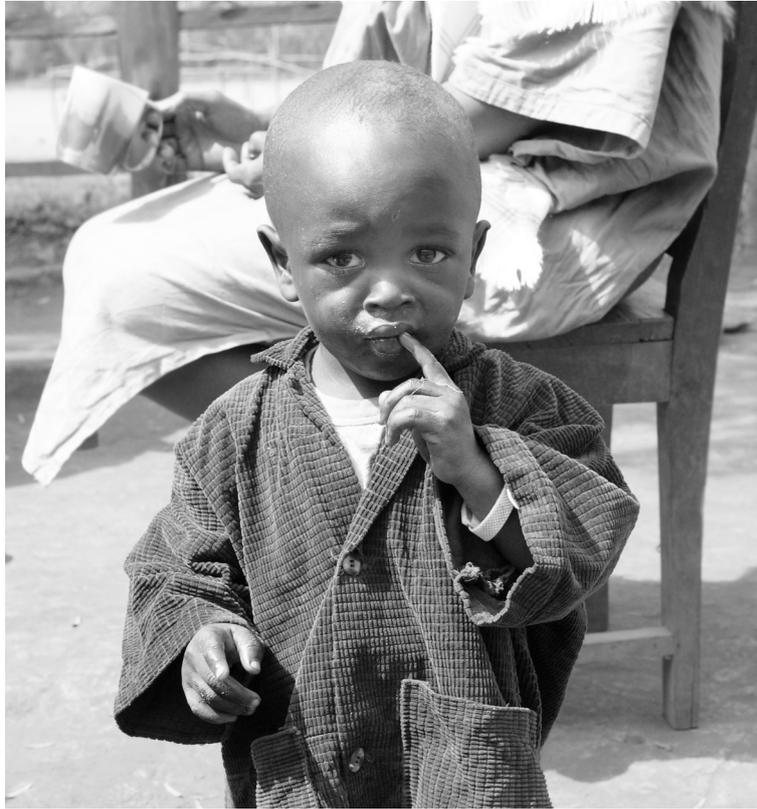


# **CULTURE-SPECIFIC ATTACHMENT STRATEGIES IN THE CAMEROONIAN NSO**

**Cultural solutions to a universal developmental task**



## **Dissertation**

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Gewidmet der besten Oma der Welt.

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## ABSTRACT

Human universals and cultural variation are frequently two pieces of the same puzzle; this also applies to attachment relationships. The attachment system is a phylogenetically rooted human universal, anchored in specific structures and functions of the central nervous system. It consists in the infant's motivation to form attachments and a basic behavioral repertoire of attachment behaviors. However, specific attachment relationships have to be constructed and are therefore based on early caregiver-infant interactions. Cross-cultural studies have demonstrated that these early interactions are influenced by the eco-cultural context within which they take place. In Bowlby's original formulation of attachment theory (Bowlby, 1982a), one of the most important functions of the attachment system is its adaptation to environmental conditions. But despite Bowlby's emphasis on the attachment system's adaptedness, ethological attachment research has concentrated on just one model of early infant-caregiver relationships as the universal strategy: the independent model of Western middle class families, thus neglecting the differential influence of socio-cultural environments on attachment relationships.

The present study regards Bowlby's emphasis on the adaptive value of the attachment system as central and investigates attachment within the non-Western cultural context of the North-West Cameroonian Nso community. It is assumed that Nso attachment styles differ from Western attachment styles since the Nso context affords other adaptational patterns. The analysis of Nso attachment patterns in this study applies the ecocultural model of child development (Keller, 2007) in order to understand the interrelation of socio-cultural parameters, socialization strategies and children's attachment development.

We identified attachment patterns in 30 Nso children when confronted with a stranger, specified maternal belief systems on attachment, and assessed the influence of socio-demographic factors on belief systems and attachment styles. This mixed-methods approach allowed uncovering the meaning and function of culture-specific attachment styles in the Nso socio-cultural context.

Our results revealed three distinct attachment styles in Nso children that are characterized by differences in behavioral and physiological emotion regulation: The first group of children was extremely calm and did not express any visible emotional arousal throughout the stranger's visit; physiologically, those children demonstrated a decline in their cortisol level. A second group of infants was inexpressive and calm in the beginning of the interaction with the stranger, but displayed negative emotions when the stranger established close body contact. This group of infants not only became behaviorally aroused, but also physiologically: they displayed an increase of cortisol. A third group of infants in our sample displayed extreme negative emotions from the very beginning of the stranger's visit; they had the highest cortisol levels at both time points of measurement.

Maternal belief systems about attachment did not explain infants' attachment differences statistically; but were extremely helpful to understand Nso parenting practices and the resulting attachment patterns. Our data points out that the Cameroonian Nso exhibit a concept of attachment relationships that is mainly defined by physical proximity, not by psychological dimensions. Nso mothers trained their children towards Nso socialization goals, which aim at producing calm and obedient children. Extremely passive and inexpressive infants were most appreciated as those infants allowed mothers to rely on multiple caretakers. Likewise, mothers tried to prevent their children from the formation of exclusive relationships –sometimes with the help of frightening behaviors– because exclusiveness was regarded as inhibiting multiple caregiving arrangements.

The expressionless and passive infants have therefore to be regarded as representing an adaptive strategy within this context; this assumption is also supported by the cortisol decline in those children. However, this result discloses an incompatibility with the classical attachment theory classification: Passivity and aloofness during a stressful situation would earn those children a disorganized attachment status. Consistently, high occurrences of disorganized attachment have been reported on African children in the literature. However, we argue that the ethic perspective of labeling the expressionless infants and the corresponding maternal behavior negatively

is incorrect from an emic perspective: the Nso regard a controlling and sometimes frightening mothering style as representative of optimal maternal behavior that aims at producing valuable developmental outcomes, i.e. inexpressive and calm infants.

We found that Nso infant attachment was strongly influenced by socio-demographic parameters; especially marital status acted as a crucial determinant for normal child development within the Nso. Married mothers could rely on sufficient social support provided by the extended family system for the upbringing of the child, whereas single mothers reportedly lacked adequate social support. Accordingly, inexpressive infants were found to grow up in extended families; infants with maladaptive emotion regulation skills grew up under adverse social conditions. Similar connections were found with respect to maternal and infantile health conditions.

Our results prove that within the Nso community the prevailing concept of attachment differs from a Western conceptualization, as does the definition of functional attachment strategies. In conclusion it can be said that attachment theory underestimates the power of social and cultural factors that shape maternal thinking and behavior and form culturally adaptive attachment patterns in children.

## 1. INTRODUCTION

*“Although it is better to be methodical in our investigations, and to consider the economics of research, yet there is no positive sin against logic in trying any theory which may come into our heads, so long as it is adopted in such a sense as to permit the investigation to go on unimpeded and undiscouraged. On the other hand, to set up a philosophy which barricades the road of further advance toward the truth is the one unpardonable offence in reasoning, as it is also the one to which metaphysicians have in all ages shown themselves the most addicted.”*

Charles Sanders Peirce (1899)

### WHY ATTACHMENT AGAIN?

Ethological attachment theory as outlined by John Bowlby, a British psychiatrist, became one of the major developmental theories of the last decades; it inspired scientists and practitioners alike. Today, more than twenty-thousand journal articles on attachment are listed in EBSCO, an international electronic research database. Most of the publications deal with the identification of individual differences in attachment relationships, seeking to understand either causes or consequences of the different attachment qualities. It is undoubtedly to Bowlby’s credit that attachment has been placed at the center of human development, emphasizing that socio-emotional development is central to all developmental domains (Keller, 2004, p. 80). Bowlby’s student Mary Ainsworth developed a standardized paradigm that allowed for assessment and identification of individual differences in attachment relationships. This paradigm is widely used by ethological attachment researchers and applied to people of different ages and with various economic and cultural backgrounds. The studies are interpreted to provide evidence of the universality of the attachment phenomenon and different attachment classifications alike.

However, the very important fact Bowlby conceived of attachment as an adaptive system, is often narrowed or neglected. Adaptation –the process of becoming adapted– and the result of this process, adaptedness, are core concepts in Bowlby’s original

formulation of attachment theory. Inherent in the nature of the attachment system is the fact that “[...] *no system whatever can be so flexible that it suits all and every environment. This means that, when the structure of a system is considered, the environment within which it is to operate must be considered simultaneously*” (Bowlby, 1982a, p. 50). Bowlby thereby draws on Darwin’s theory of evolution by natural selection as an explanation for adaptation. Darwin had defined natural selection as the “[...] *principle, by which each slight variation [of a trait], if useful, is preserved*” (Darwin, 1860, p. 61). This concept was simple but powerful: individuals best adapted to their environments are more likely to survive and reproduce. Thus, the true consideration of a system’s adaptation and adaptedness requires an understanding of the corresponding environment, because “[...] *members of each species are suited for life in a particular environment – often called the ecological niche.*” (Bowlby, 1982a, p. 53).

But despite Bowlby’s emphasis on the attachment system’s adaptation and adaptedness to environmental conditions, ethological attachment research takes an ethnocentric viewpoint, looking at the world from a Western perspective and thereby neglects the possibility of non-Western influences on the attachment system. The most acclaimed example for such an ethnocentric attitude is the Strange Situation as devised by Mary Ainsworth and her colleagues in Baltimore during the 1960s (Ainsworth, Blehar, Waters, & Wall, 1978), a widely used instrument to measure differences in attachment style in young children. Until today, this procedure has been applied to thousands of mother-infant pairs of various socio-cultural contexts with the belief that securely attached infants are a prototype of nature and that insecure attachment is abnormal and maladaptive (Chisholm, 1996). High incidences of insecure attachment were attributed to differences in maternal sensitivity towards infants. The idea, that such a high occurrence of so called insecure attachment might indicate adaptive alternative developmental strategies rather than pathology, only occurred to some culturally or evolutionary minded skeptics, who were subsequently banned from the attachment community due to their heretical thoughts (Gardner, Lamb, Thompson, & Sagi, 1986; Lamb, Thompson, Gardner, & Charnov, 1985). Psychologists’ immunity towards connecting universal and individual differences in humans with the intervening level of socio-cultural context, was criticized harshly

by LeVine: “*The study of attachment theoretically formulated by John Bowlby and translated into research by Mary Ainsworth is a perfect if somewhat perverse example: perfect in illustrating a jump from human universals to individual differences without considering cultural variations between; perverse because, though the first developmental study of attachment was carried out by Ainsworth [...] in Africa, it gave rise to an approach as blind to culture as any other in psychology*” (LeVine & Norman, 2001, p. 86). Bowlby in his theory himself had postulated to simultaneously take into account the specific environment for an understanding of attachment. However, the attachment community used a paradigm, the so called Strange Situation that is inextricably linked to the Western culture within which it was developed, ignoring the cultural implications of adaptive attachment relationships.

Ironically, Ainsworth herself had invented the Strange Situation because she recognized that a simple transfer of one method to a different cultural context did not produce the desired outcome. Nevertheless, the Strange Situation was enthusiastically transferred by attachment researchers to diverse cultural and socio-economic contexts without being aware of the fatal violations of core assumptions inherent in attachment theory. This perspective is the starting point of this study, which focuses on the attachment system’s adaptation and adaptedness to the Cameroonian Nso environmental conditions, not drawing on standardized Western methods. It acknowledges the universality of the attachment system but challenges the universality of the four attachment qualities. Since the Strange Situation itself and the observed behaviors can not bear significance without taking the socio-cultural context into account, this study goes back to Africa and seizes on John Bowlby’s and Mary Ainsworth’s original ideas by putting culture in the center of attachment theory.

The following sections introduce Bowlby’s and Ainsworth’s formulation of attachment theory (chapter 2.1), provide evidence for both the evolutionary and biological basis of attachment and the extreme plasticity of human development (chapter 2.2). Since socio-cultural environments exert a substantial influence on human development, chapter 2.3 describes useful research approaches to culture and development. Chapter 2.4 exemplifies the cultural influences on development,

contrasting Western and non-Western contexts with the help of the ecocultural model of development. The socio-cultural context of the Cameroonian Nso is presented in chapter 2.5.

The sample of this study and the methods used are described in chapter 3. Results are presented in chapter 4, starting with maternal belief systems about attachment (chapter 4.1), followed by a description of infants' behavioral (chapter 4.2) and psychophysiological reactions (chapter 4.3) to the strangers' visit. Different emotion regulation patterns are presented in chapter 4.4; the factors that impact those patterns are identified in chapter 4.5.

The findings of the study are discussed in depth in chapter 5.1, whereas in chapter 5.2 the broader implications of the results for attachment theory are debated. A discussion of imitations of the study (chapter 5.3) and suggestions for future research (chapter 5.4) complete this section. A final resume is provided in the conclusion, chapter 6.

## 2. THEORY

### 2.1 THEORETICAL FOUNDATION OF ATTACHMENT THEORY

In order to understand the relation between attachment and culture, it is necessary to explain the core assumptions of attachment theory as formulated by John Bowlby (Bowlby, 1982a, 1986). Motivated by his clinical work as a psychoanalyst, Bowlby started searching for answers to one of the major questions of science, “*how and why do certain early ontogenetic events have such lasting effects on later development?*” (Schoore, 1999, p. xi). By drawing on biology, ethology and control systems theories, he postulated an **instinctive attachment system** in humans, which has a biological basis and functions as regulator of the goals of the attachment instinct. He defined attachment as an emotional bond between infant and caregiver and the infant’s instinctive goal being the maintenance of proximity to an attachment figure. Explicit attachment behaviors result from the instinctual effort to maintain proximity to a caregiver and are observable in behaviors such as crying, clinging, following, protest. From the ethological perspective it is characteristic of an instinct to analogically appear in all members of the species, Bowlby believed that the attachment system is a characteristic of all human infants in all cultures. However, Bowlby did not conceive the attachment instinct as an absolute stable behavior pattern: “*instinctive behaviour is not stereotyped movement but an idiosyncratic performance by a particular individual in a particular environment*” (Bowlby, 1982a, p. 39). Throughout his theoretical outline of attachment, he emphasized to take into account the specific environment, while simultaneously looking at attachment: “*not a single feature of a species morphology, physiology, or behaviour can be understood or even discussed intelligently except in relation to that species’ environment of evolutionary adaptedness.*” (Bowlby, 1982a, p. 64). According to Darwin’s evolutionary theory, instincts have evolved due to their survival value for the individual organism in the **environment of evolutionary adaptedness** (EEA). This, in turn is representative of the Pleistocene environment in which humankind developed during phylogeny. Similarly, Bowlby claims that through the promotion of proximity to caregivers, the attachment system protects the child from predation, starvation, extreme temperature change, being attacked by other humans and various

other disasters that could befall an infant. Crucial to an understanding of attachment is *“the recognition that behavioural equipment [...] can contribute to survival and propagation only when it develops and operates within an environment that falls within prescribed limits.”* (Bowlby, 1982a, p. 46). The attachment system therefore represents an adaptation to our ancestors’ environment, which Bowlby characterized as consisting of small social groups of hunter and gatherer. He regarded the nuclear family: a mother, her children, and perhaps her daughter’s children as the basic and elementary social unit of mankind. Since instinctual behaviors are evolved adaptations, Bowlby assumes a strong biological basis for the attachment system and speculated about specific structures and functions of the central nervous system as being an underlying cause of human attachment behaviors. He observed that specific attachment behaviors start with innate behavior in infancy, but change with age in ways that are partly determined by experiences and situational factors. Newborns did not display preferences for their biological parents over strangers and were equally acceptive of anyone who treated them kindly. Preferences for particular persons and behaviors which solicit their attention and care, developed only over a period of time.

On the basis of his observations, Bowlby suggested the development of an attachment relationship as comprising of four phases: The phase of **preattachment** (birth-1 month), where newborns rely solely on their inborn cognitive capacities for information processing and do not discriminate between people; the phase of **attachment in the making** (2-6 months), when infants become more active in creating contact with caregivers, e.g. smile when recognising a familiar face; the phase of a **clear-cut attachment** (6-18 months) is evident when a child’s locomotory skills are sufficiently developed to actively keep proximity or seek contact with a caregiver; and the last phase, the **goal-corrected partnership** between child and caretaker (2-3 years), characterized through the child’s growing insight into the attachment figure’s motives and plans.

Bowlby supposed that infants become attached to adults who are sensitive and responsive in social interactions with the infant, and who remain consistent caregivers for some time. Their early experiences with caregivers would give rise to a system of thoughts, beliefs, expectations, emotions, and behaviors about the Self and others. He assumed that this system, called the 'internal working model', continues to develop with time and experience, and enables the child to cope with new types of social interactions. According to the 'internal working model' many of an individual's early behavior is based on experiences with caregivers but is subject to change over time due to new experiences.

Bowlby's long-time collaborator Mary Ainsworth added the attachment-exploration concept to attachment theory, assuming that the attachment system and the exploratory system are opposing each other: When feeling in danger, the attachment system is activated in the child; when feeling secure, the child feels free to explore. The primary attachment figure, assumed to be the mother, is supposed to constitute not only a haven to retrieve to when in danger, but also a secure base from which the infant is able to explore the world. Ainsworth, with the creation of the Strange Situation, provided the methodological instrument to operationalize attachment, allowing for the measurement of differences in the quality of attachment relationships in a standardized laboratory setting (Ainsworth, 1985; Ainsworth et al., 1978). The behaviors displayed by children in the Strange Situation are supposed to reflect internalized rules learned from the specific caregiver they are being observed with. With the help of home observations, Ainsworth hypothesized that differences in attachment quality might be due to differences in maternal sensitivity/responsivity towards the child and might be connected with socio-emotional and cognitive functioning of the child later. Originally, Ainsworth identified three different attachment qualities, mainly depending on the infants' exploratory behavior and behavior when reunited with the mother. In 1988, Bowlby stated: "*Three principal patterns of attachment present during the early years are now reliably identified, together with the family conditions that promote them. One of them is consistent with the child's developing healthily, and two are predictive of disturbed development*" (Belsky & Rovine, 1988, p. 166). These three types of attachment relationships and their interpretation by

Ainsworth and colleagues are derived from the infant's behavior when reunited with the mother after a short separation. They can be summarized as follows (Ainsworth et al., 1978; Belsky & Rovine, 1988):

**Secure** attachment indicates that infants actively seek contact with their mothers on their return, calm down when with their mothers again, and use their mothers as a secure base from which to explore. Infants with secure attachment are often joyful in the presence of the parent, display negative emotion openly and show confidence in knowing their needs are being met by the caregiver. Securely attached infants appear to have learned that unmanageable feelings of distress can be resolved by turning to the caregiver who displays a sense of control with respect to the management of negative emotions.

**Anxious-avoidant** attachment indicates that infants ignore or actively avoid their mothers upon their return. Those infants establish surprisingly close proximity to the female stranger and actively engage in play with the stranger without using the mother for referencing. Infants with an avoidant attachment learned to reveal as little as possible about their inner experiences of negative affect, which makes sense against the background of mothers who have been observed to be non-responsive to negative affect. They pretend all is well because they have learned that it doesn't pay to acknowledge negative emotions.

Infants with an **anxious-ambivalent** attachment show great distress when left alone by the mother and they don't calm down when reunited with their mothers – they are still stressed or even show anger towards their mothers instead. Home observations indicate that anxious-ambivalent children have parents who ignore or misinterpret infants' emotional signals. Infants therefore overtly display intense negative emotions as they are never sure whether their needs will be met by their caregiver. These infants show an acute emotional conflict in the Strange Situation, conveying a sense of confusion as to from where and from whom relieve may come.

A fourth category was added by Mary Main et al. (Main & Solomon, 1986, 1990), labelled as **disorganized** attachment, which is characterized through bizarre infant behaviors like freezing, crouching on the floor and other depressed behaviors in the presence of the caregiver during the Strange Situation. Those infants show signs of learned hopelessness or helplessness through either fearful affect generated by the caregiver or fearful affect generated from other sources in the context of emotional unavailability of the caregiver. Disorganized attachment is considered to be an early predictor of both internalizing and externalizing forms of psychopathology from the preschool period onward (Hennighausen & Lyons-Ruth, 2005).

In the foreword to Bowlby's first volume of his trilogy 'attachment and loss', Allan Schore points to the fact that "*most researchers focus on [...] the infant's sequential responses to separation from the primary attachment figure –protest, despair, and detachment– and Ainsworth's incrementally stress-producing 'strange situation', which was soon to become the major experimental paradigm for attachment research.*" (Schore, 1999, p. xv). He thereby refers to the very fact that the majority of attachment researchers focused on a very narrow domain of attachment theory and subsequently on negative infant signals, while relying on the Strange Situation paradigm. The value of attachment theory as a heuristic method that explains the mechanisms by which various early social environments interact with maturing organisms and shape developmental outcomes in an adaptive way, is overlooked by this research line (Schore, 1999).

New valuable theoretical insights were provided by other research fields such as neuroscience, sociobiology, anthropology and cultural psychology, many of which confirmed and refined some of Bowlby's original assumptions but challenged others. Neuroscience, for instance, provides on the one hand evidence of environmental influences on the maturing neurobiological substrates of young infants, while on the other, reveals that by focusing on infants' negative signals, only half the picture is captured. Positive emotions are processed in different brain regions and are as prominent as negative ones with regard to attachment relationships (Jones & Fox, 1992). Anthropologists doubt that children were exclusively raised by mothers (Hrdy, 1999, 2005), and sociobiologists as well as cultural psychologists provide

evidence that different attachment patterns represent adaptive behavioral strategies in different environments (Volland, 2000). New evidence, counterevidence and open questions regarding the evolutionary and biological basis of attachment are presented in the next chapter.

## 2.2 EVOLUTIONARY AND BIOLOGICAL FOUNDATIONS OF ATTACHMENT

### 2.2.1 Our ancestors' environment

The hominid line is thought to have evolved from the African savannahs (Tooby & Cosmides, 1990). In the environment of evolutionary adaptedness, referred to as the EEA, humans were confronted with many selection pressures. Attachment between infant and caregiver is considered a prime example of a behavior pattern that has evolved as an adaptive response to the selection pressures during human phylogeny; and it is accordingly found universally across cultures (Grossmann, Grossmann, & Keppler, 2005; Hinde, 1991; Keller, 2002). The main purpose and function of the attachment system is to keep a baby close to a caregiver for safety, nurturance and social interaction (Carlson & Harwood, 2003; Grossmann & Grossmann, 1990; van IJzendoorn, 2005). Infants being able to elicit parenting behaviors in adults with the help of attachment behaviors were more likely to survive in the comparatively insecure EEA, i.e. they were more likely to be protected against predators, climate variations and were better nurtured (Bowlby, 1982a).

Originally, Bowlby has conceived of the EEA as an environment where mother-father child-rearing units were the norm with the mother being the exclusive caretaker of a child (Bowlby, 1982a). This idea is very alike the Victorian ideal of nuclear families of that time with a traditional division of labor; mothers taking care of children, fathers providing the family income (Hrdy, 2005). Anthropology, sociobiology, and primatology however, question this long-standing ideal of an EEA characterized by mother-father child-rearing units and brought into focus the possibility of assistance from group members other than genetic parents for child rearing.

The most comprehensive account in this respect is formulated in the **cooperative breeding model** by Sarah Hrdy (1999, 2005). Cooperative breeding is a reproductive strategy and social system in which non-parental members of a social group – alloparents – help to support offspring who are not their own. This phenom-

enon occurs across diverse taxa; predominantly in birds, wild canids, mongooses, rodents and several species of primates (Clutton-Brock, 2002; Lancaster, Kaplan, Hill, & Hurtado, 2000). Anthropologists present evidence that humans benefit from an extended family system as well, which usually consists of relatives. Whilst nuclear families can survive and reproduce, they are likely to fall short compared to families that can rely on a more extensive network of support (Mace & Sear, 1997, 2006). Generally, living in social units offers advantages such as a lesser probability to be attacked, a better defence against aggressors and more efficient food acquisition (Volland, 2000). In this network different members of the family have different roles. Fathers are supposed to function as protectors from infanticide (Hurtado & Hill, 1992), whereas siblings, grandmothers as well as matrilineal allomothers seem to offset material time constraints (Hrdy, 1999). Mothers benefit from alloparent's help by redistributing the cost of raising offspring among themselves and are thereby still able to spend a considerable amount of time on domestic activities, hunting, or working on the fields rather than on child care (Kramer, 2005).

The altruism of alloparents is best explained by the **theory of kin selection** (de Waal, 2003), as formulated in the 1950's by Japanese primatologist Imanishi and British sociobiologist Hamilton (1964): a costly action should be performed if:  $C < R \times B$ , where C is the cost in fitness to the actor, R the genetic relatedness between the actor and the recipient and B is the fitness benefit to the recipient. Fitness costs and benefits are measured in reproductiveness. Alloparents provide help if the cost of helping is less than the benefits to offspring calibrated in line with the alloparent's degree of relatedness to the offspring (West, Murray, Machado, Griffin, & Herre, 2001). Alloparents enhance their inclusive fitness by helping kin (Trivers, 1997; van IJzendoorn, Bakermans-Kranenburg, & Sagi-Schwartz, 2006) and cooperative breeding systems enhance the fitness of its members by reducing birth intervals, raising maternal fertility and promoting infant survival in primates (Silk, 2002) as well as in humans (Daly, Salmon, & Wilson, 1997; Hrdy, 2005).

Anthropology provides exhaustive examples of cultures where infants are being cared for by a variety of caregivers (Cole & Cole, 1989; Seymour, 2004), contrary to

the assumption prevailing in Western countries as well as in dominant developmental theories that exclusive mothering is essential to a children's wellbeing (Barlow, 2004). An example for extreme, full-scale multiple child care system from the very moment a child is born is found among the Efe of Zaire. Newborns are passed between women who collectively hold, carry and nurse the infant. At the age of six weeks, Efe infants spend more time with other persons than with the biological mother (Ivey, 2000; Tronick, Morelli, & Ivey, 1992). Conversely, US-parents instantiate a typical Western example of mother-centred child care, where ideally mothers are exclusive full-time nurturers without kin assistance in close vicinity (Seymour, 2004). Applying the perspective of kin selection in evaluating attachment, it is not only the tie to the biological mother but also emotional bonds with other kin that serves similar functions (Belsky, 1997; Trivers, 1996). Recently, the phylogenetic entanglement of the attachment system and the social engagement system was highlighted by attachment researchers and neuropsychologists (Carter et al., 2005). A general social engagement mechanism, rooted in biobehavioral processes and core neuroanatomical structures while facilitating specific psychological processes, is assumed to be a possible missing link in attachment theory. This explains the mechanisms fostering the establishment of attachment toward frequent interaction partners, not necessarily the biological parents only (Porges, 1997; 2003).

Another line of support for the deep evolutionary underpinnings of the attachment system stems from comparative research, providing evidence that attachment and parenting are also found among non-human primates (Bard, 2000, 2002). Chimpanzees display typical attachment and parenting behaviors (Bard, 2002; Miller, Bard, Juno, & Nadler, 1986, 1990), and those reared in captivity by human allomothers can even be tested with the help of the Strange Situation paradigm (Inoue, Hikami, & Matsuzawa, 1992). The study of emotional development in chimpanzees has shown that chimpanzee mothers nurture their infants' integrative capacities, including their socio-emotional communicative skills, displaying parenting skills closely related to the intuitive parenting programs of human mothers (Bard, 2002).

Since the attachment and parenting systems comprise of an instinctual repertoire of behaviors that evolved from human phylogeny, it is deeply rooted in genes and neurobiological processes (Maestriperi & Roney, 2006; Panksepp, 2001). To fully understand attachment, it must be considered how these biologically-based processes occur within the context of environmental stimulation. Though attachment is biologically 'prewired', external ingredients are necessary for its emergence and functioning (Tooby & Cosmides, 1990). Only by understanding the interaction between maturation and experience (i.e. environmental stimulation), can one begin to appreciate the effects of individual as well as cultural experiences of the child's attachment relationship (Panksepp, 2001). The prerequisites necessary for attachment formation are introduced in the following section: the infants' genetic preparedness to learn, the infants' innate capacities to elicit social engagement in adults, and the refinement of developing brain structures and brain chemistry in accordance to environmental input.

### **2.2.2 Plasticity of attachment**

The **genetic preparedness for acquiring new information** provides the basis for human development. The genetic information that allows all modern living organisms to function, grow and reproduce, is contained in DNA (deoxyribonucleic acid). Segments of deoxyribonucleic acid function as genes that can be considered as units of inheritance (Pearson, 2006). Genes are selected depending on their adaptive value in our ancestors environment and are therefore primarily adapted to the EEA (Gangestad & Simpson, 2000). The inheritable information which comprises a gene manifests as functional genetic program (Lorenz, 1975; Mayr, 1974). These programs are either closed and contain invariable information, e.g. reflexive action patterns, or they are open and labile to environmental information, e.g. attachment behaviors. Open genetic programs need and use information from the environment, thereby acquiring new information through learning (Thompson & Nelson, 2001). Development can be thought of as a product of genes interacting with each other and with the environment (Keller, 2002; Nowak & Sigmund, 2004; Tooby & Cosmides, 1990).

Gene-environment interactions activate open genetic programs that in turn affect the degree of refinement in developmental programs and also influence development outcomes, e.g. physiology, temperament, and behavior. Phenotypic variation results as a consequence of varying environmental interactions. People differ in their genetic composition, their activated genetic programs, and in their experiences which influence modulation. This allows human behavior to be highly flexible and environmentally responsive to the degree that “*designs that produce ‘plasticity’ can be retained by selection only if they have features that guide behavior into the infinitesimally small regions of relatively successful performance with sufficient frequency*” (Tooby & Cosmides, 1992, p.101). Resulting adaptations consist of traits that give individuals a gene-transmitting advantage over individuals with other variants of the traits found in the EEA (Alcock, 1998). Adaptive behavioral flexibility is supposed to be facilitated by domain-specific psychological mechanisms operating according to specific decision rules activated by certain environmental cues and producing competent and finely tuned responses (e.g. specific behavioral reactions) designed to solve specific adaptive problems (Tooby & Cosmides 1992).

The genetic plan guiding brain development thereby significantly relies on early experiences to stimulate the organization of neural interconnections. Hence, early experiences are crucial in shaping the functional capabilities of the developing brain (Gangestad & Simpson, 2000). Although human newborns are immobile and immature, they are equipped with specific characteristics and behavioral competencies to elicit environmental stimulation, e.g. social engagement, nurturance. With their physical appearance, the so called ‘Kindchenschema’ (Lorenz, 1943), they attract attention from adults. Lorenz (1943) describes the components of babies’ bodies –the larger head in relation to the rest of the body, the rounded skull and salient front, the big eyes, the round and oversized cheeks, small nose, the short, chubby and rounded limbs– as contributing factors to ‘cuteness’. This pattern is instinctively recognizable across species and acts as a key stimulus triggering protective behavior (Koops, 1996). Innate attachment behaviors of infants like crying, clinging, following, sucking, smiling, gazing, touching are necessary to elicit nurturance and protection within the context of altriciality, i.e. human infants’ status of

prolonged helplessness and dependency (Bowlby, 1986); Altriciality puts pressure on humans to be cooperative, starting with the formation of attachment relationships (Hare & Tomasello, 2005). In fact, altriciality itself might constitute an exaptation or adaptation allowing for the investment of resources in brain growth and development (Keller, 2002), thereby radically affecting human brain development. Maturation mechanisms which previously occurred in utero are now present in the external environment. This enables the growing organism to learn within a specific environment by refining developing brain structures in accordance to environmental input. According to neurologist MacLean's theory of the triune brain (MacLean, 1973; MacLean, 1983; MacLean, 1990), the human brain itself evolved cumulatively during phylogeny. It consists of three parts ('triune brain'), each evolving at a different evolutionary time and each representing a distinct evolutionary stratum that has formed upon the prior layer. The brain stem is the first to evolve and regulates basic life functions and is responsible for primitive sexual, territorial and survival instincts. The limbic system develops next and is composed of amygdala, hippocampus, septal nuclei, cingulate gyrus, hippocampus and periventricular structures; its evolution accompanied the arrival of the first mammals. The limbic system is associated with complex instinctual behaviors (e.g. attachment, parenting), stress responses, self-awareness and the ability to experience emotions. The neocortex is the third and final part of the brain to evolve and responsible for cognitive reasoning. Thus, much of our social and emotional behavior is controlled by the 'old brain' (the first two parts to evolve), not by our higher intellect.

At birth the human brainstem is almost fully functional, whereas the limbic system is 'experience-expectant' and slower to mature and develop (Benes, 1994; Joseph, 1982). The limbic system has long been suggested to be the site for developmental changes associated with the rise of attachment behaviors (Ainsworth, 1967; Bowlby, 1982a; Schore, 1994, 2000, 2001a), critical for the modulation of social and emotional behavior as well as the homeostatic regulation of body and affectional states (Joseph, 1999, 2000). Bowlby's theoretical assumption that attachment is instinctive behavior, with emotions at the heart of these behaviors, has been confirmed by neuroscience. The neurobiological mechanisms of emotional processes that lie

at the foundation of instinctive behaviors (e.g. attachment behaviors) as well as a control system regulating these instinctive behaviors, have been identified as being embedded in the limbic system and its orbitofrontal connections (Schore, 2001a, 2001b). Neuroscience presented evidence that during the period from 7-15 months the myelination of the limbic system takes place, leading to a rapid development of the connections between the limbic system and corresponding orbitofrontal cortical association areas (Joseph, 1999; Konner, 2004). This system sustains the appraisal of visual information, touch, smell, taste and seems necessary for regulating interpersonal behavior, e.g. the capacity to adapt to changing environments (Armony et al., 2000; Hinde & Stevenson-Hinde, 1990; Mesulam, 2000). Attachment experiences constitute the early basis for the regulation of interpersonal behavior and directly influence the imprinting of these areas, i.e. the neuronal circuit wiring orbitofrontal system (Benes, 1994, 2007; Diamond, 1991).

In order to develop and function normally, the infant's experience-expectant limbic system requires a considerable amount of social and physical stimulation (Joseph, 1982; Joseph, 1999). If sufficient stimulation is not provided, or if exposed to an abnormal or neglected environment, developing neurons and dendrites will establish or maintain abnormal interconnections, wither or die (Geyer, Wilkinson, Humby, & Robbins, 1993; Izard & Harris, 1995). Environmentally induced deficits of the limbic system cause severe disturbances in all aspects of social, emotional, expressive, and perceptual functioning (Francati, Vermetten, & Bremner, 2007; Joseph, 1999). The most prominent study on long-lasting effects of deprivation on the human infant has been provided by R.A. Spitz (1949; 1950), who studied children brought up in orphanages where mothering and social stimulation was non-existent. He found that within one year these children became unresponsive to social stimulation, made vigorous attempts to avoid strangers or novel objects or toys, and when approached they would scream and withdraw. These deprived infants spent hours engaged in obsessive, repetitive, stereotyped, and bizarre self-stimulating movements; e.g. rocking, head banging. Most of these children became permanently emotionally and socially disabled.

For moral and ethological reasons, neuroscientists have to rely mostly on animal models for their research (Panksepp, 2007). Since the roots of emotional experiences exist in ancient neural territories, we share developmental processes, remarkably homologously, with all the other mammals (Merker, 2007). Experiments have shown that animals raised in social isolation form attachments with all kinds of unanimated objects or even with animals that are in fact their predators (Harlow & Schlitz, 1967; Joseph, 1999); that the different components of the limbic system serve different functions (Bauman, Lavenex, Mason, Capitanio, & Amaral, 2004; Goursaud & Bachevalier, 2007; Jonason & Enloe, 1971; Kling, 1972; Meyer, Ruth, & Lavond, 1978; Morris & Frith, 1996; Spezio, Huang, Castelli, & Adolphs, 2007); and that deprivation not only alters the development of nerve cells, but also their neurochemistry, including the secretion of neurotransmitters which are important in regulating neural development and neural plasticity (Francis & Meaney, 1999; Meaney, Brake, & Gratton, 2002; Pruessner, Champagne, Meaney, & Dagher, 2004). Disruptions of the mother-infant relationship are proven to have long-lasting effects on the mesolimbic dopamine system and the hypothalamic-pituitary adrenal axis because deprivation induces stress in infants (Léonhardt, Matthews, Meaney, & Walker, 2007; Pruessner et al., 2004).

