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The contents of manuals, entries therein and field-kit materials are modified from time to time, and this provides an additional motivation for keeping close contact with the Language and Cognition Department. We would welcome suggestions for changes and additions, and comments on the viability of different materials and techniques in various field situations.

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## Multimodal multiperson interaction with infants aged 9 to 15 months

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Interaction, for all that it has an ethological base, is culturally constituted, and how new social members are enculturated into the interactional practices of the society is of critical interest to our understanding of interaction – how much is learned, how variable is it across cultures – as well as to our understanding of the role of culture in children's social-cognitive development.

This is an exploratory subproject conducted collaboratively by members of the Multimodal Interaction project and child development specialists. The aim is to study the socio-communicative environment in which children learn to interact with caregivers and others across different cultures. Research on caregiver-child interaction in western contexts has been strongly biased toward diadic mother-child interaction. But most children in most societies grow up in a multiperson context with other children (siblings, cousins, etc.) and multiple caregivers (grannies, aunts, older siblings, as well as the mother). We are interested in documenting the range of caregiver situations represented in different cultural contexts, and the range of variation that exists in how infants are drawn into social interaction in the period prior to producing their first words. The critical age is between about 9 and 15 months, when major social-cognitive abilities emerge, including awareness of the other as an intentional agent and joint attention with a caregiver over a third object or event (the 'referential triangle', Tomasello). In this period, western infants progress from sharing attention (alternating gaze between object and adult's face) to following adult's attention (looking at what caregiver is looking at) to directing the attention of others (Carpenter et al 1998). Around 12 months of age there is an important developmental milestone: babies look where adults are looking reliably, use adults as social reference points (gaze at them to check what to do in an uncertain situation), act on objects like adults are doing, and actively direct adult attention. All of these are (putatively) essential prerequisites for coordinated interaction, and later for learning language. But we have little information about how much this process varies across cultures.

This initial exploration of infant-caregiver interaction can be done at two levels of commitment (see below). Further, there is a third section with special emphasis on pointing in infant interactions. If you are interested or have done observations with regard to the latter topic, please contact Ulf Liszkowski (liszkowski@eva.mpg.de).

1. First level: Observation and informal videotaping of naturally-occurring mother-child and other caregiver-child interaction across a range of contexts – e.g., when the baby is feeding, being put to sleep, or being handled in relation to things (i) of danger to it, (ii) of interest to it, (iii) of surprise/fear to it, as well as any interaction not in connection with caregiving. Pertinent questions concern the practices involved in the handling of babies and the specific forms of interaction with babies; videotaped documentation of these practices would provide a rich resource for further study.

The first task is to identify a family with a baby of the appropriate age (roughly 9 to 15 months), and establish a relationship to them such that it is possible to videotape people interacting with the baby across different situations. Try to find out exactly how old the baby is, and the ages of the other siblings – cousins – etc. regularly present in the household. Then document with videotape the following practices (try to keep yourself out of the interaction completely; you are the machine in the corner):

Handling:

- Who is the infant's primary caregiver (mother? older siblings? other relatives?)
- Are infants always carried (and how)?
- When are they set down (and how)?

- How are they fed? put to sleep? bathed?
- How is elimination (i.e. going to the toilet) handled?

#### Interaction:

- Is the baby treated as an interlocutor? For whom? Who facilitates interaction with the baby?
- How are babies drawn into joint attention with others?
- When and how do others try to get the baby's attention? When and how is the baby treated as an intentional other by caretakers?
- Do people point out objects – or people, or events – to babies?
- Do babies point in an attempt to draw others' attention to things?
- Do babies and caregivers jointly attend to objects? (gaze back and forth between object and each other)
- If the baby wants something that it can't get/do by itself, what does it do? (say uhuh, cry, socially communicate e.g. by looking to other? lift both arms up to indicate pick-me-up? etc.)
- Does the baby try to get others' attention? how? what kind of attention-requests do you see: requesting (indicating 'I want this') or declarative ('Look at this')?
- Are there special baby routines (e.g. patty-cake, naming body parts) that draw the infant into interaction with others?
- Is there a folk theory about when the baby becomes a 'person' or an interlocutor?
- What is the language environment of babies – how many (and which) languages are spoken around/to them?
- What is the general level of interaction with babies from birth on? Are they spoken to? With a baby-talk register (heightened or accentuated pitch, slow rate, repetition)? How does this change with the child's age?
- Do babies attend to what's going on between others?

