Infants' Social Experiences in Three African Sociocultural Contexts

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This study introduces a peri-urban context of poverty to the study of child development in Africa in contrast to the more typical assessments in middle-class and rural contexts. Spot observations were used to assess universal caregiving behaviors toward seventy-six 3-month-old infants. Results show that middle-class infants experienced distal parenting behaviors instantiated by mothers, whereas rural children experienced proximal parenting practices in interactions with others. Infants growing up in poverty had mothers and other caretakers involved at mostly low levels. They experienced low levels of body contact, body stimulation, and object stimulation, and high levels of face-to-face positions. The study indicates that caregiving in the context of poverty does not necessarily follow familiar pathways and needs to be contextualized accordingly.

Child development is culturally shaped mainly through daily interactions with caregivers in their immediate environment (Bornstein & Cheah, 2006). Three cultural systems that relate centrally to caregivers are described in the concept of the "developmental niche" (Super & Harkness, 1986): The first system consists of cultural variations in the physical surroundings and social settings of the child's life. The second system refers to culturally regulated customs, routines, and childrearing practices. The third one relates to caretakers' different cultural models, that is, ethnotheories or shared belief and meaning systems. The three systems operate together and caretaking settings, practices, and beliefs are usually closely intertwined and consistent. Jointly they create the "developmental niche" for child development, facilitating the child's adaptation to specific ecocultural contexts.

Caregiving behaviors evolved as responses to childrearing challenges during human phylogeny, thus they are biologically preprogrammed (Bjorklund & Pellegrini, 2000). At the same time, caregiving behaviors are shaped by culture to allow the expression of cultural priorities. Caretakers enact caregiving behaviors differently in various cultural contexts to teach children culturally appropriate skills and competencies, linking child development inextricably to culture (Bornstein, Putnick, Lansford, Deater-Deckard, & Bradley, 2015; LeVine, 1988; Ogbu, 1981). Caregiving is particularly difficult in the contexts of poverty and adversity due to a continuity of

environmental challenges such as inadequate housing or homelessness, crime, and deficient health services (Walker et al., 2011). Caregivers struggling with such conditions experience stress, depression, and anxiety (Newland, Crnic, Cox, & Mills-Koonce, 2013). As a result they may be less sensitive and responsive to their infants' needs, putting their infants at risk for developmental and cognitive deficits (Vernon-Feagans, Garrett-Peters, Willoughby, & Mills-Koonce, 2012). Studies investigating parenting skills in the context of poverty and adversity typically focus on maternal behaviors directed toward the infant such as sensitivity or contingent responsiveness (McFadden & Tamis-Lemonda, 2013). Prevention and intervention programs designed to improve parenting in high-risk contexts often try to enhance these skills in mother–child interactions. However, maternal behaviors such as sensitivity and responsiveness may represent concepts derived from a middle-class European American parenting style (e.g., Carlson & Harwood, 2014) and could lack validity and authenticity for parenting in other cultural contexts. Moreover, it has been shown that other caregivers besides the mothers can provide important experiences for infants (Weisner, 2014) especially in rural traditional societies; yet, they are often not included in this research. To overcome these potential biases, our study examines the caregiving experiences of infants with all possible interaction partners in different sociocultural contexts.

The "component model of parenting" (Keller, 2002) allows for cultural flexibility in universal caregiving behaviors. Alternative caregiving strategies may be realized by placing differential emphasis on separate parenting components. Although multiple strategies are hypothetically possible, observational studies have identified two prototypical styles of parenting in interactions with infants (Keller et al., 2004)—namely distal and proximal parenting. The prototypical parenting styles are associated with different cultural contexts, that is, with different physical and social settings, and with different cultural models, that is, belief and meaning systems.

A distal parenting style emphasizes object stimulation, face-to-face exchanges, and tactile stimulation. This form of parenting has been reported for German, Greek, and Italian mother–infant interactions (Carra, Lavelli, & Keller, 2014; Keller et al., 2009). Object stimulation engages infants in joint attention processes that promote cognitive development (Striano & Reid, 2006). Face-to-face exchanges allow mutual eye contact and sensitize infants' awareness for self-efficacy through visually contingent responses (Kärtner, 2015). Tactile stimulation

such as touching and caressing conveys and elicits positive emotions (Stack & Jean, 2011). A distal parenting style is characteristic for modern, urban European American middle-class families with high levels of formal education and income from salaried employment. Child-care responsibilities lie mainly with mothers, who are the principal and often exclusive caretakers of infants. The prevalent cultural model in contemporary middle-class contexts centers on psychological autonomy. It values individuality and independence, and conceives of the self as unique and separate from others (Keller & Otto, 2009).

A proximal parenting style emphasizes close body contact, body stimulation, and nursing to regulate distress. It has been documented in rural Costa Rican and Cameroonian mother–infant interactions (Keller et al., 2004, 2009). Body contact is a means of protecting infants from exposure to dangers (Bowlby, 1969), providing warmth (MacDonald, 1992), and establishing a sense of togetherness and belonging (Yovsi, 2014). Body stimulation serves to intensify body perception and accelerates motor development (LeVine, 1988). Nursing as a means of regulating negative affect minimizes children's expression of negative emotions from an early age (Yovsi, 2014). An emphasis on these systems has been shown to predominate in traditional rural societies with little or no formal education and a subsistence-based form of living. Multiple caregiving arrangements are frequent, with siblings and other relatives being important caretakers of infants besides the mother. The prevalent cultural model is based on hierarchical relatedness that values harmony and self-restraint, and which defines a person as a communal agent dedicated to the family and social in-group (Keller & Otto, 2009; Rothbaum & Trommsdorff, 2007).