These studies provide an insight into the effect of deprivation on early environmental stimulation; however, abnormal development is rare. Instead, almost all infants form attachment relationships that provide them with emotional support in stressful situations. Depending on the security or insecurity of the attachment relationship, infants develop more or less functional strategies to cope with stressors. The following section describes why and how different attachment relationships are associated with differential stress responses in infants.

### **2.2.3 Attachment and the cortisol response to stress**

Whenever threat or danger is sensed, the limbic system triggers the release of stress hormones through the limbic hypothalamic-pituitary-adrenal (LHPA) system

(Chryssanthopoulou, Turner-Cobb, Lucas, & Jessop, 2005; Gunnar, Brodersen, Nachmias, Buss, & Rigatuso, 1996). This physiological reaction is called a stress response (Haley & Stansbury, 2003). During a stress response, stress hormones such as cortisol and the catecholamines epinephrine and dopamine mobilize the body for action (Davidson, Fox, & Kalin, 2007; Fox & Davidson, 1986). Stress responses are considered to be adaptive: they alter metabolic functions, blood-clotting mechanisms, and alertness, all of which enhance self defense (McGuire & Raleigh, 1986). The behavioral and physiological systems involved in the stress response aim at restoring and maintaining an organism's homeostasis when perturbed (Barr & Gunnar, 2000; Gunnar, Mangelsdorf, Larson, & Hertsgaard, 1989; Lewis & Ramsay, 1995). Stress regulation is defined as the recovery from a stress response (Haley & Stansbury, 2003). Unsuccessful stress regulation (e.g. a prolonged response to fear) may result in chronic alterations of the limbic system, reducing physiological and behavioral adaptiveness that is associated with fatigue, restricted behavioral flexibility, altered lipid metabolism, and an increased probability of illness (McGuire & Raleigh, 1986).

Studies on the neurobiology of stress demonstrated stress responses to a variety of stressors. Aversive or stressful situations affecting the LPHA system involve novelty, strange situations, uncertainty, and/or other situations eliciting negative emotions (Spangler & Schieche, 1998). In adults, stress responses were e.g. found in exam situations (Abella & Heslin, 1989; Spangler, Pekrun, Kramer, & Hofmann, 2002), during exhausting sport activities (Anshel & Wells, 2000; Rozen, Feldman, & de L. Horne, 2007), as well as in experimentally induced stress situations (de Kloet, 2004; Puttonen, Keltikangas-Järvinen, Ravaja, & Viikari, 2003). Long-term neurobiological alterations of the LPHA system were found e.g. in traumatized (Bradshaw, Schore, Brown, Poole, & Moss, 2005; Keltner & Dowben, 2007; Schore, 2002), depressed (Barden, 2004; Carroll et al., 2007), or addicted adults (Errico, King, Lovallo, & Parsons, 2002; Lovallo, 2006; Schluger, Borg, Ho, & Kreek, 2001).

In infants, stress responses can result from infant-mother separation (Gunnar & Brodersen, 1992; Spangler & Schieche, 1994; Tennes, Downey, & Vernadakis,

1977), diaper change (Mörelus, Hellström-Westas, Carlen, Norman, & Nelson, 2006; Mörelus, Nelson, & Gustafsson, 2007), or vaccination (Lewis, Ramsay, & Kawakami, 1993; Lewis & Thomas, 1990; Ramsay & Lewis, 1994). The presence of a caregiver functions as a social buffer for the cortisol response: cortisol elevations to a range of stressors are reduced or prevented (Gunnar, 2005; Gunnar et al., 1996). Infants' LPHA systems were shown to be labile to environmental influences: Chronic maternal distress during pregnancy (Weinstock, 2005), as well as early experiences of deprivation in infants (Repetti, Taylor, & Saxbe, 2007) disrupt the normal development of the LPHA system and can result in a chronic increase of cortisol levels (Gunnar & Donzella, 2002).

Psychobiological research demonstrated the involvement of two different systems in the stress response: The first system focuses on effort, is associated with vigilance/attention, and activates catecholamines as well as related cardiac measures. The second system emphasizes distress, is associated with helplessness/fear/anxiety, and activates mainly cortisol (Lundberg & Frankenhaeuser, 1980; Nachmias & Gunnar, 1996). Cortisol became particularly prominent in the research of stress, since it is quite easy to obtain cortisol unintrusively from saliva, facilitating a quantification of the adrenocortical system's activation (Lewis & Thomas, 1990). Changes in levels of salivary cortisol before/after an stressful event are used to measure the magnitude of a stress response and provide evidence for the expected relation between a wide range of stressors, measures of emotional distress and elevations in cortisol levels after the stressor (Gunnar, 2005; Gunnar et al., 1989; Hertsgaard, Gunnar, Erickson, & Nachmias, 1995; Larson, Gunnar, & Hertsgaard, 1991; Nachmias & Gunnar, 1996; Spangler, Grossmann, & Schieche, 2002; van Bakel & Riksen-Walraven, 2004).

The adrenocortical system reacts most strongly with an excessive release of cortisol in stress situations when the organism lacks resources to cope with the stressor or lacks control over the stressor (Kirschbaum & Hellhammer, 1994; Spangler & Grossmann, 1993). Due to the fact that young children normally do not cope with stressors very well on their own, their coping reaction is largely externalized and dependent on the availability and behavior of a caregiver (Compas, 1987). During

the first year of life caregivers constitute the most powerful resources for children to regulate their emotions, as is the case when confronted with a potentially threatening situation. Hence, the development and organization of stress-response systems in infants may be largely determined by the interactive behavior of a caregiver (Haley & Stansbury, 2003).

Emotions represent the highest order of direct expressions of bioregulation in organisms (Schoore, 2001b; Sroufe, 1996). By definition, attachment processes are concerned with the regulation of emotions (Bowlby, 1982b). Attachment theory assumes that through sensitive responses to their infants' stress signals, parents are able to reduce stressful states in infants (Spangler & Grossmann, 1993). At the end of their first year of life, children of consistently sensitive parents have got accustomed to having their parents present in stress situations. These children are supposed to be securely attached and to have an internalized expectation of the caregiver's availability. They use this expectation actively as an internalized coping mechanism in stress situations (Cassidy, 1994). In contrast, insecure/disorganized infants are said to rely only on a second-best coping strategy or lack a coping mechanism altogether (Blanchard & Main, 1979). Accordingly, their adrenocortical system should react more strongly during stress situations when compared to secure infants (Spangler & Grossmann, 1993). The hypothesized correlations between attachment classifications and stress reaction have been investigated with the help of the Strange Situation Procedure, linking measures of salivary cortisol, behavioral distress, and attachment classifications.

Mainly two different models explaining the interplay of attachment and adrenocortical activation are discussed in the literature: the coping model and the arousal model. The coping model assumes that different attachment qualities equip children with different coping strategies, which are distinctively adequate for regulating their emotions. The arousal model assumes that only infants exhibiting behavioral stress in terms of crying or negative expressions have a heightened adrenocortical activity. A literary review does not yield unequivocal evidence in favor of one of the models as some studies confirm the expected relations and others report unanticipated results:

Spangler et al. (1993; 2002) found missing cortisol responses in secure infants during the Strange Situation. This finding was interpreted as proving the appropriateness of the secure attachment pattern for emotional regulation during the Strange Situation. In contrast, cortisol elevations in insecure and disorganized infants were interpreted as indicating a dysfunctional attachment strategy and corresponding coping mechanisms (Spangler, Grossmann et al., 2002). Of special interest were the elevated cortisol levels of insecure-avoidant infants. Avoidant children shut down behaviorally and do not overtly display their emotional distress; however, the high activation of their adrenocortical system showed the incidence of stress and a less successful regulation of the emotional disturbance physiologically.

However, other studies did not find differences in the adrenocortical response between the insecure attachment groups (Gunnar et al., 1996; Gunnar, Mangelsdorf, Larson, & Hertzgaard, 1991), or found cortisol increases only in insecure infants who were additionally characterized by behavioral inhibition (Nachmias & Gunnar, 1996). These studies suggest that both temperamental characteristics and attachment quality may influence the function of the adrenocortical system, whereby attachment security functions as a moderator for the activity of the HPA system. All studies including an analysis of the disorganized attachment pattern (Hertzgaard et al., 1995; Spangler & Grossmann, 1993) reported a fundamental increase of adrenocortical activation in disorganized infants. Heightened adrenocortical responses were not ever observed in securely attached infants.

In conclusion, it can be said that the coping model may be the most appropriate to describe the biobehavioral organisation of secure/insecure-avoidant infants, whereas the biobehavioral organisation of insecure-ambivalent/disorganized infants fits the assumptions of an arousal model better (Spangler & Schieche, 1998). Although the question concerning the exact mechanisms of the biobehavioral organisation of securely and insecurely attached infants has not been definitely answered yet, the interplay of the behavioral and the adrenocortical system differs between the attachment groups.

Thus, social relationships have to be regarded as powerful regulators of stress in early development (Gunnar, 2005). Infants form social relationships due to their biosocial nature (Joseph, 1982; Joseph, 1999): With their physical appearance and innate behavior they trigger instinctive parenting behavior programs in their social interaction partners. These complementing parenting programs are presented in the following section.

#### **2.2.4 Adults' intuitive competencies**

Most adults – independent whether they are biological parents or not – react appropriately towards the behavioral repertoire of a newborn; thereby they rely on a complementary caregiving program. (Bell & Richard, 2000; Bowlby, 1982a). Caregiving or parental behaviors towards infants are rooted in genetic programs that evolved to support the child's adaptation to the physical and social world, constituting the dialectic counterpart to the infants' development of integrative competencies (Papousek & Papousek, 1987). **The intuitive parenting program** defines parents' behaviors in which they intuitively/instinctively mimic and emphasize the facial expression of certain emotional states presumed from their children's facial expression within a time span of 200-800 milliseconds (Papousek & Papousek, 1995). These behaviors serve as a 'maternal scaffolding' on increasing competent emotional regulation in infants. There is ample evidence that infants perceive facial expressions from emotions and that, even at birth, they show emotional resonance by expressing the same emotions in response (Meins, 2003). Children are thus able to understand the meaning of facial expressions and develop sympathy toward others as the process is reinforced through the facial expressions of their caregivers. They empirically learn the connection between their internal state and the facial expressions of others (Muir, Lee, Hains, & Hains, 2005; Walker-Andrews, 2005). Nagy et al. (2004) found that newborns are able to imitate movements, but also to provoke an imitative response, thus sustaining the interaction. Tronick, Als, Adamson, Wise & Brazelton (1978) documented the pivotal role of infants in initiating and maintaining face-to-face social interactions (reviewed in Adamson & Frick, 2003).

Infants' capacity to take initiative in acting and intersubjective communication as well as adults' capacity to respond suggest that these two behavior programs are co-constructed in order to supply the biologically 'prewired' attachment system with the necessary external ingredients (Trevarthen, 2001; Trevarthen, Kokkinaki, & Fiamenghi, 1999). These two innate behavior programs enable humans to master their first developmental task: creating a relationship with primary caregivers (Keller, 2007; Keller, Poortinga, & Schölmerich, 2002). At one year of age, the formation of distinct attachment relationships with primary caregivers has been accomplished and individual differences with regard to attachment become observable in infant-caregiver interactions. At two or three years of age, the reception phase of the infant's development has been accomplished (Keller & Eckensberger, 1998), and by then the *"biosocial infant has developed into a cultural child who is recognizable as a member of a distinct culture in terms of appearance and behaviour"* (Keller, 2002, pp. 219-220). The primary function of the attachment system, that of assuring infant survival, is thereby amended by another: acquiring cultural knowledge necessary for the adaptation to specific socio-cultural environmental conditions. Keeping in mind the insatiable plasticity of infants' brains, especially the 'experience-expectant' limbic system, it is important to take a closer look at the variety of culture-specific inputs newborns experience within varying cultural contexts, moving towards the fields of cross-cultural and cultural psychology.

## **2.3 THE CULTURAL EMBEDDEDNESS OF ATTACHMENT**

### **2.3.1 The marginalization of culture: ethological attachment research**

Due to the strong evolutionary and biological basis of the attachment system, ethological attachment researchers conceived attachment as a human universal (Van IJzendoorn, 1990). Nature's contribution to attachment formation was strongly emphasized; while nurturing's contribution was short-sightedly regarded to consist mostly in a mother's responsivity/sensitivity towards her infant, leading to one of the four different attachment qualities in infants (Neckoway, Brownlee, & Castellana, 2007). Cultural influences on attachment were assumed insignificant; culture itself was treated as an independent factor, manifested only in distributional differences of the four universal attachment patterns across cultures (Keller, 2004). The majority of cross-cultural studies on attachment relied heavily on Mary Ainsworth's paradigm of the Strange Situation, arguing that the procedure itself represents a culture-sensitive method appropriate for various socio-cultural contexts as it was developed by Ainsworth after research in Africa and the USA (Van IJzendoorn, 1990; van IJzendoorn et al., 2006). However, this first assumption that the Strange Situation reveals the same universal attachment patterns in various socio-cultural contexts, not only disregards the intrinsic role of culture in developmental processes, but is also incorrect: a close examination of Ainsworth's original publications reveals that the invention of the Strange Situation paradigm resulted from the very fact that one method, namely natural observations during house visits, did not allow the observation of attachment behaviors in both African and American children. The invention of the Strange Situation therefore resulted as a necessary adaptation of observational methods within the African and US-contexts.

In Kampala, Uganda, Ainsworth had conducted a longitudinal field study of mother-infant interaction to examine the development of normal mother-child relationships in a natural setting (Ainsworth, 1967). From 1954-55, she visited Ganda families at home and observed attachment- as well as exploratory behaviors within a natural environment. Her exhaustive ethnographic observations provided detailed

general descriptions of the Ganda families and their child rearing patterns, as well as individual differences of mother-infant pairs with regard to feeding problems, hygiene, sleeping arrangements, infant's display of distress, infant's health status, infant's stranger anxiety and maternal responses in various other situations. Based on her observations, Ainsworth was able to categorize mother-infant pairs similar to infants' attachment behaviors and infants' frequency of crying into three groups: Securely attached (N = 16), insecurely attached (N = 7), and non-attached infants (N = 5). She concluded that there are distinct qualitative patterns of attachment that develop between infants and their mothers from the very beginning of life. These attachment relationships were related to the mother's attitude towards breastfeeding, the amount of care she gave to the baby, the mother's workload, and mother's competence as informant about her child. Ainsworth suggestion was to treat these maternal variables only as approximations of an underlying variable. In fact, in the closing chapter of her book *Infancy in Uganda* (1967) she speculated to put forward maternal sensitivity as the crucial determinant of attachment quality, which she later defined as the "*ability to perceive and interpret accurately the signals and communications in the infant's behavior and, given this understanding, to respond to them appropriately and promptly*" (Ainsworth, Bell, & Stayton, 1974, p. 127).

In order to systematically examine relations between maternal behavior and later infant attachment, she started a follow-up study with American families from Baltimore, visiting mothers and their newborns once every month at home for a period of one year (Ainsworth et al., 1978). However, her home visits of US-families did not reveal much about attachment behaviors. The Baltimore children showed continuing exploratory behavior, they displayed less or no stranger anxiety and generally cried less often or not at all compared to Ganda children (Karen, 1994). In an interview Ainsworth remembered this problem: "*I all along had this idea about a secure base. It was so conspicuous with the Ganda babies. If the mother was there, the kid would roam all around the room and explore things, looking back at mother and maybe giving her a smile, but focusing most of his attention in the environment. And just as soon as the mother got up to leave the room, the chances were the baby would shriek and absolutely stop any kind of exploratory behavior. Now the Ganda babies were much more used to having their mother with them all the time. Whereas the*

*Baltimore babies were used to having their mothers come and go, come and go, and they were much less likely to cry when their mother left the room. So when they were happily exploring it wasn't clear if it was because the mother was there or not*" (Karen, 1994, p. 146). Ainsworth hoped that an unfamiliar setting such as a university laboratory might raise the threshold of threat and prompt the US-children to display similar attachment behaviors as the Ganda babies did at home. Thereby she created the most prominent laboratory assessment of developmental psychology, the **Standardized Strange Situation Procedure** (Ainsworth et al., 1978; Karen, 1994). In this procedure a child is observed in the laboratory for 20 minutes while the mother and a stranger enter and leave the room alternately. The situation varies in stressfulness and the child's responses are observed. Depending on the amount of the child's exploration and the child's reactions to the departure and return of mother/stranger, children are categorized into three groups. Each of these groups is supposed to reflect a different kind of attachment relationship with the mother. The foundation of the whole procedure is the assumption of recreating a flow of familiar and unfamiliar presence in children's lives. The procedure worked well within the originally developed context, i.e. data collected from 1963 through 1967 in Baltimore provided insights about infants' attachment strategies. In the unfamiliar laboratory setting the Baltimore babies displayed the expected behaviors: stopping exploration when left alone, showing fear of the stranger, crying for their mother and seeking contact with their mother upon her return. The Baltimore children at that time grew up in nuclear families with traditional gender role allocations: fathers were the sole breadwinners, mothers took care of children (Popenoe, 1993). Those children were therefore used to their mothers as primary caregivers; they were used to being left alone for short periods of time during daytimes e.g. when mothers fetched something from another room and were trained to sleep alone during the night. In the Standard Strange Situation children experience to be left alone for some time or to be confronted with a stranger; these were things that could happen to the Baltimore children in their home environments as well. However, the novel environment put the Baltimore infants under enough stress to elicit behaviors comparable to that of the Ganda babies when being left alone in their homes. Variability in the US-infants' behaviors in the Strange Situation could be linked to the former home observations and yielded the important classifica-

tion of secure, anxious-resistant and anxious-avoidant attachment in its relation to maternal sensitivity. Ainsworth's classification of 106 US-children set the benchmark for later research, constituting the '**American Standard Distribution**': 66% secure, 12% avoidant, 22% resistant (Ainsworth et al., 1978).

Albeit that cultural realities caused the invention of the Strange Situation, it spread worldwide without accounting for cultural differences other than distributional differences in attachment patterns. Implicated in the transfer of the Strange Situation to various cultural contexts are not only erroneous presumptions of the universal validity of the Strange Situation, but also some profound assumptions about the nature of attachment. Most cross-cultural studies on attachment aimed at the confirmation of these assumptions, which are:

*(I) Assumption of equivalence: the Strange Situation*

*is a universally valid procedure to uncover universal attachment patterns*

The Strange Situation was used in extremely different cultural contexts, e.g. in African cultures like the Dogon of Mali (True, Pisani, & Oumar, 2001), the Gusii of Kenya (Kermoian & Leiderman, 1986), the Pygmies of Zambia (Morelli & Tronick, 1991); in Asian cultures with Chinese samples (Li, Jing, & Yang, 2004; Trnavsky, 1991) and Japanese samples (Nakagawa, Lamb, & Miyaki, 1992; Takahashi, 1990); in Israeli Kibbutzims (Oppenheim, Sagi, & Lamb, 1989; Sagi, Lamb, & Gardner, 1986); in Western Europe (Gloger-Tippelt, Vetter, & Rauh, 2000; Grossmann, Grossmann, Huber, & Wartner, 1981; Lütkenhaus, Grossmann, & Grossmann, 1985) and the US (Belsky, Rovine, & Taylor, 1984; Benoit & Parker, 1994; Cox, Hopkins, & Hans, 2000; Estrada, 1995). The behaviors of infants observed in the Strange Situation in diverse cultural contexts were coded in accordance to the original coding system developed by Ainsworth et al. (1978) and rendered a classification following the definition of the four attachment patterns by Ainsworth (1978) and Main & Solomon (1986). The resulting distributions of attachment patterns were usually compared to the American standard distribution. Deviations in the distributions of attachment patterns were explained post-hoc as cultural consequences, but not examined any further.

In Mali, Mary True (2001) used the strange situation with 42 Dogon mother-infant pairs: mothers were given the standardized instructions and the procedure was executed according to the standardized rules. The distribution of the Strange Situation classifications was 67% secure, 0% avoidant, 8% resistant, and 25% disorganized. The extremely high number of disorganized infants was explained post hoc as maternal frightened or anxious behaviors. The absence of avoidant behaviors was explained by 'often enough' parenting, i.e. breastfeeding and the amount of body contact were judged as sufficient to prevent the development of avoidant behaviors. Takahashi (1986) studied 60 pairs of Japanese mother-infant pairs and compared the Japanese distribution with Ainsworth's distributional pattern. There were no significant differences in proportions of securely attached (68%) and insecurely attached (32%) infants between the countries. However, the Japanese insecure group consisted of only resistant children, with no avoidant ones. The findings were interpreted in terms of Japanese child-rearing customs fostering the attachment to the mother and leading to the experience of excessive separation stress caused by the procedure. Similarly, a relatively high percentage of resistant classifications relative to the number typically observed in the US results, was found in Israel by Sagi et al. (1985). In Germany, Grossmanns and colleagues (1991; 1990; 1985; 1981) replicated the Ainsworth Strange Situation with 46 mother-infant pairs in Northern Germany and found the reverse pattern of attachment classifications with a high number of avoidant infants: 34% secure, 52% avoidant, 13% resistant.

The obviously deviant distributions in various cultural contexts contributed to questioning the validity of the Strange Situation as a means of assessing the attachment patterns, at least from a cultural viewpoint (van IJzendoorn et al., 2006; van IJzendoorn & Kroonenberg, 1988). Meta-analyses of cross-cultural studies showed that intra-cultural variation is far greater than inter-cultural variation (van IJzendoorn & Kroonenberg, 1988), something that would not be assumed from a cultural viewpoint. Differences could be due to environmental conditions and therefore variance across culturally defined populations would be expected to exceed the intra-population variance (LeVine, 2002; LeVine & Norman, 2001). Despite these inconsistent findings of attachment distributions, the appropriateness of the Strange

Situation as a tool for measuring attachment qualities in diverse cultural contexts was not questioned by ethological attachment theory.

*(II) Assumption of normativity: The secure attachment pattern represents a universal norm*

The secure attachment pattern as observed by Ainsworth was supposed to represent the optimal attachment strategy of infants. The main argument for the normativity of the secure attachment pattern is the assertion that 60% to 70% of all infants worldwide are characterized as securely attached in the Strange Situation Procedure (van IJzendoorn & Kroonenberg, 1988). Characterized by a balance between exploration of the environment and contact with the caregiver, securely classified children engage in proximity-seeking and contact-maintaining behavior in the Strange Situation when the caregiver returns after the separation, but explore the environment in the presence of the caregiver (Grossmann et al., 1981; Lütkenhaus et al., 1985). Diverging behavioral strategies are considered less effective for coping with the stressful experience of separation and less effective with regard to the acquisition of new skills through exploration (Baer & Martinez, 2006; Spieker, 1986; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). The two insecure patterns, observable in a lack of distress upon separation and avoidance of or anger toward the mother upon reunion, are also both regarded as negative coping strategies. As an extreme, the disorganized pattern, identifiable in stereotyped and/or antithetic behaviors, is supposed to be indicative of past maltreatment, abusive parents, or extreme neglect (DeOliveira, Bailey, Moran, & Pederson, 2004; Main & Solomon, 1990).

Since data of Ainsworth's original studies were collected in normal Western populations, infants' reactions should be interpreted as reflecting variations of norms of social distance and interpersonal responsiveness of that historical time (LeVine & Norman, 2001). However, attachment research incorporated clinical/moral dimensions by labeling one kind of the mother-infant attachment relationship as 'secure', predicting positive future developmental outcomes for the infants. Anxious/insecurely attached children were predicted negative developmental outcomes, surfacing in the

form of mental health problems and/or psychopathological disorders. New insights from cross-cultural research see the desideratum of 'psychological health' departing from the originally defined secure mother-infant relationship (Hinde, 1982). Anthropologists criticize the moral judgment of cultures' ideals about parenting and family life inherent in the nomenclature of security versus insecurity and the theory's predictions for developmental outcomes (Mead, 1974a, 1974b; Weisner, 2005a). Voland (1998) points out that from a sociobiological perspective, the high frequency of insecure attachment patterns speaks against a genetically pre-programmed biological normativity of a secure pattern. The very fact that there is such a great variance in attachment behaviors suggests that the various patterns have also evolved due to the flexibility and adaptability of children to various circumstances and therefore these represent adaptations themselves, not coercively maladaptations (Belsky, 1999, 2006). Though cross-cultural studies revealed high occurrences of insecure or even disorganized attachment patterns in various cultural contexts (e.g., Sagi, 1985; True et al., 2001), ethological attachment research insists in the secure pattern as a widespread universal phenomenon, disclaiming the possibility that attachment security might be a North American or Western ideal (van IJzendoorn & Kroonenberg, 1988).

*(III) Assumption of sensitivity:*

*attachment security is universally caused by maternal sensitivity*

Maternal sensitivity is regarded as a key indicator of the quality of mother-child interaction during the first year of life. Sensitive mothering is supposed to constitute the most important antecedent for later attachment security (Grossmann et al., 1985; Meins, 1999). Ethological attachment research focused on maternal sensitivity as defined by Ainsworth as the caregiver's –mostly the mother's– ability to recognize the infant's signals as well as to interpret these signals accurately and to respond to them promptly and appropriately (Ainsworth, Bell, & Stayton, 1978). This conceptualization of sensitivity led to inconsistent findings insofar as that a high number of cross-cultural studies could not replicate the expected associations between maternal sensitivity and infant attachment security (Nakagawa et al., 1992; van IJzendoorn & Kroonenberg, 1988). For example, in Mary True's study among the Dogon (True et

al., 2001), maternal sensitivity predicted little of the variance in infant security; only the addition of a maternal frightening variable explained a considerable amount of variance.

Bowlby argued that the attachment system with its primary emotions of fear and anxiety has as its main function maintaining contact with the mother. Accordingly, sensitivity as defined by Ainsworth et al. (1974) focused on maternal responses toward negative infant signals. Mothers' reactions toward positive signals were assumed to be consistent with their reactions toward negative signals and therefore not taken into consideration any further (Keller, 1998). However, evidence from neurobiology proves that negative and positive signals are located and processed in different regions of the brain. Neuro-imaging data show that emotional information influences patterns of neural activity differently: an activation of the amygdala is associated with avoidance of negative emotions, while an activation of the nucleus accumbens is related to approaching positive emotional stimuli (Hare & Casey, 2005; Jones & Fox, 1992; LeDoux, 2002). Since sensitivity is a cornerstone of attachment theory, it was often tried to assess sensitivity in cross-cultural research. Ironically enough, some behavioral dimensions that were chosen as indicators for sensitivity bore little resemblance to the original defined conception, but were cited to undermine the importance of the original (Morelli & Tronick, 1991): e.g. van Ijzendoorn & Sagi (1999) refer to correlations between infant attachment security and the age of the mother, size of the household, and the birth of a new baby; results found in a study among the Gusii (Kermoian & Leiderman, 1986). Interpreting older mothers as emotionally more balanced, larger households as relieving mothers from housework and new babies as a factor for decreasing maternal sensitivity to her older infant, they speculate about sensitivity without scrutinizing the underlying cultural meanings in order to affirm the sensitivity construct.

Attachment theorists conceive of sensitivity as a one-dimensional construct and focus mainly on maternal responses towards negative infant signals. Responses to positive emotions are lacking in this conception of sensitivity. However, attachment theory regards of attachment security and emotional warmth as strongly associ-

ated to each other. Contrary to this assumption, MacDonald (1992) showed that the powerful associations observed between warmth and security of attachment are culturally specific. He argued that from an evolutionary perspective it is reasonable to distinguish between warmth and attachment as two independent systems: a fear-based system that is essentially the same as what was originally described by Bowlby, and a warmth-based system that is very similar to the caregiving system. Similar evidence was provided by Keller et al. (1999), who demonstrated that two main factors of the sensitivity construct, namely contingency and emotional warmth, are components independent of each other and differentially pronounced in various socio-cultural contexts. Hence, measuring sensitivity as a one-dimensional concept does not capture its complexity. In the same light, Thompson suggested to regard sensitivity as a behavioral quality with multifaceted origins with situational- and developmental-specific effects, emphasizing the fact that maternal sensitivity must be expressed in cultural specific ways, depending on a variety of ecological and cultural constraints and incentives (Thompson, 1997; Thompson et al., 2005). Additionally, meta-analyses of attachment studies by De Wolff & Van IJzendoorn (1997) found the association between maternal sensitivity and infant attachment security to be moderately strong. They found that in normal settings sensitivity is important, but identified several other dimensions of parenting to be equally important. One can conclude that a substantial cultural perspective on the conceptualization of sensitivity is thereby still missing in ethological attachment theory.

*(IV) Assumption of competence:*

*attachment security is associated with emotional and cognitive competence*

Less support was given to the postulation that secure attachment is associated with improved socio-emotional and cognitive performance. Meta-analyses on associations between attachment and cognitive development, measured as DQ (development quotient) and/or IQ (intelligence quotient) as well as between attachment and language competence revealed a strong association between the quality of attachment and language development, but only a weak relation to cognitive competence (van IJzendoorn, Dijkstra, & Bus, 1995). Even within Western cultures, the

correlations between attachment security and cognitive performance are found to be weak. Furthermore, influences on language development might be explained alone by differences in familial discourse styles (Keller, 2004). Because attachment theory is not very clear about the range of consequences that could reasonably be anticipated from early security, attachment researchers disagree about the scope of the theoretically predicted sequelae of attachment security and explore a wide variety of expected outcomes (Thompson et al., 2005). After a literary review, Thompson & Lagattuta (2006) arrived at the conclusion that only secure and disorganized attachment patterns have predictable outcomes: They are stable over time insofar as secure/disorganized parent-child relationships are likely to remain the same in future years as those patterns are mutually rewarding or self-perpetuating. A cultural perspective poses additional problems: cross-cultural studies demonstrated that the definition of competence varies in accordance with the socio-cultural context and parents apply different parenting strategies to foster the desired competencies in their children (Keller, 2003, 2007; Keller et al., 2006a). Since enculturation starts the moment a baby is born, infants acquire culture while growing up in the middle of activities influenced by culture-specific norms mediated by parents (LeVine & Norman, 2001). The result of this enculturation process is among others observable in developmental precocity, i.e. the emergence of locally desirable behavior patterns at an age stage that would be considered extremely early elsewhere, e.g. walking (Rogoff, 2003) or compliance (Keller, Yovsi et al., 2004). However, a culture-sensitive definition of competence itself is missing and support for the competence hypothesis is still insufficient; a fact that is actually admitted by ethological attachment researchers (Lamb, Thompson, Gardner, & Charnov, 1986; van IJzendoorn & Kroonenberg, 1988).

By following the strategy of applying an instrument already developed within a particular theoretical and cultural framework and explaining different outcomes theoretically, the aforementioned cross-cultural studies side-stepped the big question concerning attachment processes from a cross-cultural perspective: **Are attachment processes essentially the same or significantly different across cultures?** The findings of ethological cross-cultural attachment research is a prominent example of the fact that a universal approach to cross-cultural psychology repeatedly failed

to replicate Western laboratory findings in non-Western settings (Shweder, 1991). Currently, there are only a few studies (e.g. Harwood, Miller, & Irizarry, 1995) on attachment that tried to answer the essential question about cultural influences by taking culture seriously into consideration. Since a true cultural perspective on attachment implicates an understanding of the corresponding socio-cultural context, it is obligatory to use an emic approach, including the consideration of ecological conditions, social practices and cultural values. Only this approach allows to answer the question whether attachment processes are essentially the same or essentially different across cultures.

### **2.3.2 The significance of culture: cultural attachment research**

One exemplary culture-sensitive study on attachment conducted by Harwood et al. (1995), compared socialization goals and perceptions of attachment in Anglo and Puerto Rican working- and middle class mothers. In their study they followed Sagi's (1990) notion that "*the repertoire of attachment behaviors is similar across countries, but the selection of these behaviors is culturally specific.*" (Sagi, 1990, p. 19). In order to test the cultural specificity of attachment behaviors, Harwood et al. (1995) used vignettes of Strange Situation behaviors, revealing that "*Anglo mothers preferred that toddlers balance autonomy and relatedness, and they disliked clinginess; Puerto Rican mothers preferred that toddlers display respectfulness, and they disliked highly active or avoidant behaviors.*" (p. 65). Maternal perceptions of desirable and undesirable attachment behaviors differed from the labels given to them by attachment theory. Mothers could prefer behaviors coded as insecure, and disapprove behaviors coded as secure, based on the Strange Situation ratings. Harwood et al. (1995) found that both socioeconomic status and culture influenced maternal socialization goals and thereby the way mothers perceived and evaluated attachment behaviors.

Similar results were found with regard to attachment relationships in the Japanese culture. Rothbaum et al. (2000; 2004; 2007) analyzed Japanese attachment relationships and concluded that the indigenous Japanese concept of related-

ness, *amae*, involves insecure-ambivalent behaviors. He attributes this finding to the cultural values that are central with regard to the economic, educational and religious institutions which Japanese children are prepared for by their parents. *Amae* relationships, in which security is inextricably linked to dependence and harmony, are contrary to American attachment relationships, in which security is inextricably linked to independence and autonomy. However, both forms of attachment predispose the development of skills needed to succeed in the different cultural spheres (Rothbaum, Kakinuma, Nagaoka, & Azuma, 2007).

As these two studies indicate, an examination of attachment relationships has to take place within their eco-cultural environments. For humans, culture can be regarded as the primary mode of adaptation to the demands of a particular eco-cultural context or niche (Greenfield & Keller, 2004; Super & Harkness, 2002). This study conceptualizes culture as a dynamic social process, creating shared activities leading to cultural practices (the material part of culture) and shared meaning systems leading to cultural interpretations (the symbolic part of culture) (Greenfield, 1997; Keller, 2007; Rogoff, 2003). Cultural practices, beliefs and meaning systems are seen as adaptations to specific socio-economic conditions (Keller, 2007; LeVine et al., 1994). As LeVine et al. (1994) stated, culture can be regarded as the necessary software that gives adaptive direction to the neurophysiological hardware, the inherent capacities all newborns possess. The mediating factor between the cultural software and the neurophysiological hardware constitutes the ecological firmware, consisting of the socioeconomic conditions within a cultural context. Interrelated socioeconomic conditions and cultural factors form the core of social-cultural environment. Due to the diversity of eco-cultural contexts, Greenfield (2002) concludes that cultural environments and the biological nature of human development are inter-related, constituting the various ways in which culture and biology mutually define and influence each other. As the two aforementioned studies attest, parental socialization goals and strategies vary in accordance with socio-cultural environments and result in the formation of culture-specific, ideal patterns of attachment, which differ across cultures.

Since the formation of attachment constitutes one out of many universal developmental tasks, the study of attachment can be placed into the broader framework of cultural studies of development. Generally the cultural study of development addresses universal developmental tasks that are solved in culture-specific ways, proceeding along either the independent or the interdependent pathway (Greenfield, Keller, Fuligni, & Maynard, 2003; Whiting & Whiting, 1975). Following Whiting's model of psycho-cultural research, Keller (2007) proposes for the cultural study of development the **ecocultural model of development**, a hierarchical model depicting the interrelatedness of ecological and socio-cultural conditions, socialization strategies, and developmental consequences (Figure 1).

