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Received sensitivity: adapting Ainsworth's scale to capture sensitivity in a multiple-caregiver context

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ABSTRACT

A network of multiple caregivers contributing to the care of an infant is the norm in many non-Western cultural contexts. Current observational measures of caregiver sensitive responsiveness to infant signals focus on single caregivers, failing to capture the total experience of the infant when it comes to the sensitive responsiveness received from multiple sources. The current paper aims to introduce the construct of received sensitivity that captures the sensitivity that an infant experiences from multiple sources in cultural contexts where simultaneous multiple caregiving is common. The paper further presents an adaptation of Ainsworth's Sensitivity versus Insensitivity observation scale to allow for the assessment of sensitivity as received by the infant regardless of who is providing the sensitive responses to its signals. The potential usefulness of the Received Sensitivity scale is illustrated by two case studies of infants from an Agta forager community in the Philippines where infants are routinely taken care of by multiple caregivers. The case studies show that the infants' total experience of being responded to sensitively cannot be simply derived from the sum of individual caregiver sensitivity scores, demonstrating the potential added value of the new Received Sensitivity observation measure.

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Introduction

In many non-Western rural cultural contexts, infants are cared for by multiple caregivers (Hrdy, 2009). For example, one study showed that the number of people actively involved in taking care of an infant among the Aka foragers varied from 17 to 24 (Meehan & Hawks, 2015). From an evolutionary perspective, caregiver sensitive responsiveness to infant signals (Ainsworth, Bell, & Stayton, 1974) is crucial to infant survival as infants are incapable of taking care of themselves and require extensive care by others. Sensitive responsiveness allows the infant to be fed when signaling hunger, to be cared for when signaling pain, and protected when signaling fear (Mesman, Van IJendoorn, Behrens, Carbonell, & Carcamo et al., *in press*). Yet, the existence and relevance of sensitive responsiveness to infant signals outside of the Western world has been hotly

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debated in the past decades (e.g., Lancy, 2015; LeVine, 2004; Weisner, 2015). One of the major criticisms on the use of the construct in most attachment research is that it focuses solely on the mother as a single caregiver of the infant, whereas this approach simply does not fit the daily reality of many non-Western communities in which multiple caregivers play an important role in infant care and the individual caregiver–infant relationship is not representative of the infant’s social experiences (Keller, 2015). The aim of the current paper is to introduce the idea of sensitive responsiveness as received by the infant from a network of caregivers, and a measure based on Ainsworth’s sensitivity scale (Ainsworth et al., 1974) to assess received sensitivity. The use of the new scale is illustrated by two case studies of Agta foragers from the northeastern Philippine coast.

The construct of sensitivity was first defined in the context of attachment theory to describe a caregiver’s behavioral pattern that was hypothesized to lead to a secure infant–caregiver attachment relationship (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969/1982). The sensitive caregiver is well-attuned to the infant’s signals, interpreting them correctly to know what the infant needs, and then responds accordingly to satisfy the infant. This caregiving pattern gives the infant confidence in the availability of that particular caregiver in times of need or distress, and will lead the infant to use the caregiver as a secure base from which to explore, and a safe haven to return to when he is in need of support (Ainsworth et al., 1974, 1978). The relation between sensitive caregiving and a secure attachment relationship has been confirmed meta-analytically, although the effect size was small (De Wolff & Van IJzendoorn, 1997). However, the utility of the sensitivity construct is not restricted to attachment processes. In fact, it has been linked to a variety of positive developmental outcomes in children, including social-behavioral competence (e.g., Kochanska, Barry, Aksan, & Boldt, 2008), language skills (e.g., Tamis-LeMonda, Briggs, McClowry, & Snow, 2009), and self-regulation (e.g., Bernier, Carlson, & Whipple, 2010). These links may be partly explained by secure attachment, but several mechanisms other than those related to attachment have been proposed to explain sensitive caregiving as a predictor of positive development across domains.