Using natural observation data of universal caregiving behaviors, infants' social experiences have been documented largely in prototypical urban middle-class and poor rural traditional contexts as well as in a few migrant contexts. To the best of our knowledge, however, there are no studies investigating the social experiences of infants growing up in a peri-urban context of poverty and adversity in Africa. We therefore asked: What are the social experiences of 3-month-old African infants growing up in a poor peri-urban context compared to infants growing up in a poor rural or middle-class urban context? We chose to examine 3-month-old infants as they are already beyond the "2-month revolution," which is the transitional time when infants become more alert and show signs of

shared experience and reciprocity with others (e.g., Trevarthen, 1987). Typically developing infants start to show associated behavioral changes as early as 6 weeks of age, that is, responding contingently. By 8 weeks, they reliably display their newly acquired social capacities during interactions (Striano & Reid, 2006), though the preferred interaction modalities (e.g., visual or tactile) seem to vary across cultures (Kärtner, 2015). Taking into consideration that child development may be delayed in the contexts of poverty and adversity (e.g., Knitzer & Perry, 2009), the children in our study were 3–4 weeks beyond this critical age.

The Research Contexts

We focused on three sociocultural contexts in Africa that embody dissimilar constraints and affordances for caregivers and infants. They are as follows.

Middle-class families from Stellenbosch and Somerset West, South Africa were selected as a prototypical urban middle-class sample. Approximately 250,000 people live in the greater area of Stellenbosch and Somerset West. The population consists of 53% White, 35% mixed race, and 12% Black people. Employment levels in the Stellenbosch and Somerset West population are high (90%), and wine tourism constitutes an important source of income. South Africa's racially segregated past has left the country with high levels of inequality and White South Africans show substantially higher income and higher educational attainment than Black and mixed race South Africans (Louw, Van der Berg, & Yu, 2006). However, South Africa is now fostering a growing middle class. Educated, affluent Black and mixed race households are emerging as part of this new middle class (Seekings, 2008). South African middle-class families usually own their homes, rely on private medical care, and live as nuclear families comprising father, mother, and children (Chadwick & Foster, 2013). During the last month of pregnancy and for 3 months after birth, working mothers in South Africa are entitled to maternity leave. It is also fairly common for middle-class families to employ nannies to assist with child care. Most South African middle-class mothers give birth in private hospitals, and infant mortality rates in urban middle-class settings are low (Bachmann, London, & Barron, 1996).

Infants from Nso families in Cameroon were chosen as a prototypical rural traditional subsistence-based sample. With 250,000 inhabitants, the Nso are the largest chiefdom in the Bamenda Grassfields known today as the North West Region of Cameroon (Goheen, 1992). The traditional language of the Nso is Lamnso, but most Nso also speak pidgin English as they were formerly colonized by the United Kingdom (Trudell, 2006). The Nso society has a strict hierarchy with the so-called Fon being their traditional king. Most Nso are subsistence farmers who grow maize, potatoes, beans, and vegetables; the farm work is done cooperatively among family members. The Nso are organized patrilineally and patrilocally, and women move in with their husband's family when marrying. The Nso typically live as extended families of six to eight persons on average, made up of paternal grandparents, parents, and children (Yovsi, 2014). Families live in houses built of mud bricks with corrugated iron roofs. The houses are typically arranged in compounds, that is, neighboring houses connected by big open yards where the daily activities take place. Running water and access to electricity is still rare in the rural Nso area. Children are considered to belong to the husband's family and are expected to help on the farm, do household chores, and take care of younger siblings (Mbaku, 2005). Child care is a shared communal responsibility, and multiple caretaking arrangements are common (Yovsi, 2014). Nso parents attach spiritual, social, and economic dimensions to children. Pregnancy is regarded as a divine gift that requires expecting couples to adhere to certain taboos (Nsamenang, 1992). Mothers typically work on the fields up till giving birth but do not return to work on the farm until the baby is about 3 months of age, when they can leave the child with sibling caretakers for longer periods of time (Keller et al., 2005). Many women give birth with the help of traditional birth attendants, but modern health care practices are becoming more frequent as well. Although there are no data available for the Nso in particular, the general infant mortality rates in Cameroon are relatively high with 59 deaths per 1,000 live births (The World Fact Book, 2013).

The township of Khayelitsha, South Africa was chosen to represent a peri-urban context, that is, a rural–urban transition zone, with high levels of poverty and adversity (see also Cooper et al., 2009; Tomlinson, Cooper, & Murray, 2005), as well as providing a potentially different cultural model of caregiving. According to recent estimates, more than one million people live in the township of Khayelitsha (Brunn & Wilson, 2013), which is a densely populated area on the outskirts of Cape Town. The dominant population is Black African (99.5%), and isiXhosa is the first language. Khayelitsha is characterized by high levels of poverty and

violence, insufficient infrastructure (Tomlinson et al., 2005), and high rates of HIV infection (MacGregor, 2009). Approximately 50% of the Khayelitsha population is unemployed and those who are employed earn about Rand 1,600 (US$ 140) per month (The City of Cape Town, 2012). The majority of the population lives in crowded, temporary, informal shacks, often without electricity and poor access to sanitation (The City of Cape Town, 2012). Due to limited work opportunities, many families are divided between several locations. A significant proportion of Khayelitsha residents have migrated from the Eastern Cape. Their parental and ancestral roots may still be in the Eastern Cape, with many grandparents and other extended family members remaining in the rural areas. The dispersion of family members led to an expansion of choice and agency for township inhabitants and kinship in the township appears much less binding than in the past. Historically the Xhosa people from the Eastern Cape were organized in patrilineal and patriarchal structures. However, the townships today show rising numbers of single mothers as household heads, struggling with poor financial circumstances but compelled to support large numbers of children on their own (Posel & Devey, 2006). Because work often means commuting long distances, leaving early in the morning, and coming back late at night, children may maintain the household in the absence of adults (Bozalek, 1999). Household structures in South African townships have been described as unstable, fluid, and porous (Seekings, 2008; Spiegel, Watson, & Wilkinson, 1996). People are often members of several households, sleeping and eating at changing places. Social networks are short lived and change rapidly. These settings create fragile domestic worlds for children, who often lodge with a variety of relatives, neighbors, and friends, moving between both places and caregivers (Ross, 2009). The economic and social pressures in Khayelitsha seem to limit both the material and emotional resources available to child care (Bray & Brandt, 2007). Moreover, if and when kin are available to help with child care, responsibility to kin is often viewed as conditional, and no longer as unconditional (Seekings, 2008). Most pregnant women are tested for HIV at antenatal clinics and give birth in hospitals (Médecins Sans Frontières, 2011). Due to economic forces, mothers who are employed usually resume work soon after giving birth, leaving their children with other caretakers; crèches are rarely used as day care places for infants. Following the introduction of a mother to child HIV transmission prevention program by the government in 1999, infant mortality has decreased from 42 deaths per 1,000 live births in 2003 to 35 deaths per 1,000 live births in 2009 (Médecins Sans Frontières, 2011).