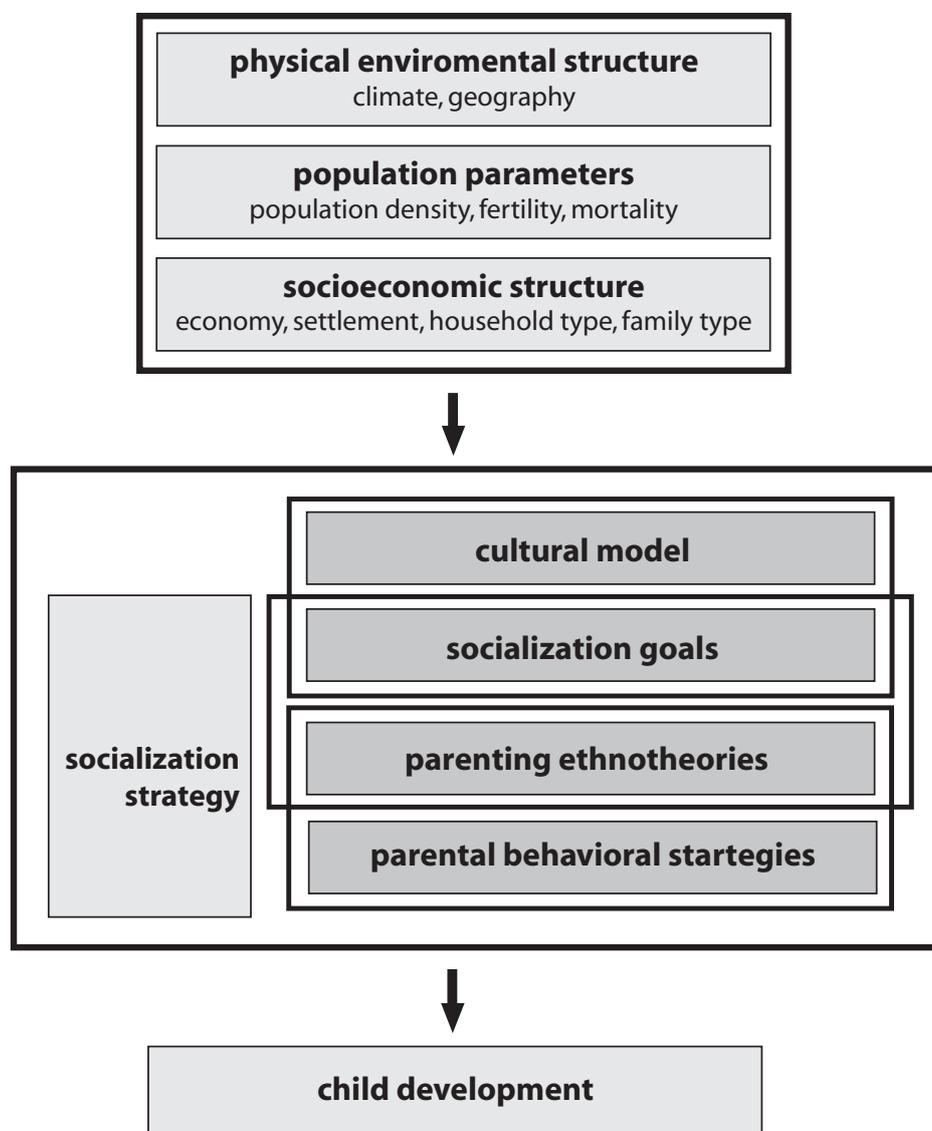


Figure 1: The ecocultural model of development with specified socialization strategies (adapted from Keller, 2007, pp. 31, 103).

Based on evolutionary theory, analysis starts at the level of populations. According to the allowances and affordances of the physical structure of an environment, populations develop specific parameters regarding fertility and mortality rates which in turn define a population's socio-economic structure, e.g. the economic system, family structure, household type. Considered as a whole, these factors lead to the emergence of adequate socialization strategies, composed of parental ideas and practices, which have a direct impact on child development. The socialization strategies are expressed in everyday activities and exert lasting physical and psychical effects on the members of a cultural community (Keller, 2007). "*It is through the enactment of these population-specific codes of conduct in locally organized practices that human adaptation occurs.*" (LeVine et al., 1994, p.12). Hence, any attempt to explain developmental processes must start with an explanation of how adaptation is organized within the local environment of the child.

The most common differentiation of existing socio-cultural contexts lies in the distinction between Western and non-Western cultural orientations, representing two extremes with respect to socio-demographic characteristics (Kagitçibasi, 1996b; Keller, 2007; Keller et al., 2006a; Markus & Kitayama, 1991). Although it is a gross oversimplification to refer to these two prototypes, the point here is to emphasize broad, cross-cultural contrasts in the mutual relationships between Western and non-Western populations and their environments. Developmental pathways start early in infancy across diverse cultural contexts that relates to the socio-cultural orientations of Western/non-Western societies as well as the cultural models of independence/interdependence (Keller, 2007; Keller et al., 2006b; Keller et al., 2002). Cultural models relate socio-cultural orientations to the individual's self-construal (Kagitçibasi, 1996b, 1997). Prototypically, the **cultural model of independence** is defined as comprising autonomy and separateness; the corresponding self is defined as an individual agent who is unique, self contained, and separate from others. The independent self is adaptive in Western, urban, educated middle-class families (Kagitçibasi, 1996a; Keller, 2007). The **cultural model of interdependence** is defined as comprising heteronomy and relatedness; the corresponding self is defined

as a communal agent who is basically interconnected, role oriented, and compliant. The prototypical interdependent self is adaptive in non-Western, rural families with a lower socioeconomic and educational profile (Kagitçibasi, 1996a; Keller, 2007). Since parents, children, and families adapt to the options and constraints of their surroundings, the differences between Western and non-Western environments are reflected in the respective cultural models of independence and interdependence and the corresponding socialization strategies (Keller, 2007; Super & Harkness, 2002; Weisner, 1984, 2002). While the two prototypical environments are associated with different cultural models, it has to be highlighted that cultural models always comprise of both independent and interdependent components, and only the emphasis placed on the two dimensions varies across cultures. The respective cultural models define socialization goals that represent an optimal way of existence or a desirable target within a particular environment. Parental ethnotheories translate the socialization goals into ideas guiding actual parenting behaviors, thereby affecting infant development (Keller, 2007; Keller et al., 2006a; Sigel, McGillicuddy-DeLisi, & Goodnow, 1992; Super & Harkness, 1996).

In the following section, a culture-sensitive approach following the ecocultural model of development is applied to explain attachment theory's approach to addressing different socio-cultural contexts. The main argument here is that ethological attachment theory can be demonstrated as following a primarily Western model of development, disregarding non-Western developmental pathways.

### **2.3.3 Extending attachment theory: adding the non-Western developmental perspective**

The central focus of attachment theory lies in the dyadic bond between an infant and its mother, arranged as a linear sequence with the mother as the sole contributor to the child's physical and emotional wellbeing (Ainsworth et al., 1974; Baer & Martinez, 2006; Bowlby, 1982a). By definition, lasting and stable internal working models are a function of parenting behaviors, with sensitive parenting leading to the preferred outcome of a secure attachment relationship (Ainsworth, 1985). However,

parenting does not necessarily follow attachment theory's ideal pattern, but instead represents an adaptation to the socio-cultural environment within which children are raised (Whiting & Whiting, 1975). Various socio-cultural contexts promote parenting practices that are inconsistent with or even contrary to attachment theory's ideal. Different cultural contexts foster a variety of caregiving arrangements, extending attachment relationships from the dyadic infant-mother bond to multi-layered bonds between an infant and multiple caregivers (Neckoway et al., 2007).

In Ainsworth's Baltimore sample, mothers represented the exclusive caregivers of children; a childcare arrangement typical for many Western societies. The US-children grew up in nuclear families within a society that was complex, industrialized, technological, with highly educated members and a cash economy (Popenoe, 1993). As described in the model of ecocultural development, reproductive strategies are adaptations of the allowances and affordances of the physical structure of an environment (Keller, 2007; Keller et al., 2005a). However, cultural groups follow different reproductive strategies that can be seen as cultural formulas providing parents with historically embedded solutions for local problems of parenting (LeVine et al., 1994). Having only few children, as in the case of Western nuclear families, can be regarded as one adaptive reproductive strategy: American middle-class parents, faced with high economic costs for raising children, but provided with good health health-care, follow the strategy of having fewer children, but focus on equipping the infant with behavioral competencies necessary for the attainment of a job or a professional career (LeVine et al., 1994). However, there is also an alternate adaptive reproductive strategy: having many children. This strategy is adaptive in environments with a high infant mortality rate and a difficulty of assuring subsistence, where the optimal strategy is to have as many children as possible and to focus on an infant's physical survival (LeVine et al., 1994). The latter strategy is prevalent in environments with high infant mortality rates, insufficient medical care, poor economic support associated with little formal education. These environments can be mainly found in non-Western rural farming villagers, pastoral nomads or hunter/gatherer groups (Keller, 2007).

Nuclear families usually adhere to attachment theory's linear sequence of the mother as the primary caregiver of a child (Neckoway et al., 2007). However, in interdependent socio-cultural contexts families usually live as extended families and draw on a network of relatives when caring for an infant (Bornstein & Bradley, 2003; Keller, 2003; Lamb, Bornstein, & Teti, 2002; Weisner, 2005b). All family members share a collective responsibility for caring for and nurturing an infant. Often, maternal relatives and siblings spend more time with an infant than the mother herself (Rothbaum, Rosen, Ujiie, & Uchida, 2002). It is therefore likely that other people besides the mother become important attachment figures to a child. Attachment theory, however, does not include wider social relationships other than mothers and in some cases fathers, except to suggest that the mother-infant attachment relationship becomes a template for future relationships (Lewis, 2005; Lewis & Takahashi, 2005). In order to be universally applicable, attachment theory has to detach itself from a dyadic view of attachment relationships and incorporate the possibility of multifaceted attachment relationships.

The responsive or sensitive mother in Ainsworth's US-sample, responding readily and appropriately to her infant, while preferring distal modes of interaction at the same time, is supposed to provide the infant not only with a secure base to explore the environment, but also with a secure attachment status at one year of age (Ainsworth, 1985; Ainsworth et al., 1974). However, cross-cultural studies showed that a definition of sensitive mothering is inextricably linked to specific eco-cultural contexts: not all cultures interpret a child's needs in the same way or react in the same manner to emotional expressions (Harwood, 1992; Harwood et al., 1995; Neckoway et al., 2007). Cultures develop very specific socialization goals, embodying traditional knowledge about the optimal parenting strategy within a specific cultural context (Keller et al., 2006a). Attachment theory's conception of sensitive parenting is attuned to the socialization goals of the American mothers in Ainsworth's sample, whose most important socialization goal was to promote early independence in their children. In interdependent socio-cultural contexts, other socialization goals are more prevalent, e.g. promoting interdependence and harmonious relationships. Since socialization goals are translated into parental behaviors, sensitive mothering

as described by Ainsworth conveys early independence. But what if a mother aims at promoting early interdependence in her infant? Surely her optimal parenting strategy will then differ from the optimal strategy as defined by attachment theorists.

A universal conceptualization of parenting, the so called '**component model of parenting**', capturing not only universal propensities but also cultural peculiarities, has been formulated by Keller (2000; 2004; 2007). She showed that mothers from various cultural contexts use the same parenting systems and interactional mechanisms when caring for three month old infants; however, they vary in the emphasis they place on the systems and mechanisms. Representative for attachment theory's ideal is a distal strategy of parenting, focusing on verbal exchanges, object play and face-to-face contact within the context of exclusive attention. Attachment theory's optimal parenting style is characteristic for Western urban, middleclass mothers and can be assumed to foster a feeling of uniqueness and the development of autonomous agency. A contrasting parenting style is found in rural, non-Western mothers with low formal education: they use a proximal parenting style with an emphasis on primary care, physical closeness, and body stimulation in the context of shared attention (Keller, 2007; Keller et al., 2005a,b). This parenting style is assumed to foster a feeling of belonging and the development of heteronomous relatedness. Moreover, the cultural emphases differ not only between the systems, but also within the systems, as exemplified in a microanalytic study of the vocal/verbal communication patterns used in mother-infant communication during the first three months (Keller, Otto, Lamm, Yovsi, & Kärtner, 2007). According to attachment theory, mothers are expected to be responsive to the infant's communicative initiatives, a pattern found in Western (German) dyads that were characterized by a alternating, turn-taking style of communication, thereby emphasizing the ego boundaries of the baby (Keller, 2007; Keller et al., 2007). On the other hand, non-Western (Cameroonian) dyads were characterized by overlapping vocalizations/verbalizations; this co-action mode can be assumed to foster the experience of synchrony between organisms.

The role of cultural differences concerning parenting styles was discussed in a study by Neckoway et al. (2007), questioning the relevance of attachment theory's

definition of sensitivity to culturally different parenting styles. They demonstrated that Japanese mothers would be classified as following a hypersensitive parenting style according to attachment theory's conception. Japanese mothers engage in a high level of emotional closeness and anticipate a child's needs rather than wait for signals from the child. Following ethological attachment theory, this hypersensitive parenting style could predict negative consequences with regard to attachment quality, leading to insecure-resistant attachment relationships. Applying the classic Strange Situation in Japanese culture, the results confirm this prediction: A high proportion of infants (32%) were rated as insecure-resistant. Yet, in the Japanese culture, mothers are expected to perceive their infants as an extension of themselves and are therefore in constant, close physical contact with their children. The Japanese parenting style contrasts with what attachment theorists have described as sensitive parenting: the most central socialization goal of Japanese mothers for their children is to become interdependent, thereby they follow a parenting strategy that puts this socialization goal into practice, and promote behaviors that are classified as insecure-resistant in the Strange Situation. In the Strange Situation, Japanese children are overly needy when their mothers return and not easily calmed. They are so appalled at their mothers leaving them that they may even show some hostility or anger.

Neckoway et al. (2007) cite African mothers and shared parenting practices as an example representing a parenting style that might be classified as insensitive according to attachment theory. African cultures rely very much on multiple caregiving arrangements and are known for feeding infants on demand and keeping infants in close proximity day and night. These cultures pride themselves on instant responses to infant cues, a communal system of permanent caring and nurturing, and sensitive parenting. The aim is to create a dense network of relationships within which mutual sharing and obligations ensure that an effective safety net is in place for infants. Nevertheless, insensitive maternal behaviors, as defined by attachment theory, were observed in African infant-mother interactions. E.g., maternal insensitivity explained the unusual high proportion of infants classified as disorganized in the study by True (2001), which conforms to attachment theory's predictions. However, in the African socio-cultural environment mothers are not expected to be

responsive to the infant's communicative initiatives. Mothers are rather expected to know what is best for the baby and to exert responsible control. Accordingly, good parenting is characterized by parents taking the lead by controlling and directing the infant (Keller, 2007). This strategy characterizes a responsible parenting style that puts into practice the most central socialization goal, i.e. the infant's obedience and accepting responsibility (Yovsi, 2003).

As the aforementioned studies indicate, classifications of attachment quality across diverse cultures were often interpreted congruent with attachment theory's predictions regarding cultural differences in maternal sensitivity; However, thereby two important facts are omitted: The fact that a classification of attachment qualities with the help of the Strange Situation in different cultures is not a valid method to assess attachment qualities within different cultural contexts (already discussed in chapter 2.3.1). Secondly, the fact that attachment theorist's definition of sensitivity is not consistent with the parenting realities that define sensitive parenting. Diverse eco-cultural demands, which are not considered by attachment theorists, consider the sensitivity construct as defined by Ainsworth et al. (1974) useless as causal explanation of later attachment quality. To overcome this problem, attachment theory has to take into account what constitutes sensitive parenting in various socio-cultural contexts, considering socialization goals, parental ethnotheories, and parenting behaviors as adaptations to socio-cultural contexts.

Attachment theorists' assumption that secure attachment predicts emotional and cognitive competencies also lacks a culture-sensitive perspective. Attachment theory's optimal parenting style represents the distal parenting style that fosters the cognitive development of infants, preparing them for the context of formal education (Keller, Yovsi et al., 2004). Children gain competence in logical reasoning; a capacity that is likely to be highly valued in Western, information based technological societies. Non-Western mothers use a proximal style of parenting that aims at supporting infant survival and creating a feeling of belonging and the development of heteronomous relatedness. Resulting traits such as cooperativeness and respect for authority are likely to be valued in non-Western, hierarchical organized agrarian communities

(Keller, 2003). As a consequence of the various parenting styles, different kinds of competencies are promoted in infants. Supportive evidence was found with regard to the development of compliance and self-recognition (Keller, Yovsi et al., 2004): Toddlers of non-Western Cameroonian Nso farmers who experienced a proximal parenting style showed compliant behaviors – indicative of successful self-regulation – earlier as opposed to Western children, who experienced a distal parenting style and recognized themselves earlier in a mirror. Likewise, Weisner (1984) found that complex Western societies promote increased non-affiliative, individual goal setting, competitiveness between children, egoistic and dominant social behaviors as well as a decline in the use of sibling caretaking, whereas non-Western societies promote affiliation, cooperation, pro-social and nurturing behaviors in children.

Since the accomplishment of universal developmental tasks follows different cultural pathways (Greenfield et al., 2003), children gain specific cultural competencies which fit into particular eco-cultural niches. Parental belief systems define the cultural conceptions of competence useful in a particular socio-cultural context. However, attachment theory's definition of competence considers only the Western perspective, focusing on individual achievements, school performance and competences in logical reasoning, as measured in IQ tests (van IJzendoorn et al., 1995). In order to be universally applicable, a non-Western concept of competence, e.g. social intelligence (Ogunnaike & Houser, 2002), measurable by the responsibility a child assumes, has to be incorporated into attachment theory's framework.

Ethological attachment research can be demonstrated to be strongly influenced by a Western concept of development. However, culturally diverse developmental pathways that can be related to the socio-cultural orientation of Western/non-Western societies and the cultural models of independence/interdependence are identifiable early in infancy (Greenfield et al., 2003). This study aims at examining attachment in a non-Western interdependent socio-cultural context, detaching itself from attachment theory's main assumptions concerning the Strange Situation paradigm and the normativity of the secure attachment pattern, the concept of maternal sensitivity and a definition of intelligence in terms of technological skills. The study focuses on the

Cameroonian Nso as being representative of a prototypical interdependent socio-cultural context. The Nso community featuring in the study is described in detail in the following section.

## **2.4 THE CAMEROONIAN NSO**

### **2.4.1 History, geography, society**

The Nso is the largest chiefdom in the Bamenda Grassfields known today as the North West Province of Cameroon (Goheen, 1992). The traditional language of the Nso is Lamnso, however, many Nso also speak a form of pidgin English (Trudell, 2006) as they were formerly colonized by England. With a population of some 250,000 over an area of 2,300 square kilometres, the Nso area is heavily populated for an agricultural region, with an average density of some eighty-five inhabitants per square kilometre compared to an average of twenty per square kilometre nationwide (DeLancey, 1989). The life expectancy averages 52.15 years for Cameroonian males and 53.59 years for Cameroonian females (The World Fact Book, 2007). The Grassfields which the Nso inhabits, constitute a distinct area comprised of a number of chiefdoms of various sizes and complexity (Chilver & Kaberry, 1967). While these chiefdoms are linguistically and ethnically diverse, they have several features in common, including a Chiefship at the center, the presence of men's secret societies and an emphasis on title and rank as significant political attributes (Goheen, 1992).

In the past, the Grassfields was a forest zone occupied by hunters (Nkwi & Warnier, 1982). Today the forests are almost extinct with only the savanna grass, after which the region is named, remaining as the most distinctive vegetation. The Grassfields is a high lava plateau surrounded by a series of lower plains and valleys. Altitude within the Grassfields varies substantially which leads the subsequent change in temperature and rainfall. The high plateau around Kumbo receives over 3,000ml of rainfall annually, while lower regions in the Grassfields average between 1,000 and 2,000ml. Average temperatures around Kumbo range from a mean annual maximum of 66°F to a mean minimum of 51°F (Goheen, 1992; 1996). There are generally a six- to seven-month rainy season from April to October, a cool dry season from October to December, and a hot dry season from January to March.

Renowned as fierce warriors and described by their conquerors as greatly feared slave hunters, the Nso are today often referred to by their neighbors as arrogant and stiffnecked (Goheen, 1992). The emphasis placed by local people on regional cultural identity is common in Cameroon with more than 239 ethnic groupings (Goheen, 1992; Nsamenang, 1992a). Currently, many conflicts are emerging over land ownership and inheritance of the Grassfields. The main reason for this being the incompatibility between the state-promoted privatisation of land, emphasising individual accumulation, and the core values of Nso, which stress land ownership as a right of citizenship, see the earth as a repository of lineage values and emphasise the moral commitment and generosity of lineage leaders (Konings, 1996). The traditional dialectical relationship between land settlement and tribe supports an internal hierarchy where legitimacy is based on the moral bond between the earth and the ancestors (Goheen, 1992; 1996; Yovsi, 2001).

The Nso society has a strict hierarchy: The Fon is the traditional ruler. He is both the traditional head and the chief religious authority in charge of keeping the ancestors satisfied. His power is controlled mainly by two secret society groups: the 'Ngwerong' and the 'Ngiri'. New Fons are selected from a group of eligible princes. The Nso society is divided into groups according to lineage. Each lineage group is lead by a 'Fai'. Tradition prohibits a handshake with a Fai. Fais are recognized by their glass necklaces and walking sticks. Several lineages are grouped together under a 'Shufai' (Goheen, 1992; Nsamenang & Lamb, 1994; Yovsi, 2003). Approximately 40 percent of the Cameroonian population practice indigenous beliefs, 40 percent are Christians and 20 percent Muslims (The World Fact Book, 2007). Spirits form an important part of the Nso indigenous religion and Jujus, i.e. masked representation of spirits can be seen at important occasions such as funeral celebrations of secret society members (Goheen, 1992).

#### **2.4.2 Nso families**

Most Nso are subsistence farmers, growing preferably maize, potatoes, beans and vegetables. The farm work is done cooperatively among family members; however,

women are the primary providers of subsistence (Goheen, 1996). Women do not only plant, weed, harvest and organize the farm work, but also do housework such as cooking and providing childcare. Apart from this, they are also responsible for selling part of the harvest on the market. The money is spent on commodities they can not produce themselves and on children's education (Yovsi & Keller, 2003). Men primarily fulfill communal duties in order to "*fully participate in the welfare of the Nso folk*" (Yovsi, 2003, p. 8), but they also gather firewood or are employed in paid labor. Unmarried women occupy a perpetual child status and are considered almost incongruous as social persons (Mbaku, 2005); "*in fact they do not exist at all*" (Vubo, 2005, p. 168). Only after marriage, women rise to full status with rights, privileges, and obligations (Vubo, 2005). Since the Nso are organized patrilineal and patrilocal, women move in with their husband's family when marrying. Women's average age at marriage is 19.8 years. Children are considered to belong to the husband's family. They are expected to help on the farm, do household chores and take care of younger siblings (Keller, 2007; Mbaku, 2005; Yovsi & Keller, 2003). Mothers breastfeed infants and wean them only after two or three years (Mbaku, 2005; Yovsi, 2003). The average family size in the Nso is 6 – 8 persons; usually made up of paternal grandparents, parents and children. Uncles and aunts and nephews and nieces usually live close by (Goheen, 1996; Keller, 2007; Yovsi, 2003). Christian Nso families live in monogamy, with polygamy frequented among Muslim families (Vubo, 2005). Infant mortality rate is still very high with 65.84 deaths per 1 000 live births (The World Fact Book, 2007) and even higher in the rural areas. To increase the probability of grown children and therefore an heir, couples are likely to produce many offspring (Mbaku, 2005). The total fertility rate is 4.49 children born per woman (The World Fact Book, 2007). Families inhabit one house or several houses, often in close vicinity. Houses are arranged in compounds – neighboring houses connected by big open yards where many of the daily activities takes place (Yovsi & Keller, 2003). The houses are built of mud bricks with corrugated iron roofs; the kitchen is often in a separate hut, used for cooking, food and firewood storage. The Nso display a general friendliness towards strangers, always ready to invite people to join in a meal (Mbaku, 2005).

### 2.4.3 Nso infant care practices

It is normal for Nso families to rely heavily on extended family networks in their daily routines, e.g. with regard to child care. For children it is natural to grow up among many relatives who share child care responsibilities and to whom children are committed throughout their lives (Keller, 2007; Verhoef, 2005). A Cameroonian proverb says that “*a child belongs to the mother only when it is in the womb*” (Yovsi, 2003, p. 80). However, from toddlerhood on, children’s life is more influenced by peer-groups and siblings than by adults (Nsamenang, 2006). Fostering childhood is a common practice strengthening family ties (Verhoef, 2005; Verhoef & Morelli, 2007). Early Nso parenting is primarily geared towards infant survival, focusing on health and motoric development (Keller, 2007; Keller et al., 2005a,b). But parenting is also a communal activity that from early on aims at initiating a ‘fledgling’ into society by promoting harmonious relationships between family members and the social reference group (Keller, 2007; Nsamenang, 2006; Nsamenang & Lamb, 1994). Nso developmental goals are obedience, conformity and respect for authority, with the long-term consequences of developing a cohesive society where members are collaborative and cooperative, responsible for each other, having developed a collective identity and a sense of belonging (Keller et al., 2006a; Nsamenang & Lamb, 1994; Yovsi, 2003). From an African point of view, a sense of self is only attained through the community in terms of being interconnected and enacting one’s social role (Nsamenang, 2006). Identity is defined in terms of status in lineage, clan, and community (Mbaku, 2005). Development is interpreted as the acquisition and growth of competencies required to fully engage in society and family life. Children are expected to assume social responsibility as a primary value and children’s competencies are defined in accordance with their social maturity. Intelligence is conceived as responsibility and social maturity, not an abstract, cognitive ability (Greenfield et al., 2003; Mundy-Castle, 1974; Nsamenang, 1992b).

The majority of the Nso can be considered to represent a typical non-Western society, following an interdependent cultural model aiming at interconnecting individuals in the community. However, influences of the Western world are found

in various domains as well. Whilst it is plausible to treat the Nso as a community extremely different from Western societies, it is at the same time necessary to take a careful look at variances within the Nso community. Social changes due to modern globalization seem to have had an impact the traditional family structure and gender roles. Shiftings observed and described by Mbaku (2005, p. 167) are a decrease in family size, an increase in female participation in the labor market, the emergence of new childrearing patterns influenced by Western ideals, and accelerated migration from rural to urban areas. The assumption that social changes in Cameroon have consequences with regard to maternal socialization goals and infant development has been proven by Tschombe (1997), studying 164 mothers from four different Cameroonian provinces. She compared three generations of mothers, revealing that older generations focused more strongly on obedience and physical health of children whereas younger mothers emphasized cognitive development and the acquisition of new experiences. The older generation believes that children should be seen but not heard, i.e. not question parental advice. The younger generation of mothers admit children to be seen and heard, i.e. they allow children to have an own opinion. Tschombe (1997) interprets these findings as an effect of higher formal school levels in the younger generation of mothers. Another interesting finding of her study is the fact that children's personalities as well as cognitive development was found to vary with regard to family type: single and widowed mothers had girls who were often described by them as extremely shy and at the same time as being aggressive. This was not the case with mothers who were in monogamous or polygamous marriages. Children of monogamously married mothers had significantly better linguistic and mathematical competencies compared to children of polygamously married, single, or widowed mothers.

## 2.5 RESEARCH QUESTION

For the present study, Bowlby's emphasis on the adaptive value of the attachment system is regarded as central (Bowlby, 1982a). It is therefore assumed that the Nso attachment styles need to be adaptive to the prototypical Nso environment, where, due to their relational socio-cultural orientation, interconnectedness with others and hierarchical relationships are central aspects of the self and social life; hence, children are raised with obedience, respect for their elders, and responsibility towards others (Keller, 2007; Yovsi, 2003). The Nso environment differs substantially from the prototypical Western middle class environment which is characterized by an autonomous socio-cultural orientation. Western middle class parents emphasize individuality and autonomy in the socialization process and focus on the child's personal attributes, preferences and judgement (Keller, Hentschel et al., 2004). These contextual/environmental differences imply that the application of one standardized situation, e.g. the Strange Situation Procedure, to various cultural contexts can be regarded as futile. The analysis of the Nso attachment patterns in this study follows a different approach and applies the ecocultural model of child development (Keller, 2007) in order to understand the interrelation of socio-cultural parameters, socialization strategies and child development in the domain of attachment. Hereby attachment is defined as emotion regulation, i.e. the child's ability to regulate his/her emotions in the presence of one or more caregivers during a stressful situation.

The purpose of this study is thus to examine the function and regulation of the attachment system within a prototypical interdependent socio-cultural context, namely the Nso community. In line with the ecocultural model of child development, this study implements three different levels of analyses: socio-demographic parameters, maternal belief systems, and children's developmental outcomes.

(1) The comprehensive examination of the socio-demographic parameters of the participating Nso families are regarded as providing the basic foundation for understanding the adaptation of the attachment system to Nso environmental conditions. The Nso environmental conditions –semiaridity, hot climate and the grass-

fields and mountain-plateaus locally– led to population parameters characterized by high fertility and mortality rates. The socio-economic structure developed accordingly and resulted in an exchange economy, subsistence-based farming, a compound based settlement pattern with large households of extended families. These eco-cultural factors differ strongly from the eco-cultural factors that describe Western environments and are considered to shape parental socialization strategies in a way different from Western socialization strategies and hence lead to different developmental outcomes. However, in addition to the general socio-cultural conditions of the Nso community, this study also scrutinizes individual differences with regard to socio-cultural and socio-demographic parameters within this community. The provision of a general socio-demographic profile as well as the examination of inter-individual socio-demographic differences within the Nso sample defines the first level of analysis.

(2) The link between the socio-cultural context and developmental outcomes –such as attachment patterns– is supposed to be established through socialization strategies that are provided by cultural models. As shown in previous studies, the cultural model describing the Nso community is the model of interdependence (Keller, 2007). Nso socialization strategies were found to differ from socialization strategies as prescribed by the respective cultural model of independence, the model of Western cultures (Keller et al., 2006a). Nso mothers' socialization goals aim at the development of respect, obedience, and social harmony; contrary to mothers of Western cultures who focus on the development of early autonomy and assertiveness (Kärtner et al., 2006). In their ethnotheories, Nso mothers view children as being apprentices that have to be stimulated, controlled and trained. Contrary to this, mothers with an independent cultural model regard children as equal partners in interaction whose wishes, desires and individuality have to be taken seriously (Keller et al., 2006a). Nso mothers' parental behaviors with three month old infants reflect the former socialization goals and ethnotheories in social interactions with their infants. Nso mothers focus on body contact and body stimulation in contrast to Western middle-class mothers who emphasize face-to-face interactions, object play, and verbal exchanges (Keller, Lohaus et al., 2004). Following attachment theory,

Cameroonian Nso mothers' interactional behavior could often be classified as insensitive. Attachment theorists would therefore predict adverse attachment outcomes for Nso children. However, in line with Bowlby's notion of adaptation of the attachment system and the ecocultural model of child development, the value of the Nso socialization strategies has to be assessed with respect to the eco-cultural conditions necessitating them (Yovsi, Keller, Kärtner, & Lohaus, 2007). Therefore the evaluation of the Nso socialization strategies that incorporate belief systems about attachment are defined as the second step of the analysis. It is hypothesized that, with regard to attachment, Nso mothers rely on socialization strategies that differ from those of Western mothers, but are adaptive in relation to their socio-demographic profile. An additional assumption is that socio-demographic differences might result in variances in socialization strategies.

(3) The final step in the analysis is defined as the observation of Nso children's attachment behaviors in naturally occurring situations. The hypothesis is that different influences of the socio-cultural context, conveyed through different socialization strategies, manifest themselves in observable developmental differences. Generally, it is expected that within the Nso community, culture-specific, adaptive attachment patterns have developed that differ from attachment patterns prevalent in Western cultures.

Simultaneously, the study aims at identifying individual differences of attachment within the Nso community, which are expected due to naturally occurring variances between individuals. Additionally the findings support the hypothesis that socio-demographic differences and/or differences in maternal socialization goals might provoke individual differences in attachment behavior as well as an attempt to uncover whether or not these factors account for individual differences within this particular cultural community.

Finally, it is assumed that some attachment patterns observable within the Nso community might be more adaptive than others in this particular environment. The attachment system is activated the very moment an infant is exposed to stress

factors and attempts to re-establish emotional security in the infant. An attachment pattern is adaptive if it enables the child to regain emotional security with the help of a caregiver. Malfunctioning attachment patterns fail to reestablish security immediately and the infant experiences higher levels of stress for a longer period of time. Therefore the hypothesis is that different identifiable attachment patterns, in this study defined as differences in the ability to regulate emotions, are correlated with different cortisol levels after a stressful situation. Infants with more adaptive attachment patterns should therefore have lower cortisol levels than infants with less adaptive patterns.

### **3. METHOD**

#### **3.1 STUDY SITE AND SAMPLING TECHNIQUE**

Data collection took place in the North West Province of the Republic of Cameroon between March and August 2005. The participating mothers and children all belong to the ethnic group of the Nso who at the time of data collection, lived in the Nso' capital Kumbo or in small villages in the surrounding area. The author obtained permission from a Shu-Fei, one of the Nso Community's leaders, to recruit participants on a voluntarily basis and was also supported by local assistants throughout the data collection phase. A probabilistic sampling technique was used to recruit a representative sample of mothers to ensure that generalizations derived from the sample are correct. The researcher obtained permission to consult the birth register of the local health center to select compounds with children of the appropriate age. The local assistants contacted 'biggies', the family heads of Nso compounds and told them about the author's research project. In order to avoid ambiguous religious influences, only Christian children, respectively Christian compounds, were chosen. The aim of the study was briefly described as research on child development in the Cameroonian Nso, focusing on the behavior of one-year olds. All contacted family heads permitted the author to recruit mothers with infants of the appropriate age. The mothers were given more detail about the procedure of the study since they had to agree to be interviewed, the measurement of the infant's salivary cortisol, as well as the videotaping of the infant's behavior under certain conditions: 1. when approached and greeted by a stranger (2x); and 2. the infant in everyday situations (9x). Mothers interested in participating were asked to show the birth certificate of the infant in order to validate the infant's age and to schedule the different visits accordingly. Since only twenty mother-infant pairs could be recruited via the birth register of the health center, the local research assistants asked the participating mothers whether they knew mothers with infants of the appropriate age. A total of 32 mothers with infants of the appropriate age consented to take part in the study and had been assessed. Data sets of two cases had to be excluded from further analysis: in

the first case a mother had one-year old twins, where the gathered observational data were not comparable to the data of the single children and, in the other, the mother showed signs of mental illness.

### **3.2 SOCIO-DEMOGRAPHIC DATA OF PARTICIPANTS**

The age of the participating mothers' ranged from 17 to 43 years (mean = 26.8) and the majority had attended school for 7 years – with the least educated mother having 5 years of formal education and the mother with the highest level of education having been to teachers' college, with 14 years of education (mean = 8.5). The mothers had 2.7 children on average. Twelve mothers had only one child and one mother had seven children. Sixteen mothers were married, thirteen mothers were single parents living with their parents or relatives and one mother was widowed. Considering mothers' subsistence patterns, seventeen mothers lived of subsistence farming, five worked as seamstresses, five as hairdressers, two as teachers and one mother worked in a health center as a midwife. The husbands of the married women in the study either helped on the farm or had the occasional small scale job such as bricklayer or building hand. One father worked as a priest. 40 % of the mothers came from rural villages around Kumbo and 60% lived in Kumbo town itself.