First, sensitive caregiving provides the child with positive experiences of behavioral contingencies (e.g., “if I cry, my mother will come to soothe me”). Learning behavioral contingencies is a crucial aspect of many learning processes relevant to multiple domains of functioning (e.g., “if I touch the kettle, my finger will burn”, or “if I break the rules, I will be punished”). Indeed, there is evidence that the experience of contingent maternal care predicts infant’s ability to detect other behavioral contingencies (Tarabulsy, Tessier, & Kappas, 1996). In addition, behavioral contingency experiences are likely to enhance a child’s sense of self-efficacy, because the child realizes that it can influence the (social) environment, rather than being a helpless recipient of unpredictable social interchanges. Further, the experience of sensitive caregiving promotes children’s conscience development through motivational processes (Kochanska et al., 2008). In sum, sensitive caregiving is beneficial to a variety of developmental outcomes reflecting basic human adaptive functioning, such as contingency detection, agency, and conscience development.

The versatility of the sensitivity construct does not only lie in its relation with multiple positive outcomes, but also stems from its organizational nature (Mesman et al., *in press*;

Sroufe & Waters, 1977). Ainsworth's Sensitivity versus Insensitivity scale does not contain a list of concrete caregiver behaviors that are deemed to be sensitive or insensitive. Rather, it contains descriptions of a particular pattern of behaviors that serve the function of smooth interactions with the infant, resulting in a content infant whose needs have been met (Ainsworth et al., 1974). Thus, the sensitivity construct is characterized by emphasizing function over form, allowing for multiple concrete behavioral manifestations so that the construct may also capture cross-cultural variations in the expression of sensitive responsiveness (Mesman et al., *in press*). Especially in non-Western communities, sensitive responsiveness can take on more subtle and less verbal forms than the variety seen in Western samples (e.g., Chapin, 2013; Tronick, 2007). Indeed, several empirical studies confirm the existence of maternal sensitivity in non-Western countries, including China (Jin, Jacobvitz, Hazen, & Jung, 2012), Mexico (Gojman et al., 2012), Mali (True, Pisani, & Oumar, 2001), and South Africa (Tomlinson, Cooper, & Murray, 2005).

Nevertheless, several scholars have criticized the relevance of the sensitivity construct to cultural contexts in which a network of caregivers is involved in infant care (Keller, 2015; Lancy, 2015). The use of the sensitivity construct in studies in Western samples has indeed been restricted to single-caregiver observations (predominantly mother–infant interactions). Even when both parents are observed interacting with the infant, they are generally observed as two separate dyads, mother–infant and father–infant (e.g., Schoppe-Sullivan et al., 2006). This approach fits with the daily reality in most Western contexts where multiple caregiving tends to be serial: one person takes over from another and they take turns caring for the infant. For example, a mother might do the infant's morning routine (e.g., getting up, clothing, feeding) because the father goes to work very early, then she takes the infant to daycare when she goes to work herself, and at the end of the day father picks the infant up from daycare and does most of the evening routine (e.g., feeding, bathing, putting to bed) while mother attends mostly to household tasks. We can also replace daycare by grandmother in this example, or of course reverse the mother's and father's roles, but the idea is essentially the same: when one person is busy with the infant, others are free to do other things. Some triadic interactions do of course occur, but these form only the minority of interactions in Western family life. In contrast, in many non-Western communities multiple caregiving tends to be simultaneous rather than serial: multiple caregivers are present at the same time, and take turns responding to the infant's needs without any clear place-bound or time-bound task division (Hrdy, 1999; Tronick, Morelli, & Ivey, 1992). It is exactly this pattern of caregiving that requires a different approach to assessing sensitive responsiveness in infant care.

