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Blinking when talking depends on the receiver: The case of mothers feeding infants

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Abstract: During nursing, a mother faces an infant who does not speak and hardly blinks. We established the eye-blinking rate in this special interactive context for comparison with the high rate repeatedly reported in between adult conversation. The 22 mothers we observed during bottle-feeding blinked much less—especially when talking to their infant—than when talking with another adult. Nursing may have put mothers in a state of concentration that inhibits blinking. So, we propose that the frequent blinks usually displayed during conversations may depend on intentions or expectations about the receiver, which maybe modulated by the affective state.

Subjects: Language Development; Attachment; Biological Development; Cognitive Neuroscience of Vision; Developmental Neuroscience; Social Neuroscience; Pediatric Nursing

Keywords: spontaneous eye blink (SEB); meta-communication; non-verbal communication; mother-infant interaction; baby talk; affection

1. Introduction

The literature is abundant about the impact of non-verbal motor behavior in interpersonal communication (Ekman, 2004; Ekman & Friesen, 1969; Ekman et al., 1987; Mehrabian, 1972). The present study aims at better understanding the spontaneous eye blink (SEB) in this regard. The SEB is distinct from the voluntary blink made consciously and from the blink reflex that mechanically protects eyes from aggression (Doane, 1980; Kaneko & Sakamoto, 1999; Leemann, 2004). It fulfills more functions than the uniform wetting of the cornea.

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Emmanuel Descroix has been interested for the past 10 years in Non-Verbal Communication, exploring it and teaching it the context of business interpersonal communication. To explore embodied cognition and action/perception models, he has engaged in an academic research program, conducting a PhD thesis in Cognitive Sciences at Grenoble Alpes University in France.

PUBLIC INTEREST STATEMENT

In typical conditions, humans blink around 10–30 times per minute: this is more than necessary to keep the eye surface operational for vision. We blink less when we focus and more to punctuate conversation.

Infants blink around 10 times less than adults. When investigating children from birth to six months with mothers in natural settings, we not only confirmed low blinking in babies but observed it in mothers too. By carefully scoring blinks on video records at feeding time, we assessed that the mothers, with their child, blinked less than four times per minute, whether they were silent or talking to him/her. However, they immediately returned to normal range if they began talking to another adult.

These results, issued from the real world, suggest that affective and attentional factors that are difficult to manipulate in the lab, impact on non-conscious behaviors and on underlying cerebral processes involved in interpersonal communication.

SEB received much more interest in physiological than in social psychology, perhaps because it is largely non-conscious (Bristow, Frith, & Rees, 2005; Bristow, Haynes, Sylvester, Frith, & Rees, 2005; Burr, 2005). Still, most experiments on SEB involved tasks with a communication dimension, implicitly or explicitly (Cruz, Garcia, Pinto, & Cechetti, 2011; for a review). Although the spontaneous blinking rate (SBR) has been known for decades to increase when talking,(Bentivoglio et al., 1997; Freudenthaler, Neuf, Kadner, & Schlote, 2003; Ponder & Kennedy, 1928) it has been investigated much later as a paralinguistic cue. SEB occurs more often at breakpoints of speech (Nakano & Kitazawa, 2010) and it marks speech turn (Cummins, 2012). Various processes involved in adult conversation may explain these correlates: accentuation of the emitted messages addressed towards the partner or accentuation of the received messages from the partner. In the context of talking, however, SBR is low when lying (Fukuda, 2001; Leal & Vrij, 2008). This peculiarity has been related with decreases of SBR observed in various situations of high concentration or attention (Holland & Tarlow, 1972; Shultz, Klin, & Jones, 2011).

Thus, the paralinguistic roles of blinking maybe better understood by atypical contexts, for instance, when interacting with someone who cannot speak. Infants actually do not speak, but they also blink very little (Bacher & Smotherman, 2004a).