In view of the distinctly different contextual portraits of our study groups, we hypothesized that infants in the three study groups would have different socioemotional experiences. We examined specifically two aspects of caregiving in children's microenvironment: the presence of infants' interaction partners and their caregiving practices in everyday interactions with infants.

We assumed that in the middle-class context of Stellenbosch and Somerset West, mothers would be in most instances the sole interaction partners of the infants. We expected infants from Stellenbosch and Somerset West to experience a distal parenting style characterized by object stimulation, face-to-face exchanges, and tactile stimulation.

Based on the earlier work by Keller et al. (2005), we assumed that in the rural Cameroonian Nso context, people other than the mother might play an important role as social interaction partners. We expected rural Nso infants to experience a proximal parenting style consisting of body contact, motor stimulation, and nursing as a means of distress regulation.

In the Khayelitsha peri-urban context of poverty and social adversity, we expected infants to spend the least amount of time with social interaction partners, mothers, and others, and to be alone most often when compared to infants from the two prototypical contexts. Furthermore, we assumed that economic and social pressures in Khayelitsha might reduce caregivers' engagement and result in low levels of both proximal and distal parenting behaviors.

Method

Participants

The total sample of this study comprised 76 mothers and their 10- to 12-week-old infants from three different African communities: 25 from the middle-class cities of Stellenbosch and Somerset West, South Africa; 29 from the township of Khayelitsha, South Africa; and 22 from a rural Nso region, Cameroon. Data were collected between 2011 and 2012 (the South African middle-class and poverty samples) and 2000 and 2002 (the rural Cameroonian Nso sample; published by Keller et al., 2005, reanalyzed in the present study). Local research assistants recruited participants via health centers and breastfeeding clinics using a snowball sampling technique combined with referrals from

health care professionals and participants. Mothers, and in Cameroon also the lineage heads, were informed about the goal of the study and asked for their consent. In the following, we abbreviate the names of the cultural groups and refer to them as Stellenbosch, Khayelitsha, and Nso.

Procedure

Children's socioemotional experiences were assessed using spot observations. Spot observations are an unobtrusive observation technique designed by anthropologists to gather systematic data on children's everyday activities and social partners (Munroe & Munroe, 1994). Our research entailed observing infants and their caretakers in their natural environment over a 1-week period at different times of the day and on different days of the week. Thereby we ensured that differences in the activities reflected differences between the cultural contexts and not merely random fluctuations due to the variability in people's activities. The spot observations were all conducted when the infants were between 10 and 12 weeks old.

In Stellenbosch and Khayelitsha, the researchers conducted 20 home visits, where they video-recorded infants and their interaction partners for 15 min during each visit, resulting in a total of 5 hr of observation time. In the Nso context, we used a paper and pencil approach, with a research assistant visiting families 20 times for 15 min during each visit and coding the spot observations.

The 15 min of observation used for coding were split into 30 single assessments: Each consisted of 10 s of observation time followed by a recording time of 20 s. During the 10 s of observation time, the coders closely observed the infant, the presence of caretakers, and the behaviors of caretaker(s), "live" in the case of the Nso sample or using the recorded videos in the South African samples. During the subsequent 20 s of recording time, the coder noted the observations on an observation sheet. The 30 single assessments totaled 5 min of actual observation time for each observation unit, and 20 observation units provided 600 single observations and 100 min of actual observation time per infant.

Coding

We coded the presence of caretakers and their caregiving behaviors concurrently with the infant's state in order to assess infants' social experiences in the three cultural contexts. We were interested in the distribution of universal caregiving behaviors across different infant states and different interaction partners. In each category, any code was applied only when the corresponding infant state, person's presence, or caregiving behavior lasted for more than 5 s during a 10-s interval to ensure that the predominant state, interaction partners or behaviors were captured. Otherwise, no code was given. In the rare case that an infant switched during a 10-s interval from crying to neutral to smiling for about equal amounts of time, the interval was not coded at all because it could not be linked to one specific infant state. States, person's presence, and behaviors could occur intermittently (e.g., pausing during object stimulation). The codes are shown in Table 1.

Interrater Agreement

The codings of spot observations were taught with the help of videotapes from Cameroonian Nso and German middle-class mothers' daily routines. These videotapes had been recorded during home visits for other studies (Keller et al., 2004), capturing daily interactions of mothers and their 3-month-old infants at different day times. The length of the videotapes ranged from 10 to 20 min. Coders were considered reliable when they reached kappa values above .70 for all coding categories at the assessment of eight videotapes, four from the Cameroonian Nso sample and four from the German middle-class sample. The person who had conducted spot observations in the rural Nso context in 2000–2002 trained the South African coders in 2011.

Data Analysis

Occurrences of each of the six parenting behaviors were aggregated separately for infant states and persons present. Subsequently, we computed the percentages of observation time for different infant states and for persons present.

As a first step, we computed two multivariate analyses of variance (MANOVAs): one MANOVA with culture (Stellenbosch, Khayelitsha, Nso) as between-subjects factor and infant states as dependent variable using the percentage of observation time when infants were awake, sleeping, or crying; and a second MANOVA with culture as between-subject factor and persons present as dependent variable, using the percentage of observation time infants spent with mothers, others, both, and alone.