The importance of ethology in the development of our understanding of culture-specific aspects of infant care in general and sensitive responsiveness in particular has been shown not only by Mary Ainsworth herself in her Uganda study as described by Bretherton (2013) in her comprehensive overview of the development of the sensitivity construct, but also in recent work on culture and sensitivity (e.g., Posada, 2013). Several (ethological) studies in non-Western contexts have shown that infants receive responsive care from multiple caregivers (e.g., Marlowe, 2005; Meehan & Hawks, 2015). This recognition of the role of non-maternal caregivers in responding to infant signals represents an important step forward in the field, and provides a more comprehensive

account of infant care in communities where multiple caregivers are the norm. In such studies, sensitive responsiveness has been qualitatively described or quantitatively assessed for each separate caregiver, in keeping with traditional observation methods of sensitive caregiving. However, separate assessments of sensitive responsiveness provided by each caregiver might obscure the infant's total experience of sensitive care. For example, if one caregiver is highly sensitive, two other caregivers are moderately sensitive, and a fourth caregiver is insensitive, it is important to know how much time the infant is spending with each of these caregivers to adequately assess the extent to which the infant is receiving responsive care in daily life. The infant's total caregiving experience would be determined more strongly by those providing more frequent care than by those who only sporadically care for the infant. Thus, in such situations, obtaining a "total sensitivity experience" score would require time-weighted averaging of all dyadic sensitivity ratings.

However, the strategy of weighted averaging of dyadic scores would not work so well in a situation where multiple caregivers are present at the same time. The question then becomes whether at least one of them responds to the infant (regardless of who does the responding), or whether there are also situations in which the infant is not responded to at all even when various caregivers are present. When using an average score, the infant's total experience of sensitive care would be overestimated if multiple caregivers respond to the infant simultaneously, whereas it would be underestimated if one caregiver is generally not sensitive, but only when others are present who do then respond sensitively to the infant's signals. In other words, the total sensitivity experience from the infant's point of view cannot be equated with the sum of its parts, i.e., individual caregivers' sensitivity scores. Instead, it makes more sense to assess the caregiver *network's* sensitive responsiveness to the infant when simultaneous multiple caregiving is the norm. In this paper, to illustrate the proposed construct of received sensitivity, we present an adaptation of Ainsworth's Sensitivity versus Insensitivity observational measure that captures sensitivity as received by the infant by the total caregiving network, regardless of who provides the responsiveness at specific times. The use of the adapted measure is illustrated with two case studies obtained from ethnographic observations among Agta foragers living along the Dimasalansan coast in the northeastern Philippines where multiple caregivers are the norm.

Methods

Participants and procedures

The two case studies represent two infants and their extended families from the coast-dwelling Dimasalansan Agta (northeastern Philippines). At its maximum size, the Dimasalansan Agta population numbers around 100 people, living in some 25 households spread out over two neighboring settlements. These households are part of three main extended families. Like other coast-dwelling Agta groups the Dimasalansan Agta mainly depend on marine fisheries for their subsistence. While time spent in agriculture is limited and no formal land ownership rights are held, the root crops planted on small swiddens behind the beach front provide an important source of food, especially during

the lean rainy months. The Dimasalansan Agta also trade fish with nearby non-Agta fisher folk and farmers, and engage in the commercial collection of rattan and scrap-metal as a source of livelihood. Involvement in paid farm labor is in this group mostly limited to the wet season. Women generate additional household income by selling hand-woven mats and baskets to nearby farmers (Minter, 2010).

Video data were collected in the context of an ethnographic study on weaning in forager societies. The focus of the videos is on two infants and their caregivers who were filmed over the course of four days, at various times of the day. Free and prior consent was obtained from all adults appearing in the videos. This means that the participants agreed to being filmed and to the video materials being used for research (and education) purposes in studies on infant care and development, and that they had the option to withdraw their consent at any time during the study. The infants were filmed during naturalistic daily routines and during semi-naturalistic situations in which one of the adults in the group was being interviewed by the researcher (the second author) with the help of an interpreter. Table 1 provides an overview of the available video materials for each infant, and shows the number and identity of the caregivers involved in the infants' care. The names appearing in this paper are not the infants' real names. For each infant, the network of caregivers was established through ethnographic observations and interview data. For our purpose, a caregiver is defined as a person (child or adult) who performs caregiving duties for the target child, such as feeding, rocking to sleep, carrying the infant to places, or supervising the infant's exploration.