The demographics for age and education of the recruited mother-infant pairs fit the demographic data reported in the literature for the Cameroonian Nso culture with a mean age of mothers giving birth the first time, 20.2 years and most mothers having attended school for 7 years with a mean of 8.5 years of formal education. Comparable demographic data have been reported by e.g. Keller (Keller, 2007), (Keller et al., 2005b) and Yovsi (Yovsi, 2001; Yovsi & Keller, 2003).

However, in the present sample almost half the mothers (43%) were single mothers, which is unusually high compared to the general demographics of Cameroon reported in the literature so far. (e.g., Yovsi, 2001; Keller, 2007). Contrasting the single mothers' socio-demographic characteristics to the married mothers' socio-demographic characteristics revealed differences between the two groups (cf. table x). The single mothers represented the younger ones at the time of data collection (t

= 3.84,  $p = 0.001$ ), they were younger at the time of first birth ( $t = 2.66$ ,  $p = 0.01$ ), had fewer children than the married mothers ( $t = 2.44$ ,  $p = 0.02$ ), but the single mothers did not differ significantly from the married mothers with respect to formal education ( $t = 1.70$ ,  $p = 1.02$ ). Most married mothers lived off subsistence farming, but only few single mothers stated that, Fisher  $p = 0.027$ . The majority of single mothers earned their money as hairdresser or seamstress. The two groups did not differ with regard to residing area – rural or urban.

marital status	Total N	number of children*		age at first birth*		age at data collection**		years of education	
		M	SD	M	M	SD	SD	M	SD
married	16	3.13	1.99	21.56	3.18	29.62	6.79	9.19	2.83
single	13	1.70	1.11	18.85	2.30	22.00	3.70	7.77	1.59

Table x: Socio-demographic characteristics of participating single and married Nso mothers

Note. \*  $p < .05$ ; \*\*  $p < .01$ ;

All participating mothers had healthy, one year old children at the time of the data collection. In the sample, infants' gender was almost equal, with sixteen girls and fourteen boys. Twenty-six infants were breastfed at the time of data collection, three infants were about to be weaned and one infant had been weaned completely at ten months due to an illness of the mother. Half the mothers told to have infants that never had health problems. The other half of the sample talked about health problems like malaria, fever, cough and catarrh. Of the 15 infants with health problems, 7 children had at least once been admitted to a hospital during their first year of life due to a severe illness. The days they spent in a hospital ward ranged from 3 to 35 days with a mean of 11.4 days. During their stay in hospital, mothers stayed with their children all the time. Given reports by mothers, three children had had contact with Western people before this research project; in one case the mother was regularly visited by a European priest and in the other two cases mother and child lived close to a quarter in Kumbo where the child was visually exposed to European doctors who work there.

### **3.3 PROCEDURES**

To clarify this study's questions about the cultural shaping of attachment behaviors and the possible proleptic influence of maternal belief systems on the development of specific attachment behaviors, the method of choice was a mixed method approach – combining ethnographic procedures such as video recordings of everyday behaviors as well as behaviors in quasi-experimental settings, psycho-physiological measures and interview data. Since studying cultural meaning systems requires data assessment settings in which the relevant systems can unfold, an everyday setting with as little restriction as possible was chosen for behavioral observations. This allowed the participants to behave in accordance with their cultural rules and display the typical behaviors of their eco-cultural environment. The methods used were:

- Questionnaires to collect socio-demographic data
- Assessment of infants' emotion regulation by videotaping the infants' reaction towards the greetings from female strangers
- Measurement of cortisol reactivity before and after these incidents
- Naturalistic observation of infants' everyday functioning
- Interviews with the mothers to assess attachment belief systems

#### **3.3.1 The context of data assessment**

Since we consider it as essential for the understanding of attachment to observe the behaviors as occurring in their natural environment, the research team organized the data assessment as taking place in the infants' everyday environment, i.e. inside their family's house, at a neighbor's place, outside on the compound, or at the fields where their mothers work.

The infant's ability to regulate his/her emotions in the presence of a stranger was the first step of the assessment. To ensure we could reach the infants when they were one year old or within the next two weeks after the child's first birthday,

the research assistants scheduled appointments for these first two visits with the mothers. At the arranged day, the first author and two assistants, doing the videotaping as well as the communication with the Nso family, went to the place where infant and mother were. Normally other family members, neighbors or friends were present there as well. People present were greeted by the first assistant and told that they should continue with whatever they did and should not feel disturbed by our presence. The assistant instructed the mothers how to collect saliva samples with the help of cotton swabs and mothers collected the samples directly before the female stranger arrived and ten minutes after the female stranger had left. When the first saliva sample had been taken, one of the female strangers approached the child, greeted the child and interacted with the child for approximately five minutes; this was videotaped by an assistant. Because children are used to relatives, neighbors and family acquaintances approaching them and picking them up, the author considers the situation of a female stranger greeting the infant within the context of natural interaction. The whole procedure was repeated several days later, only this time the female stranger was exchanged.

Additionally, the research team wanted to observe the infants' everyday behaviors, as well as naturally occurring attachment behaviors without prompting such behaviors externally, as it has been done with the help of strangers' visits. Therefore, mothers and families were informed that we would like stop by at the families place to visit the infants nine more times at different day times. Since these visits were unannounced, the research team went to the families' places and tried to locate the infant in question. Often, infants did not sojourn at the families' places, but stayed at neighboring places or were with their mothers at the farm. In cases where the assistants found out about the infant's whereabouts by querying people, the research team went to the place where the infant was supposed to be. When the infant could be located, one assistant videotaped the infant and everything that happened in the infant's close vicinity for twenty minutes, the European researcher stayed out of sight of the infant. Again, people present were asked to continue their ongoing activities and not to feel disturbed by the videotaping.

Only the interviews with the mothers and the collection of socio-demographic data did not take place in the infants' everyday environment, but at a local restaurant, to ensure mothers were not disturbed by other family members or neighbors.

### **3.3.2 Assessment of infants' reactions towards the greetings from female strangers**

The first data assessment took place when the child was exactly one year old or within the next two weeks after the child's first birthday ( $M = 372$  days). Mothers and infants were visited twice, once by a Western (German) stranger, and once by a native (Cameroonian) female stranger. The two visits took place on different days at around the same time. In half of the cases, the families were first visited by the Cameroonian stranger and in the other half, by the German stranger. The mean time lapse between the two visits was 2.3 days.

In each case, an assistant greeted mother, family and other people present and told them that we were interested in the infant's reaction to the greeting of a strange person and that we wanted the mother to be present during the interaction. The mother and others present received no further instructions on how to behave and were asked to ignore the videotaping as far as possible. Maybe due to the fact that mothers were asked to collect a salivary sample from the infant beforehand (described in detail in the next section), all mothers except for two kept the infants on their laps when the female stranger came into sight, although they had received no instructions in this regard.

The strangers' task was to approach the infant in the presence of the mother, to pick the infant up and to interact up to five minutes, preferably while holding the infant in her arms. This had been practiced by both strangers several times before the actual data collection took place. However, the strangers were free in the exact embodiment of the interaction: depending on their judgement if the infant feels at

ease with them, they were free to move around with the infant, they could decide to stay close to the mothers, to give the infant back to the mother or to somebody else, or to put the infant on the ground.

When the first saliva sample had been collected, the stranger came into the infant's sight, first greeted the family, the mother, and others present, before greeting family, mother, and child and interacting with the child for approximately five minutes. This situation was supposed to elicit mild stress in the child, especially in the case when the stranger had white skin colour. It is however, a common gesture in the Nso community to pick young children up and cuddle them. Therefore the situation was supposed to be in the range of children's normal experiences. The infants' experience of proximity or even physical contact with strangers was supposed to elicit observable attachment behaviors in form of typical emotional reactions and approach/avoidance behaviors.

The visits were recorded on video by a local research assistant. Since every infant was visited by a female stranger twice, a total of sixty different scenes were recorded.

### **3.3.3 Measurement of cortisol reactivity**

Since elevated cortisol levels are supposed to indicate a response to acute stress (Gunnar & Brodersen, 1996; Panksepp, 2001), cortisol assessments were made with respect to the visit of a stranger. In accordance with procedures reported in the literature on stress research, the saliva samples were taken immediately before the hypothetical stressful event as well as 10 minutes after the child was confronted with the female stranger (Flinn & England, 1995; Luecken, 1998; 2000). Directly before the visit of the stranger, a first sample of saliva was taken from the child with cotton swabs (Sarstedt, Rommelsdorf, Germany) with the help of the mother (see figure 2). Prior testing had revealed that it was more comfortable/less stressful for the children when the salivary sample was taken by the mothers. Mothers were therefore

instructed by a research assistant on how to collect the saliva samples from the infant. Sampling was monitored by the research assistant. Ten minutes after the visit of the stranger, which lasted approximately five minutes, the research assistant asked the mother to take the second sample of saliva. Samples were stored in a refrigerator until the author's return to Germany, where they were sent to a laboratory for further analysis.



Figure 2: Mother taking saliva from the child

#### **3.3.4 Naturalistic observation of infants' everyday functioning**

Following the visits of the female strangers, the author and a research assistant visited each of the participating children unannounced nine more times at different times of the day. The research assistant videotaped the child's activities and immediate environment for twenty minutes as unobtrusively as possible while the author stayed in the background and took field notes. Since this material has not been analyzed yet, it will not be referred to further in this study.

### 3.3.5 Interviews and questionnaires

The assessment of maternal ethnotheories was the last step of the assessment to avoid the mothers becoming aware of the focus on attachment behaviors; it consisted of a semi-structured interview with all mothers. The aim of the interviews was to gather information about prevailing ethnotheories on attachment relationships, attachment behaviors as well as socialization goals in Cameroonian Nso mothers.

To ensure the questions were formulated in a culturally appropriate way, i.e. broken down into manageable chunks that are clearly and concisely understandable, the interview guideline was based on focus groups that were conducted beforehand. Especially the fact that people differ –dependent on their social context– not only with regard to content, but also in their discourse style (Keller, Hentschel et al., 2004) made the focus-group interviews indispensable for the development of the interview questions.

The two focus-groups involved 12 and 15 grandmothers respectively, who were considered to be experts in child rearing issues. During the focus-group discussions a local research assistant translated a range of theoretical questions concerning attachment relationships, attachment behaviors as well as socialization goals into Lamnso, the Nso language. The grandmothers as ‘experts on child development’ were asked about their opinion. They could talk freely about these issues and the discussions were recorded and later translated into English by a research assistant. The discussions lasted about one hour per focus-group and each grandmother was paid 2.000 Cameroonian francs (approx. 3 Euros in 2005) for her participation. This approach ensured valuable insights for the development of the interview guideline. Some questions, for example, were misunderstood or misinterpreted by the grandmothers and had to be re-formulated. This revealed the importance of asking very specific and brief questions and resulted in the restructuring of the maternal interview questions into 65 direct questions. The developed guideline for the maternal interviews is found in Appendix 2.

The mothers were taken to a local restaurant for dinner and the interviews were conducted in a separate room away from the other guests. A questionnaire was completed beforehand to obtain socio-demographic information about mother and child. Included were age, education, marital status, subsistence patterns (see Appendix 1 for the full questionnaire). The interviews were conducted in Lamnso by a local research assistant and simultaneously translated into English. This enabled the author to clarify questions and/or to acquire detail about issues raised by the interviewee. The interviews lasted about one hour each and were audio taped.

The interviews started with an open question about the pregnancy in general and the first year after birth. Mothers were told that interviewers were interested in details and that there was no right or wrong answer. Many mothers were not very talkative and the remaining questions on health issues, daily routines, socialization goals and attachment were broken down into concrete questions, addressed very specifically in order to simplify the mothers' task of talking about these topics.

The first section of structured questions consisted of questions covering detailed topics such as health problems during pregnancy and the following year, circumstances surrounding delivery, problems during delivery, as well as infant's health conditions.

With regard to mother's and child's daily routines, several questions were asked about the mother's work day, who spends time with the child, what activities are done together with the child, whether father, grandparents or siblings are around and what their assigned roles are, what the child does from morning until evening, and the like. Apart from gaining a better understanding of the daily activities of mother and child, the aim of these questions was to find out who acts as the primary caretaker of the child as well as how many people are actually involved in taking care of the child and –if so– whether there is a distinguishable hierarchy between the multiple caregivers.

Another part of the interview covered questions about socialization goals and ideal parenting: what values and habits are taught to the child, what makes a good/

bad child, what is representative for a good/bad mother/father. This information is necessary to understand the general direction of development in the Cameroonian Nso and how parents try to gear their children's development towards this. The biggest part of the interview consisted of a variety of questions concerning infant's attachment behaviors and their regulation, the role of attachment figures as well as situations where attachment behaviors are typically displayed. The questions were put explicitly, e.g. 'what does it mean when the child cries?' 'What do you do when the child cries?' The aim was to learn how mothers interpret and react to attachment behaviors and to determine individual differences in the maternal perceptions and reactions towards attachment behaviors.

The interviews lasted about one hour each. Mothers were thanked for their participation and paid 12.000 Cameroonian Francs (around 20 Euros in 2005) for their willingness to participate in the study which comprised a total of 11 visits by the research team as well as the interview.

### 3.4 DATA ANALYSIS AND MEASURES

#### 3.4.1 Analysis of strangers' visits

Videotapes were digitalized and stored on compact discs to enable labeling and effortless locating of different episodes. Video data were analyzed using a software system designed especially for qualitative analysis of different data formats, Atlas.ti. (Muhr, 2004). Data from the coding of the video measures could be combined with data from the coding of the interviews as well as easily exported into a spreadsheet program for statistical analysis.

The first step of the analysis consisted of segmenting the strangers' visits into different episodes according to content of interactional behavior. Watching the videotapes revealed a great variety in the embodiment of the interaction. However, two qualitatively different episodes could be identified in almost all the strangers' visits: The 1<sup>st</sup> episode, where the female stranger was in proximity of the infant, but had no body contact with the infant yet and a 2<sup>nd</sup> episode, where the stranger established body contact with the infant for the first time (cf. figure 3). The physical proximity between stranger and child varied in the two episodes with an increase of proximity in the 2<sup>nd</sup> episode. With regard to attachment behavior it is of interest whether varying degrees of proximity between infant and stranger result in the differential arousal of the attachment system. The first author as well as a second coder identified the two episodes in the videotapes, which could thus be further analyzed.

In the **1<sup>st</sup> episode** a female stranger arrives and is noticed by the child, moves towards the infant, but does not establish any body contact. The guiding question for the analysis of the 1<sup>st</sup> episode was: 'How does the infant react towards the approaching female stranger?' The 1<sup>st</sup> episode was defined to start from the point when the female stranger was noticed by the child until the female stranger established body contact. Due to distorted videotapes or delays in the beginning of video-recording, only N = 27/N = 28 1<sup>st</sup> episodes could be identified for the Cameroonian/Western strangers' visit and be further analyzed. Mean length of the first episode was 16 seconds, with a range from 03 seconds to 56 seconds.

In the **2<sup>nd</sup> episode** the female stranger establishes body contact with the child for the first time. Here the guiding question for the analysis was: ‘How does the infant react towards body contact with the female stranger?’ The 2<sup>nd</sup> episode was defined to start with the onset of the stranger’s movement that led to the establishment of body contact and to end with an additional 10 seconds from when body contact was interrupted, allowing for the infant to show a delayed reaction. In 3/2 of all cases the first body contact between the Cameroonian/Western stranger was not interrupted throughout the entire visit and continued until the female stranger left at the end of the visit. In these cases the second episode was still defined to end after 10 seconds. N = 28/N = 29 2<sup>nd</sup> episodes could be identified for the Cameroonian/Western strangers’ visit.

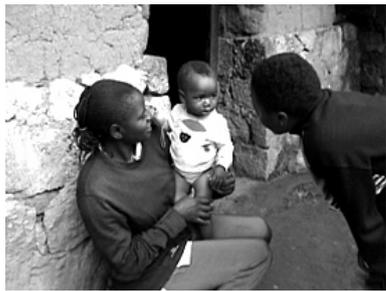
	<i>episode 1</i>	<i>episode 2</i>
<i>Cameroonian</i>		
<i>German</i>		

Figure 3: The two episodes of the strangers’ visits.

All sixty videotaped interactions of the strangers’ visits were divided into the episodes. In the following step –by watching the videotapes over and over again– a systematic coding manual was developed by determining dimensions considered to be relevant to attachment. The following dimensions were derived from the data:

- (a) the emotional reaction of the infant towards the female stranger
- (b) signs of acceptance or avoidance in the infant towards the stranger
- (c) closeness of body contact with mother
- (c) closeness of body contact with stranger
- (d) exploratory behaviors of the infant
- (e) infant's general activity level
- (f) maternal guidance
- (g) maternal breastfeeding

A survey of the codes and the corresponding definitions are found in table 1.

Codes	Definitions
<b>(a) Infant's emotional reaction towards the stranger</b>	
Joy	Infant laughs, smiles, is happy, excited.
Engagement	Infant is actively engaged in the interaction with the stranger, reacts appropriately to interaction offers and /or initiates interaction turns. Positive affect throughout.
Curiosity	Infant is very attentive, follows stranger with gaze all the time and/or turns body in the direction of the stranger, shows a very typical facial expression with eyes wide open, mouth sometimes open. Concentrated, slightly positive, no negative affect.
No emotional reaction	Infant is unimpressed by stranger's presence, pays no attention to stranger, takes only a short look and then switches to other people or things in the environment or gets back to what he/she was doing before. Neither positive nor negative affect.
Wariness	Infant is apprehensive of stranger, very attentive, but with slight negative affect. Follows stranger with gaze, not with body.
Fearfulness	Infant is scared by stranger, cries, sobs, tries to hide from stranger, often avoiding mutual eye contact with stranger. Strong negative affect.

Angriness	Infant resists all interaction offers, seems disturbed by stranger's presence, beats at stranger, often frowning and sometimes crying. High body tension, negative affect.
<b>(b) Infant's signs of approach/avoidance towards stranger</b>	
Reaching out	Infant uses hands to reach out for stranger as an answer towards the stranger's offer to take the infant.
Leaning forward	Infant bends forward as an answer towards the stranger's offer to take the infant.
No sign of approach/ Avoidance	Infant shows no signs of extending or diminishing the distance between stranger and him/herself in reaction to interaction initiatives.
Turning away	Infant turns head away from stranger in reaction to interaction initiatives, interrupts mutual eye gaze.
Withdrawal	Infant turns away from stranger with the whole body in reaction to interaction initiatives, interrupts mutual eye gaze.
<b>(c) Infant's closeness of body contact with mother</b>	
Very close body contact	Infant sits/lies on mother's lap, touches mother with upper body, arms and/or legs. Additionally, mother has arm(s) around the infant's body (e.g. during breastfeeding).
Close body contact	Infant sits on mother's lap, infant's torso touches mother or mother has both arms around the child.
Little body contact	Infant's arm/s or leg/s touch the mother's body. Infant sits on mother's lap without being hold by her and infant's torso does not touch mother's body.
No body contact	No body contact between infant and mother.
<b>(d) Infant's closeness of body contact with stranger</b>	
Close body contact	Infant is picked up and held by stranger.
Little body contact	Infant is touched by stranger (e.g. arms, legs) without being held.
No body contact	No body contact between infant and stranger.

<b>(e) Infant's activity level</b>	
Low activity	Infant is frozen, does not move his/her arms, legs or body actively.
Medium activity	Infant moves arms and/or legs and/or whole body actively, but in moderation.
High activity	Infant moves arms and/or legs and/or whole body actively and excessively. Infant moves/dances rhythmically.
<b>(f) Infant's exploratory behavior</b>	
Object play	Infant's attention is geared towards an object or the infant is engaged in object play. Animals count as objects.
Exploring stranger	Infant touches stranger's body or face with his/her hands.
Greeting stranger	Infant shakes hand with stranger.
<b>(g) Maternal directivity</b>	
Directive	Mother structures the interaction for the infant, imposes behaviors on the infant, e.g. by pushing the infant's hand or body towards the stranger, or handing the infant to the stranger.
Passive	Mother sits passively without any initiatives. No interfering with infant's behavior.
<b>(h) Breastfeeding</b>	
Breastfeeding	Mother breastfeeds the child.

Table 1: Measures for the coding of the strangers' visits.

The complete set of codes was used for the analysis of the second episode, i.e. the first body contact between stranger and child. The first episode had to be coded with a limited set of codes due to the following reasons: During the first episode, when the stranger arrived, but was still without reach of the child, the codes concerning 'infant's closeness of body contact with stranger' were superfluous. The code 'exploring stranger' was not applicable for the same reason.

Coding was done sequentially for all videos of one episode. An episode was watched in view of one of the behavioral dimensions –several times if necessary– until the coder arrived at a decision for one code of the behavioral dimension. The occurrence of the above described behavioral dimensions was coded accordingly with the software program Atlas.ti (Muhr, 2004).

Regarding **infant's emotional reaction**, the most dominant emotional reaction being displayed within the 1<sup>st</sup> and 2<sup>nd</sup> episode was counted; since the single episodes did not last very long, the infant's emotional expression often stayed the same or perhaps changed only slightly over time. Only one emotion was coded per episode.

In case of **infant's signs of approach/avoidance** towards female stranger, a code was given, when any reaction of approach or avoidance towards the stranger could be identified within the episode. If the infant showed the same reaction several times within the same episode, only one code was given. In case the infant showed different reactions within the same episode, e.g., turned away and withdrew the whole body, a different code was given for each reaction.

With regard to **infant's closeness of body contact with mother**, the type of body contact was indicated which lasted longest within an episode. Only one code was given per episode.

As far as **infant's closeness of body contact with stranger** is concerned, any time the stranger touched the infant's body within the 2<sup>nd</sup> episode, little body contact was counted. In all other cases the child was either held by the stranger, rated as close body contact, or had no body contact with the stranger. Only one code was given per episode/interaction sequence.

With regard to **infant's activity level**, one rating of the activity level was given per episode. In case the activity level changed within one episode, the most dominant activity level in terms of length was coded.

In case of **infant's exploratory behavior**, a code for greeting stranger and/or exploring stranger and/or object play was assigned if the behavior occurred within one episode. If the same behavior occurred several times within the same episode, the behavior was coded only once. The codes were only applied for episodes, in which instances of the behaviors occurred and could be used mutually.

Regarding **maternal directivity**, every episode was coded as directive when the mother showed any signs of directivity. In all other cases maternal behavior was coded as passive.

As far as **breastfeeding** is concerned, a code was given only in episodes where the mother breastfed the infant throughout or partly during the episode. An overview of the use of the different measures in the separate episodes is provided in table 2.

Measures for the analysis of stranger's visits	Episode	
	1 <sup>st</sup>	2 <sup>nd</sup>
Infant's emotional reaction towards stranger	x	x
Infant's signs of approach/avoidance towards stranger	x	x
Infant's closeness of body contact with mother	x	x
Infant's closeness of body contact with stranger		x
Infant's activity level	x	x
Infant's exploratory behavior		x
Maternal directivity	x	x
Breastfeeding	x	x

Table 2: Coding system of the different episodes

### *Reliability*

Half of the videos were coded by a trained second coder to ensure reliability. The author coded all the 112 episodes (1<sup>st</sup> and 2<sup>nd</sup> episode for both strangers) and was used as standard. Reliability of the identification of the different episodes and interaction sequences was 100 % for the first author and the trained second coder. Mean time difference for the definition of on- and offset of episodes and interaction sequences was <1 second concerning the onset and 2 seconds concerning the offset of episodes. Reliability of the measures used in coding 1<sup>st</sup>/2<sup>nd</sup> episodes were calculated using Cohen's kappa and ranged from

.86 for infant's emotional reaction towards stranger

.82 for infant's signs of approach/avoidance towards stranger

1.0 for infant's closeness of body contact with mother

1.0 for infant's closeness of body contact with stranger (only 2<sup>nd</sup> episode)

.78 for infant's activity level

.76 for infant's exploratory behavior

.77 for maternal directivity

1.0 for breastfeeding

The quantitative data of the video analysis was recorded by using Excel and could thus be exported to a spreadsheet program for statistical analysis, using Nie, Stein & Bent's (1975) Statistical Package for the Social Sciences (SPSS, version 14.0).

#### **3.4.2 Cortisol analysis**

Saliva samples were analyzed by the Center for Psychobiological and Psychosomatic Research at the University of Trier in Germany. Cortisol concentration was measured in nmol/l by a time-resolved immunoassay with fluorescence detection (for an exhaustive description, see Dressendörfer, Kirschbaum, W. Rohde, Stahl, & Strasburger, 1992). The cortisol response to acute stress (CRAS) was operationalized through the change from the mean cortisol concentration before the stress procedure to the mean cortisol concentration at 10 minutes afterwards.

### 3.4.3 Analysis of interviews

The approach chosen for the analysis of the interviews was a content analysis (Mayring, 1997; 2000). The focus of interest for the interviews was to gain an understanding of the prevailing concepts of attachment, childcare and parenting in the Cameroonian Nso mothers. As far as the author knows, no studies exist to date in the Cameroonian Nso with a focus on maternal belief systems on attachment. Therefore it is necessary to use an approach for the analysis that allows for the establishment of categories as close as possible to the original textual material. Content analysis provides two different pathways for the definition of categories, either inductive or deductive. This study follows an inductive path, creating categories ‘bottom-up’ from the interview data. The classical procedure to define categories inductively is a step by step or gradual process (for a detailed description see Mayring, 2000): First, the research question has to be defined clearly. For the development of categories, selection criteria as well as a level of abstraction have to be determined. The central process consists of viewing the textual data and creating categories or redefining categories depending on what information emerges during the review of the text. The aim is to develop a set of categories for the analysis. In order to be consistent and coherent, transcription rules are developed to determine what is relevant and how to code it. Everything of relevance for the research question is coded, either by defining new categories or by subsuming new information under already existing categories. When 20-50% of the textual material has been worked through, reliability is checked by going back to the coded material and validating the categories with regard to the research question, coherence and/or asking a second person to code the material. If needed, categories are deleted, redefined or created once more. In case reliability is adequate, all material is coded and results may be used to develop e.g. a typology or might be used for a further quantitative analysis, depending on the research question.

In this study the procedure of a qualitative content analysis was applied in the following way: In the first place, all interviews were transcribed verbatim from the audio tapes by research assistants. Secondly, in order to structure the material,

answers of all mothers to a specific or the same question were grouped together into a new document, resulting in sixty-five documents –one for each question– containing all the corresponding maternal answers. This way, the answers of all mothers to one question could easily be considered at the same time during the process of analysis. Interview data were also analyzed with the help of the software system, Atlas.ti. (Muhr, 2004), which allowed for a systematic analysis of the interviews. Information units consisting of sets of words or phrases were chosen as an appropriate level of analysis. Since detailed information for each question had to be retrieved ‘bottom-up’ from the actual text, all relevant information given by the mothers was paraphrased and condensed. The author coded all information given by mothers with respect to the question asked as close as possible to the verbal response. Irrelevant information, like an excursus that departed from the main subject, e.g. neighborhood gossips, was ignored. At this point in the analysis, the level of generalization was very low, preserving the given information in detail. The paraphrased information units were then grouped together into categories and this way an inductively derived set of concepts and categories –instead of using predefined concepts– was developed for every question asked. In order to guarantee the development of a coherent and sensible coding system, the author assisted by two students grouped the paraphrased information units into general categories/concepts independently of each other. In case of disagreements, the categorization was discussed among the author and the independent coders and the disputes settled. This way, a coding system was developed that comprised of specific codes for each question. Analysis was done per question across all interviews based on the corresponding coding systems.

Since the 65 questions of an interview included various topics, such as family roles, routines and attachment behaviors, the analysis of all questions was regarded as too exhaustive; only questions considered to be of direct relevance to the study question were chosen for further analysis and are presented here. The following questions were analysed in detail:

- Open question (question number 1)
- Maternal expression of attachment towards child (question number 52)

- Infant's attachment towards mother (question number 53)
- Father and child (question number 15)
- Exclusiveness of child and carer (question number 24, 25, 26, 27)
- Health status of mother and infant (question number 2, 6)
- Infant's favourite caretaker (question number 17, 18)

For illustrational purposes, the development of the coding system for question 52 is partially depicted in Appendix 3.

Questions 2, 6, 17, 18 dealt with basic topics, such as whether the infant had been severely ill during the last year. For such questions it was only of interest whether mothers were affirmative or not. Accordingly, those questions were coded for existence only, i.e. categories would be counted only once in the interview section, no matter how many times they appeared or how much mother elaborated on the concepts. For questions 1, 24, 25, 26, 27, 52, 53 the emphasis put on the different categories was of interest, e.g., do mothers talk more often about body contact or about emotions while describing their feelings for their child. The number of times a mother refers to a concept was considered important. Accordingly, the frequency of the concepts, which is the exact number of times a concept appears in a text, was coded. The former coding system was used to extract simple dichotomies in the sample while the latter was used for further quantitative analyses, e.g. computing relative frequencies. The aim of the analysis was therefore twofold: on the one hand it aimed at revealing underlying concepts of Nso mothers about attachment and child development and on the other hand by revealing individual differences in maternal conceptions.

Reliability for the development of the interview coding systems was ensured by discussing disagreements in the categorization of the concepts with other researchers. In case of disagreements, solutions were based on attachment theory's previous findings concerning interviews of adults about attachment related topics.

Data obtained from the interview analysis was also converted from Excel into the spreadsheet program for statistical analysis, SPSS.

## 4. RESULTS

Descriptive results for the three different levels of analysis constitute the **first part** of the result section, with the exception of an analysis of the socio-demographic parameters, which has already been reported in the method section (cf. chapter 3.2). Hence, detailed descriptive results are provided for

- Maternal representations of attachment relationships as assessed in interviews (chapter 4.1),
- The infants' behavioral regulation in the interaction with the two culturally diverse strangers (chapter 4.2), and
- The infants' experience of stress towards the greeting of the two culturally diverse strangers (chapter 4.3).

In the **second part** of the result section (chapter 4.4), infants are grouped in accordance with identifiable patterns in their emotional reactions (chapter 4.4.1). Due to differences in the greeting style of the two strangers, reported data is restricted only to dimensions relating to the Cameroonian stranger. The identified emotion patterns are supported with the help of psycho-physiological data (chapter 4.4.2).

**Finally** (chapter 4.5), an overall model is derived depicting the interrelationship between the socio-demographic parameters, maternal belief systems, and the specific emotion regulation patterns of the infants. Interview sections substantiating the function of the derived model are used as a preliminary evaluation of the model.

## 4.1 MATERNAL REPRESENTATIONS OF ATTACHMENT RELATIONSHIPS

### 4.1.1 Mothers' conceptions of attachment

Maternal as well as infantile expressions of attachment as assessed in the interviews centered upon positive feelings expressed or released through close body contact. Distal forms such as smiles, nicknames or presents were rarely used. Maternal nominations uncovered a better developed and more distinctive concept of attachment for themselves, compared to the concept they attributed to their children's attachment.

#### *Mothers' expressions of love*

Maternal views of attachment relationships revealed as the most important dimension for the expression of attachment a very high amount of bodily proximity between mother and child. When mothers were asked how they convey that special feeling of love they have for their child, most frequently mothers referred to the establishment of **close body contact** between themselves and their child: "*At times I just hold her close to me.*" (Participant 11). Additionally, most mothers reported activities like playing with the child while being in close body contact with the child at the same time: "*And there are times when I'm just taking her, put her on my lap and we are playing. That's an expression of love.*" (Participant 26). Togetherness of mother and child and their close companionship was also often described as a sign of love, e.g. "*When he is with me, he knows I love him.*" (Participant 20).

References to direct physical contact between mother and infant were followed by references to **primary care activities**, which also include close proximity between mothers and infants for the most part, e.g.: breastfeeding: "*There are times I call her, when she does not need breast milk, I just give it to her.*" (Participant 30) or bathing: "*I bath the child most often*" (Participant 29).

Mothers mentioned **distal signs of love** less often, e.g. buying special gifts like biscuits or puff-puff [traditional fried dish] for the child; similarly, some mothers reported that in order to show their affection they would smile at the child in order to make the child happy: "*We smile together, I make him to laugh.*" (Participant 25).

Few mothers referred to language use, e.g. to call the child special names or to use a special language when talking to the child, “*I call his name [...] call him anyhow [...] many names.*” (Participant 3).

Two out of the thirty mothers referred to their children as being too immature or too young to understand maternal expressions of affection yet: “*As she is this small, even if I’m showing that I love the child, the child will not know the difference.*” (Participant 1).

Except for the two mothers who did not believe that their infants are able to apprehend their love, the twenty-eight mothers listed in sum 82 single nominations representing their expression of love towards their children (see figure 4).

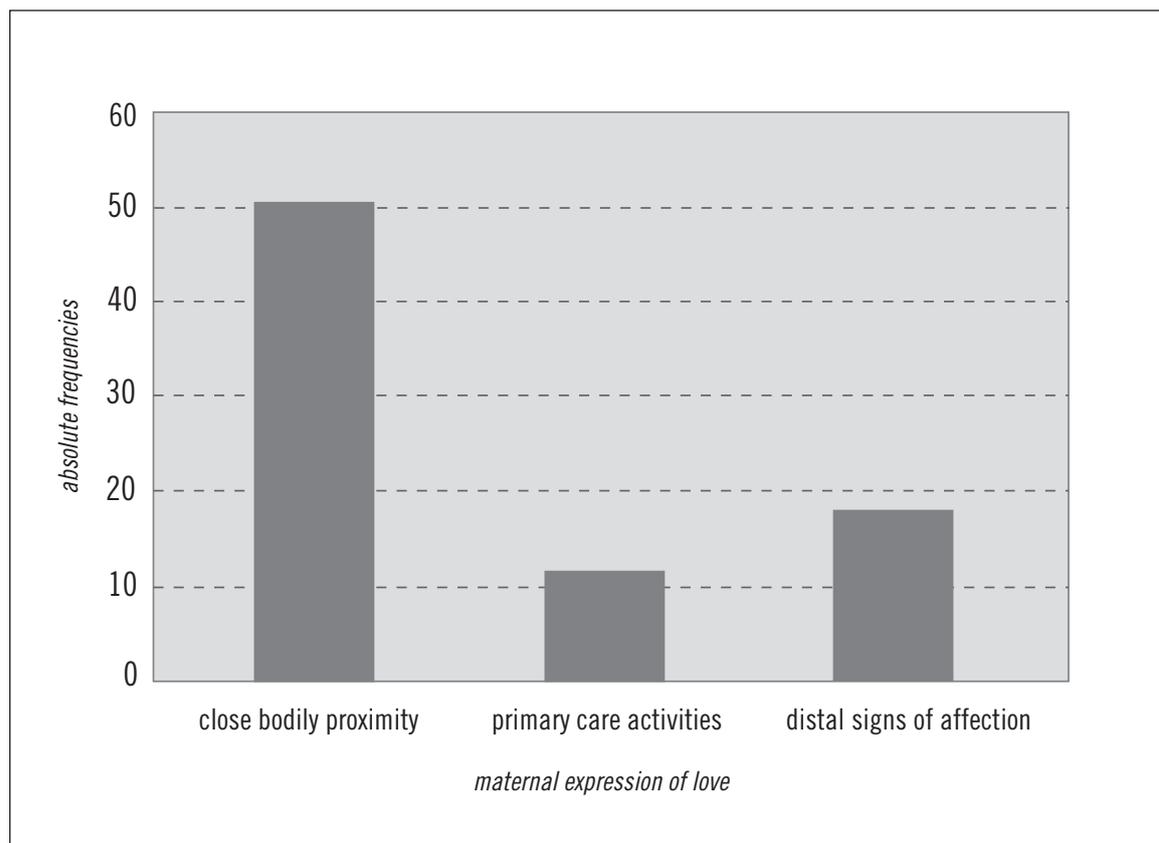


Figure 4: Absolute frequencies of mothers' expressions of love

### *Infants' expressions of love*

The complementary question aimed at signs of love displayed on the part of the infant: 'Does your child love you? How do you know?' Firstly, all mothers affirmed that they were loved by their children (N = 29; one participant missing). As it has been the case with maternal signs of attachment, maternal explanations for infants' signs of love concentrated on happiness reflected by different degrees of bodily proximity. Predominantly, mothers described their children as happy whenever they were enjoying **close proximity** with their mothers. Infants' love was reported to manifest itself as happiness in the form of smiles, positive excitement, or special behaviors: "*When she is with me, she is very happy and smiles. So I know that she loves me.*" (Participant 4), "*I have to hold him, so that he feels fine.*" (Participant 20). "*I know from her actions when she is with me. The way she behaves.*" (Participant 11).

