
7) Interactive smoothness	5.74	1.05	3.00 -- 7.00
8) Physical contact:			
a) Frequency	5.79	1.21	3.00 -- 7.00
b) Quality	5.72	1.32	1.50 -- 7.00
9) Verbal communication:			
a) Frequency	5.55	1.33	1.50 -- 7.00
b) Diversity of functions	5.51	1.25	1.50 -- 7.00
Maternal Sensitivity (MBQS)	.71	.15	.13 -- .88
Attachment security	.46	.20	-.18 -- .68

Table 2
Associations among domains of maternal care [a]

	2	3	4	5	6	7	8	9	10	11
1- Promptness of response	.91	.86	.87	.81	.81	.79	.65	.77	.68	.67
2- Response effectiveness		.88	.86	.81	.89	.90	.80	.87	.72	.74
3- Behavioral consistency			.87	.81	.82	.81	.80	.84	.69	.77
4- Balance baby-other demands				.82	.70	.79	.67	.74	.65	.68
5- Physical care-social interaction					.86	.70	.70	.82	.84	.84
6- Enjoyment of interaction						.84	.80	.88	.77	.77
7- Interactive smoothness							.76	.81	.57	.65
8- a) Frequency of physical contact								.90	.61	.71
b) Quality of physical contact									.75	.84
9- a) Frequency of verbalizations										.92
b) Diversity of verbalizations										

[a] All correlation coefficients among domains of maternal caregiving behavior significant at $p < .01$

Table 3

Associations between domains of caregiving behavior and MBQS sensitivity scores

_____

	Sensitivity (MBQS) r
Overall quality of care	.55**
Specific domains of early care	
1) Promptness of response	.66**
2) Response effectiveness	.61**
3) Behavioral consistency	.48**
4) Balance between responding to the baby & other demands	.54**
5) Balance between physical care & social interaction with baby	.46**
6) Enjoyment of interaction	.55**
7) Interactive smoothness	.52**
8) Physical contact:	
a) Frequency	.43**
b) Quality	.48**
9) Verbalizations:	
a) Frequency	.46**
b) Diversity of functions	.40*

_____

** p <. 01   * p < .05

Table 4

Relations between domains of caregiving behavior and infant secure base behavior

_____

	Security r
Overall quality of maternal care	.61**
Specific domains of early care	
1) Promptness of response	.51**
2) Effectiveness of response	.63**
3) Behavioral consistency	.51**
4) Balance between responding to the baby & other demands	.33*
5) Balance between physical care & social interaction with baby	.57**
6) Enjoyment of interactions	.76**
7) Interactive smoothness	.55**
8) Physical contact:	
a) Frequency	.55**
b) Quality	.65**
9) Verbalizations:	
a) Frequency	.53**
b) Diversity of functions	.53**
Maternal Sensitivity (MBQS)	.41*

_____

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

Table 5

Relations between AQS items and overall quality of maternal care

_____

AQS Item	Quality of care r
82- Child spends most of his play time with a variety of toys or activities. [a]	.54**
39- Often silly and or laughing when playing away from mother or alone with his toys. [a]	.52**
87- If mother laughs or approves of something the child has done he repeats it again and again.	.52**
14- When child finds something new to play with, he carries it to mother or shows it to her from across the room.	.46**
65- Child is not easily upset when mother makes him change from one activity to another. [a]	.46**
30- Child does not easily becomes angry with toys. [a]	.45**
56- Child does not become shy or loses interest when an activity looks like it might be difficult. [a]	.45**
36- Child clearly shows a pattern of using mother as a base from which to explore.	.44**
69- Often asks mother for help. [a]	.44**
8- When child cries, he weeps sobs, does not cry hard, or hard crying never lasts very long. [a]	.43**
72- If visitors laugh at or approve of something the child does, he repeats it again and again.	.42*
16- When mother says to follow her, child does so.	.41*
19- When mother tells child to bring or give her something, he obeys.	.41*
40- Child examines new objects or toys in great detail. Tries to use them in different ways or to take them apart.	.41*

9- Child is lighthearted most of the time. .40*

88- Goes to mother when he cries. Does not wait for mom to
come to him. [a] .38*

57- Child is cautious or fearful. [a] .36*

90- If mother moves very far, child follows along and continues his
play in the area she has moved to. .36*

5- Child is more interested in people than in things. .35*

13- If upset by mother's leaving, child's crying stops right after
mom leaves. [a] .35*

21- Child keeps track of mother's location when he plays around
the house. .35*

74- When mother does not do what child wants right away, he
waits a reasonable time, as if he expects mother will
shortly do what he asked. [a] .34*

1- Child readily shares with mother or lets her hold things if
she asks to. .33*

34- When child is upset about mother leaving him, he actively
goes after her. [a] .33*

68- On the average, child is less active type person than mother. [a] .33*

70- Child quickly greets his mother with a big smile when she
enters the room. .32*

35- Child prefers playing with or near mother. [a] .31*

55- Child copies a number of behaviors or ways of doing things
from watching mother's behavior. .31*

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[a] Item has been reversed.

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