As a second step, we analyzed the distribution of caregiving behaviors across different cultural groups and persons. Caregiving behaviors are often responses to a specific infant state and can carry

Table 1
Codes

Category	Code	Definition
Infant states	Sleep	The infant is sleeping or is about to fall asleep. Signs for falling asleep are yawning, closed/closing eyes, and relaxed muscle tone
	Awake	Signs of sleep and sleepiness are absent and the infant is not fussy or crying
	Cry	The infant is awake and cries or manifests signs of being upset by moaning, whining, or whimpering
Persons present	Mother	The child's mother is within reach of the baby
	Other(s)	Other persons than the mother are within reach of the baby
Parenting behaviors	Body contact	The baby is either carried or held on a person's arms, hip, or back, or the baby is held on the person's lap or legs, includes also lying close to each other
	Motor stimulation	Motor and/or vestibular stimulation. The infant is rocked with the whole body or upper trunk, with or without having body contact (e.g., lying in a cradle)
	Tactile stimulation	The person caresses the infant with her or his own face or parts of the face (e.g., mouth, nose) without moving the infant's body
	Object stimulation	The person introduces an object or toy and directs the infant's attention to the object
	Face to face	Infant and person have a bodily position to each other that allows them to look into each others' faces; eye-contact can, but need not occur
	Nursing	The person nurses the infant

different meanings depending on the infants' states (Lewis, 1971). Accordingly, the caregiving behaviors were calculated as state-related behaviors across persons (mothers, others), that is, the score of each caregiving category reflected the percentage of this behavior during one of the three infant states. Due to the fact that no parenting behaviors occurred when there was no one present, this condition was not considered in the analysis. In addition, the Nso data did not allow us to determine who showed caregiving behaviors when both, mother and others, were within reach of the infant simultaneously; therefore, this condition, which constituted < 10% of the total observation time in all groups (cf. Table 3), was excluded from the analysis, too.

We computed for awake and crying infant states separately a repeated measures MANOVA of Culture (Stellenbosch, Khayelitsha, rural Nso) × Persons Present (*mother* and *others* being the repeated measures) for six caregiving behaviors as dependent variables: *face-to-face position*, *object stimulation*, and *tactile stimulation* as indicators of a distal parenting style; *body contact*, *motor stimulation*, and *nursing* as indicators of a proximal parenting style. For sleeping infants, we excluded face-to-face position and object stimulation from the analysis due to the fact that sleeping infants will not be aware if caregivers establish face-to-face positions or engage in object stimulation but can experience tactile stimulation, body contact, motor stimulation, and nursing as bodily perceptions. Accordingly, we computed for sleeping infants a repeated measures MANOVA of Culture

(Stellenbosch, Khayelitsha, rural Nso) × Persons Present (mother, others) for four caregiving behaviors as dependent variables: tactile stimulation, body contact, motor stimulation, and nursing.

We did not control for age or formal education, because we regard these variables as essential components characterizing the different sociocultural contexts. In case of significant interaction effects, Scheffé post hoc tests were calculated to determine the cell mean differences between the three cultural groups at both levels of the factor persons present (mother, others).

Results

Sample

There were no differences across the three cultural groups regarding gender distribution and birth rank of children. However, mothers showed the expected cultural differences in terms of age, formal education, marital status, family size, and income (see Table 2): Stellenbosch mothers were older than Nso mothers and received more years of formal education compared to Nso and Khayelitsha mothers. Mothers from Khayelitsha had more years of formal education than the Nso mothers. Moreover, more Stellenbosch and Nso mothers were in a marriage relationship compared to Khayelitsha mothers (Fisher's exact test, $p < .001$ and $< .01$, respectively). In terms of number of household members, the Nso households represented the largest households with

Table 2
Sociodemographic Data

N	Stellenbosch, South Africa 25	Khayelitsha, South Africa 29	Rural Nso, Cameroon 22	χ^2	p
Gender of infants (% of females)	56	48.3	59.1	0.652	.722
Birth rank of infants (% of firstborn)	56	41.4	36.4	2.039	.361
Mothers marital status (% of married)	92	27.5	72.7	25.15***	.000
	M (SD)	M (SD)	M (SD)	F statistics df = 2, 73[a]	
Maternal age	31.60 (4.52)	27.79 (6.14)	25.54 (6.80)	6.45 (S > N)*	
Maternal years of formal education	14.94 (1.30)	9.27 (3.50)	7.40 (1.25)	64.93 (S > K > N)***	
Number of household members	3.76 (0.77)	5.86 (2.03)	7.40 (2.50)	22.15 (S < K < N)***	

Note. Cross-tables and one-way (cultural group) ANOVAs. [a]Significant pairwise comparisons are in parentheses. S = Stellenbosch; K = Khayelitsha; N = rural Nso.
*p < .05. ***p < .001.

7.40 persons, the township of Khayelitsha had the second biggest households with 5.86 persons per household, and Stellenbosch families lived as nuclear families with only 3.76 persons per household. Three Stellenbosch mothers reported having nannies helping with child care. All the Stellenbosch mothers reported a regular income, compared to only half the Khayelitsha mothers. The Nso mothers lived off subsistence farming.

Infants' States and Caregivers' Presence

The first step of the analysis showed no difference in the distribution of infant states between the three groups but revealed a main effect of culture for persons present, $F(6, 144) = 8.26$, $p < .001$, $\eta_p^2 = .26$ (see Table 3). During our observations mothers were more frequently present in the Stellenbosch sample when compared to the Khayelitsha and the Nso samples, whereas others were more often the caretakers often in the rural Nso sample than in Khayelitsha and Stellenbosch. Infants from Stellenbosch and Khayelitsha were more often alone than rural Nso infants. There was no difference among the three groups of infants in terms of the time they spent in the presence of both mothers and others.