The first infant, baby Maya, is about 6–8 months old and her caregivers are her mother (aged around 25–30 years), her aunt (aged 40–45 years), and several older children (mostly her cousins, aged around 8–12 years). Maya's father (aged 30–35 years) is also involved in child care in between fishing trips, but during the period of filming he was absent most of the time. Baby Maya has three older siblings in the age range of 2–5 years. The second infant, baby Jade, is an only child of about 18 months old and her caregivers are her mother (aged about 25–30 years), her father (aged about

Table 1. Summary of video materials.

Maya (age 7 months) ¹			Jade (age 18 months) ²		
Caregivers present	Duration ³	(%)	Caregivers present	Duration ¹	(%)
Mother only	0:05:00	(3%)	Mother only	1:09:11	(27%)
Mother & aunt	0:06:44	(4%)	Father only	1:11:11	(28%)
Mother & children ⁴	0:15:50	(10%)	Mother & father	1:21:59	(32%)
Mother & aunt & children ⁴	1:48:46	(67%)	Mother & children ⁴	0:03:28	(1%)
Child(ren) only ⁴	0:18:24	(11%)	Children only ⁴	0:04:16	(2%)
Mother & large group	0:08:26	(5%)	Mother & large group	0:16:30	(6%)
			Mother & grandmother	0:10:03	(4%)
	2:43:10			4:14:38	

¹ Observation settings included mostly the family sitting outside, interacting with each other, eating, and/or speaking to the visiting anthropologist via an interpreter.

² Observation settings included the infant walking around the settlement exploring the environment while one or more caregivers followed her around, infant on father's back or with father in the family hut while he crafts a fishing net, infant in the family hut with both parents grooming each other's hair, and the larger family eating together.

³ Duration in minutes and seconds

⁴ One or more older children present (mostly cousins), walking in and out of view. They are considered caregivers as they are also sometimes alone with the infant without close adult supervision and thus in those episodes responsible for looking after her. The "children only" times reflect such episodes.

25–30 years), and her grandmother (aged 60–65 years) who coincidentally was absent in most of the videos. The two infants are cousins, as Jade’s father is the brother of Maya’s mother. So they share one set of grandparents.

Video coding

Initial descriptive analyses

All video materials were transcribed in detail, always starting with the description of an infant signal, followed by a description of the responses to that signal from any individual. Infant signals were defined as any significant change in posture, affect, or vocalization. Responses refer to any behaviors of potential caregivers that follow the infant’s signal within two seconds. The researchers transcribing the videos (the first author) does not speak the Agta language, but noted the instances in which a caregiver would say something that appeared to be directed at the infant. Then, a researcher familiar with the Agta language (the third author) translated what was said in those instances (and added text if he felt that the original transcript missed important information). Coding was done by again viewing the video materials with the final transcript at hand to check for translations and to ensure that important details were taken into consideration.

Individual caregiver sensitivity

Sensitive responsiveness as provided by each of the individual caregivers in the video was coded using the Ainsworth Sensitivity versus Insensitivity scale (Ainsworth et al., 1974). The Ainsworth sensitivity scale ranges from 1 (highly insensitive) to 9 (highly sensitive), and highlights the extent to which a caregiver notices the infant’s signals and adapts her or his behavior accordingly to meet the needs of the infant. Coding was done by the first author, who is a trained observer with extensive experience with the Ainsworth sensitivity scale in multiple cultural contexts. Individual caregivers only received a score if the video materials included at least five consecutive minutes in which the caregiver is close enough to the infant to notice and respond to potential signals. Note that coding individual caregiver sensitivity is not a prerequisite to coding received sensitivity. We report it here as a bridge from the original construct to the proposed new construct.