Following on the numerous descriptions of happiness (see figure 5) while in close bodily contact with their mothers, considerations mentioned less frequently showed the direct opposite, namely **separation distress**, caused by a disruption of proximity and closeness. Mothers described the infants' separation distress as signs of love, manifest in the children's quest of body contact and their seeking of proximity: "*I know because when I'm going somewhere, she is crying. And if I come back and take her, she stops crying. So from there, I know that she loves me.*" (Participant 14).

**Distal signs of affection** between mother and child were reported as signs of love least often, e.g. infants calling for their mothers: "*Because often he is calling mama, mama.*" (Participant 25) or infants readily sharing their food: "*When her father brings something and gives it to her, she will come and give my own.*" (Participant 8).

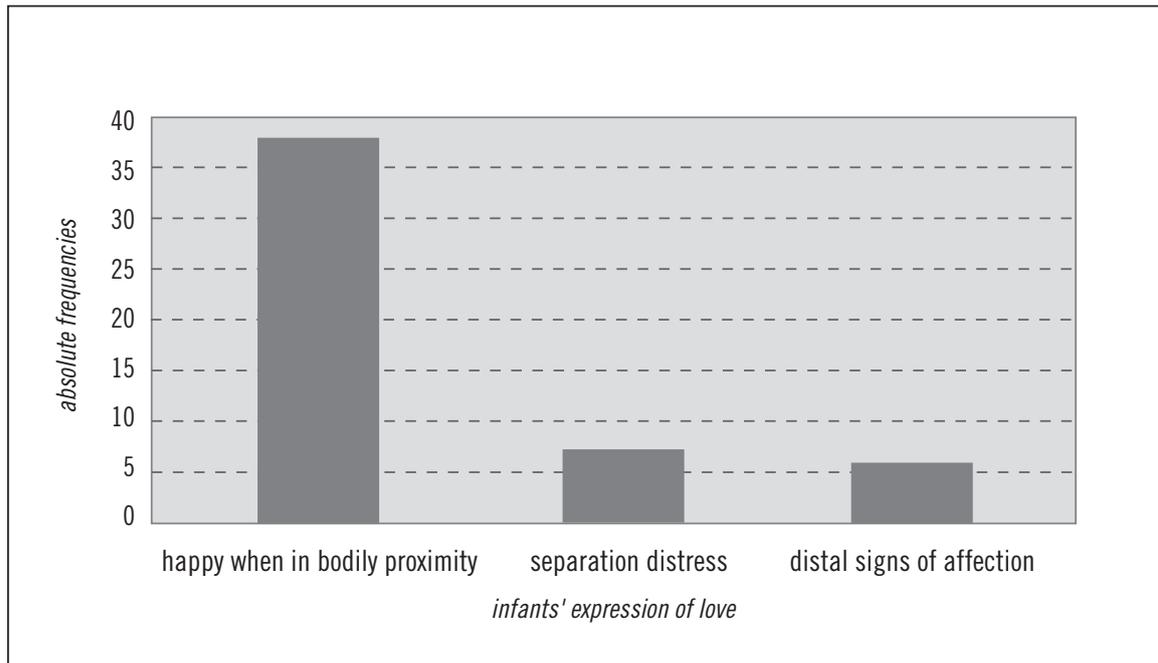


Figure 5: Absolute frequencies of infants' expressions of love

Compared to maternal expressions of love for their infants, infants' signs of love were described in less detail by mothers with a total of 51 single nominations.

#### 4.1.2 Mothers' perceptions of the context of attachment relationships

Apart from the above mentioned questions that aimed directly at the mothers' state of mind with regard to attachment, the remaining questions were used to gain information about mothers' perceptions of the contextual factors which impact on attachment relationships. The kind of family support the mothers experienced turned out to be the most crucial factor in determining the mother-child relationship. Of minor importance were paternal support and the gender of the infant.

##### *Social support: The extended family*

Social support was mentioned most frequently in the interviews and emerged as the most powerful factor determining not only a feeling of security and the wellbeing of mother and child, but also enabling the mother to rely on a variety of caregivers and to enhance chances for the child to actually survive.

Most mothers relied on the **extended family system** –consisting of the father’s as well as the mother’s family– during pregnancy and the first year of the child’s life. They cited the extended family as extremely important and helpful in many ways, e.g. the extended family provided a constant support system, through supervision and help in case of an emergency during pregnancy. As one mother puts it: “*My mother used to take very good care of me. My mother used to come here often and check on me. And my mother-in-law used to come here nearly every day when I was pregnant. When it reached about time I should deliver, she never went to anybody, she was just around.*” (Participant 15). When a child is born, the extended family is referred to as providing financial and childrearing support as well as support in case of illness and generally takes up a common responsibility for the child. “*All of our family members were very happy. They were ready to help with the bill. We did our best and our relatives they also helped us [...] When I go to the farm, his father helps me with the child. And my mother-in-law. And my father-in-law, too. So all of us we take care of the child together. Up to now the child knows all of us, because everybody’s concern is taking care of the child.*” (Participant 24). From the moment the child is born, other kids begin to play an important role in the infant’s life. Siblings, relatives or neighbors were often cited as spending a considerable amount of time playing, carrying, and feeding the infant “*When my niece, who already goes to school, when she returns from school, she takes her and they play together.*” (Participant 24).

Social support provided by **fathers** constituted a minor factor compared to the social support received from the family, noticeable in the fact that fathers were not mentioned at all by half of the mothers during the free report part of the interview. The majority of mothers who talked about the biological father of the child in the open question part reported having marital problems or told a story of how they were left by the father of the child: “*But when I delivered, the boy did not pay my hospital bill, he ran away. Up to today, I have not seen him again.*” (Participant 10). “*When I discovered that I was pregnant, I told my husband that I was pregnant. We were together. When the pregnancy was about five months, we used to be happy, but at times we had problems. After about five months, when we had problems, he told me that I should go to*

*our compound. Then I packed my things and I took my first son.*” (Participant 18). Most mothers depicted the infant’s father as not being present or even being abusive. Few mothers explicitly referred to the child’s father as being helpful during the time of pregnancy or after the birth: *“When I gave birth people in the hospital were saying that my child’s father loves me very much, because he did everything for me. In case I want to go and bath, he will help me to go and bath. And we are very happy. Anything for Junior, he will get it for him. When we came home from the hospital, he paid the hospital bills. [...] When I came out from the hospital, I came to our own house. He comes and looks after Junior every day. My father was very happy to see that he was caring.”* (Participant 5).

However, in most reports of supportive fathers, support was restricted to contributing money to sustain the mother and child, a behavior mothers regarded as adequate paternal support: *“There are days that he even comes and stands on the machine and gives me money and goes away. [...] At times he asks me to buy something for the child [...] He bought everything for the child.”* (Participant 19). Likewise, fathers were not very involved in the upbringing of the children. Although several mothers reported that the biological father did at least spend some time with the child, many of these spoke of visits on a very irregular basis. With regard to joint activities of father and child, mothers reported most frequently that fathers would play with their infants: *“When the child is playing beside him, he will be playing with him.”* (Participant 27) or take the child along, e.g. for a walk to a different compound. However, siblings or neighboring children were much more often cited as playing with or caring for the infants. Very few mothers reported that fathers participate in feeding or carrying the child. One mother mentioned the father as actually scaring the child.

Communal caregiving through an extended family is also emphasized in maternal evaluations of **exclusive relationships** between their children and other selected persons. Most often mothers reported that they do not appreciate exclusiveness between the child and another person, because it could be harmful for further child development. They justified this attitude on the grounds that:

- Multiple caregivers provide optimal care for a child:  
*“Because just one person can not take care of the child throughout.”*  
(Participant 33),
- Integration into the community and equal love for everybody is fundamental: *“No, it [following only one person] is not considered good, because I want her to be used to everybody and love everybody equally.”* (Participant 4),
- The ability of the child to cope in case of a sudden maternal death:  
*“Following only me? For me I don’t think it’s too good for her, because like now if she keeps on following only me, loving only me, if I’m not by her side now or if I maybe die, who will take care of her? She needs to at least love everybody or try to be used to everybody, so that in case I am not around, anybody can take care of her.”* (Participant 33).

A consequence of this is the fact that many mothers practiced ‘giving their infants away’ in order to make them used to others, so as to be able to continue their daily work. When necessary, they even forced their children towards others: *“I force him to go to other people. When I see any person, I would like to force the child to go to them, so that I should not be the one who is taking care of the child alone. Because it is not possible that I can be taking care of him alone. He would be disturbing me most often. It means I will not be able to do any other thing.”* (Participant 18).

Some mothers differentiated according to the familiarity of persons and situations: following a strange, unknown person was considered dangerous and therefore not allowed; however, sticking to relatives, neighbors or other familiar children was considered a good habit. Equally mothers did not want their children being in places they didn’t know themselves, being too far away from the mother or being out of sight for too long. But if they were sure about the children’s whereabouts, they appreciated infants going along with a familiar person, e.g.: *“At times, if they are not going to a distant place and I know the person as a neighbour. If it is not the neighbour, I won’t let the child go with him. If it is the neighbour, I must know where you are going with the child before you can take her along. If I am not sure of your destination, I will not allow the child to go.”* (Participant 27).

The focus on communal caregiving might also account for the fact that only 1/3<sup>rd</sup> of the mothers considered themselves as representing the **primary attachment figure** of the child. In 2/3<sup>rd</sup> of the cases other persons, like a mothers' younger sister, a sibling, or a grandmother, were nominated by the mothers as being the persons best-liked by the infant.

In those cases where mothers could rely on an extended family system, they reported joyful feelings, **contentment** and gratefulness when they discovered being pregnant. *“When I was pregnant [...] when I heard that I was pregnant I was very happy [...] When I just saw the child, I became very happy and I thanked God.”* (Participant 3). Generally, in the Nso community a female only reaches a real mature adult status with subsequent responsibilities, competencies and prestige, through bearing children. Therefore, a pregnancy itself is considered as a reason to be happy. Explaining this joyfulness, mothers referred to their children as special gifts from God, bringing blessings to their family, e.g. in the form of presents from other people or in form of a very special, gifted child. *“And now he is one year, three weeks, I thank God and tell him that he has helped me. I can say that Noel has a special gift, because of the way I delivered him. Many people were bringing him gifts, so many gifts. Some will give savon, others will give bathing soap and bathing oil and rubbing oil. And I would think that Noel is a different child, is a child with a difference.”* (Participant 21).

Although most women reported a general happiness about the pregnancy, the joy was explicitly influenced by the **infants' gender** in several cases. Only one mother reported being happy when she discovered that she had delivered a girl; the others stated to be extremely happy about a boy: *“When I delivered, I heard the child was a male child. I was very happy because I had two female children and had just a boy. When I heard that this one was a boy, I was very happy. When I just saw the child, I became very happy and I thanked God. And thanked him that he give me a male child that I really needed, because it is the same thing that [...] I was discussing with his father that if I have a boy-child it will be very good.”* (Participant 3). The Cameroonian Nso is a male-dominated society and accordingly most women wishes to deliver a boy; especially because the birth of a boy is much more appreciated by the fathers; in some

cases mothers reported that only after the father had heard about the infants' male gender he would come to the hospital or health centre to see the child. Therefore, a clear differentiation between boys and girls in favour of boys already exists before the child is born.

### *Social support: Restricted familial support*

In several cases mothers reported a **restricted social support** system, relying only on their close relatives for assistance, or reported to be dependent on a single person for support, e.g. the employer, the grandmother, or a neighbor. In those cases mothers were struggling much more to cope with the situation of having a baby, e.g. they had difficulties to pay the hospital bills or reported difficulties to manage their everyday life with all household chores and farm work while simultaneously having to care for the baby. For some mothers the pregnancy had detrimental effects on their social support system, as their relatives did not appreciate the pregnancy. The following quotation illustrates the case of a mother losing the support of her family due to the pregnancy and hence relying on a neighbor for support: *“When I was pregnant I was staying with my uncle and aunt and neither of them loved it. They gave me a very bad treatment during that period. Even the boy who impregnated me treated me badly. So it was one of our neighbours who used to give me money and what I needed. So that our neighbour treated me like a daughter [...] She bought the child's bowl, what I used to bath the child and she paid the hospital bill. That was all that I had. So I came here, I was so poor; I had nothing. So we used to only manage to survive [...]”* (Participant 31). Such a disruption of family ties was often caused by the fact that the mothers were very young and not married at the time they became pregnant. Since unmarried pregnant women can not count on supplementary support by the father's family. It is eventually the mother's family who has to bear all the costs resulting from the pregnancy. A high proportion of single mothers therefore suffered from their family's anger. *“My parents did not like it [pregnancy] at all, so they sent me away from the house. That after my child is big, I should come back.”* (Participant 33).

Concurrently, a high number of single mothers reported **being unhappy** about the pregnancy, either because they were very young themselves and still in school or because they assumed that the biological father would not take good care of them and the infant: “*When I discovered I was pregnant it was when I was about going to school. I didn’t tell anybody. [...] My aunt with whom I was to stay was giving me much trouble. [...] When I leave the house that is when they’ll start talking about my being pregnant. Then my mother asked me. I told her. She was not harsh towards me or did not insult, she pitied me.*” (Participant 28).

Mothers who could not rely on an extended family system were often the ones who allowed **exclusiveness** between the child and themselves, especially in cases where the child refused to go to other people. Typical statements were: “*If she refuses to go to any other person, I take care of her. I hold her by myself.*” (Participant 18), “*There are days, if I see that he does not want to go to anybody, I prefer to be with him the whole day.*” (Participant 7) or “*If he was sticking to me, I would take him and back-carry him and we’ll go where I am going to.*” (Participant 2). While talking about allowing exclusiveness, mothers were not as expressive compared to talking about not appreciating exclusiveness; in their examples they most often referred at themselves as being the exclusive caretaker. Reasons why they allowed the child to cling/adapt to (or adopt) only one person were rarely given, some mothers explained that otherwise the child might become angry: “*Then I let him [follow the person], because if I don’t let him he is angry, he is only rolling on the ground and playing carelessly.*” (Participant 17) or crying: “*Then I give her to that person. At that time she is crying, I give her to him or her.*” (Participant 18), indicating that a crying or agitated child might get his/her will easily.

## 4.2 INFANTS' BEHAVIORAL REGULATION

Behaviors of people are culturally predetermined. Therefore the way in which a Cameroonian stranger approaches and greets an infant can be assumed to differ from the behavior of a German stranger in the same situation. In order to account for these differences, children's behaviors were analyzed separately with respect to both strangers, and compared afterwards. Since the central focus of this section lies in infants' attachment behaviors in terms of emotion regulation, infants' emotional reactions towards the female strangers are conceived of as the most important behavioral dimensions in this case. Accordingly, all other behavioral measures are related to the observed emotional reactions.

### 4.2.1 Infants' behavioral regulation towards the Cameroonian stranger

#### *Infants' emotional reactions*

During the 1<sup>st</sup> episode (N=27), where the children were approached by the Cameroonian female stranger, but had no body contact with her yet, the largest group of infants (N=12) was constituted by children not showing any emotional reaction at all.

During the 2<sup>nd</sup> episode (N=28), when the Cameroonian female stranger established body contact with the child for the first time, the emotional reactions were more negative, but still no observable emotional reactions were most frequent (N = 9). The distribution of the emotional reactions for the first two episodes is depicted in figure 6.

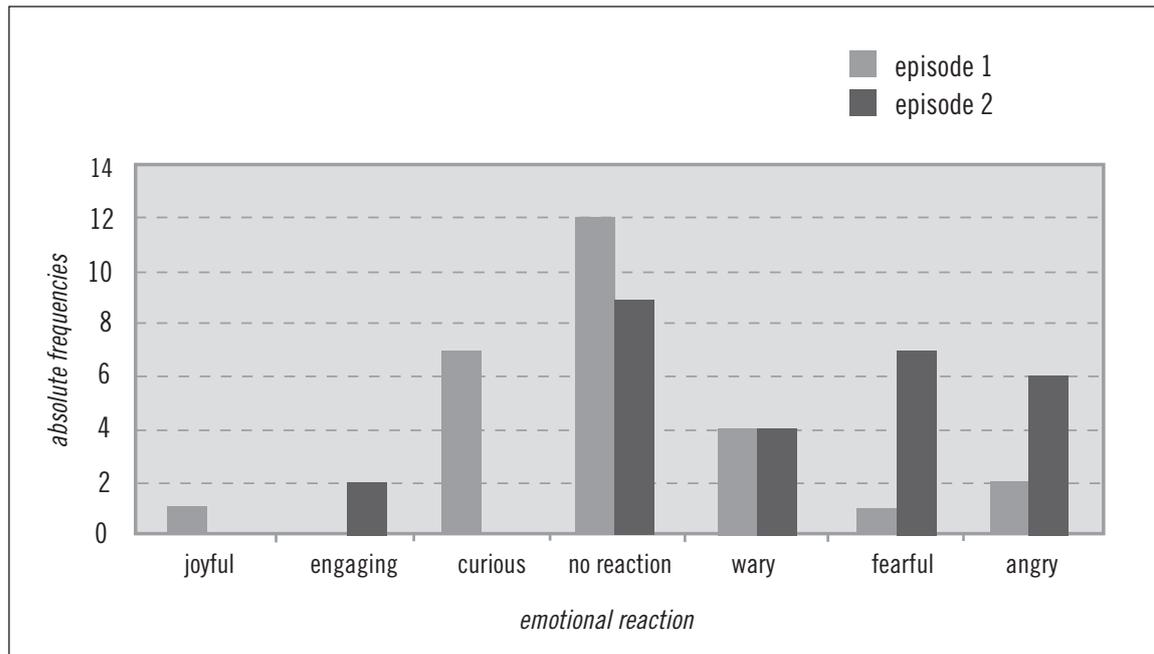


Figure 6: Emotional reactions of the children towards the Cameroonian stranger during 1<sup>st</sup> and 2<sup>nd</sup> episode.

### *Infants' approach/avoidance behaviors*

In accordance with the high frequency of non-observable emotional reactions, approach/avoidance behaviors towards the Cameroonian stranger during the 1<sup>st</sup> and 2<sup>nd</sup> episode were rare: the largest group of children did not show any sign of approach or avoidance behavior (N = 14; N= 10). Avoidance behavior towards the Cameroonian stranger became more pronounced in the 2<sup>nd</sup> episode, when the Cameroonian established body contact with the child. The relationship between the emotional reactions of the children and approach/avoidance behaviors of the children was clear-cut: the only approach behaviors towards the female stranger were found in children with positive emotion. Not only were approach/avoidance signals found most often in the group of unemotional children, but they were also frequent in children with positive emotion. Avoidance in terms of turning away was most prevalent in wary and fearful children and withdrawal was most frequent in angry children.

### *Infants' activity level*

In both episodes most infants had a medium activity level (N = 14; N= 15). During the 1<sup>st</sup> episode, this activity level was most frequent in the group of children not showing any observable emotional reaction. However, in the 2<sup>nd</sup> episode, the

medium activity levels were most frequent in the groups of wary and fearful children. In fact, children with no observable reactions most often had a low activity level. Almost all angry children were classified as highly active.

### *Maternal behaviors*

The majority of mothers (N = 18; N = 19) behaved passively during both episodes, few mothers were directive (N = 7; N = 8) and even less mothers breastfed their infants (N = 2; N = 1). During the 1<sup>st</sup> episode, directivity of mothers was randomly scattered among the infantile emotional expressions. However, in the 2<sup>nd</sup> episode all mothers classified as directive –with one exception– had infants with negative (wary, fearful, angry) emotional expressions.

### *Infants' body contact with their mothers*

Body contact between children and their mothers was similarly distributed in the 1<sup>st</sup> and 2<sup>nd</sup> episode: most often children had little body contact with their mothers (N = 13; N = 14), but a relative high proportion of children also kept close body contact with their mothers (N = 12; N = 10). They rarely had no body contact or extremely close body contact with their mothers. There were no obvious differences in the amount of body contact with regard to positive or negative emotion in the 1<sup>st</sup> episode. However, differences in the amount of body contact in relation to the infants' emotional reactions became noticeable during the 2<sup>nd</sup> episode: Children with no observable emotional reaction mostly maintained little body contact with their mothers; close body contact was frequent in children with negative emotion, especially in angry children.

### *Infants' body contact with the Cameroonian stranger*

The 2<sup>nd</sup> episode comprises the first establishment of the body contact between the female stranger and the child. In 21 cases the Cameroonian female immediately established close body contact with the child, i.e. she picked the child up and held him/her on her arms. In 7 cases the female stranger only touched the child, e.g. on an arm or leg, and therefore initially established only little body contact with the child.

There was a clear interrelation between children's closeness towards mothers and the establishment of body contact with the female stranger: Children who had little body contact with their mothers in the 2<sup>nd</sup> episode were usually taken up by the female stranger, whereas children who had close body contact with their mothers were less often picked up by the female stranger. Similarly, it was mainly children with positive emotion (joy and curiosity) and those with no observable emotional reactions during the 1<sup>st</sup> episode who were picked up and held by the Cameroonian female stranger in the subsequent 2<sup>nd</sup> episode. In contrast, children with negative emotional reactions (wariness, fear and anger) in the 1<sup>st</sup> episode, were less likely to be held by the stranger in the 2<sup>nd</sup> episode.

Children reacted differently towards the amount of body contact the Cameroonian female stranger initiated during the 2<sup>nd</sup> episode: Children who were picked up and held (closely) by the stranger often kept an emotionless expression; however, a considerable number of those children also reacted with negative emotions: displaying fear, wariness and anger. The children, who experienced only little body contact, i.e. only being touched by the stranger, mostly retained their negative emotional expression.

#### **4.2.2 Infants' behavioral regulation towards the greetings from the German stranger: A comparison with the behavioral regulation towards the Cameroonian stranger**

##### *Infants' emotional reactions*

As in the case of the Cameroonian stranger, children with no observable emotional reaction were again frequently found in the 1<sup>st</sup> as well as in the 2<sup>nd</sup> episode. However, during the 1<sup>st</sup> episode the same number of children were reacting with curiosity towards the approach of the German stranger (N = 9). The distribution of the emotional reactions is depicted in figure 7. As with the Cameroonian stranger, children showed more negative emotional reactions in the 2<sup>nd</sup> episode than in the 1<sup>st</sup> (N = 8 in 1<sup>st</sup> episode; N = 11 in 2<sup>nd</sup> episode). However, children displayed

in sum less negative emotional reactions towards the German (N = 11) than towards the Cameroonian (N = 17) female stranger in the 2<sup>nd</sup> episode.

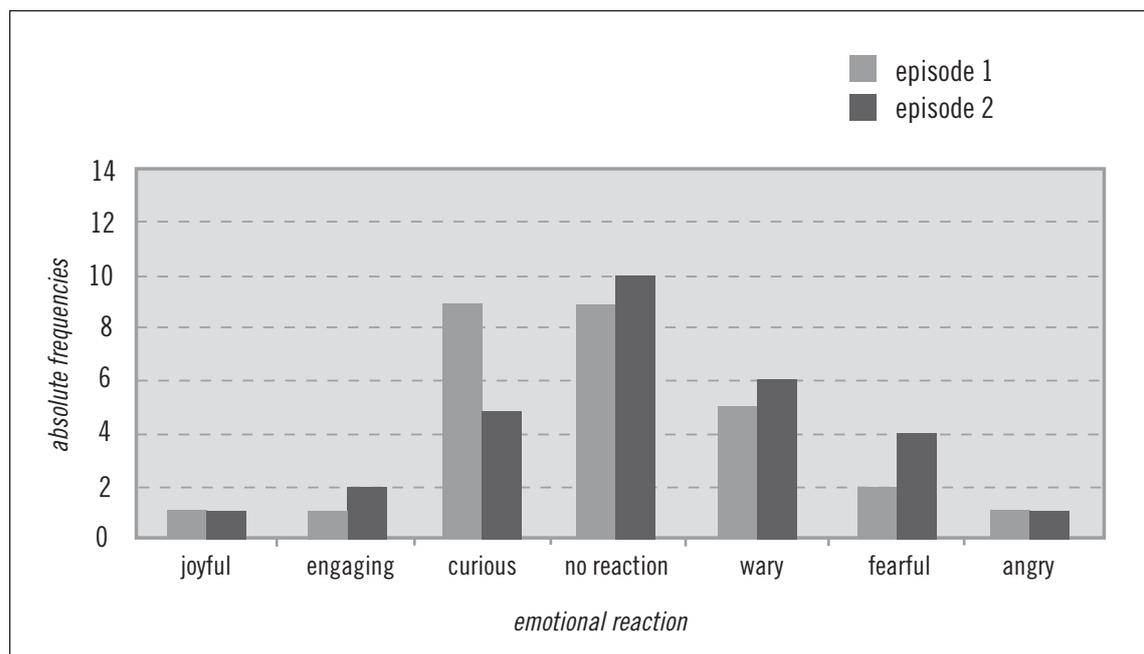


Figure 7: Emotional reactions of the children towards the German female stranger during 1<sup>st</sup> and 2<sup>nd</sup> episode.

### *Infants' approach/avoidance behaviors*

The pattern of approach/avoidance behaviors in relation to the emotional reactions of the children found in the case of the German stranger was very similar to the approach/avoidance pattern found towards the Cameroonian stranger in the 1<sup>st</sup> and 2<sup>nd</sup> episode: Only the few children classified as reacting positively towards the German stranger showed approach behaviors. The majority of children did not show any signs of approach/avoidance behaviors at all, and fewer children did so in the 2<sup>nd</sup> episode. Clear signs of avoidance occurred mostly in children with negative emotional reactions, i.e. wariness, fear and anger.

### *Infants' activity level*

Infants' activity levels were also comparable to the activity levels found towards the Cameroonian stranger with few children being highly active or extremely quiet; most children had a medium activity level between the two extremes (N = 12 in 1<sup>st</sup> episode; N = 14 in 2<sup>nd</sup> episode).

### *Maternal behaviors*

Maternal behavior did not differ with respect to the strangers' origin: Most mothers behaved equally passive when the German stranger arrived and when body contact between the child and the German stranger was first established (N = 22 in 1<sup>st</sup> episode; N = 21 in 2<sup>nd</sup> episode). Some mothers were directive in their behavior and only one mother breastfed her child during the 1<sup>st</sup> episode. As in the case with the Cameroonian female stranger, directivity of mothers was linked to negative emotional reactions of the children towards the stranger: In most cases where mothers were classified as behaving in a directive way, children's emotional reactions were negative, i.e., wariness, fear, or anger.

### *Infants' body contact with their mothers*

Body contact between infants and their mothers was also similar for both the Cameroonian and the German strangers' greeting episode: During the 1<sup>st</sup> and 2<sup>nd</sup> episode children frequently had very little body contact with their mothers (N = 20; N = 17), followed by those with close body contact with their mothers (N = 7; N = 12). However, no body contact or extremely close body contact occurred rarely.

### *Infants' body contact with the German female stranger*

A significant difference between the German and the Cameroonian female strangers' visits was –despite a lot of exercise on the side of the German stranger– the way the female strangers established body contact with the children, i.e. the amount of body contact between stranger and child differed with regard to the strangers' origin (cf. figure 8): The German stranger established most often little body contact with the children from the very beginning (N = 25) and rarely close body contact (N = 4), whereas the Cameroonian stranger had close body contact frequently (N = 21) and rarely little body contact (N = 7) with the child ( $\chi^2 = 21.67$ ,  $p < .001$ ).

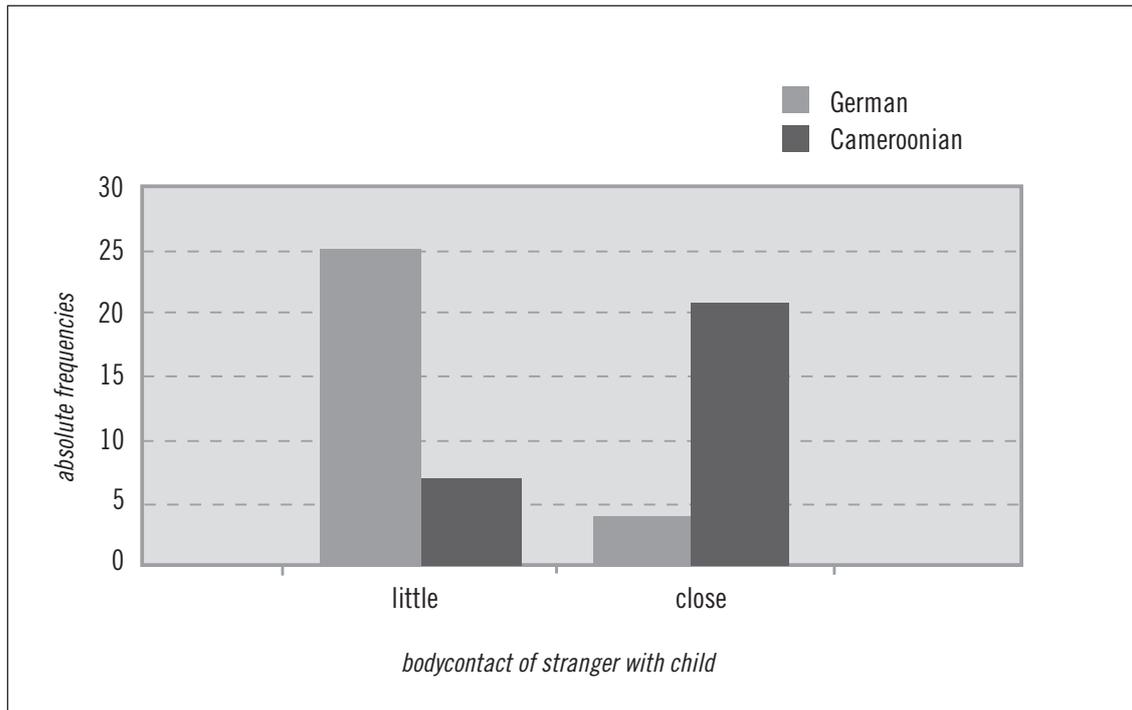


Figure 8: Closeness of the children towards the Cameroonian and the German stranger during the 2<sup>nd</sup> episode.

#### 4.3 INFANTS' PSYCHO-PHYSIOLOGICAL REGULATION: CORTISOL RESPONSE TO THE STRANGERS' VISITS

Because cortisol values were positively skewed, they were transformed to the natural logarithm scale after which all cortisol values were normally distributed as tested with a Kolmogorov–Smirnov analysis. A repeated-measure analysis of variance (ANOVA), with time and strangers' cultural origin as within-subjects factors and the log(cortisol) values as dependent measure revealed no significant main effect for stranger's cultural origin, but a marginal main effect for time ( $F(1, 29) = 3.12$ ;  $p < .1$ ): Cortisol levels increased from t1 to t2. Generally, cortisol levels at t1 and t2 were correlated positively to each other, both with respect to the Cameroonian stranger's visit ( $r = .54$ ;  $p = .01$ ) as well as with respect to the German stranger's visit ( $r = .56$ ;  $p = .01$ ), representing stable individual differences in general cortisol concentration and reactivity. For reasons of physiological meaningfulness, the graphical representation in figure 9 shows absolute cortisol values instead of log(cortisol) values.

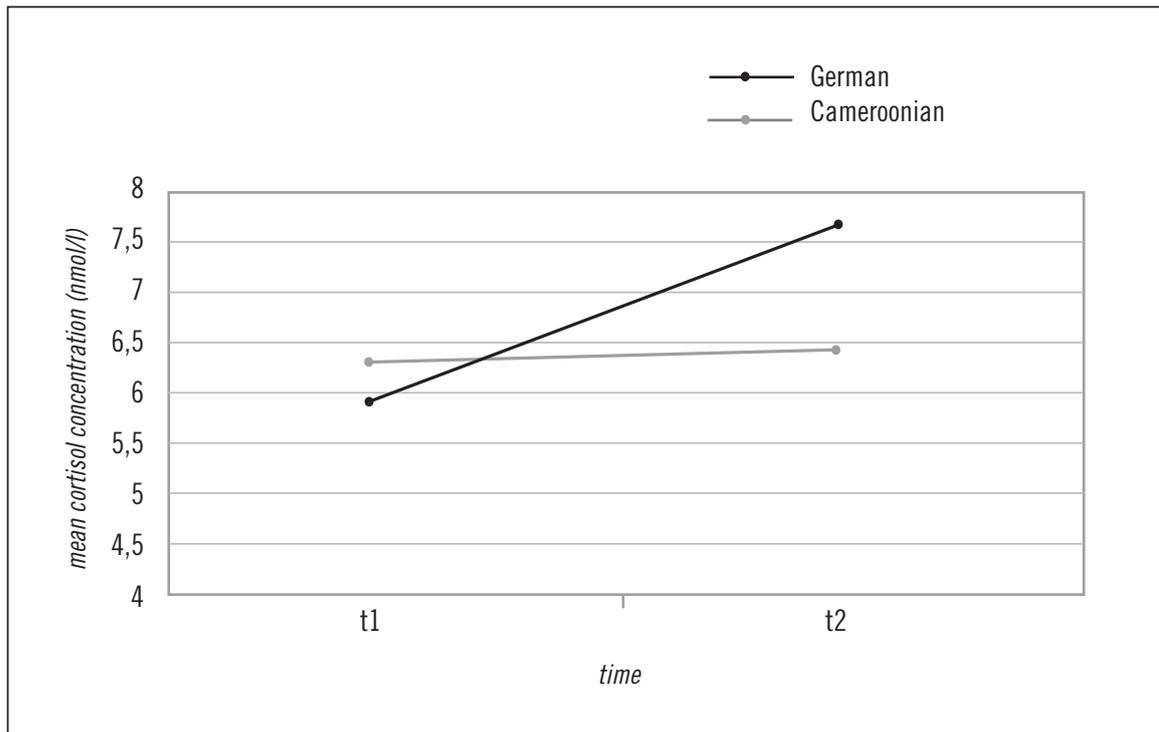


Figure 9: Cortisol means at t1 and t2 in relation to the culturally different strangers.

#### 4.4 INFANTS' EMOTION REGULATION PATTERNS

This section aims at identifying the influence and impact of demographic variables and maternal belief systems on the emotion regulation of the infants. Due to the fact that the Cameroonian and German stranger provoked different emotional reactions in the children and the likely assumption that the Cameroonian stranger displays the proper interactive behavior for her socio-cultural environment, the data sets of this section are restricted to the emotion regulation towards the Cameroonian stranger.

In order to apply inferential statistical methods for further analyses, the above outlined descriptive results for the infants' emotional reactions in the 1<sup>st</sup> and 2<sup>nd</sup> episode are classified/divided into three distinct emotional reaction groups, i.e.:

- Positive emotional reaction  
(infants with joyful, engaging or curious reactions)
- No observable reaction (infants with no observable reactions)
- Negative emotional reaction (infants with wary, fearful or angry reactions).