Table 3
Differences Between the Cultural Groups With Respect to Infant States and People Present

	Cultural community			
	Stellenbosch, South Africa (N = 25) M (SD)	Khayelitsha, South Africa (N = 29) M (SD)	Rural Nso, Cameroon (N = 22) M (SD)	F statistics Cultural group df = 2, 73[a]
Infants' state				
Awake	64.06 (13.94)	59.00 (11.36)	64.89 (9.16)	1.88
Sleep	29.42 (13.34)	33.87 (11.23)	29.16 (11.25)	1.30
Cry	6.54 (2.87)	7.19 (3.99)	5.96 (3.27)	0.80
Persons present				
Mother	63.63 (16.85)	49.18 (15.37)	51.78 (12.49)	6.69 (S > K, N)**
Other(s)	13.40 (14.40)	21.56 (15.36)	33.23 (14.30)	11.90 (S, K < N)***
Mother and other(s)	8.38 (10.55)	9.36 (7.30)	7.96 (5.88)	0.20
No one	14.26 (22.37)	18.87 (20.97)	5.04 (10.43)	7.80 (S, K > N)**

Note. Mean percentages of observed time intervals and standard deviations together with summary statistics for one-way (cultural group) ANOVAs. [a]Significant pairwise comparisons are in parentheses. S = Stellenbosch; K = Khayelitsha; N = rural Nso.
**p < .01. ***p < .001.

Caregiving Behaviors During Different Infant States

The results for the second analysis are reported separately for each of the infant states. The mean percentage of time invested in different caregiving behaviors across the three cultural communities and persons present is shown in Tables 4–6 separately for the three infant states, along with the results for the subsequent univariate analyses.

For awake infants, the repeated measures MANOVA yielded a significant main effect for culture, $F(12, 138) = 9.76$, $p < .001$, $\eta_p^2 = .46$, persons present, $F(6, 68) = 36.18$, $p < .001$, $\eta_p^2 = .76$, as well as a significant Culture × Persons Present interaction, $F(12, 138) = 5.98$, $p < .001$, $\eta_p^2 = .34$.

Subsequent univariate analyses (see Table 4) revealed Culture × Persons Present interaction effects for body contact, object stimulation, face-to-face positions, and tactile stimulation. Scheffé tests showed that Nso infants were in body contact with others significantly more often than Stellenbosch ($p < .001$) and Khayelitsha ($p < .001$) infants. The three groups of infants had body contact with their mothers to a comparable degree. Stellenbosch mothers used objects in the interactions more frequently than Khayelitsha mothers ($p < .05$) and Nso mothers ($p < .05$). There was no difference in the engagement of others in object stimulation. Infants experienced face-to-face positions with their mothers more often in Stellenbosch and Khayelitsha than in the Nso context ($p < .05$). Khayelitsha infants also had face-to-face positions with others more often than Nso infants ($p < .05$), whereas Stellenbosch infants did not differ in the amount of face-to-face contact they had with others when compared to the Khayelitsha and Nso infants. Finally, Stellenbosch mothers used tactile stimulation more frequently than rural Nso mothers ($p < .05$); however, in the Nso context, other persons used tactile stimulation more frequently than in the Stellenbosch context ($p < .05$). Khayelitsha infants were no different from the Nso or Stellenbosch infants in terms of tactile stimulation.

For crying infants, the repeated measures MANOVA yielded a significant main effect for culture, $F(12, 138) = 9.21$, $p < .001$, $\eta_p^2 = .45$, persons present, $F(6, 68) = 11.85$, $p < .001$, $\eta_p^2 = .51$, as well as a significant Culture × Persons Present interaction, $F(12, 138) = 3.05$, $p < .01$, $\eta_p^2 = .21$.

Subsequent analyses (see Table 5) revealed a main effect for motor stimulation. Crying Nso infants experienced significantly more motor stimulation than Khayelitsha infants. Moreover, we found Culture × Persons Present interactions for

Table 4

Time Invested in Different Caregiving Behaviors Across Different Cultural Communities and Different Caregivers When Infants Are Awake

| | Cultural community | | | | | | F statistics | | |
| | Stellenbosch, South Africa (N = 25) | | Khayelitsha, South Africa (N = 29) | | Rural Nso, Cameroon (N = 22) | | Cultural group[a] df = 2, 73 | Caregivers df = 1, 73 | Cultural Group × Caregivers df = 2, 73 |
Persons present	Mother M (SD)	Other(s) M (SD)	Mother M (SD)	Other(s) M (SD)	Mother M (SD)	Other(s) M (SD)			
Caregiving behaviors									
Face to face	44.34 (20.97)	4.06 (7.79)	32.82 (20.44)	6.35 (10.12)	0.69 (1.12)	0.48 (0.75)	42.49 (S, K > N)***	96.40***	24.81***
Object stimulation	5.72 (6.21)	0.17 (0.34)	2.12 (2.77)	0.89 (2.56)	0.52 (0.97)	0.57 (1.09)	8.61 (S > K, N)***	16.54***	15.96***
Tactile stimulation	3.69 (2.57)	0.17 (0.34)	2.12 (2.77)	0.34 (0.48)	1.49 (1.46)	0.54 (0.67)	3.53 (S > N)*	56.64***	7.19**
Body contact	53.79 (16.68)	5.94 (10.99)	47.01 (18.89)	10.48 (14.04)	53.10 (14.98)	32.74 (15.28)	19.45 (S, K < N)***	140.75***	6.83**
Motor stimulation	7.97 (6.66)	2.03 (4.84)	5.90 (5.13)	0.94 (1.67)	5.44 (3.94)	3.00 (4.00)		27.83***	
Nursing	15.36 (8.86)	0.33 (1.19)	12.66 (8.61)	0.66 (2.05)	10.29 (10.30)	0.16 (0.60)		132.76***	

Note. Mean percentages of time intervals, standard deviations, and summary of statistics. Two-way (Cultural Group × Caregiver) ANOVAs. [a]Significant pairwise comparisons are in parentheses. S = Stellenbosch; K = Khayelitsha; N = rural Nso. *p < .05. **p < .01. ***p < .001.