Received sensitivity

In addition, a new scale was developed by adapting Ainsworth’s sensitivity scale so that it can capture the level of sensitive responsiveness received by the child from the total network of caregivers, regardless of the identity of the caregiver providing responsiveness. This scale therefore does not include any reference to a particular caregiver, but instead takes the infant as the point of reference, receiving sensitive responsiveness from various caregivers. It is the infant’s total experience across the observation period that defines the scale. The scale was developed to capture received sensitivity specifically in cultural contexts where extensive dyadic interactions between caregivers and infants are not that common, so that dyadic coding would not be representative of the infant’s experience. The scoring is based on all available observations of the infant with one or more caregivers, including dyadic, triadic, and group interactions. The way that

received sensitivity is scored in practice is actually the same as for a single caregiver: the coder monitors the infant's signals and assesses whether a caregiver responds promptly and appropriately to these signals. The only difference is that the responses can come from any one of a number of caregivers. If the infant is consistently responded to sensitively (regardless of who responds), the received sensitivity score will be high. If the infant is sometimes or more often not responded to (regardless of who is present), this will lead to a lower sensitivity score. Thus, duration of interaction with a specific caregiver is no longer relevant. Only duration and frequency of the infant receiving sensitive responsiveness is important. The scale points as described in Appendix 1 provide more detail regarding the scoring of specific combinations of quality and quantity of caregiver responsiveness received by the infant. This approach requires an even stronger focus on the infant's needs and communications than traditional sensitivity scoring, because it is in essence not the caregiver who is being rated but the infant's experience.

Because of the focus on an infant's total experience of sensitive care, the Received Sensitivity scale can only be used for extensive naturalistic observations. To fully capture the breadth of the caregiving network and their contribution to sensitive responding to the infant's needs and signals, observations on different days and at different time points during the day are necessary. Following the example of the Ainsworth scale, only the uneven scale points were defined. Appendix 1 provides the overall scale description as well as the descriptions of these scale points, ranging from 1 (consistently insensitive) to 9 (consistently sensitive), and coding guidelines. The new scale was then applied to the two focus infants in the current study. Two independent coders assigned received sensitivity scores to the two cases, and in one case the score was exactly the same, and in the other case only 1 point difference, suggesting that the scale has potential in terms of intercoder reliability.

Results

As can be seen from [Table 1](#), the two infants had rather different caregiving networks. The first infant is around more than two caregivers about two-thirds of the time. The second infant spends most of her time with her mother, her father, or both.

Case 1: baby Maya

Maya's mother received a score of 5 on the Ainsworth scale (score label: inconsistently sensitive). She consistently monitored Maya's signals and behaviors, often responded to Maya's signals with physical facilitation (e.g., changing position to facilitate a certain movement or focus of interest), but also showed several episodes during which she just watched Maya without responding to her signals throughout the videos. The mother appeared tired a lot of the time, which is likely to be due to the fact that she had four young children to take care of. Maya's aunt often stepped in and took the infant to allow mother to have a break from holding Maya. The aunt thus took on a large share of the care for the infant, as her own children were already old enough to be mostly self-reliant. The aunt clearly enjoyed taking care of Maya, which she also confirmed during the interviews. She was consistently attentive to Maya and generally responded in a

prompt and sensitive manner to her signals, fitting the description of score 8 on the Ainsworth scale (score label: between sensitive and highly sensitive). Three cousins (aged roughly between 7–12 years old) were also observed to take care of Maya at several occasions. One cousin in particular spent quite a lot of time with her, allowing for assigning a sensitivity score. This cousin was very responsive on some occasions, but also showed clear signs of letting her own wishes prevail over Maya's wishes and intentions on other occasions. Her Ainsworth score was therefore a 5 (score label: inconsistently sensitive).

Simply averaging the scores for the three main caregivers observed in the videos (scores 8, 5, and 5) would yield a total score of 6 (score label: between inconsistently sensitive and predominantly sensitive). However, this would not be an accurate representation of the sensitive responsiveness that Maya received for several reasons. First, the time spent in proximity of Maya varied significantly between the three caregivers. Second, the time spent in proximity of Maya overlapped, in that multiple caregivers were present at the same time in most of the videos (see [Table 1](#)). Third, other caregivers than the three who received individual scores were also present on several occasions. And although their total caregiving time of Maya was too short to assign an individual Ainsworth sensitivity score, they did sometimes respond to her when others did not, thus contributing to Maya's experience of being responded to. The Received Sensitivity scale takes this multiple-caregiver context into account by only looking at the sensitive responsiveness received by Maya, regardless of the caregiver who provides the responsive care. Coding the video set from that perspective, Maya's received sensitivity was scored as a 7 (score label: predominantly sensitive).