#### Socially loaded moments:

- Attachment: what's the baby's reaction if everyone leaves? If a stranger comes to the door? Does the baby try to stay close to mother? fear of strangers?
- Where was the baby the first time it saw you? What was the baby's reaction to you?
- What does the baby do in response to a novel object?

## 2. Second level: More systematic observations of caregiver-infant interaction

These are systematic sampling procedures for going beyond anecdotal observation of interactional practices in order to establish the nature of particular event types, their relative frequency in a cultural context, and the associated social factors when they occur. There are three types of systematic probes, using a fixed set of predetermined codes for the behaviour being observed, and sampling by moment, by event, or by time. If you aren't going to do them all, do them in this order.

### 2.1 A momentary sample:

The purpose of this probe is to get a quantitative assessment of how much time (proportionally) the infant spends in what kinds of interaction with people and with objects. It involves the investigator taking a 'snapshot' of what is happening with the baby at regular time intervals. Sit in an everyday family setting observing interaction and behaviour for several hours (ideally 3 or 4), and every 5 minutes (like clockwork) write down what all the people present are doing at that moment vis a vis the baby (or otherwise), using the codes suggested in the notes for a coding sheet below (and any others that strike you as culturally relevant/necessary). Do this with a watch, strictly on time every 5 minutes, ignoring (for this task) what happens not at the every-5-minutes-defined moment. The result will be a series of random snapshots of activity in relation to the baby that will enable you to say with some confidence how much interaction the baby engages in – and when – and how this fits into the daily activities of the household. Do this for 3 families, and/or 3 different times of day (e.g. morning, midday, late pm). Be sure that you sample exactly every 5 minutes; don't let the sampling be shifted because at some other time point something interesting is

happening – the idea is to randomly sample. An actual photograph could be taken every 5 minutes if you have an assistant and if it can be done unobtrusively so as not to affect the activities being observed.

You need to draw up your own coding sheet: columns across the top for each member of the household who interacts with the baby; have codes for: work, rest, play with object, attend to bodily functions (eat, sleep, pee, clothe), social orientation (interacting, observing, taking care), other (not home, etc.) (Elaborate as necessary with culturally relevant activities.)

## 2.2. An event sample:

This kind of sampling aims to document particular events of interest, in our case interactional moments with the baby, and their internal structure. Again, sit in a household in an everyday natural setting, and write down a description of what happens every time someone interacts with the baby or the baby initiates interaction (successfully or not). You will need to define the boundaries of an interaction event – what behaviours initiate an interaction and what terminates it in culture-specific terms (speaking, gaze, touching, etc.). Aim for a very concrete description of behaviours, avoiding your own interpretive gloss (e.g. write mother 'touches' baby, not mother 'fondles' baby). At the end of this sampling period you should be able to answer the following questions for each period of interaction you recorded: Who started the interaction? How was it initiated? What was the goal? (e.g., caregiving, stimulation, showing/sharing an object, etc.) What was the emotional tone (positive/negative/ neutral)? Who terminated the interaction, and how? (You will need a termination criterion defined in a culturally meaningful way: e.g. no look or vocalization for 30 secs. or whatever is culturally relevant.) How long did it go on for? Who was involved? What was the spatial orientation of participants? Was the baby physically constrained (e.g., tied onto the interlocutor)? How does physical constraint affect the interaction? Was gaze locked between baby and interlocutor? Was there pointing or other gesture? What do they say? baby talk? whisper? How was turn-taking organized? (both at once? orderly alternations? competition for the floor?). Was the interaction co-occurring with other physical activities? with objects? etc.

## 2.3 A time sample:

This kind of sampling allows one to establish the range of activities an infant engages in over a particular period of time, in relation to what else happens during that period. Take for example a time period of 20 minutes. Here you write down whatever happens in the time period (using a coding sheet), and you make a line under the description every 60 seconds so you can see how what happens is distributed in time. Do this at 3 or 4 different times of the day, and different days of the week, making sure that the samples occur at routine, not unrepresentative, times in the baby's life. Coding categories should include: orients to objects, orients to people, goes to someone, eats/nurses, cries/frets, sleeps, goes out, comes in, etc.

## 3. Pointing behavior:

Below we have included a section by Ulf Liskowski and Pattie Epps of the MPI for Evolutionary Anthropology. This provides guidelines for documenting pointing behaviour; in addition it may serve as an illustration of how to code for the other aspects of interaction you may be interested in (turn-taking, coordinated laughter, back channel signals, eye-gaze, repair, etc.)