Table 5
Time Invested in Different Caregiving Behaviors Across Different Cultural Communities and Different Caregivers When Infants Cry

| Persons present | Stellenbosch, South Africa (N = 25) | | Khayelitsha, South Africa (N = 29) | | Rural Nso, Cameroon (N = 22) | | F statistics | | |
	Mother M (SD)	Other(s) M (SD)	Mother M (SD)	Other(s) M (SD)	Mother M (SD)	Other(s) M (SD)	Cultural group[a] df = 2, 73	Caregivers df = 1, 73	Cultural Group × Caregivers df = 2, 73
Caregiving behaviors									
Face to face	38.69 (24.62)	8.10 (15.51)	33.93 (21.58)	7.22 (10.89)	0.20 (0.65)	0.29 (0.76)	35.48 (S, K > N)***	46.45***	11.05***
Object stimulation	0.84 (2.03)	0.00 (0.00)	1.74 (4.47)	1.37 (4.64)	0.10 (0.48)	0.64 (2.57)			
Tactile stimulation	3.79 (6.37)	0.25 (0.90)	2.00 (3.13)	0.16 (0.67)	0.80 (1.76)	1.43 (3.71)		8.43**	4.58*
Body contact	54.57 (27.57)	8.45 (15.97)	37.56 (18.75)	11.22 (16.49)	39.46 (21.19)	45.05 (19.77)	16.76 (S, K < N)***	32.34***	13.72***
Motor stimulation	13.02 (13.47)	3.65 (7.68)	8.58 (8.67)	2.95 (6.92)	12.57 (12.38)	12.03 (15.38)	5.65 (K < N)**	6.99**	
Nursing	5.37 (7.85)	0.37 (1.34)	7.42 (8.75)	1.01 (3.09)	7.81 (11.81)	0.19 (0.63)		33.37***	

Note. Mean percentages of time intervals, standard deviations, and summary of statistics. Two-way (Cultural Group × Caregiver) ANOVAs. [a]Significant pairwise comparisons are in parentheses. S = Stellenbosch; K = Khayelitsha; N = rural Nso.
*p < .05. **p < .01. ***p < .001.

body contact, face-to-face positions, and tactile stimulation. Scheffé tests showed that crying Stellenbosch infants experienced body contact with their mothers more often than Khayelitsha infants (p < .05). Crying Nso infants had body contact with other people more often than did Stellenbosch (p < .001) and Khayelitsha infants (p < .001). Face-to-face positions were significantly more frequent in Stellenbosch and Khayelitsha for both mothers and others when compared to mothers in the rural Nso context (p < .05). Stellenbosch mothers used tactile stimulation more frequently than Cameroonian mothers (p < .05), whereas Khayelitsha mothers showed intermediate levels of caressing in response to crying. In the Nso context, other persons used tactile stimulation more frequently in response to crying than in Stellenbosch or Khayelitsha (p < .05).

For sleeping infants, the repeated measures MANOVA yielded a significant main effect for culture, $F(12, 138) = 5.92$, p < .001, $\eta_p^2 = .25$, persons present, $F(6, 68) = 8.55$, p < .001, $\eta_p^2 = .32$, but no Culture × Persons Present interaction. Subsequent univariate analyses (see Table 6) showed main effects of culture for body contact and nursing. Sleeping Nso infants more often had body contact with their caretakers and were nursed more often than Stellenbosch and Khayelitsha infants. The main effects of persons' present showed that mothers invested more time in these behaviors than others.

Discussion

Cultural contexts and their structural conditions inform settings and practices of child care, thereby influencing children's early socioemotional experiences (LeVine, 1990; Super & Harkness, 1986; Whiting & Whiting, 1975). Our study shows that 3-month-old infants growing up in the peri-urban township of Khayelitsha may have different socioemotional experiences compared to infants growing up in the prototypical middle-class and rural subsistence contexts.

Caregiver Involvement

Across all three groups, mothers were most frequently the infants' interaction partners, with a presence of at least 50% of the observation time. The primacy of mothers as caretakers for young infants has been widely acknowledged, also cross-culturally (Bornstein & Cheah, 2006).

Table 6
Time Invested in Different Caregiving Behaviors Across Different Cultural Communities and Different Caregivers When Infants Sleep

	Cultural community						F statistics		
	Stellenbosch, South Africa (N = 25)		Khayelitsha, South Africa (N = 29)		Rural Nso, Cameroon (N = 22)				
Persons present	Mother M (SD)	Other(s) M (SD)	Mother M (SD)	Other(s) M (SD)	Mother M (SD)	Other(s) M (SD)	Cultural group[a] df = 2, 73	Caregivers df = 1, 73	Cultural Group × Caregivers df = 2, 73
Caregiving behaviors									
Tactile stimulation	0.37 (0.84)	0.03 (0.01)	0.05 (0.26)	0.04 (0.15)	0.09 (0.20)	0.02 (0.07)		4.93*	
Body contact	18.59 (25.67)	1.81 (5.64)	11.45 (14.66)	3.89 (11.02)	36.04 (18.99)	15.52 (16.90)	19.13 (S, K < N)***	27.65***	
Motor stimulation	2.80 (6.11)	1.09 (2.93)	0.84 (1.62)	0.12 (0.46)	2.77 (4.64)	0.35 (0.73)		8.10**	
Nursing	0.03 (0.17)	0.00 (0.00)	0.91 (2.55)	0.02 (0.09)	3.52 (7.64)	0.03 (0.16)	4.02 (S, K < N)*	8.37**	

Note. Mean percentages of time intervals, standard deviations, and summary of statistics. Two-way (Cultural Group × Caregiver) ANOVAs. [a]Significant pairwise comparisons are in parentheses. S = Stellenbosch; K = Khayelitsha; N = rural Nso.
*p < .05. **p < .01. ***p < .001.

However, mothers' involvement was significantly higher in the Stellenbosch group than in the Nso and Khayelitsha groups. In European American middle-class contexts with nuclear family settings, mothers are usually the main caretakers of young infants (Weisner & Duncan, 2013) and the social settings are adapted accordingly, for instance, mothers are granted extensive maternity leave. The Stellenbosch group reflects the typical middle-class caregiving setting—Stellenbosch mothers were either on maternity leave or stay-at-home mothers and, as such, constantly available to take care of their infants.

Although the involvement of others as caretakers never exceeded maternal involvement, others acted as caretakers more often in the Nso sample than in Khayelitsha and Stellenbosch. In African rural societies with extended family settings and a high workload of mothers, multiple caregiving arrangements are common (e.g., LeVine, 1988; Weisner, 2014). The Nso group was characterized by the social settings that favor multiple caregiving arrangements.