Case 2: baby Jade

Jade's mother received a score of 9 on the Ainsworth sensitivity scale (score label: highly sensitive). In contrast to Maya's mother, she had no other children to take care of and baby Jade was a long-awaited child after several miscarriages. Jade's mother was consistently attentive to her infant's signals and responded to them promptly and appropriately throughout the videos, with only few minor lapses. During a particularly informative walk across a coconut grove, the mother stopped whenever Jade stopped, adjusted her pace to Jade's pace, looked to wherever Jade was pointing, sometimes verbally labeling what she pointed at, and generally followed her every move. Jade's father received a score of 5 on the Ainsworth sensitivity scale (score label: inconsistently sensitive). Although Jade's father responded consistently and adequately to clear signs of hunger, thirst, or needing to be cleaned, he was often unresponsive to her other bids for attention.

As can be seen in [Table 1](#), in just over half of the videos baby Jade is with either her mother or her father, but in the other half of the videos she is with more than one potential caregiver (mostly with both mother and father, but also with others such as older children). This means that the total amount of responsiveness that Jade experiences cannot be simply obtained by averaging mother and father scores, because we do not know whether father's unresponsiveness occurs mostly when mother is present and responsive (and the infant thus receives consistent sensitive care), or whether he is mostly unresponsive when he is alone with the infant, or some combination of these

patterns. Further, averaging mother and father scores would not account for the potential responsiveness of several others who were around baby Jade and who had the opportunity to respond to Jade's signals even when mother or father did not. The total experience of Jade in terms of receiving responsive care from multiple caregivers is therefore not the same as the sum of its parts (the individual caregiver's sensitivity). The received sensitivity score captures Jade's total experience, and was coded as 7 (score label: predominantly sensitive). In this case the received sensitivity score is equal to the average of mother and father, but this was not how we arrived at this score. The infant was taken as the center of the observations and her experiences were coded, regardless of caregiver identity.

Discussion

The current paper describes a new observational scale to assess sensitive responsiveness from the infant's perspective in multiple-caregiver contexts of infant development that is common in many non-Western communities. The two case studies of baby Maya and baby Jade from the coastal Agta community in the north-eastern Philippines illustrate how the scale might be applied.

Interestingly, both Maya and Jade ended up with the same received sensitivity score (7 = predominantly sensitive) whereas their mothers showed quite disparate traditional sensitivity scores (i.e., 5 versus 9). The case of Maya suggests that the multiple-caregiver context can facilitate compensatory caregiving patterns, with several other proximal caregivers being available to step in and provide sensitive responsiveness if a mother does not provide this care at times. Alternatively, the mother can relax her vigilance regarding infant signals precisely because there are others around to respond, so that her overall sensitivity is lower than if she was the sole caregiver of the infant. The case of Jade shows that a highly sensitive primary caregiver (mother) cannot always be there to provide this high level of sensitive responsiveness, and that the total experience of Jade in terms of her efficacy in eliciting care and attention from those frequently around her cannot be captured by observing just the mother, even if she is the primary caregiver of the infant.