#### 4.4.1 Emotion patterns during the 1<sup>st</sup> and 2<sup>nd</sup> episode:

##### Change, stability and valence

The 1<sup>st</sup> and 2<sup>nd</sup> episode are considered to induce different amounts of stress in the infants due to increasing proximity between infant and stranger and an increasing distance between infant and mother. Firstly, it may be of interest whether children show the same emotional reactions in either episode or whether children change in their emotional reactions between the two episodes and adapt to the new affordances of the situation. The pattern of stability and change of emotional reactions is displayed in figure 10:

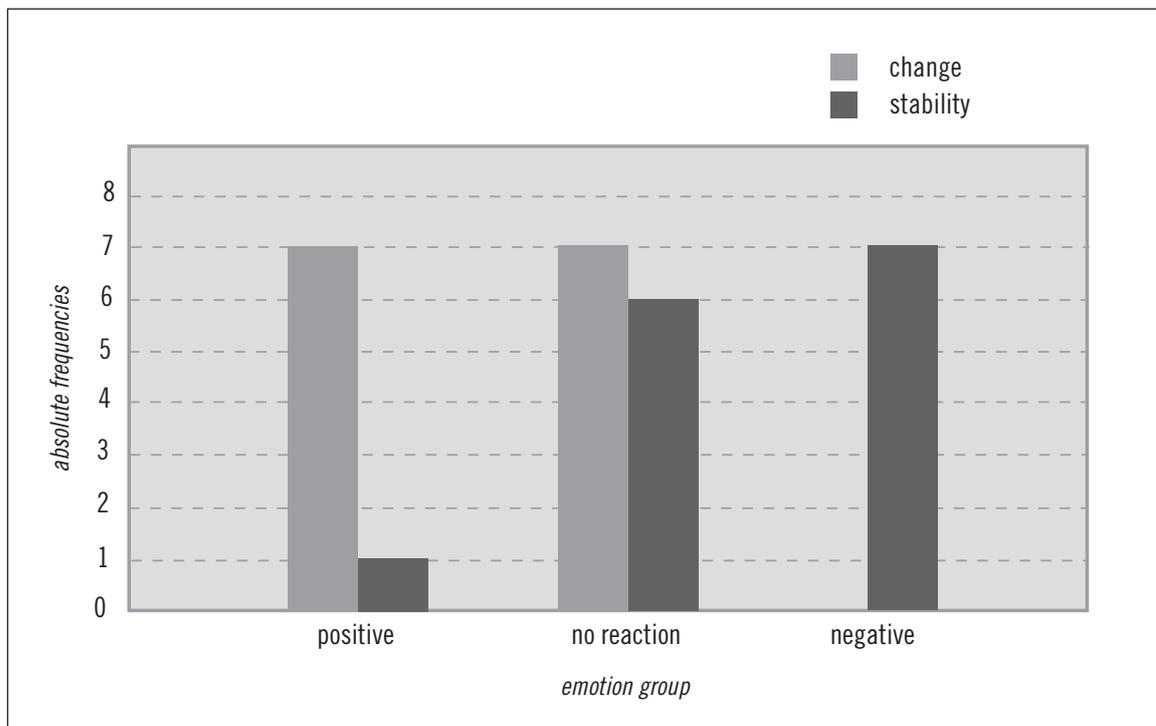


Figure 10: Absolute frequencies of changing/stable infants' emotion patterns for the Cameroonian stranger in the 1<sup>st</sup> episode.

Except for one child, all children who displayed a positive emotion in the 1<sup>st</sup> episode changed in their emotional reaction towards a neutral or negative emotional state. More than half of the children who displayed no observable emotional reaction changed as well and, except for one infant, they switched to a negative emotional state in the 2<sup>nd</sup> episode. None of the children showing negative emotional reactions

during the 1<sup>st</sup> episode changed in their behavior; they continued to show negative emotional reactions. In sum, about half of the children (N = 14) changed in their behavioral reactions, mostly towards a more negative emotional state; the other half of the children (N = 13) displayed the same emotional behavior during both episodes.

Due to the fact that all children with changing emotional reactions were classified as positive/neutral in the 1<sup>st</sup> episode, the few children that changed in their emotional state to a positive (N = 1) or neutral state (N = 4) during the 2<sup>nd</sup> episode had been neutral and positive, respectively, in the 1<sup>st</sup> episode. Those children, as well as children with stable positive or neutral emotional reactions (N = 6), did never display negative emotional reactions and therefore represent a discrete emotion pattern (cf. figure 11). Hence, when simultaneously taking into account the valence and the change or stability of the emotional reactions, three distinct emotion regulation patterns can be identified:

- Children not showing any (negative) emotional reaction (N = 11)
- Children changing from a positive to a negative emotional state in the 2<sup>nd</sup> episode (N = 9)
- Children being in a negative emotional state during both episodes (N = 7)

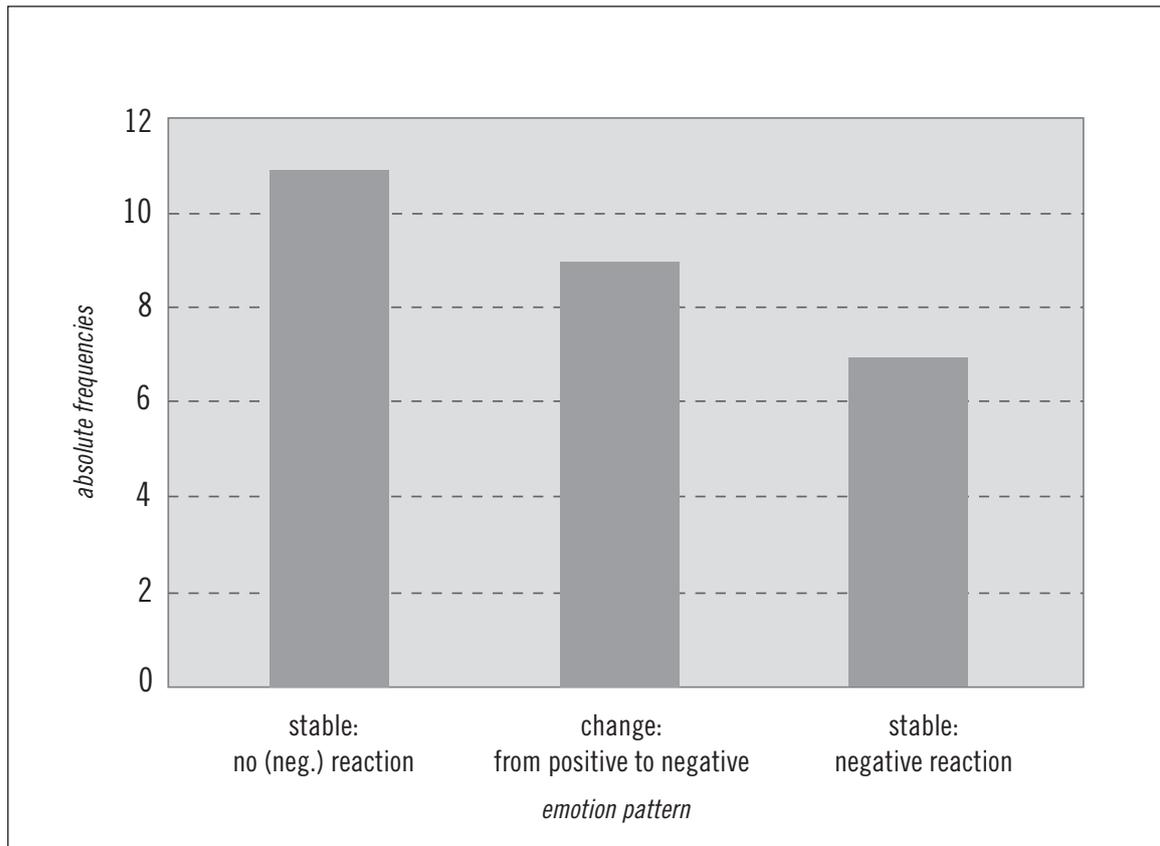


Figure 11: Absolute frequencies of the three emotion patterns during the Cameroonian stranger's visit in the 2<sup>nd</sup> episode

The children of the three emotion regulation patterns did not differ with regard to the following behavioral dimensions: activity level, closeness of body contact between infant/mother and infant/stranger, and the frequency of object play. However, distributional differences were found with respect to **approach/avoidance** behaviors for the 1<sup>st</sup> (Fisher's exact test,  $p = .034$ ) and 2<sup>nd</sup> (Fisher's exact test,  $p = .0006$ ) episode: No sign of approach or avoidance behavior was most often found in the group of children with no (neg.) emotional reaction and least often in the group of children with stable negative emotional reactions. Avoidance behaviors were distributed oppositionally: most frequent in children with stable negative emotional reactions and least in children with no (neg.) emotional reactions. Infants changing from a positive to a negative reaction showed pronounced avoidance behaviors only during the 2<sup>nd</sup> episode.

**Maternal behaviors** were also found to differ between the three emotion regulation patterns; however, the distributional differences became only significant in the 2<sup>nd</sup> episode. During the 2<sup>nd</sup> episode, almost all mothers displaying directive behavior were found in the group of children who changed from a positive to a negative emotional state (Fisher's exact test,  $p = 0.015$ ); in contrast, all other mothers behaved mostly passively.

#### **4.4.2 Infants' psycho-physiological arousal relating to the three emotion patterns**

Distinct emotional competencies should be reflected not only on a behavioral level, but also on a psycho-physiological level. In order to examine whether the three emotion patterns also represent distinct groups on a psycho-physiological level, a repeated-measure analysis of variance (ANOVA), with time and emotion pattern as within-subjects factors and the  $\log(\text{cortisol})$  values as dependent measure was conducted. The analysis revealed neither a significant main effect for time or emotion pattern, but an interaction effect ( $F(2, 24) = 4.14$ ;  $p < .05$ ;  $\eta^2 = .26$ ): Children with no negative emotional reactions showed a slight decrease in their salivary cortisol concentration, children who changed from a positive to a negative emotional reaction showed a slight increase in their salivary cortisol concentration. Children with stable negative emotional reactions did not change over time, but had the highest cortisol concentration at both time points of measurement. The graphical representation in figure 12 shows absolute cortisol values instead of  $\log(\text{cortisol})$  values so as to be physiologically meaningful.

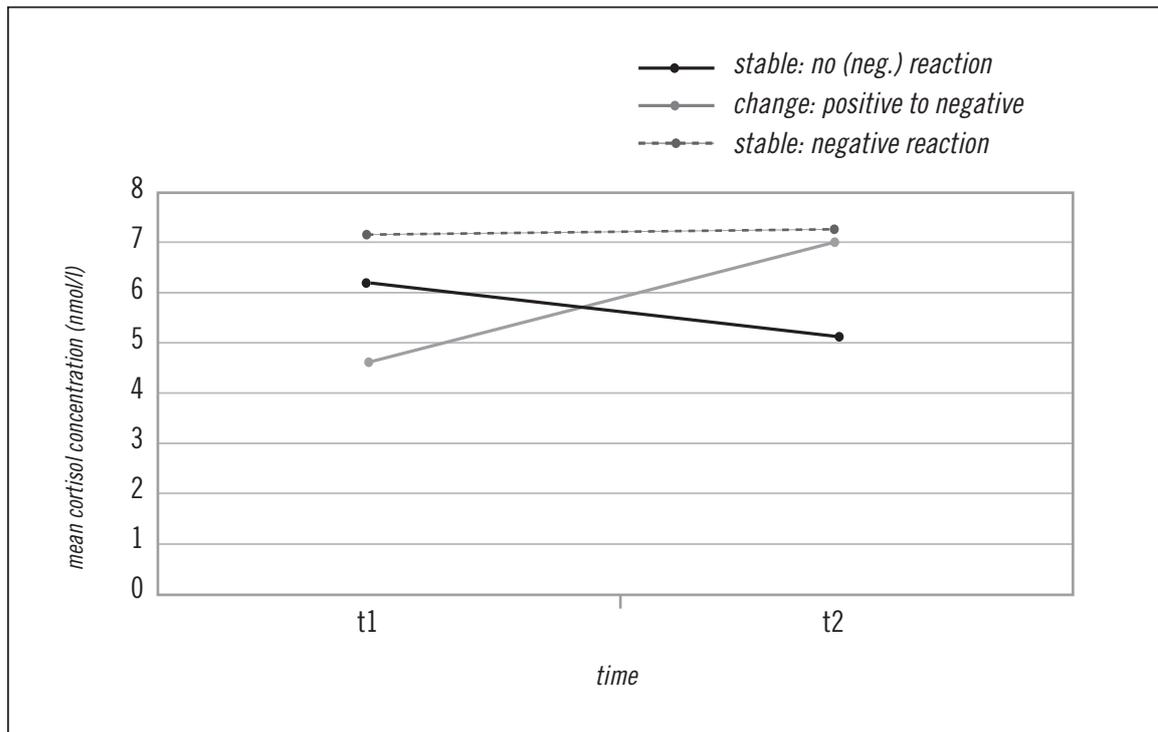


Figure 12: Cortisol means in relation to infants' emotion patterns

These results suggest that the three groups of children experience the stressful situation of being greeted by a stranger differently: Children who changed from a positive to a negative emotional state seemed to be stressed by the strangers' greetings and unable to cope with it; in response their cortisol concentration increased. In contrast, the children with no negative emotionality appeared to cope well with the situation and managed to adapt to it by way of behavior, not needing a physiological response. Children with stable negative emotions may generally be under stress and have therefore elevated cortisol levels, not only because of the strangers' greetings.

#### 4.5 FACTORS RELATING TO THE THREE CULTURAL EMOTION REGULATION PATTERNS OF CAMEROONIAN INFANTS

In this final section, an overall model describing the function of attachment in its broader context is successively derived by depicting the interrelations between socio-demographic factors, maternal belief systems, and the three different emotion regulation patterns. At first, connections between socio-demographic data and maternal

belief systems are reported; secondly, their relation to the three emotion patterns is analysed. The derived model incorporates all influencing factors on infants' emotion regulation and is proven by the interview data.

#### **4.5.1 Connections between socio-demographic factors and maternal belief systems**

The socio-demographic profile as reported in the method section (cf. chapter 3.2) revealed two different groups of mothers, defined by their **marital status**: Married mothers, who are on average older, have more children and live traditionally on subsistence-based farming; single mothers, who are younger, have less children and live by means of commercial activities. The two groups of mothers did not differ with regard to education, health status, or residing area.

As the qualitative analysis of the interview data has shown, the marital status of a woman was strongly connected to her concomitant **social support** system. The married mothers could usually rely on an extended family system for support, whereas the single mothers reported restricted or even derogated familial support. Apparently, fathers were more supportive and spend more time with their children when the mothers were married to them compared to fathers who were not married to the mothers. The distributional difference of social support between the married and single mothers could also be statistically verified (Fisher's exact test,  $p = .014$ ).

Possible interrelations between the mothers' socio-demographic profile and their conceptions with regard to attachment issues were tested with the help of t-tests, using the relative frequencies with which mothers referred to attachment concepts during the interview concerning their ways of **expressing affection** and their **evaluation of exclusive relationships**. Using the marital status as group variable, results revealed no statistical differences between the two groups of mothers. Using the availability of social support as group variable, a significant difference between mothers who could rely on an extended family network and mothers who had restricted social support only was found with regard to the way they expressed their affection towards

their infants: Mothers who relied on an extended family system reported significantly more often to convey their love through close bodily proximity ( $t = -2.55, p = 0.02$ ) than mothers who reported restricted social support. Regarding exclusive relationships, mothers with an extended family support system reported slightly more often to be opposed to exclusive relationships ( $t = -1.8, p = 0.08$ ). With regard to **infant's favourite caregiver**, a  $\chi^2$ -test, respectively Fisher's exact test, did not reveal distributional differences between the groups of mothers as constituted by marital status or social support.

On part of the infant, gender and health status were tested as possible influencing factors on maternal conceptions of attachment, but did not reveal statistically significant differences.

The traced interrelations between the socio-demographic variables and maternal conceptions of attachment are depicted in figure 13.

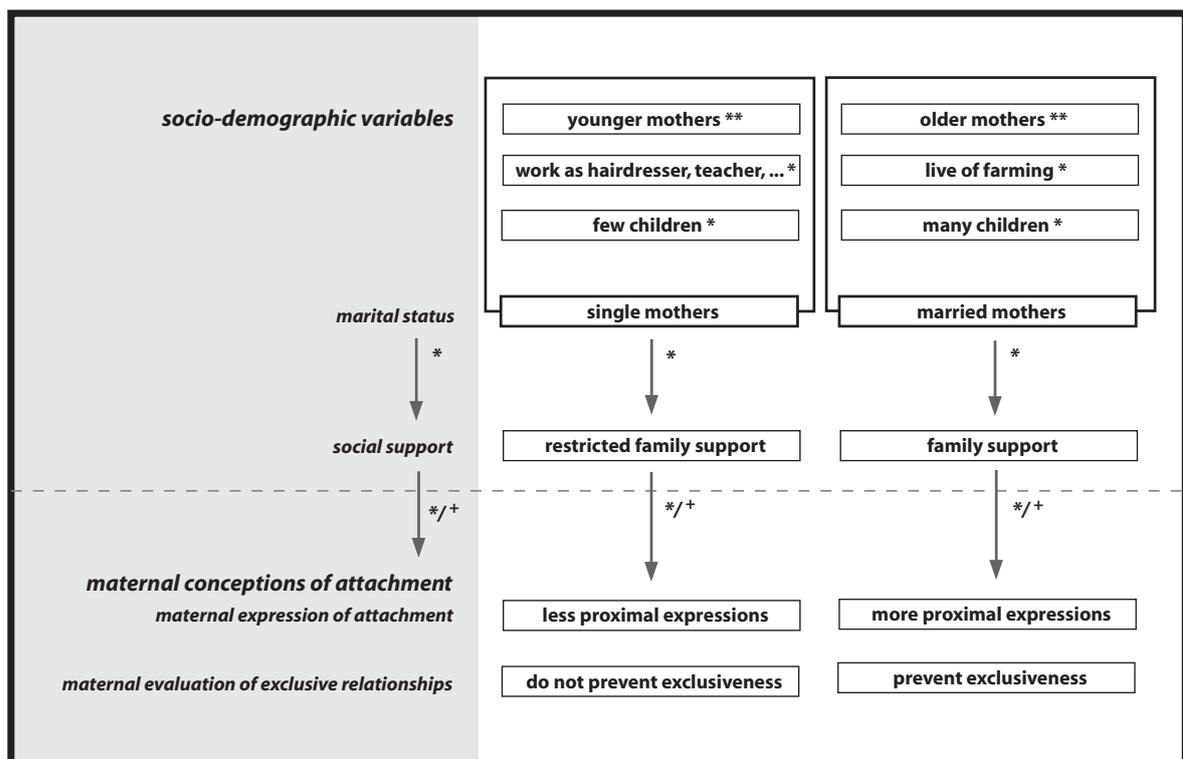


Figure 13: Relations between socio-demographic factors and maternal belief systems

#### 4.5.2 Socio-demographics relating to the three emotion patterns

Demographic factors can also be assumed to directly impact the behavioral competencies of children. Possible connections between demographic variables and the three emotion patterns were tested again with the help of  $\chi^2$ -tests –or, if necessary– Fisher’s exact test. T-tests were used to test for age and educational differences between the mothers of the three groups. Results revealed no direct influence of mothers’ marital status, mothers’ age, maternal education, the number of siblings, mother’s economic activity, or residing area on infants’ emotion patterns. The availability of **social support**, however, was distributed differently across the three emotion patterns. Descriptively, the majority of mothers relied on an extended family system; however, mothers of children with stable negative emotional reactions were the exception: they relied more often on a single person only for support.

In order to test for differences between the three groups of mothers statistically, a repeated-measure analysis of variance (ANOVA), with infants’ emotion pattern as within-subjects factor and the number of all maternal statements concerning positive social support/no social support in the open question as dependent measure was conducted. Results revealed no main effect for emotion pattern or social support, but a significant interaction effect for emotion pattern x social support ( $F(2, 24) = 4$ ;  $p < .05$ ;  $\eta^2 = .25$ ): Mothers of children with stable negative emotional reactions talked less often about positive social support, but mentioned more often negative social support compared to the other mothers (see figure 14).

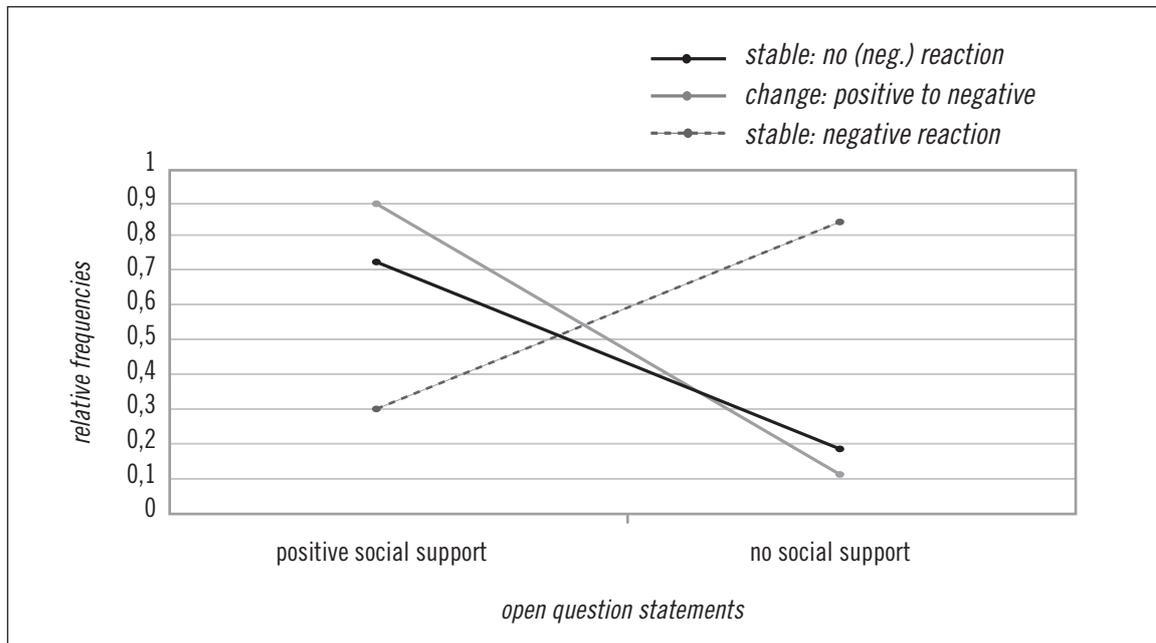


Figure 14: Relative frequencies of maternal statements concerning social support in relation to infants' emotion pattern

**Fathers'** preparedness to take responsibility for mother and child had been identified as an important topic in the open question part of the interview, and mostly mothers who were on bad terms with the child's father had mentioned this topic. For the statistical analysis we summarized answers from two questions that explicitly asked about fathers' commitment. Differences between the three groups of mothers were again analyzed by conducting a repeated-measure analysis of variance (ANOVA), with infants' emotion pattern as within-subjects factor and the number of maternal statements relating to supportive/non-supportive fathers as independent variable. Results revealed that when explicitly asked about fathers, all mothers talked significantly more often about fathers being supportive than about absent fathers ( $F(1, 25) = 12.05; p < .01; \eta^2 = .33$ ). Neither a main effect for the emotion pattern nor an interaction effect for emotion pattern x supportive/non-supportive fathers was obtained.

Maternal **health** problems also manifested as influencing factor. The distribution of infants' emotion pattern was not independent of maternal illnesses (Fisher's exact test,  $p = .02$ ): In both groups of infants with stable emotional reactions the majority of mothers reported to have had health problems during the past year. In the group of children changing from a positive to a negative emotional reaction, the majority of mothers had not been ill during the past year.

On part of the infant, health problems turned out to have a similar impact on the distribution of infants' emotion regulation pattern (cf. figure 15).

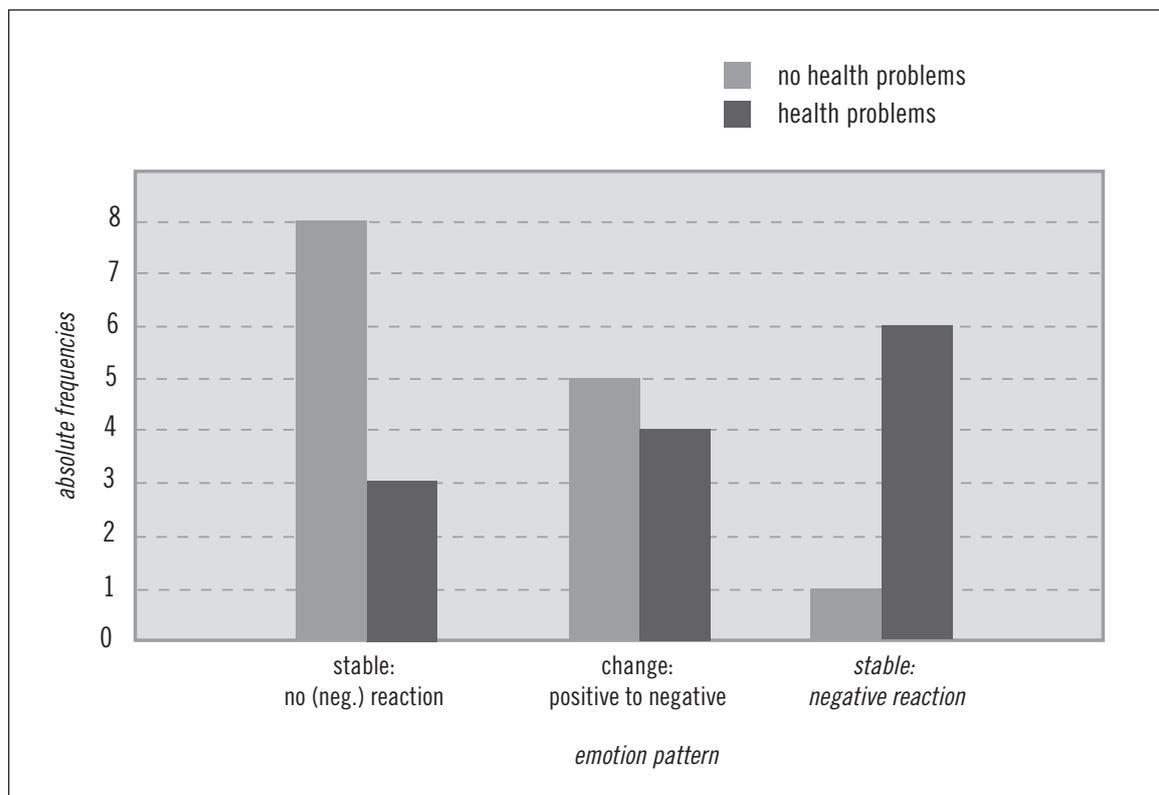


Figure 15: Absolute frequencies of the three emotion patterns in relation to child's health problems

Almost all children with stable negative emotions had reportedly had health problems during their first year of life, whereas almost all children with no (neg.) emotional reactions and the majority of children with changing reactions had not suffered from health problems (Fisher's exact test,  $p = .05$ ). The relations between maternal and infantile demographic variables on the one hand and the three emotion patterns on the other hand are displayed in figure 16.

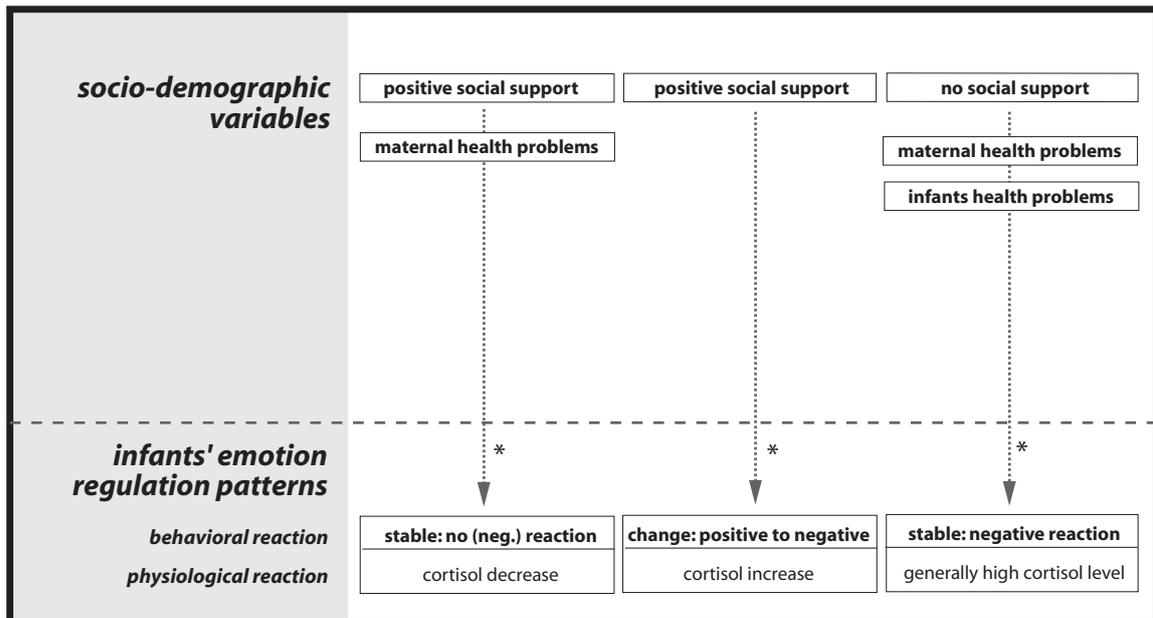


Figure 16: Relations between socio-demographic factors and the three emotion patterns

#### 4.5.3 Maternal belief systems relating to the three emotion patterns

##### *Expression of love*

Statistically, no significant differences were found with regard to the conception of attachment the three groups of mothers held. However, results revealed descriptively that the three groups of mothers varied slightly in the emphasis they put on the expression of maternal love: Mothers of infants with no (neg.) reaction focused on togetherness in their descriptions, mothers of infants changing from positive to negative emotional reactions talked most often about presents, and mothers of children with stable negative emotions talked most often about primary care. The three groups of mothers did not differ in their conceptions of their infants' expressions of love; they all regarded the display of happiness as the most important sign of their infants' love.

### *Exclusive relationships*

With regard to exclusiveness of caregiver and child, a repeated-measure analysis of variance (ANOVA) did not yield significant results; indicating that all mothers did not appreciate exclusiveness. Descriptively, results suggest that mothers of children with no (neg.) emotional reaction were most intent on preventing their children from getting used to an exclusive caretaker in contrast with the other mothers (cf. figure 17).

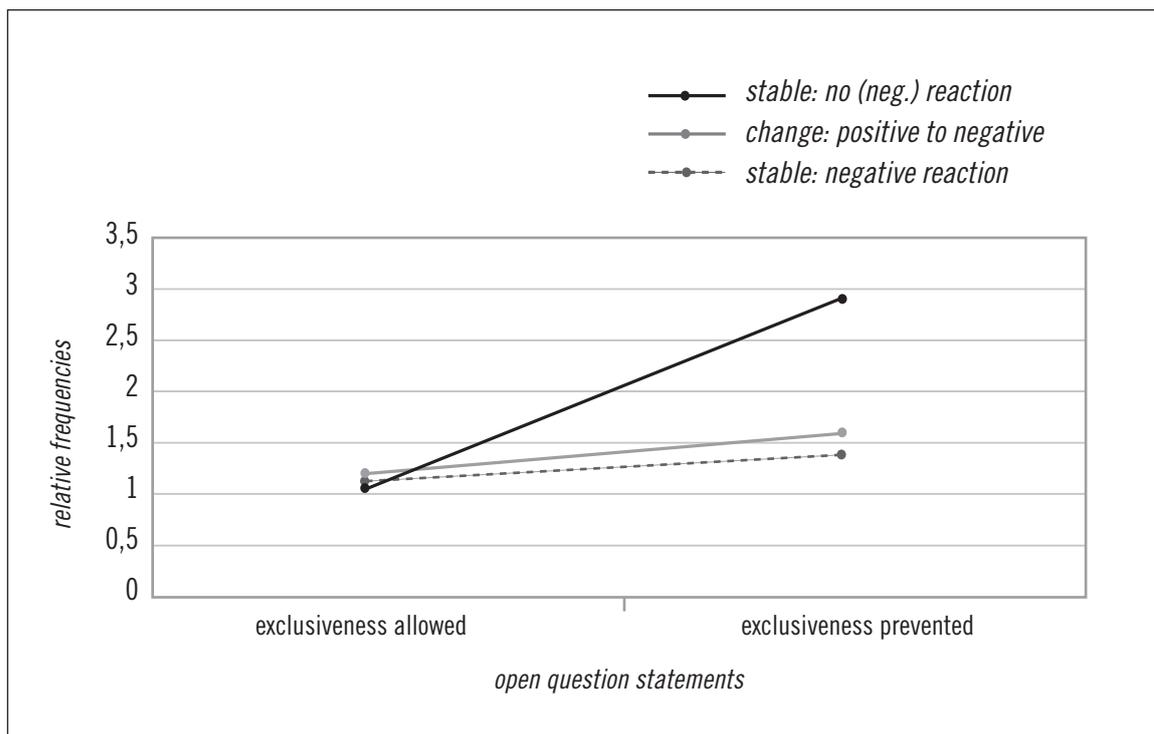


Figure 17: Relative frequencies of maternal statements concerning exclusiveness of child and caretaker in relation to infants' emotion group

Looking at the maternal answers concerning the favorite caregiver of the child, only 1/3<sup>rd</sup> of the mothers had reported to be the favorite caregiver of the child themselves. A  $\chi^2$ -test with infants' emotional group and favourite caregiver as variables did not prove significant differences in the distribution. However, the descriptive (varied\* see my note on p 30) display of the distribution of emotional reactions (cf. figure 18) revealed that within the group of infants with no (neg.) reactions mothers referred most often to others as favourite caregivers.