In Khayelitsha, mothers; involvement was not as frequent as in the neighboring context of Stellenbosch and multiple caregiving experiences were less frequent than in the Nso context. It is plausible that the adverse structural conditions affect the caregiving settings in Khayelitsha. The dispersion of family members leaves many mothers without a husband/partner and economic pressures may keep them from attending to their infants' needs (Bray & Brandt, 2007). Social networks of relatives are not easily available and children are often left with non-kin, who may be less likely to invest in parenting than their biological counterparts (e.g., Park, Schaller, & Van Vugt, 2008). Interestingly, the involvement of mothers and others in caregiving in Khayelitsha was never lower than in the prototypical samples: Khayelitsha mothers spent as much time with their infants as Nso mothers, and others were present to a similar degree as in Stellenbosch.

The amount of time infants spent alone differed across the cultural groups: Nso infants were least often on their own. Cosleeping arrangements during the night and back carrying during the day are the norm in many African rural societies (LeVine, 1988; Nsamenang, 1992; Yovsi, 2014) and could, in addition to the multiple caretaking setting, explain the marginal amount of time Nso infants were left alone. Although cosleeping arrangements are also frequent in Khayelitsha (Tomlinson et al., 2005), Khayelitsha infants spent almost 20% of the observed time on their own, which is considerably

more time than Nso infants but comparable to the time Stellenbosch infants spent alone. In many middle-class contexts, babies sleep in a separate room and spend time on their own during the day, for example, in a playpen (Keller & Otto, 2009; Super & Harkness, 2013). Although these settings may account for the considerable amount of time Stellenbosch infants were being on their own, the Khayelithsa settings are different. Thus, it is likely that the adverse structural conditions that lower the presence of both mothers and others also increase the time infants spent alone.

Caregiving Behaviors

Stellenbosch infants experienced distal caregiving behaviors, mostly instantiated by their mothers. The prevalence of a distal parenting style has been reported for similar middle-class groups (e.g., Carra et al., 2014; Keller et al., 2005, 2009). By placing emphasis on the face-to-face system, object play, and tactile stimulation, Stellenbosch mothers may support the development of early agency and cognitive abilities in their infants.

In the Nso context, our results highlight the differential role of caretakers. Mothers were involved in proximal caregiving to a comparable degree in all three samples, but others were found to emphasize proximal caregiving elements in the Nso context. Thereby they may foster a sense of belonging and accelerate motor development in Nso infants (Keller et al., 2009; Yovsi, 2014). Although the role others play as caretakers may not have fully emerged yet, we assume it may become more pronounced later, especially once mothers give birth again (Hrdy, 2005).

With the exception of face-to-face contact, Khayelitsha infants experienced only low levels of both proximal and distal caregiving behaviors. Contrary to our assumptions, the caregiving behaviors observed in Khayelitsha were not less frequent than in the other groups. Khayelitsha infants experienced less body contact than Nso infants, but it was only when crying that they had even less body contact with their mothers than Stellenbosch infants. Object stimulation was as rare in Khayelitsha as in the Nso context, and Khayelitsha infants experienced low levels of tactile stimulation.

The only system emphasized in Khayelitsha was the face-to-face system. In Western middle-class contexts, the focus on face-to-face positions is often combined with exclusive attention toward the infant and the use of language (Keller & Otto, 2009). An elaborate, dialogical, and child-centered communication style characterizes Western middle-class, face-to-face interactions and seems to foster the development of verbal skills and agency in children (Demuth, Keller, & Yovsi, 2012). Based on our observations, it is unclear whether and how Khayelitsha caretakers implement language in face-to-face interactions and future research is needed to gain a better understanding of the meaning of these interactions in the context of Khayelitsha.

Prototypical Models of Child Care

Prototypical contexts are rather stable and the associated caregiving systems are seen as part of caregivers' long-term developmental strategies. Accordingly, the cultural models of prototypical contexts are mostly consistent with the caregiving settings and practices, ensuring that caregiving fits to the overall ecocultural conditions. In case of broader structural alterations, such as socioeconomic changes, the childcare systems seem to be adjusted accordingly to reestablish coherence between the caregiving systems and the broader ecocultural context (Super & Harkness, 1986).

In contemporary middle-class contexts, the marked presence of mothers is in line with the cultural emphasis placed on the mother–child relationship (Keller & Otto, 2009; LeVine, 2014). It is based on the middle-class ideology of a child-centered "mominess," following attachment theory's principle that a secure attachment relationship with one primary caregiver, mostly the mother, is fundamental for the healthy development of children (Bowlby, 1969). Caregivers' ethnotheories value autonomous, outspoken, and self-reliant children (e.g., Kärtner et al., 2007; Rothbaum & Trommsdorff, 2007); these are competencies that are also supported by a distal parenting style. Thus, prototypical middle-class caregiving seems to be consistent in its focus on psychological autonomy and independence.

The multiple caregiving arrangements in many African rural contexts are consistent with the widespread cultural belief that "it takes a village to raise a child." Multiple caretaking seems to foster the establishment of attachment toward other interaction partners, not the biological parents only (Gottlieb, 2004; Otto, 2014; Weisner, 2014). Caregivers' ethnotheories emphasize values such as sharing with others, maintaining social harmony, and obedience (e.g., Kärtner et al., 2007; Nsamenang, 1992). Similar competencies, for example, a feeling of belonging, are promoted by a proximal parenting style. Hence, childrearing in rural African contexts

seems to be consistent in its focus on hierarchical relatedness.

Our data show that the caregiving settings and practices in the Stellenbosch group and the Nso group are comparable to the settings and practices in corresponding prototypical study groups. Thus, it is plausible to assume that Stellenbosch and Nso caregivers follow corresponding cultural models of caregiving, favoring psychological autonomy and hierarchical relatedness as developmental organizers, respectively.