This insight is of course not specific to non-Western cultural contexts, and research including both parents has become more common in the literature on Western families (e.g., Grossman et al., 2002; Hallers-Haalboom et al., 2014; Schoppe-Sullivan et al., 2006). However, as noted earlier, most multiple-caregiver contexts in Western countries are serial in nature (with alternating caregivers not present at the same time), whereas in many non-Western communities multiple caregiving tends to occur simultaneously. It is the latter situation that requires a different approach than the traditional observation of dyadic interactions when assessing sensitive responsiveness. Of course there may also be situations in Western countries showing similar patterns, for example in weekends when all family members are home and might respond to the infant without clear allocation of caregiving hours (e.g., during family meals). The same could be true in families in which older children routinely also take care of their younger siblings, or at least spend a lot of time with them in settings where they can be expected to show sensitive responsiveness. Other settings in which simultaneous multiple caregiving may be found are institutions or daycare centers where multiple caregivers attend to a group,

and older children may also respond to some of the infant's signals. Thus the received sensitivity construct may be relevant to any simultaneous multiple-caregiver context.

What does the notion of received sensitivity mean for processes of attachment formation? This is an important question to address when trying to understand sensitive caregiving across cultures within an attachment theory framework, but to which no straightforward answer is yet available. Attachment relationships can be formed with multiple caregivers, and a particular caregiver's individual level of sensitive responsiveness would be expected to predict the quality of the attachment relationship of the infant with that caregiver. However, in simultaneous multiple-caregiving contexts where being with just one caregiver is rare, it may be that even specific infant-caregiver attachments are influenced by the wider caregiving environment. We suggest that the notion of a secure base may be applied to a group experience as well as to a dyadic experience. In cultural contexts where caregiving is characterized by a network of (simultaneous) caregivers, the secure base is provided by the total network, not by a single individual. Maybe being responded to sensitively most of the time by many people fosters trust in the availability of the entire network of caregivers (e.g., Weisner, 2015) and this general trust in caregiver responsiveness may in turn foster secure attachment to a large number of individuals. Thus, the most important question for future studies is then whether shared sensitive caregiving in this type of context might also foster secure attachment even those who themselves are not necessarily the ones who respond most frequently or most consistently, or whether individual variations will remain the most important predictors of attachment quality. We need much more empirical work to test these types of potential mechanisms linking network sensitivity with attachment formation.

We also want to note that, even in contexts where simultaneous multiple caregiving is common, mothers generally do play a unique role in the infant's care as primary caregivers. For example, in almost all multiple-caregiver contexts, infants sleep with their mothers (e.g., Jenni & O'Connor, 2005; Konner, 2005; Morelli & Tronick, 1991). It is therefore likely that nighttime responsiveness is almost exclusively provided (or of course not provided) by the mother. Given evidence that nighttime responsiveness is very important in attachment formation (Ding, Xu, Wang, Li, & Wang, 2012; Higley & Dozier, 2009; Sagi, Koren-Karie, Gini, Ziv, & Joels, 2002), this specific caregiving role of mothers is important to keep in mind. The status of mother as primary caregiver in most cultures is also illustrated by the fact that intense crying in infants very often results in the other caregiver handing the infant back to mother, or mother herself retrieving the infant (e.g., Marlowe, 2005). Thus, assessing single-caregiver sensitive responsiveness remains important for understanding individual variations in attachment security even in the context of multiple caregivers. Further, variations within a network in terms of their sensitive responsiveness may also be worth examining. A high degree of network consistency (be it low, medium, or high sensitivity) versus large disparities in sensitivity within the network may in itself have implications for infant developmental outcomes.

The current study represents only a first step in conceptualizing the nature of sensitive responsiveness to infant signals in a multiple-caregiver context. The two cases described in this paper are obviously not enough to offer robust evidence for the usefulness of the Received Sensitivity scale. We want to emphasize that the cases were only used as illustrations of the potential use of the Received Sensitivity scale.

Apart from the very small number of cases, the video materials were not systematically made to represent all caregiving received by these infants. For example, although grandmother does play a role as caregiver of both infants, she was rarely in the videos. Thus, the video footage used here is not fully representative of all daily caregiving interactions in these cases. The cases of baby Maya and baby Jade should be seen as no more than illustrations of the use of the Received Sensitivity scale. We hope that they inspire other researchers to approach sensitive responsiveness from the infant's point of view in communities where infants are taken care of simultaneously by several non-maternal caregivers.