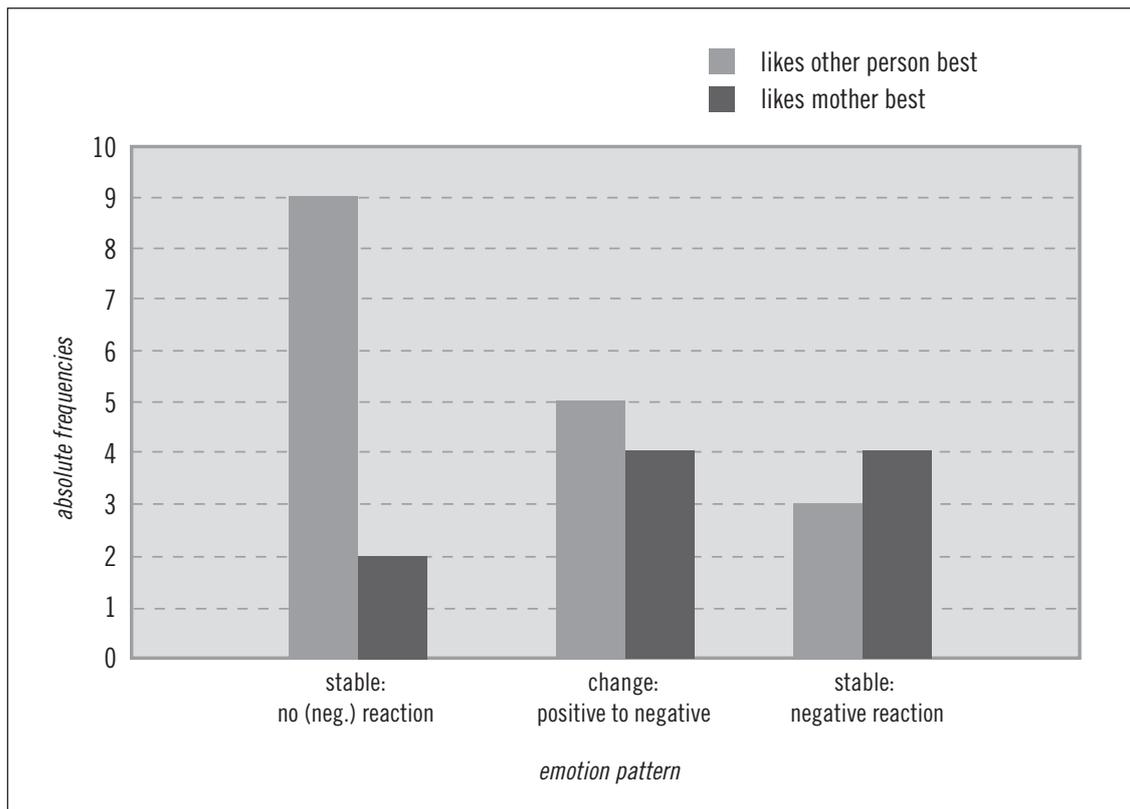


Figure 18: Absolute frequencies of infants' emotion groups in relation to infants' favourite caregiver

Although no significant influences could be found between maternal belief systems and the three emotion patterns, the descriptively found relations are summarized in the following table:

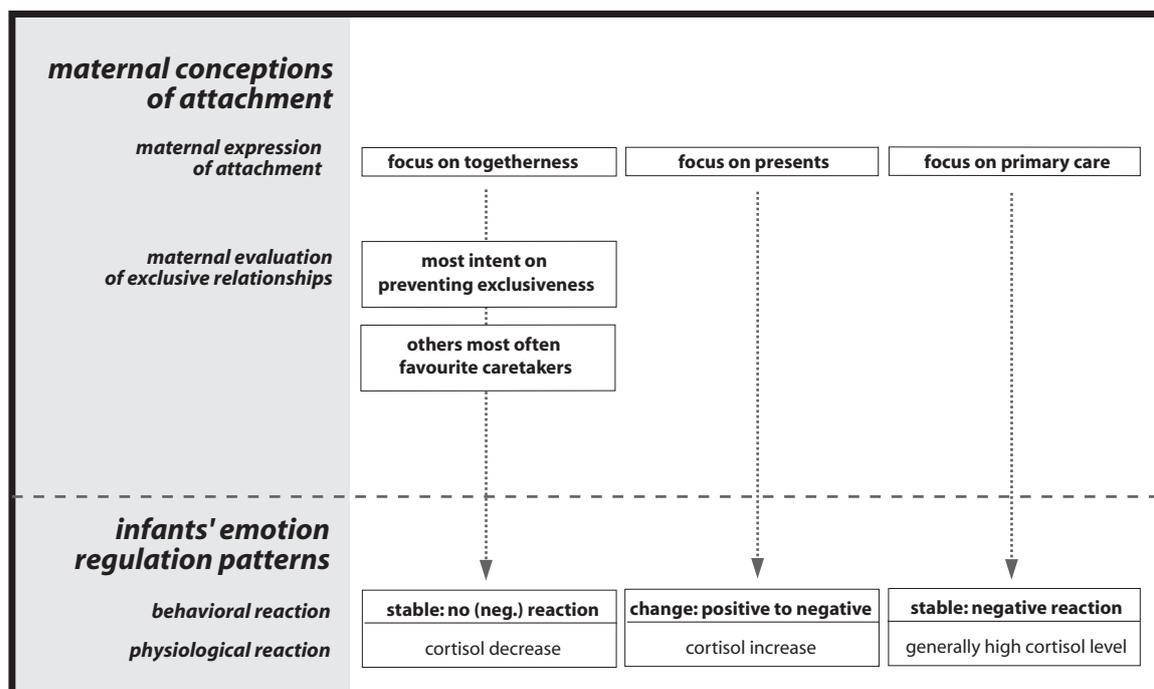


Figure 19: Descriptive relations between maternal belief systems and the three emotion patterns

#### **4.5.4 The cultural emotion regulation pattern of Cameroonian infants**

The overall model describing the function of attachment in its context is depicted in figure 20 (p. 123). Direct relations could be proven between socio-demographic variables and maternal conceptions of attachment as well as between socio-demographic variables and the infants' emotion patterns. Relations between maternal conceptions of attachment and the three emotion regulation patterns could be established only descriptively. On the socio-demographic level, marital status had an extensive influence on the social support system of the mother, which in turn influenced not only maternal conceptions of attachment (expression of attachment & the evaluation of exclusiveness), but also the infant's emotion patterns.

The three emotion regulation patterns of infants can thereby be characterized by distinctive social criteria: Children with no (neg.) emotional reactions had married mothers and grew up embedded in a traditional extended family system. Their mothers reported a lot of social support; however, they also reported to have suffered from health problems. Descriptively, those mothers focused on togetherness and proximity with their infants, while at the same time training their infants to get used to many different caregivers. Accordingly, those children often had other people than their mothers as favorite caregivers. In the presence of a stranger, those children do not show any (neg.) emotional reaction at all, independent of the degree of bodily proximity between stranger and themselves. Their cortisol concentration even decreased over time during the stranger's visit.

Children changing from a positive to a negative emotional state grew up in a very similar social context: They also had married mothers with an extended family and a strong social support system. However, their mothers had not suffered from any health problems. Although their mothers also put a lot of emphasis on proximity with their infants, this group of mothers referred most often to presents when describing their affection for their children. In the visiting situation, children belonging to this emotion pattern reacted with indifference as long as the stranger was close by; however, the moment proximity between themselves and the stranger was increased,

they showed clear negative emotions. Their cortisol response matched their behavioral reactions: it increased during the stranger's visit.

The third group of infants is characterized by poor social circumstances: Their mothers are single with restricted familial support. Both, mothers as well as infants, reportedly had had health problems over the course of the past year. Mothers of this group stand out between the group of mothers because they neither emphasize proximity between themselves and their infants, nor do they refer to the usual strategies that should prevent the child from getting used to an exclusive caregiver. However, in their description of affection, this group of mothers refers most often to primary care activities. Children of this group reacted with fierce negative emotions the very moment a stranger arrived, independent from the degree of proximity between themselves and the stranger. Their cortisol response reflects their behavioral response: it was the highest in the sample; however, it did not change over time but stayed at this high level throughout.

A preliminary evaluation of the three emotion patterns and their contexts is achieved with the help of maternal interview data. Since the interviews did not include direct questions concerning the emotion regulation strategies, only anecdotic evidence can be provided in this case. Nevertheless, it is obvious that mothers judge the emotional reactions of their children in a very straightforward way, praising children who are not afraid of a stranger: "*she [child] has a good disposition, she is happy with you, she is not afraid of you, smiling at you.*" (Participant 29), stay quiet: "*A good child is one who is always calm.*" (Participant 18), and have a positive attitude towards other people: "*A good child is one who plays with people, smiles with them.*" (Participant 10), "*from the way a good child is relating to others, politely or not, you'll just know.*" (Participant 31). It can therefore be concluded that one socialization goal of Nso mothers captures as desirable developmental outcome calm and even-tempered children who don't cry easily and relate well with others. This socialization goal is translated into a parenting strategy that aims at teaching children indifference and aloofness towards different caregivers, e.g. by forcing children onto other people on a regular basis: "*People that she hates, I will give her to them, so that she will be used*

*to them. Like my neighbors, they love her very much, but she does not go to any of them. When they go out, they will come to take Laura, she will just cry. And I always say that they should go with her.*" (Participant 33). In the present study, children who did not react with any emotional reaction towards the stranger can be said to typify the good, desirable, well-mannered child in the Nso community.

The second group of children in this study changed to a negative emotional state the moment the stranger increased proximity between them. Those children reacted in a desirable way only at the beginning of the interaction, but subsequently changed to a less desirable reaction. The evaluation of this behavioral change becomes obvious from the maternal reactions: Mothers behaved extremely directive the moment the children displayed negative emotions and tried to impose their idea of appropriate behavior on their children. They verbally criticized their children while actively directing their children's attention to the stranger, refrained from taking the child themselves while trying to make the child stay with the stranger.

Obedience and respect are very important elements of proper demeanour in Nso children, and are acquired through social interactions. Children who do not follow their mothers' commands are considered bad children: "*A bad child is one who does not listen to her mother.*" (Participant 15). Negative emotions and the expression in form of crying is often attributed to bad conduct: A crying child is referred to as disobeying, annoying, stubborn, or naughty: "*When anything happens that she can get angry, she starts to cry.*" (Participant 31), "*Or maybe when it has rained and she is going out to play with mud and you refuse, she can cry.*" (Participant 18). The behaviors of the children in this study who reacted with strong negative emotions to the strange visitor are clearly evaluated as displaying a lack of proper demeanour. But –in contrast to mothers of the second group of children– these mothers do not control their children's behavior at all during the stranger's visit. This might be due to the fact that those mothers are younger and less experienced in educating children.

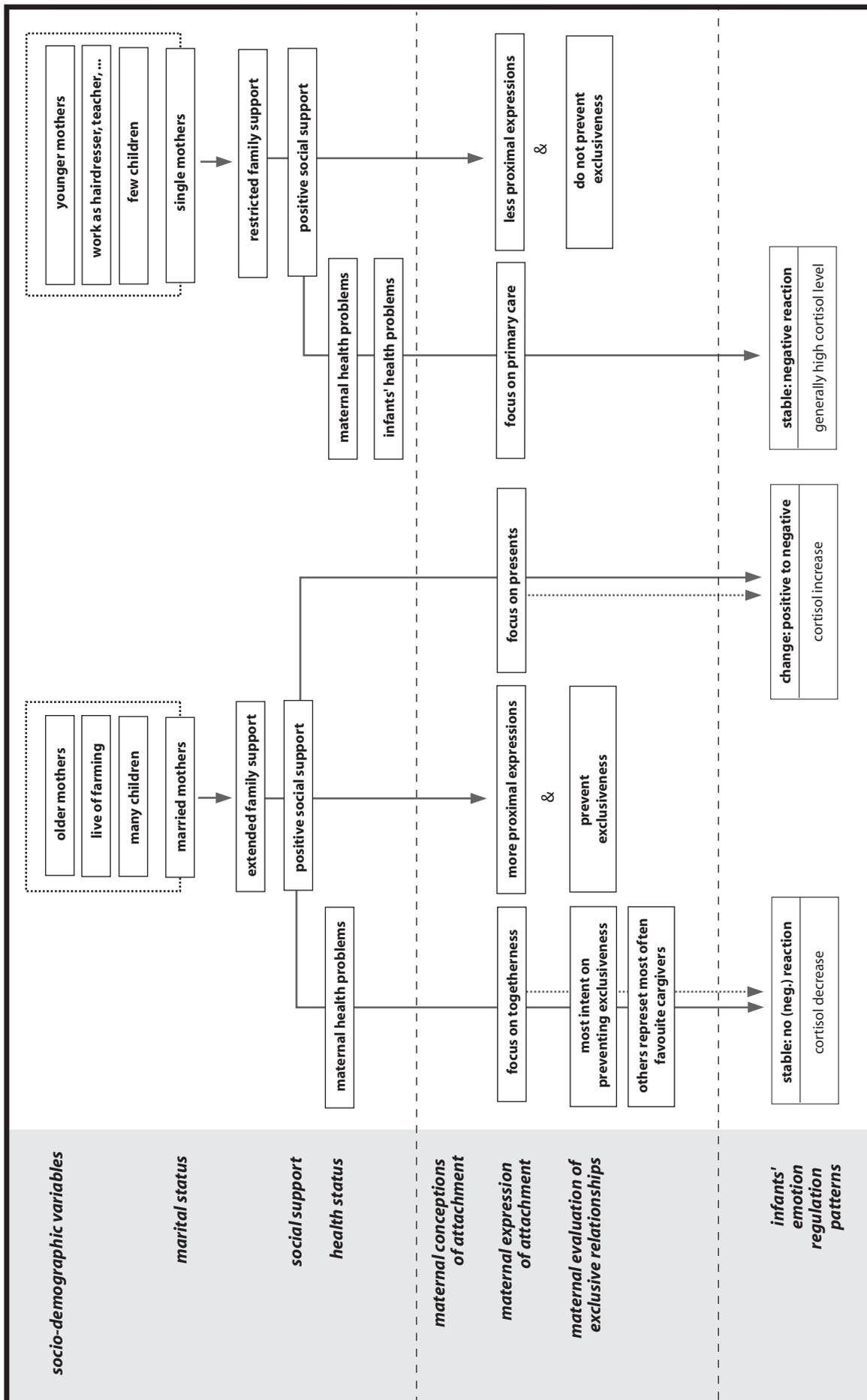


Figure 20: Overall model depicting the interrelations of sociodemographic variables, maternal belief systems and attachment patterns

## 5. DISCUSSION

The central aim of this study was the investigation of Nso children's attachment strategies when a strange woman approaches them. In order to understand children's behavioral strategies within their cultural contexts, maternal conceptions of attachment and socio-demographic parameters were also assessed.

In the **first paragraph** of the discussion section (chapter 5.1), the major findings of this study are summarized and discussed:

- After addressing the apparent uniformity of maternal belief systems with regard to attachment (5.1.1);
- the differential aspects of the attachment patterns are debated (5.1.2) by discussing the three attachment strategies of infants and the differential impact of socio-demographic factors on attachment;
- followed by summarizing the adaptiveness of the three attachment strategies within their respective contexts (5.1.3).

**Secondly** (chapter 5.2), attachment theory's core assumptions are contrasted with this study's results, indicating an incompatibility of ethological attachment theory's assumptions with a true cultural perspective on attachment.

**Thirdly** (chapter 5.3), limitations of the study are addressed.

**Lastly** (chapter 5.4), an outlook for future research is provided.

### 5.1 ATTACHMENT IN THE CAMEROONIAN NSO

#### 5.1.1 Shared attachment concepts of Nso mothers

As has been argued in the introduction, maternal beliefs embody cultural solutions for childrearing and thereby influence child development. In order to better understand the role of maternal beliefs with respect to the development of attachment, we specifically analyzed the mothers' conceptions of the attachment relationship to the one-year old child, as well as their evaluation of exclusive relation-

ships. The analyses revealed in general a strong focus on the bodily expression of attachment; a second focus concerned the prevention of exclusive relationships. In the following paragraph, the bodily expression of attachment and the evaluation of exclusive relationships for the development of attachment relationships in Nso infants are discussed.

### *The substantial role of bodily proximity*

As a rule mothers conceived of bodily proximity as the most important feature for the expression of maternal and infantile attachment; they rarely referred to mental or psychological constructs in their descriptions of attachment relationships. This very physical nature of attachment was found among all Nso mothers and supplements research findings about Nso infant development, where physical proximity is generally stressed. For example, a Nso-specific conception of maternal sensitivity with a strong emphasis on bodily proximity was derived from Nso mothers' ethnotheories of good parenting by Yovsi et al. (Yovsi et al., 2007). Their findings reveal that within the Nso, a responsible mother is depicted as controlling and directing the ongoing activities of the infant with close body contact and vestibular/kines-  
thetic stimulation. Infants' obedience and responsibility –the most central social-  
ization goals (Yovsi, 2003)– are achieved by Nso mothers through controlling the infant mostly with the help of bodily signals (Keller, 2007). This proximal parenting style, characterized by a focus on primary care, body contact, and body stimulation, was also apparent in Nso mothers' interactions with their three-month old infants. Nso mothers regard this parenting style as responsible parenting, reflecting high emotional involvement of the mother (Keller, 2007; Keller et al., 2006a, 2005b).

Our results show that the focus on bodily proximity persists throughout the first year of Nso infants' lives and pervades not only Nso mothers' ethnotheories of good parenting, but their ethnotheories of attachment as well. Therefore, bodily proximity has to be regarded as a general caregiving principle for Nso mothers. It represents a pivotal element of Nso mothers' ethnotheories and becomes translated into Nso mothers' expressions of attachment. Likewise mothers expressed

negative emotions, i.e. annoyance and anger, largely physically, e.g. they reported to administer beatings. The bodily punishment of children emphasizes the role of physicalness as a general caregiving principle of Nso mothers: bodily proximity is used to express affection and love, bodily punishment to express anger and annoyance.

The substantial value of bodily proximity becomes apparent when taking into account the socio-ecological context of the Nso, where infant mortality rates are high, everyday life poses risks on infants' health, and mothers are burdened with a lot of work and several children. Hence, bodily proximity has a considerable adaptive value in the Nso socio-ecological context: The parental investment in bodily proximity is achieved at relatively low costs in the Nso community, but is crucial for infant survival at the same time. Bodily proximity guarantees constant surveillance, the monitoring of the infant's nutrition and health status, and the protection of the child from injuries. Cross-cultural research revealed comparable evidence of a strong physical component in maternal belief systems about child development in diverse cultural contexts, where infant care is primarily defined as nurturance and protection, in accordance with the perceived high risks of infant survival (e.g., Keller, 2007; LeVine & LeVine, 1988; Richman et al., 1988). Against the background of these findings, it is obvious that Nso mothers who focus on bodily proximity in their descriptions of attachment refer to the most important dimension of their infants' development: survival. Furthermore, the embodiment of bodily proximity into a conception of attachment may be regarded as reflecting a new developmental stage: The 'actual' physical proximity that is needed for securing early infant survival shifts towards a more 'virtual' level insofar as physical proximity conveys love and affection to one-year olds.

### *Exclusive relationships as inhibiting multiple caregiving arrangements*

Ethological attachment theory defines attachment relationships as unique and exclusive relationships in which one or both partners provide security for the other (Hinde, 1997); therefore most studies focused on the relationship between mother and child. Within the cultural context of the Nso, where child care is considered to be a communal responsibility and mothers rely heavily on multiple caretakers,

our analysis revealed ambiguous maternal attitudes towards exclusive relationships: The majority of mothers reported that it would be harmful for a child in many respects to rely on only one caregiver, only few mothers reported to allow exclusive relationships to some extent, especially between themselves and their child. The strategy to prevent children from establishing exclusive relationships was to forcefully give children away to other caregivers, sometimes even by beating children; this maternal strategy was considered as necessary for the habituation of children to multiple caretakers. Although there is not much found in the literature with regard to the actual practices mothers employ to develop their infants' adaptability to other caretakers, it is for sure that in many non-Western cultures the 'harsh' physical disciplining of children is frequent and normatively regarded as a proper educational method (Quinn, 2005).

The attitude of mothers to prevent exclusive relationships in order to allow for multiple caregiving arrangements may be explained twofold:

On the one hand, multiple caregiving has to be regarded as an adaptation to a mother's future time and energy demands, e.g. the birth of a next child (Cervera & Mendez, 2006; LeVine et al., 1994; LeVine & LeVine, 1988). Infants' adaptability to multiple caregivers and their responsiveness to being soothed by nursing and backcarrying by siblings are central socialization goals of mothers in socio-cultural contexts characterized by high fertility and the heavy workload of mothers (Super & Harkness, 1986). Mothers who successfully train their children to get used to multiple caregivers can accomplish their daily chores more easily than mothers whose children are not used to other caretakers. Most Nso mothers in our sample were confronted with a heavy workload; hence, with the help of multiple caregivers, the barring of an exclusive relationship between themselves and the child permitted them to pursue their daily work undisturbed.

On the other hand, the prevention of exclusive relationships also fosters the integration of children into a broader cultural community, as children interact with many different individuals from an early stage. Especially in interdependent cultural contexts such as the Nso, maternal socialization centers upon the establishment of a feeling of unity and belonging between the child and members of the

community (Keller et al., 2006a; Nsamenang & Lamb, 1994; Yovsi, 2003). Against this background, it is apparent that the majority of mothers deliberately prevent exclusive relationships between the child and a specific caretaker in order to foster multiple attachment relationships between the child and multiple caretakers.

However, some mothers also reportedly allowed their children to establish an exclusive relationship; similarly, not all mothers put the same emphasis on bodily proximity in their expression of attachment. These differential aspects of bodily proximity and exclusiveness correspond to differences in the socio-demographic profiles of the mothers and are also connected to the emotion regulation patterns of the infants. Thus, the differential aspects of maternal beliefs will be discussed at the end of the next paragraph, which debates the three attachment patterns and takes into account the impact of socio-demographic variables on attachment.

### **5.1.2 Differential aspects of Nso attachment**

#### *Infant attachment strategies: Behavioral and physiological data*

The approach of one-year old children in the familiar family context by a strange Nso woman concluded three distinct attachment patterns; the three patterns can be described by differences in the behavioral and physiological emotion regulation of the children. Observing the children's emotional reactions when the stranger arrived and established body contact, allowed for the assessment of their behavioral regulation. The change in the children's salivary cortisol concentration before/after the stranger's visit determined their physiological regulation.

(I) The largest group of children did not express any visible emotional arousal in both situations, i.e. when the stranger arrived and when the stranger established body contact. They demonstrated extreme passivity, aloofness and calmness throughout the stranger's visit. Although they temporarily recognized the arrival of the stranger and glanced at her, they continued their current activities, e.g., playing with objects at their disposal or simply sitting on their mothers lap looking around. When the

stranger picked them up, the effect was similar: The children kept looking around or playing as if they did not notice the change in their whereabouts. Their mothers behaved passively as well: they only observed the child and the child's interaction with the stranger, but never did play an active part in the course of the interaction.

In general, the high number of the passive infants is of importance as the high incidence of a behavioral pattern can be regarded as indicative of a behavior pattern's adaptiveness within its context (Gardner et al., 1986; Lamb et al., 1985). The cortisol analysis supports this view: Physiologically these children demonstrated a decline in their cortisol level. According to Bowlby (1982), a physiological adaptation in the 'inner ring' of the life maintaining systems is not necessary in secure infants because regulation can be established on a behavioral level in the 'outer ring' of homeostasis (Spangler, Schieche, 1998). Given that the behavioral and physiological systems are organized according to this premise, our physiological data indicate that the expressionless and quiet infants in our sample already regulate their emotions at a behavioral level successfully and are therefore not in need of an activation of physiological stress systems to gain an emotional equilibrium. The inexpressive infants should therefore be designated a 'successful' emotion regulation status.

(II) The second group of infants was expressionless and quiet in the beginning of the interaction with the stranger, but displayed negative emotions when the stranger established close body contact. The very moment the infants started to withdraw from the stranger, their mothers became agitated and intervened in the ongoing interaction: They walked up to the stranger who held the infant and grabbed the infants' arm or leg, shaking the infant, telling them to 'stop crying'. However, the mothers did not take hold of the infant themselves, instead, they tried to force the children closer to the stranger. They called the crying children 'stubborn' or 'naughty' and showed anger towards the upset infants.

This group of infants became not only behaviorally aroused in response to body contact, but also physiologically: they displayed an increase of cortisol. Heightened cortisol levels in response to a stressful event are supposed to be indicative of

maladaptive behavioral coping (Spangler & Grossmann, 1993) or representative for an interaction of maladaptive coping and behavioral inhibition (Nachmias & Gunnar, 1996). Those children's negative emotions may be indicative of a less effective regulation of arousal on a behavioral level in the 'outer ring' of homeostasis. A physiological adaptation in the 'inner ring' of life maintaining systems was necessary for them, reflected in the increase of cortisol. Mere behavioral emotion regulation was not sufficient for those children to cope with the situation. The second group of children may therefore be designated a 'second-best' emotion regulation status.

(III) The third group of infants in our sample displayed extreme negative emotions from the very beginning of the stranger's visit, turning fearfully away from her, slashing at her, crying. Surprisingly and contrary to the cultural expectations, the Cameroonian stranger rarely picked up those infants; instead, she –unsuccessfully– tried to distract the children by clapping her hands or pointing at objects like mobile phones or animals. Although those children stayed for the most part of the interaction in body contact with their mothers, they did not regain their emotional balance as long as the stranger was present, but displayed consistent negative emotions. Surprisingly, their mothers did not try to soothe or calm the infants; instead, they behaved passively throughout.

Physiologically, this group of children did not show changes in their cortisol concentration in response to the stranger; however, they had the highest cortisol levels at both time points of measurement, compared to the other two groups of infants. An intense and constant arousal of the adrenocortical system is symptomatic of children who were exposed to chronic stress and lack any potential coping mechanism (Bevans, Cerbone, & Overstreet, 2008; Cicchetti & Rogosch, 2001). Social disadvantage (Lupien, King, Meaney, & McEwen, 2000) as well as maternal illnesses (Ashman, Dawson, Panagiotides, Yamada, & Wilkinson, 2002) were identified as factors causing learned helplessness and cortisol hypersecretion among infants. With regard to the physiological data of our third group of children, it is justifiable to indicate the lack of a proper coping mechanism. Those children were unable to regulate their emotions on both the behavioral and the physiological level, hence, they may be designated an 'ill-conditioned emotion regulation' status.

*The differential impact of socio-demographic factors:*

*(I) The crucial role of a Nso mother's marital status*

Research indicates that marital status may function as a resilience factor for healthy infant development, as infants of married women are said to have better emotion regulation competencies than children of single women (Rosenkrantz & Huston, 2004). Conversely, research provides evidence that children of single mothers experience poorer social and cognitive outcomes, perform worse in school, have higher rates of emotional and behavioral problems, and are more likely to engage in sexual and delinquent behaviors and to bear a child as a teenager (Amato, 1999; Amato & Booth, 2001; Meadows, McLanahan, & Brooks-Gunn, 2007; Thomson, Hanson, & McLanahan, 1994). In general, these findings suggest that the quality of mother-infant relationships varies on the basis of marital status (Rosenkrantz & Huston, 2004).

Consistent with literature, we found that within the Cameroonian Nso mothers, marital status acted as crucial determinant for a mother's social support system, which in turn influenced child development. How and why a mother's marital status had such an impact on her social support system and subsequently on child development will be discussed underneath.

Differences in the mothers' social support systems can be regarded as reflective of the different social statuses of married and single mothers within a hierarchical society that is stratified by a social ranking system. Within the Nso society, marital status is crucial for ascribing a dominant or subordinate social status to women (Tegomoh, 1999). This status differentiation is quite rigid and guides Nso people's actions.

It is only through marriage that women move from low to high status, i.e. from daughter to wife in the patrilineal Nso society (Vubo, 2005). Marriage and childbearing beget a woman accepted and respected as a full member of the society, with rights, privileges and obligations (Yovsi, 2003). Traditionally married mothers fulfill an expected role within the Nso. Hence, the married mothers in our sample

enjoyed a high social status as fully accepted members in the Nso community: albeit being subordinate to men, they had a high status among women and were respected in their own as well as their husband's family. Since married mothers move in with their husband's family, they are guaranteed the support of their husband's family. Married mothers in our sample reported to be provided with financial support, the provision of essential household items, moral support, assistance in case of illness, and childcare assistance by the paternal family as well as their own relatives.

In contrast, unmarried women remain daughters with a subordinate status as long as they live among their kins, i.e., their father's household (Goheen, 1996). They occupy an inconspicuous position within the Nso kinship structure (Vubo, 2005). Most single mothers in our sample still lived with their relatives, which equaled the low status of a daughter. Additionally, it is against the tradition for unmarried women to have children (Tegomoh, 1999). As a result single mothers in the Nso society had to face the stigma. Vubo depicts the position of single mothers in the Cameroonian grassfields as so marginal that "*in fact they do not exist at all.*" (Vubo, 2005, p. 168). Because they had born a child, but were left without paternal family support, they were dependent on their own family to compensate for the missing paternal family support; hence, single mothers did not only degrade the family's reputation, but also lingered on as a burden on their family's resources. One single mother in our sample who had one child born out of wedlock already, described her social situation: "*When I discovered I was pregnant, I was afraid, because I already had a son in the house. So I was afraid that when I come to our house, my parents abuse me [...] I was afraid that my mother would attack me. That how could I deliver the second child again in the house [...] The man who impregnated me ran away from Bamenda and went to Douala [...] Now as I'm with my mother, if I see anybody who has a farm that I can help to work and he pays, then I'll do it. Me and my mother we go and do the work. Then we can have money to buy things for the child. I did salon work, I learned how to plait, so if somebody wants to plait their hair, I do it. At times I plait for 500 or 300 then. I look for what I can feed the child with. That's what I do to cope.*" (Participant 14). Due to their low social status, the single mothers faced hardship even within their family and had to rely strongly on themselves to earn money for their own and their child's

sustenance. Goheen (1996) attributes the negative attitudes toward single mothers to the Nso hierarchical system which is characterized by a strong male dominance. Single mothers may be regarded as threats to this traditional system, because they are gradually gaining some independence from men, violating the traditional kinship ties upon which the system is based.

Although marital status resulted in seriously diverse social situations for mothers, marital status did not seem to affect fathers' involvement with mother and child: Paternal commitment as a rule comprises of providing money for basic needs; single and married mothers reported approximately the same financial support from fathers. However, fathers were assigned a decisive role for providing material security on the one hand and establishing social conformity on the other by integrating mothers into the traditional societal system and the extended family network through marriage.

### *(II) The impact of social support on maternal parenting and infant emotion regulation*

Nso mothers who reported to rely on an intact and functional social network had children with a more-or-less successful emotion regulation status: Their children belonged to the groups of infants with a 'successful' or 'second-best' emotion regulation status, who were able to cope with the situation of a stranger visiting on either a behavioral or physiological level. Socially, those mothers and their children were embedded in an extended family system: they could rely on help from the mother's relatives as well as on the father's family.

Research generally provides evidence that mothers who have sufficient positive social support, both in terms of perceived and received support, have better parenting skills and are more likely to have infants with excellent emotion regulation skills (Fish, 2001; Fortner-Wood, 1998; Green, Furrer, & McAllister, 2007; Huth-Bocks, Levendosky, Bogat, & Von Eye, 2004; Poehlmann, 1996). Studies suggest that social support buffers maternal stress (Matthew, 2006), or maternal depression (Kuscu et al., 2008) and thus impacts on parental caregiving qualities and child development.

It is likely to assume that Nso mothers who reported to rely on an extended family system had a functional social support system. In line with the above-cited literature, those mothers should possess effective parenting skills; hence, it comes as no surprise that their children demonstrated better emotion regulation competencies during the stranger's visit.

In contrast, Nso mothers lacking adequate social support were found to have children with 'ill-conditioned' emotion regulation status, lacking a functional coping mechanism. Those mothers were depending on their own resources or relied only on a single person for help and support. Additionally, the lack of social support was often accompanied by financial problems.

Research evidence suggests that mothers lacking social support are significantly more stressed and exhibit a lower parenting quality than mothers with an intact social support system; this in turn impacts child development (Sepa, Frodi, & Ludvigsson, 2004). Similarly, poverty was found to enhance stress and weaken parenting skills (Brody & Flor, 1998; Ricketts & Anderson, 2008). A study of African American mothers reports that especially poor women saw their support networks as critical to their ability to cope with the stress and to adequately parent their children (Green et al., 2007). Being economically disadvantaged, unemployed, or inadequately housed was found to provide sufficient stress in US parents to interfere with their ability to be sensitive and responsive to the needs of a child (Belsky, 2006). In worst case scenarios where mothers reach the limit of their endurance, they can even become estranged from and indifferent towards their infants (Scheper-Hughes, 1985). Since the Nso mothers who had no social support were faced with adverse contextual determinants, it is reasonable to assume high levels of stress in those mothers. In accordance with literature, it is likely that those mothers had limited resources to take sufficient care of their infants. As a result, their children were distressed and not able to cope with the visit of a stranger.

*(III) The impact of maternal and infantile health problems on maternal parenting and infant emotion regulation*

There is good evidence that children of parents with psychiatric disorders and chronic diseases are at increased risk of disturbances in their development (Park, Senior, & Stein, 2003) since maternal health problems are connected to parenting stress, which constitutes a risk factor for normal child development (Sepa et al., 2004).

Mothers of children with an ill-conditioned emotion regulation status, i.e. negative emotional expressions and high cortisol levels, reported severe illnesses of both mother and infant during the infant's first year of life. This result is in line with the above-cited literature that provides evidence that maternal illnesses constitute a risk factor for healthy child development. Since this group of mothers had no social network to rely on, diseases may have functioned as another hazard in their already difficult life circumstances: in case of an emergency, e.g. during the mother's illness, they had nobody to assist with childcare. The reported illnesses of their infants may constitute a direct consequence of the infants' experience of stress and adverse contextual determinants. Connections between an infant's experience of stress and psychological and/or physical illnesses have been widely acknowledged (Francati et al., 2007; Joseph, 1999) Spitz, 1949; Spitz, 1950). As no other caregivers were available, it also made no sense for those mothers to train their children's adaptability to multiple caretakers. Interacting with a female stranger may therefore constitute an unfamiliar situation for those children and their distress reaction can be regarded as an expression of helplessness and their inability to cope with such a situation.

Mothers of infants with a successful emotion regulation status, i.e. neutral emotions and a cortisol decline, stated to have suffered from severe health problems themselves. At first glance, this finding seems contradictory to existing literature. However, our interviews revealed that the Nso mothers were often concerned about their children's well-being in case of their own death. Hence, especially unhealthy mothers may have had in mind how their children would cope in case of their sudden death. They might have been especially aware of the necessity to equip their children

with competencies to adapt to other people and put more effort on educating their infants to be quiet, calm, and compliant. As those mothers relied on an extended family with multiple caregivers at hand, they were in the position to make use of the option to share the task of childcare. Moreover, it is likely that sick mothers were strongly dependent on other caregivers as substitutes for themselves during the period of their illness; thereby their infants involuntarily became used to strangers through interaction with them. Hence, the combination of maternal illness and the availability of multiple caretakers may have brought on the familiarity of the child towards multiple caregivers and resulted in the identified successful emotion regulation pattern when confronted with a stranger.

Mothers of children with a second-best emotion regulation status did not report any health problems. Since they did not suffer from illnesses, it is plausible to assume that an adaptation of their infants to other caretakers was less significant to them; similarly, they had never been in a situation that forced them to rely heavily on other caregivers beside themselves. Although those mothers had social support and thus availability to multiple caregivers, their children were trained and familiar with multiple caregivers to a lesser extent. This became evident in the infants' emotion regulation strategy during the stranger's visit: the infants were at ease with the stranger and interacted friendly as long as the stranger kept a certain distance, but changed to a negative emotional state in response to close body contact with the stranger.

### **5.1.3 Summary: The adaptiveness of culture-specific attachment strategies in the Cameroonian Nso**

Our mixed-methods approach allowed the identification of three distinct attachment qualities in Nso infants. From an evolutionary viewpoint, each pattern has to be regarded as instantiating an adaptation of the infant to the individual socio-demographic circumstances of the mother-infant pair.

Although the Nso mothers held shared beliefs on attachment that represent important aspects of Nso culture in general, we also found different emphases and aspects in the maternal belief systems. Those differential aspects were found to correspond with the different attachment strategies to some degree. Since they may illuminate influences of maternal belief systems on the development of attachment, they are discussed here with respect to the different adaptive values of the attachment patterns.

*(I) The first attachment pattern in the Nso is characterized by quiet and expressionless infants designated a successful emotion regulation status.*

Mothers of infants with a successful emotion regulation status put a high emphasis on bodily proximity and showed the strongest focus on the prevention of exclusive relationships, thereby implementing pivotal strategies for successful child development in the Nso socio-cultural context. Additionally, they reported that most often other people besides themselves represent the favorite caregiver of the child. The descriptive analysis of the single nominations of maternal affection revealed that those mothers referred most frequently to 'togetherness', a concept that was subsumed under the category of proximal signs of affection. Albeit speculative, a focus on togetherness may be indicative of a mother's focus of integrating the child into the community. The finding that those mothers were most intent to prevent exclusive relationships supports this view. The simultaneous emphasis of physical proximity can be regarded as fostering a feeling of unity between the infant and his/her multiple caregivers, which also facilitates an early integration of the child into the broader cultural context, which is highly valued in the Nso community.