High-Risk Models of Child Care

In high-risk contexts, no overall model of child development has been suggested to date. The settings and practices observed in Khayelitsha are unlike the settings and practices reported in prototypical contexts. Moreover, they do not correspond to parenting styles reported for migrants in low-risk samples. The cultural model of migrant families has been termed autonomous-related (Kagitcibasi, 1996) to highlight the emphasis that is placed on both autonomy and on interrelatedness (Kagitcibasi, 2005, pp. 412–413). Migrants from rural areas have been shown to add distal elements to their proximal caretaking ideas and practices, thereby scoring high on both dimensions (Carra et al., 2014; Kagitcibasi, 2005). Keller et al. (2009) demonstrated that families with an autonomous-related cultural model occupied a middle position concerning their parenting style, with intermediate levels of distal and proximal parenting that ranged between the levels reported for Western urban middle-class families and rural non-Western samples. In comparison, our spot observations show that Khayelitsha infants experienced minimum levels of distal and proximal caretaking. This form of caretaking has not been reported in the literature so far and may represent a model of caretaking that is not captured by the prototypical dichotomous classification of child-care models.

Research indicates that poverty and adversity may reduce caregivers' availability and result in a shift toward prioritizing basic needs. Studies carried out in different high-risk contexts, such as war zones or slums, have shown how contextual constraints can limit caregivers' emotional attachment and their investment in children (e.g., Mann, 2002; Masten & Narayan, 2012; Scheper-Hughes, 1985). It has been suggested that caregiving in high-risk contexts may be mainly geared toward the most basic goal of infant survival (LeVine, 1988). The overall minimal caretaking style observed in Khayelitsha may be in line with such elementary values: Basic needs can be met by few caregivers with little caregiving investment. In this case, the underlying cultural model could be a survivorship model of child care.

Our study cannot answer the question of whether the minimal caretaking style in Khayelitsha is the result of adverse structural factors, part of an overarching cultural model of caregiving, or the result of a more complex interaction between structural and cultural factors. The combination of low caregiver involvement with low levels of almost all caregiving behaviors is potentially problematic for child development. At the same time, we regard a minimal caregiving style as an adaptation, that is, an adjustment, to a context with particularly severe constraints. This form of caretaking may be the "best possible" in a high-risk context. We believe that caregiving is optimal in a given context if the settings and practices are coherent with underlying cultural beliefs (see also Harkness & Super, 1996). We do not know if this is the case in Khayelitsha because we do not have data on mothers' and other caregivers' ethnotheories. There is evidence that parenting in the contexts of chronic stress and trauma can interfere profoundly with long-term developmental strategies (Newland et al., 2013). Thus, it may well be that the unstable and unpredictable high-risk context of Khayelitsha renders it impossible for caretakers to form coherent caregiving systems instead leading to arbitrary settings, beliefs, and practices. In this case, it may no longer be useful to talk about an adaptive ecocultural model of caretaking. Interestingly, it has been suggested that globalization and the accompanying rapid changes may also create cultural contexts with heterogeneous or even contradictory caregiving elements (Kärtner, 2015). Future research is needed to tease out the structural and cultural components of caregiving in high-risk contexts. For example, intragroup comparisons of settings, practices, and ethnotheories with Xhosa caregivers from different social classes would allow for examining cultural factors against different structural constraints.

Contextualizing Development

Infants growing up in different ecocultural contexts experience different caregiving. Since Bowlby's (1969) seminal work on early attachment, the importance of early social experiences for later child development is no longer questioned and the developmental consequences of early parenting practices

have been widely documented, for example, in relation to children's development of attachment security (Belsky & Fearon, 2008). In stable low-risk contexts, the settings, practices, and beliefs of caretakers are usually congruent and geared toward optimal development in the respective context. Literature focusing on prototypical contexts provides evidence for different developmental pathways during infants' 1st year of life: In Western middle-class contexts, children develop attachment relationships with few significant others based on their experience of psychological security. Caregivers' sensitive responsiveness and autonomy support are regarded as key ingredients for optimal development, that is, attachment security (Carlson & Harwood, 2014; Rothbaum, Weisz, Pott, Miyake, & Morelli, 2000). In non-Western rural cultures, infants form multiple attachment relationships based on the physical availability of caretakers. Here, responsive control and bodily proximity are regarded as the ideal parenting behavior, leading to very calm children that easily integrate into the larger community (Otto, 2014; Yovsi, Kärtner, Keller, & Lohaus, 2009).

The study of infancy with a focus on mediators and outcomes represents an under researched area in high-risk contexts, especially in Africa. Our data show that the township context may create new childcare settings and practices, possibly even an alternative model of child care. Khayelitsha infants experience a minimum caretaking style, both in terms of the involvement of caretakers and their behaviors. Etic approaches arrive at the conclusion that minimal caretaking does not represent adequate care and might lead to negative developmental outcomes. Intrusive parenting (Cooper et al., 2009) and high rates of disorganized attachment (Tomlinson et al., 2005) have been reported for Khayelitsha children. However, the Khayelitsha infants did not experience a prototypical caregiving style, neither with mothers nor with others. Their caretakers did not adopt a Western model of caretaking nor did they follow a rural traditional model of caretaking. Also, the social setting in Khayelitsha did not correspond to either the nuclear or the extended families' setting. Hence, it seems rather questionable to assess and evaluate caregiving and its potential developmental consequences with tools developed in prototypical cultural contexts. A major question for future research is therefore what are the positive and negative aspects of alternative child-care settings and practices? Also, what constitutes normative and deviant child development in a high-risk context such as Khayelitsha?

Research needs to contextualize child development, not only in low-risk contexts but also in the contexts of poverty and adversity. The benchmarks and standards set for optimal development are largely based on Western middle-class ideals, rarely on non-Western ideals, and never on ideals prevalent in socially adverse contexts. Interventions to raise the level of care in high-risk contexts might focus on easing the structural constraints. Alternatively, they might try to reconcile potential discrepancies between settings, practices, and beliefs within high-risk contexts. In this case, prevention and intervention programs are needed that take into account culture-specific manifestations of the caregiving systems and build upon them, instead of simply applying principles, notions, and approaches derived from European American caregiving models. Although such an approach presents challenges, these challenges need to be faced in order to serve human well-being globally and fairly.

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