The use of the Received Sensitivity scale requires extensive naturalistic observation times similar to those used in Ainsworth's Uganda study (Ainsworth, 1967) and her Baltimore study (Ainsworth et al., 1978), rather than the currently more common brief observation intervals that often encompass no more than 10 minutes. More extensive field work is necessary to truly understand an infant's socialization experiences when being taken care of by several adults and older children throughout the day. The test for the construct of received sensitivity lies in the application of the scale to a larger sample of infants, and linking the scores to infant developmental outcomes. More specifically, the validity of the construct and the measure would require, for each infant: (1) 2–3 hours of naturalistic observations in multiple-caregiver communities; (2) scores of traditional dyadic caregiver sensitivity and of total received sensitivity by all caregivers; and (3) assessments of contingency detection and social functioning. The expectation would be that received sensitivity predicts children's ability to detect contingencies, their sense of agency, and their social competence above and beyond the sensitivity levels of single caregivers. Further, elaborations on specific forms of received responsiveness (verbal responsiveness, or responsiveness to distress) might be useful ultimately to capture specific pathways to particular outcomes.

Attachment research is often criticized for its Western orientation and the field remains vulnerable to this kind of criticism if it does not move beyond standardized single-caregiver assessment procedures and embrace alternatives such as more ethnographic approaches to infant caregiving. Indeed, Mary Ainsworth herself advocated field work as an important way of studying infant caregiving that should not disappear from the research state of the art (Ainsworth & Marvin, 1995). The Received Sensitivity scale is an attempt to combine the benefits of naturalistic ethnographic materials with a standardized observation system. Collaborations between developmental scientists and anthropologists can be especially fruitful in this regard, as the current study also illustrates. Such collaborations and the use of mixed methods will move the field forward and yield new avenues of investigation that will enrich our understanding of complex early caregiving patterns across cultural contexts.

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Appendix 1

The Received Sensitivity scale and coding guidelines

RECEIVED SENSITIVITY

Coding guidelines:

- Apply only to a minimum of 2-hour naturalistic observations in contexts in which multiple caregivers are present simultaneously during a significant portion of an infant's daily routines;
- During coding the focus is on the infant rather than on a particular caregiver. The infant's signals are the point of departure and the frequency and appropriateness of any caregivers' responses to those signals are being assessed and rated on the 9-point scale provided below.
- All specifications regarding the nature and behavioral manifestations of sensitivity provided by Mary Ainsworth et al. (1974), also apply here and are assumed to be familiar to coders using the Received Sensitivity scale.
9. **Consistently sensitive.** Virtually all of this infant's signals are responded to in a sensitive manner, including both its more subtle and clear signals. Infant distress is always responded to in a timely and appropriate manner so that the infant is soothed. Overall, the infant experiences consistently well-rounded interactions with the caregiving network.
 7. **Predominantly sensitive.** The large majority of this infant's signals are responded to in a sensitive manner, although some subtle signs may be missed. Infant distress is almost always responded to in a timely and appropriate manner, although sometimes somewhat delayed. Responses by the caregiving network are rarely seriously out of tune with the infant's tempo, state, and communications.
 5. **Inconsistently sensitive.** This infant's signals are responded to sensitively somewhat more often than not, but there are clear lapses in sensitivity. Both subtle and clear signals are ignored at times, or responded to rather late so that the infant no longer perceives the link between his own behaviors and the caregiver network's responses, or responsiveness is delivered in a manner that does not satisfy the infant.
 3. **Predominantly insensitive.** More often than not, this infant's signals are either ignored or responded to late and/or inappropriately. Some of this infant's signals may be responded to in a way that fits its needs and intentions, but the caregiving network appears to be mostly geared towards other tasks than responding to the infant's needs.
 1. **Consistently insensitive.** This infant's signals are rarely responded to or, if they are responded to, it is in a manner that does not at all fit with the infant's needs and intentions. Some appropriate responding might be present, but this is likely to reflect a coincidental overlap between the infant's needs and the caregiver network's needs.
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