Accordingly, this attachment pattern definitely represents an adaptation to socio-demographic circumstances of the mother-infant pairs, who followed the traditional living pattern of the Nso, characterized by an extended family system, many children and multiple caregiving arrangements, and a high maternal workload due to subsistence-based agriculture. Probably due to maternal diseases and the availability of other caregivers, this group of children was used to multiple caregivers from an early age on and had no difficulties in adjusting to a stranger. The decline of the

infants' cortisol level in response to the stranger supports the interpretation of a successful behavioral emotion regulation in these infants.

A similar behavioral pattern was observed by Gottlieb (2004) in Beng infants of Côte d'Ivoire, whose mothers are -due to work and social demands- urged to share their babies with as many people as possible from the earliest morning following birth. The majority of those children did not show any negative emotions towards the strange and white Anthropologist, who wrote: "*the babies I observed went willingly to their new temporary caretakers, and it was rare for them to cry or otherwise express regret, fear, anxiety or anger when their mothers disappeared from view.*" (Gottlieb, 2004, p. 160). The Beng mothers socialize their babies to be minimally attached to the mothers; at the same time, they provide a dense social network with many caretakers and a high comfort level with strangers. This socialization strategy and the developmental consequences are very similar to our findings with respect to Nso infants designated a successful emotion regulation pattern.

*(II) The second pattern consisted of infants designated a second-best emotion regulation status.*

Interview data revealed that mothers of infants with a second-best emotion regulation status also put much emphasis on bodily proximity, but less emphasis on the prevention of exclusiveness. The descriptive analysis of maternal expression of attachment revealed that this group of mothers surprisingly often relied on 'presents or gifts' as an expression of their love. Gifts and presents fall into the category of distal signs of affection. The mothers' emphasis on distal signs of affection is of interest, as it may be an indicator that those mothers were in a position to attend to the marginal or secondary needs of their infants. It may also have been that protection and survival of the infant were taken for granted by those mothers as they relied on sufficient social support for childcare and overcame the first year of their infant's life without suffering from serious health problems. The mothers' indulgence in training their infants to multiple caregivers supports this view: They were in a position where multiple caretaking was always an option, but never an urgent necessity.

Although those children also grew up within a functional social network and interacted friendly with the stranger as long as they were with their mothers, they became behaviorally stressed by close body contact with the stranger. Additionally, a physiological arousal was identifiable by an increase of cortisol. Since the mothers of those children had never been forced, e.g. by illnesses, to rely completely on others as caregivers, they could afford to keep their infants' distress –caused by an adaptation to different caregivers– low by a more gradual and tolerant training to multiple caregivers. Thus, it may be an adaptive strategy for those infants to cry when a stranger establishes body contact, because they know that their mother is available. The mothers' involvement during the stranger's visit supports this view: the mothers touched the upset infants and used the situation to teach proper behavior, i.e. told the child to stop crying. Hence, those mothers had not yet completely achieved their socialization goal to have calm and expressionless infants.

*(III) The third group of infants was designated an ill-conditioned emotion regulation status.*

Mothers of infants with an ill-conditioned emotion regulation status put least emphasis on bodily proximity and were found to be most lenient with their children with regard to exclusive relationships. Descriptively, we found that those mothers reported most often to breastfeed their infants in order to communicate maternal love. Albeit speculative on the basis of our data, breastfeeding and primary care aim at the nurturance of infants and are supposed to secure infant survival. Hence, those mothers considered it as most important to focus on the most basic need of nutrition to ensure the infant's survival; maybe this was the best the mothers were able to provide for their infants. The mothers' allowance of exclusive relationships between themselves and their children mainly mirrors their adverse social situation: Although the mothers also acknowledged the importance to train infants to multiple caregivers, they often had no other choice than to take care of the infants themselves.

This group of children exhibited an extreme behavioral and physiological arousal throughout the stranger's visit. DeVries (DeVries, 1984) reported for the Masai, that under extremely adverse conditions, a difficult infant temperament may

have survival value. Difficult and crying infants are more likely to get breastfed in a society in which breastfeeding is administered on demand. The Nso children of this group are faced with an adverse socio-cultural context, characterized by the lack of social support, including financial support, caused by the mother's pregnancy out of marriage, as well as health problems of mother and child. In the interdependent Nso culture, these contextual determinants can be regarded as detrimental for a mother's well-being. Since social support is lacking, nobody else may function as a maternal substitute, e.g., providing additional childcare. Hence, the extreme negative responses of those children may reflect the children's inexperience with other caregivers and indicate the lack of any proper behavioral coping mechanism for such situations. At the same time, the extremely negative responses may be adaptive as extreme signals necessary for those children to gain their mothers' attention. Surprisingly, the mothers remained indifferent towards the infants' crying, hinting at the possibility that those mothers were unable to provide their children with responsible maternal care. With respect to the Nso context, those children did not show appropriate behavior, as nobody could handle those infants while continuing with daily routines at the same time. The fact that those children reacted extremely negative by the mere sight of a stranger seemed to have discouraged the research assistants' hope to be able to calm those children down. They often refrained from picking those infants up, contrary to the cultural expectations and contrary to their behavior with the other children. The overburdened 'bad mothers' had not taught their infants proper demeanor.

Again, comparable findings are reported for the West-African Beng people of Côte d'Ivoire by Gottlieb (2004): Beng infants who exhibit stranger anxiety are considered to have a difficult character; those infants are criticized as nuisance or failure and their mothers are pitied as unfortunate victims of the excessive attachment of their infants to them. Gottlieb met only few such infants among the Beng people; however, in cases where infants displayed a wariness of strangers, she identified poor social circumstances that may account for the intense attachment between mother and child. She concludes that an examination of the biography and social circumstances of such mother-infant pairs helps to understand "*what sort of relatively unusual social universe may produce stranger anxiety in a society whose members routinely –and fairly*

*successfully- discourage its onset in most babies.*” (Gottlieb, 2004, p. 159). The same seems to hold true for the ill-conditioned Nso children and their mothers.

## 5.2 REAPPRAISAL OF ATTACHMENT THEORY'S ASSUMPTIONS

The following section contrasts the findings of our study with the core assumptions of ethological attachment theory, which have been outlined in chapter 2.3.1.

A first basic notion hereby is that the very **concept of attachment** seems to carry different meanings, depending on the socio-cultural context. Bowlby (Bowlby, 1982a) already notioned that parental behaviors are steered at a cognitive level by internal representations of the attachment relationship, guiding their behaviors in interacting with the child (Slade, Belsky, Aber, & Phelps, 1999). In order to investigate the influence of parental representations on parenting behaviors and infant attachment, a number of attachment researchers developed tools for the measurement of parental representations of attachment relationships. These tools were developed in Western socio-cultural contexts and focus mainly on the psychological dimension of the attachment concept. Studies assessing representations of a mother's relationship with her child used e.g. the 'Parent Development Interview' (Slade et al., 1999), the 'I feel pictures test' (Nagaya, 2005), or 'the Working Model of the Child Interview' (Benoit, Zeanah, Parker, & Nicholson, 1997). They primarily deploy the following operational definition of attachment: the interpretation of an array of emotions, desires, needs; parental acceptance or rejection of the child; and parental fostering of the child's dependence or independence. Hence, attachment theorists consider maternal representations of attachment relationships to be composed of mainly psychological components, which meet an infant's needs and foster autonomy in children. Highly educated US parents were found to define parental love as unconditional and responsive to the needs and desires of the child (Johnson, 2008).

Within the Nso, the physical needs of infants are met immediately; however, the infants' psychological desires, such as curiosity and the pursuit of a child's interests remain neglected to a large extend. The mother-infant bond described by the Nso mothers revealed only few psychological dimensions, but mostly physiological components that are also used to guide and control the child's behavior. The finding that Nso mothers convey their love through bodily proximity revealed a close

relationship between Nso belief systems and Nso parenting behaviors. The findings are consistent with the assumption that maternal representations of the relationship with the child are meaningfully linked to maternal behavior and provide a more direct link to parental behavior than measures of parental attitudes, which often do not predict behavior (Holden & Edwards, 1989). The Nso conception of attachment represents an ideal of affection that is –due to its physical nature– adaptive within the Nso context. Scheper-Hughes (Scheper-Hughes, 1985) reports of extremely adverse conditions in which an infant’s death is anticipated, that the concept of ‘mother love’ may be completely irrelevant and absent; instead, ‘mother love’ is replaced by an estranged and guarded ‘watchful waiting’. The maternal indifference towards an infant was due to maternal insufficiency and deprivation. Hence, socio-cultural conditions can affect not only a mother’s ability to nurture, but also a mother’s ability to love her child.

Since the meaningfulness of belief systems is closely connected to the socio-cultural and socio-ecological contexts within which they develop, the meaning of attachment is affected by contextual determinants as well. Ethological attachment theory has rarely questioned a universal meaning of the attachment concept. But, instead of assuming ‘mother love’ as an universal concept that may be emphasized differently inter-individually or cross-culturally, our data points out that ‘mother love’ and the concept of attachment must be seen as products of specific socio-cultural and socio-ecological determinants. We argue that valid representations of attachment can only be assessed through an investigation of the meaning of attachment within a specific socio-cultural environment.

The same problem of neglecting differences in cultural meaning systems is inherent in ethological attachment theory’s assumption that the Strange Situation constitutes the appropriate procedure to uncover different attachment qualities in all cultural contexts (**assumption of equivalence**). Although the adequateness of the Strange Situation Procedure has not explicitly been tested for the Nso in this study, the reasons to choose a different approach are based on the specificities of Nso belief systems and parenting practices. Due to the fact that children are never left alone,

but are always in close proximity with the mother or a caregiver, we supposed that to be completely alone would be extremely unusual and stressful for these children. A hypothetical thought experiment of applying the strange situation in the Nso community might reveal the difficulties resulting from the diverse cultural meaning system: the very moment a Nso child is left alone –at worst locked inside a room– will most likely lead to severe crying. The consequence would be that all people within hearing distance would gather to inquire about the problem, prepared to help. One can assume that the Nso with their focus on bodily proximity and the prevention of negative infant signals may judge the procedure of leaving a crying child alone as loveless, cruel, and irresponsible. The main outcome of applying the Strange Situation may hence be a refusal of Nso families to take part in these kinds of ‘immoral’ studies in the future and the scientific insight that being left alone puts extreme stress on Nso children.

Additionally, the assessment of attachment by applying the Strange Situation focuses exclusively on variables on the part of the infant; meanwhile, differences in maternal behaviors are ignored in this procedure. However, by definition, the assessment of an attachment relationship should take into account both partners, realizing a more interactive approach. With regard to our data, it is obvious that an evaluation of the adaptiveness of infant behavioral strategies is strongly determined by maternal variables. Nso children display attachment behaviors that are truly understood only with respect to maternal behaviors, such as the prevention of exclusive relationships.

What we can deduce clearly from our results is that the **assumed normativity** of the secure attachment pattern as defined by ethological attachment theory does not hold true for the cultural context of the Nso. In our sample, the most adaptive emotion regulation strategy was present in the expressionless infants. Ethological attachment theory would agree on the basis of the physiological data that those infants use an adaptive emotion regulation strategy. Studies on the differential release of cortisol in relation to different attachment qualities unanimously report no increase or even a decrease in cortisol for securely attached children (Gunnar, 2005;

Nachmias & Gunnar, 1996; Schieche & Spangler, 2005; Spangler & Grossmann, 1993). Given these results, our infants with a successful behavioral emotion regulation status would be designated a 'secure' attachment status, referring to attachment theory's terminology. However, the observable behavior of those children during the interaction with the stranger may lead to quite a contrary classification, applying attachment theory's classifications: an infant's behavior of extreme passivity and inexpressiveness during a stressful situation without any attempt to get the mother's attention may lead to the classification of attachment disorganization. Although this is a hypothetical conclusion, the extremely high occurrences of disorganized attachment reported for African children in the literature (True et al., 2001) reinforce this hypothesis.

Ethological attachment theory regards maternal frightening behavior to be an important factor for the development of disorganization. Hence, the expressionless infants developed a disorganized attachment status due to their mothers' frightening behaviors. This connection is supported by our data: These are the very mothers who posed threats in order to prevent exclusive relationships and to educate their children. Within the framework of ethological attachment theory, the connection between maternal frightening behavior and infant disorganization is consistently found and has been confirmed even for an African culture (True et al., 2001). Yet, from the perspective of Nso mothers, expressionless and passive infants are appreciated in the cultural context of high fertility/mortality rates, the heavy workload of mothers, and the use of multiple caregivers. Maternal –sometimes frightening, often controlling– behavior aims at producing exactly this valued and adaptive developmental outcome. Hence, attachment theory's assumed link between maternal frightening behavior and behavioral disorganization, such as inexpressiveness, may hold true insofar as maternal frightening behavior produces calm and expressionless infants. However, the negatively loaded notion of 'disorganization' does not hold true, especially not in regard to negative developmental consequences: The inexpressive Nso children are appreciated in their cultural context (Yovsi et al., 2007); they are obedient and compliant and are said to turn into valued adults in their society (Nsamenang & Lamb, 1995). The same behavior is viewed differently from another

socio-cultural perspective: within the context of Brazilian shantytown mothers, who tend to a contrary evaluation of calm and expressionless infants. They judge them as weak and vulnerable and detach themselves from those infants because they consider them to be prone to illness and death (Scheper-Hughes, 1985).

Obviously, a culturally valid evaluation of attachment patterns has to also take into account the culturally adaptive value of a behavior pattern, which is embodied in maternal belief systems (LeVine & Norman, 2001). As belief systems represent adaptations to various socio-cultural contexts, belief systems may change drastically across cultures, and the evaluations of behavior patterns change just as drastically (Harwood et al., 1995; Rosenthal & Roer-Strier, 2001; Rubin & Chung, 2006). Therefore the behavior pattern underlying the negatively valued 'disorganized attachment status' of ethological attachment theory has to be reappraised in accordance to the adaptability within a specific cultural context. In our Nso sample, we found illuminating evidence for the incompatibility of attachment theory's classification and the context-dependent evaluation of behaviors with regard to disorganization. The same difficulty is encountered in evaluating secure and insecure attachment styles. With respect to our data, the extremely distressed infants may be classified as insecure-resistant by ethological attachment theory; the Nso mothers evaluated this behavioral style as the worst. The children, who interacted friendly with the stranger as long as they still had body contact with their mothers, may be classified as secure by attachment theorists; in the Cameroonian Nso context this behavioral style is indicative of immature emotion regulation competencies. Based on her careful observation among the Beng people, Gottlieb (2004) arrives at the same conclusion: "*Some babies who would be categorized as emotionally healthy by psychologists would be categorized by Beng mothers as [...] emotionally unhealthy as well as socially problematic.*" (p.157). Since we did not analyze infants' reunion behavior with the mother, it is admittedly difficult to compare Nso infants' behavioral organization with the classical attachment patterns. However, our inductively derived evaluation of Nso emotion regulation patterns is coherent with the corresponding physiological data and meaningful in the light of Nso mothers' belief systems. Albeit that our emotion regulation patterns may be deviant from ethological attachment theory's classifications of the same behavioral reactions, they are still culturally valid.

Consequently, a culturally valid assessment of attachment has to rely on an emic approach that includes an analysis of socio-ecologic and socio-demographic parameters, explores maternal belief systems and uses an everyday situation to elicit behavioral responses to stress. The use of an artificial standardized situation and a predetermined coding system for the evaluation of behavioral styles is not helpful in environments that differ from the environment where the methods were initially derived from.

With regard to attachment theory's **assumption of sensitivity**, our findings suggest a view of good mothering in the Nso community that is substantially different from attachment theory's definition. Sensitivity as defined by attachment research is based on the idea that infants have their own wishes, desires and preferences that caregivers have to fulfill (LeVine & Miller, 1990; Rothbaum et al., 2000); good mothering as defined by Cameroonian mothers imposes the mothers' ideas on the child as she guides the infant to a desired developmental goal, i.e. by first being a quiet and obedient child and later becoming a respected member in the hierarchically organized Nso community (Yovsi et al., 2007). Within Western cultures, a sensitive parenting style leads to a secure attachment status of the child. Within the Nso culture, a parenting style of responsible control leads to successful emotion regulation of the child.

Cross-cultural studies report, if at all, only a moderate association between attachment security and the concept of maternal sensitivity as defined by Ainsworth (Ainsworth et al., 1978). Especially studies within African cultures (Leiderman & Leiderman, 1974; True et al., 2001) had to draw on various additional factors, such as mothers' age, birth of siblings, or maternal frightening behavior, to be able to explain the variance in attachment quality with differences in maternal sensitivity. True et al. (2001) coded instances of maternal frightening behavior when e.g. a mother handled the infant in a violent way such as picking the infant up by the ankle or when a mother gazed into the infant's eyes or assumed attack postures that could not be ignored by the child. True et al. (2001) argue that the modest effect size for maternal sensitivity is caused by the omission of fear-inducing behaviors from

the Ainsworth sensitivity scale, which should be incorporated in the evaluation of maternal behaviors.

Since the Nso mothers in our sample showed many instances of frightening behavior, we support the notion to include maternal frightening behaviors in the evaluation of parenting. However, our data suggests a more careful interpretation of maternal frightening behaviors: they often constitute good parenting behavior as they aim at protecting the child from the worst that might happen: *“At times, like fire, I can remove a hot burning charcoal from the fire and put it and ask her to touch it. When she is touching it and gets that it’s hot, she runs away from it. That teaches her not to go near fire again.”* (Participant 29). Frightening behaviors are common in Nso educational practices. The harsh discipline can be explained by the dangerous environment within which Nso children grow up. If they don’t fear fire, they may get seriously burnt, if they don’t stay away from filth, they may get seriously infected. The moment children are able to walk by themselves, they are more difficult to control and must already have learnt their lessons of taking care of themselves. Since Nso children usually grow up in extended families with internal hierarchies, they also have to learn to accept unequal status and the corresponding rules of conduct from early on. Nso mothers’ caregiving agendas include harsh and frightening behaviors; however, they do so to prevent their children from getting seriously injured and to equip them with behaviors necessary for the successful integration into the Nso community. Hence, Nso mothers’ frightening behavior should not be regarded as maltreatment, but has to be conceived of as an integral part of Nso parenting behavior.

Poor parenting skills and the maltreatment of children are most common in families suffering from economic hardship (Gabarino, 1992). Attachment research has shown that socio-economic status and other indicators of social deprivation are linked to maternal sensitivity and infant attachment (e.g. Ward & Carlson, 1995; van Ijzendoorn & Kroonenberg, 1988; Crittenden et al., 1991; Zeanah et al., 1993). Maltreatment of children, most strongly associated with economic deprivation, most strongly affects the disorganized pattern of infant attachment (Belsky, 1993). Insecure attachment status and poor parenting skills are also more common in

deprived groups. Within our sample, we found the same correlation between indicators of social deprivation, parenting quality, and infants' emotion regulation competencies: The single mothers suffered the most adverse socio-economic conditions and were likely to have children with a maladaptive emotion regulation status. In their parenting, they focused less on bodily proximity and the prevention of exclusive relationships, differing from the traditionally expected maternal behaviors. Although their children displayed poor behavior when approached by a stranger, the mothers didn't interfere in order to change their children's behavior. In contrast, the married mothers were likely to have children with a functioning emotion regulation. In their parenting they represent the Nso standards: they focus on bodily proximity and train the infant –often forcefully– to accept other caregivers. Their children displayed the expected behavior when approached by the stranger; in case they did not, the mothers interfered and tried to steer the child's behavior towards the proper behavior.

Summarizing, our data show that the definition of sensitivity by Ainsworth is not relevant to the Nso cultural context. Instead, the concept of responsive control captures the essence of good parenting for Nso mothers (Yovsi, 2003; Yovsi et al., 2008), including maternal frightening behaviors. Again, we argue that it is necessary to consider culture-specific socialization goals and ethnotheories defined as what constitutes good parenting within a specific cultural context.

Concluding, ethological attachment theory's core assumptions can be said to underestimate the power of social and cultural factors that shape maternal thinking and behavior and hence infants' attachment: the cultural meanings of fertility, birth, and death; the mother's assessment of her economic and social support and her psychological resources; and maternal belief systems. All these factors influence the development of emotion regulation competencies in children and shape culturally adaptive attachment patterns.

### 5.3 LIMITATIONS OF THE STUDY

There are limitations regarding the present study that need to be acknowledged and addressed.

The first limitation concerns the small sample size and hence the limited use of statistical analyses. Our sample comprised of 30 one-year old children and their mothers. The further subdivision of children and mothers into three distinct groups leaves on average 10 mother-child pairs per group. However, the aim of this study was to explore cultural syndromes on the basis of eco-cultural and socio-cultural parameters, maternal belief systems and infants' emotion regulation patterns. Crucially important was the detection of culture-specific patterns pervading all levels of analyses and not confirming hypotheses statistically. Our study took place in the North-Western province of Cameroon, where the provision of electricity is pretty unstable, and the charging of batteries alone was always a tantalizing event. It took more than four months on-site to collect the extensive data for 30 mother infant pairs.

Studies on attachment using observational techniques are often not confronted with difficult field work conditions and do not simultaneously collect data on children's everyday behavior or interview data about mothers' belief systems and many report comparable small sample sizes: Van den Boom et al. (van den Boom, Broekema, Leonard, & Kellenaers, 1987) observed 39 mother-infant pairs in the Netherlands, Sagi and Lewkowiez (Sagi & Lewkowiez, 1987) reported on 36 Israeli mother-infant pairs, Schneider-Rosen and Cicchetti (Schneider-Rosen & Cicchetti, 1984) provided results for 37 US mother-infant pairs, True et al. (True et al., 2001) investigated attachment in 42 mother-infant pairs from Mali. However, it might be worth to collect additional data in order to increase the sample size of this study for future analyses.

A second potential limitation of the study may lie in the fact that the behavioral observations were video-recorded. The camera might have affected the natural behavior of mothers and infants. Mothers and infants were aware of the video camera;

however, from the moment the female stranger approached the child and started interacting with the child, at least the children were not focused on the camera any more. Additionally, if mothers' behavior was affected by the video recording, this might even have provided valuable information: Mothers aware of the video recording may deliberately have displayed a behavior they consider to be appropriate parental behavior, allowing us to observe what they consider to be a good Nso mother's response to a child's signal. Compared to most studies on attachment that take place in artificial laboratory settings, where a child's response possibilities are severely restricted, the video recording of mother-infant pairs in their homes constitutes a much less artificial situation.

A third limitation concerns the interview translations and the interpretations of observed behavior. With regard to the interview translations, we relied on assistants with Nso ethnicity, who conducted and simultaneously translated the interviews. This enabled the author to ask for clarifications where needed. The interviews were analyzed with the help of content analysis. Compared to other, more elaborate qualitative analyses that require a verbatim, precise, timely translation, such an effort is not needed in order to conduct a content analysis. Instead, we considered it more important to catch the exact meaning of maternal answers by being able to ask for explanatory statements, examples or interpretations.

Similarly, to guarantee a culturally valid interpretation of the observational data, the author watched the video recordings with two Cameroonian Nso assistants separately, comparing their interpretation of the ongoing activities with her own. In the few cases where the interpretations between the author and the assistants differed, the Cameroonian assistants could easily convince the author of their interpretation by identifying some culture-specific perceptual biases. The direct involvement of Nso assistants in the discussion of behavior patterns as well as the author's experience of Cameroonian everyday life should warrant cultural appropriate evaluations within the realms of possibility.

## 5.4 OUTLOOK

### 5.4.1 Future research

The assumption of competence as formulated by attachment theory has generally received less support from research. Within the scope of this study, we were not able to evaluate whether the emotion regulation patterns predict a differential functioning of the children in other domains than attachment. However, it is obvious that the often used definition of competence/intelligence as cognitive performance or technical skill is not the optimal operationalization with regard to Nso children. It may be of interest to know how the children perform in school or related cognitive tasks, but the more important first step should be to explore how the Nso define competence/intelligence.

As Nso parenting aims at the integration of new members into a hierarchical society, children have to develop obedience towards those with higher social status and responsibility for those with lower social status (Yovsi et al., 2007). Therefore, social skills and the maintenance of harmony in relationships may be most central for a definition of competence/intelligence within the Nso. A study with Nigerian children (Ogunnaike & Houser, 2002), who are also trained towards being helpful, respectful and responsible, showed that the successful completion of errands is highly valued in this context. Nigerian adults use the fulfilment of errands as an indicator of a child's competence. Children, who are able to successfully go on errands on their own, are perceived as reliable and responsible; and in future, those children will be trusted with additional responsibilities. Those children have acquired skills that are conceived of as important in their cultural context. However, the study found no correlations between children's successful completion of errands and the Bayley Mental Development Index, which is widely used to measure children's cognitive performance. Associations between errands and cognitive performance were only found when culturally salient items were chosen from the Bayley scale and adapted to the Nigerian context. Hence, the study provides evidence for a culture-specific conception of competence and strengthens the credible assumption that definitions

of competence vary across cultures, obviously because they are steered by culture-specific developmental goals (Mundy-Castle, 1974).

We collected data on the Nso children's everyday behavior that would allow an evaluation of how obedient and respectful the children behave in their everyday life, but due to a lack of time it has not been possible to analyse this data yet. Instead, the investigation of the children's everyday functioning constitutes a next illuminating step in the investigation of Nso attachment and its sequelae.

#### **5.4.2 Practical implications**

The findings of this study challenge a universal formulation of attachment theory as proposed by many attachment researchers to date (cf. chapter 2.3.1). Human universals and cultural variation are frequently two pieces of the same puzzle (Quinn, 2005) and attachment has to be regarded as such a case. The embodiment of cultural and social factors into attachment theory's framework will have serious consequences with regard to the ideals that dominate the current debates about healthy child development within different environments. A definite formula providing all ingredients necessary for healthy child development does not exist. Instead, one has to adopt the view that there are many ways that turn a child into a well adopted adult.

In Western cultures, the prevailing ideal of a good mother is a full-time mother who stays at home with her children. This ideology of a 'monogamous love' between mother and child often causes feelings of guilt when abandoning the child by putting them in someone else's care, e.g., among employed mothers in Western societies (Bhattacharyya, 1980; Tizard, 1991). The Cameroonian mothers in our sample worked –as soon as they had recovered from childbirth– either on the fields or held another occupation. Their full time occupation with field- and housework made it necessary to 'abandon' the child to multiple caregivers. Within the Nso as well as in many non-Western societies with a shared responsibility of childcare, the prevalent ideal of mothering is 'equal love for everybody'. The Nso describe a good mother as "*[...] one who loves all children the same and can teach even other people's children, [...]*"

*everybody speaks good of her.*” (Participant 11). Thereby Cameroonian mothers don’t follow the ideal of exclusive mothering, as do most mothers in non-Western contexts; nevertheless, their children grow up within the range of normal development.

Over the past 25 years, the employment rate for mothers with young children has increased dramatically in Western cultures (Hill, Waldfogel, Brooks-Gunn, & Han, 2005). Studies exploring the effects of maternal employment on children’s development report equivocal results (for a review see Goldberg, Prause, Lucas-Thompson, & Himsel, 2008): Some studies find negative effects of maternal employment for children’s development (e.g., Brooks-Gunn, Han, & Waldfogel, 2002; Hill et al., 2005; Symons, 1998), some report that other factors, such as intensified shared activities, may compensate or even transmit psychological benefits to children (e.g., Huston & Aronson, 2005; McDonald, Bradley, & Guthrie, 2005; Tizard, 1991).

On the basis of our data, we would argue that the question to be asked with regard to child development should not be if mothers are employed or not. The question should however be which intrapersonal and contextual variables affect maternal behaviors and hence child development when mothers are employed. For the Cameroonian mothers, the role of the familial and social support was critical for normal child development. In non-Western contexts with nuclear families, support provided by the government has to replace social support systems. Instead of normative beliefs of motherhood and childrearing, ecologically appropriate models are needed in studies of environmental influences on child development, treating attachment as a much more complex phenomenon as it has been treated until today. Such studies may contribute to the development of targeted policies that support families in their employment and caregiving responsibilities in Western contexts as well.

## 6. CONCLUSION

The data reported in this study challenge ethological attachment theory's universalism and provide a first thorough exploratory analysis of the function and regulation of attachment processes in a non-Western socio-cultural context. We argue that much of the discussion on attachment suffers from a severe ethnocentric bias of the dominant Western culture, especially from the culturally and temporally normative beliefs of motherhood and parent-child relationships.

Empirical evidence is provided, showing that a culturally nuanced perspective on attachment in a non-Western context bears results that are incompatible with attachment theory's assumptions of equivalence, normativity, sensitivity and competence. We argue that in order to understand the function and regulation of attachment within a specific socio-cultural context, at least three different levels of analyses have to be considered: Socio-demographic parameters, maternal belief systems as well as infants' emotion regulation competencies. Thus, attachment theorists should broaden their view on attachment relationships beyond infant variables to include maternal interactive behaviors and the respective belief systems. This is the first study that combines the different levels of analyses, using a multi-method approach, in order to explore attachment patterns in a non-Western cultural context.

This study could demonstrate that patterns of attachment have to be regarded as adaptations to contextual demands. Although attachment is rooted in universal principles, attachment relationships are contextually shaped and ontogenetically acquired. The same behavioral patterns carry meanings that are understood only with respect to their socio-cultural context. The nature of human attachment has to be treated as a complex phenomenon with a biological basis that is socially shaped and made meaningful only through culture. There is still much work to be done.

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# APPENDICES

## APPENIX 1: SOCIODEMOGRAPHIC QUESTIONNAIRE

### Questionnaire for Mothers

1. Name:
2. Age in years:
3. Place of birth:
4. Economic activity:
5. Religion:
6. Years of schooling:
7. Marital status:     Married    Widowed    Divorced    Single

Since when?

If married, husband's occupation:

8. Are you living in your house?     Yes     No  
 If no,     renting     provided by a relative

9. With whom do you live?  
 Husband     Grandparents     Siblings     Sitter     Other relatives

If other relatives, who?

10. How many children do you have?

Age	Gender	Temperament: Hot or cold	How much time do you spend with this child	What activities do you like best to do with this child

## APPENDIX 2: INTERVIEW GUIDELINE

### INSTRUCTION:

We would like to know about you and your child. Please notice that everything you tell us is of importance and that you can not do wrong. We don't judge the things that you are going to tell us as right or wrong. We are only gathering information.

- First tell us about all important things that happened to this child during his first year of life. Describe in detail everything you can remember. Take your time, we will listen to you, afterwards we will ask you some questions.  
(1 open question)
- Did you have any physical problems during pregnancy?  
If yes, what kind of problems?  
(2 maternal health problems)
- Where did you give birth to this child?  
(3 place of birth)
- Did you have any complications during delivery?  
(4 delivery complications)
- Has the child ever been to hospital?  
(5 infant's hospitalization)
- Did your child have any serious health problems during the first year?  
(6 child's health problems)
- Does the child take any medicaments regularly?  
If yes, what kind of medicaments?  
(7 medication)
- Have you as the mother ever been to the hospital during the last year?  
(8 maternal hospitalization)
- Do you still breastfeed?  
(9 breastfeeding)

- Where does the child sleep during the night?  
(10 sleeping)
- How does a normal working day look like for you? What are your activities?  
(11 maternal working day)
- What does the child do from morning to evening?  
(12 child's day)
- Have you any established routines in your daily activities?  
(13 mother's daily routines)
- Are there special routines the child should follow?  
(14 child's routines)
- How much time does the child spend with the father?  
If they spend time together, what do they do?  
(15 father and child)
- Are your parents living near you?  
(16 grandparents)
- Who else takes care of the child?  
(17 alloparents)
- Who does the child like best?  
(18 favorite caretaker)
- When does the child look for an older person?  
(19 looking for elders)
- Is your child acquainted to a white?  
(20 white man)
- What are some of the habits that you teach your child?  
And how do you teach your child these habits?  
(21 habits)
- When the child is crying, what does it mean?  
(22 meaning of crying)

- When she is crying, what do you do?  
(23 reaction to crying)
- When the child sticks to a particular person, following wherever this person is going, what does it signify?  
(24 meaning of following)
- Is it considered a good or bad habit?  
(25 appraisal of following)
- When the child sticks to a particular person, following wherever this person is going to, what do you do?  
(26 meaning of sticking)
- If the child does not like going to anybody else, what do you do?  
(27 reaction to sticking)
- What does it signify, if this child is laughing at you?  
(28 meaning of laughing)
- What do you do when the child is laughing at you? How do you react?  
(29 reaction to laughing)
- Is it necessary to toss the child up and down?  
(30 stimulation)
- What is the importance of bathing the child?  
(31 importance of bathing)
- What is the importance of breastfeeding the child?  
(32 importance of breastfeeding)
- What is the importance of clothing the child?  
(33 importance of dressing)
- How do you carry this child? On your lap, on your back, hand, side carry and why?  
(34 carrying)
- What does your child play with?  
(35 playing)

- Are toys of any importance to the child?  
(36 toys)
- Is it necessary to talk to the child?  
(37 talking)
- Is it necessary to look directly into the child's face and to have eye contact? Why?  
(38 eye-contact)
- How do you know that the child is feeling good?  
(39 feeling good)
- How do you know that the child is feeling bad?  
(40 feeling bad)
- What is dangerous for the child?  
(41 dangers)
- How can you prevent the child from danger?  
(42 prevention)
- If you need any assistance as a mother, where or who do you go to?  
For example financial assistance  
(43 financial assistance)
- When you need moral assistance who do you go to?  
(44 moral assistance)
- In case of sickness, who do you go to?  
(45 sickness assistance)
- In case of marital problems, who do you go to?  
(46 marital assistance)
- When you have problems with your children?  
(47 child assistance)
- What assistance do you get from your husband?  
(48 husband's assistance)

- Have there been any separations between you and this child during the first year?  
(49 separations)
- Can you describe situations when you leave your child behind, for example you go shopping, to the farm or visiting somebody? Can you describe how the child is reacting when you are leaving and how the child is reacting when you return?  
(50 situations)
- When everybody, who lives with you, is present, are there situations when the child wants only to be with you?  
(51 exclusiveness)
- How do you express that special feeling that you have for your child?  
(52 affection)
- Does your child love you?  
(53 child's love)
- What important behaviour must a boy be taught during childhood?  
(54 boys)
- What important behaviours must a girl be taught during childhood?  
(55 girls)
- What values should your children copy? What principles of life should they follow?  
And why?  
(56 values)
- How would you describe a good mother?  
(57 good mother)
- How would you describe a bad mother?  
(58 bad mother)
- How would you describe a good father?  
(59 good father)
- How would you describe a bad father?  
(60 bad father)

- How would you describe a good child?  
(61 good child)
- How would you describe a bad child?  
(62 bad child)

### APPENDIX 3

Exemplary illustration for of developing the coding system for question 52, maternal affection

<b>Maternal answers to the question: ‘How do you express that special feeling that you have for your child?’</b>	<b>Step 1 Information units</b>	<b>Step 2 Derived categories</b>
Because we are always together, it shows that concern that I have for him.	Being together with child	Togetherness
When I see any nice thing for him, I buy it for him.	Buying something nice for child	Presents
I play with her, hold her on my laps and make her to laugh.	Playing with child; Holding child on the lap; Making child laugh	Play activities Body contact Positive emotionality
Because I hold him, I feed him. I bathe him.	Holding child; Feeding child; Bathing child	Body contact Feeding Bathing
When I make her to laugh. At times I just hold her close to me and we play.	Making child laugh; Holding child close; Playing with child	Positive emotionality Body contact Play activities