We focused on mothers with their infants during feeding time. Homogenous real-life records of dyads in natural interaction are priceless because they are difficult to obtain (Oertel, Cummins, Edlund, Wagner, & Campbell, 2013). We exploited a 25-year-old collection of videotapes recorded in maternity ward and family home for a longitudinal study on non-verbal mother-infant interaction (Charavel, 1992). A prior investigation assessed that the infants blinked very little (around two blinks per minute), with no detectable change from birth to six months (Descroix, Charavel, Świątkowski, & Graff, 2015). The mothers also appeared to blink little, in comparison with adults put in various contexts (Al-Abdulmunem & Briggs, 1999; Doughty, 2001; Karson et al., 1981).

Is this low rate attributable to the *nonverbal* type of interaction mothers held with their infant, or rather to the specific type of their non-speaking *receiver* (i.e. their infant)? Individual mothers' levels appeared not correlated with those of the infant they were interacting with, thus discarding somehow a mimetic effect on mothers' low SBR. In this paper, we use the same footage and investigate the SEB of feeding mothers further on, in relation with the type of interaction they had with the child, by comparing it with that of a conversation with a third adult person. In general, mothers interacted silently with their infants; occasionally they talked to him/her; in some instances, they talked with one adult, namely the operator, generally at the end of the recorded session. We contrasted these three contexts in order to separate the importance of talking per se and the importance of the person the mother is talking to, in order to explain why the overall mothers' SBR scores found in this specific—real-life—interaction condition were so low. Unfortunately, non-conversational context with an adult alone was not available for comparison; we used literature results in similar situation instead.

To test the non-verbal—vs. verbal—interaction factor, we tested if mothers blinked less when they were remaining silent with their child than when they were talking to him/her. To test the effect of the receiver, we also tested if they blinked less when talking with the child than when talking with an adult.

To explore the underlying modulation mechanisms, we also tested two correlations: (1) between the two infant-related interpersonal contexts (consistency when talking and when silent with the child); (2) between the two talking-related contexts (consistency when talking with infant and with adult).

Table 1. Features of sampled dyads

Sample size (Boys : Girls)	10:12
Mother's socioeconomic status	Middle or upper
Mother's age M ± SD (years)	29 ± 4
Newborn's rank among siblings (1st, 2nd, 3rd, 4th)	(10, 10, 0, 2)
Pregnancy age M ± SD (weeks)	30.2 ± 2.5
Infant weight at term session (KG)	3.26 ± 0.51
Infant/Mother pathologies before six months	None

2. Material and methods

2.1. Participants and recording

Twenty-two mother-infant dyads were recorded longitudinally from birth to six months after term (sample features, Table 1). Participant volunteers were recruited through a direct contact with parents from one maternity ward and two neonatal units in Lyon, France.

The mothers and the operator were all native French speakers. In half of the dyads, the infant was born premature, as they had been initially selected for an investigation on age and prematurity. However, both factors did not show any effect on the SBR of infants and their respective mothers (Descroix et al., 2015). The sample of mothers was homogenous over the two groups with no known exception as for sociocultural (middle or upper), origin (Caucasian), age (29 years and 7 months ± 4 years and 3 months), and health conditions; no pathologies were known before or after six month from the delivery date.

The 11 premature dyads were recorded in 4 sessions: after birth before theoretical term, at the age of the theoretical term, 3 months and 6 months after the theoretical term. The 11 term-infant dyads were recorded in 3 sessions: shortly after birth at term, 3 months and 6 months after birth at term. The 3 sessions of each the 11 term-dyads and the 4 sessions of each the of 11 premature dyads thus totalized 77 sessions recorded in as many cassettes, but because 6 cassettes were damaged at the time of the present study, only 71 usable session records were processed.

Each dyad was recorded in a clinic room for the birth session, then at home in the family living room for all the following ones. Mothers were sitting on a bed, on a couch, or in an armchair in front of the camera. They were asked to behave as usual. At the end of the session, the mother either called the investigator waiting in a next room, or left the place with the child in her arms. The camerawoman investigator often came into the room and exchanged with the mother before switching the device off, which later offered the unplanned opportunity to observe the latter in a verbal interaction with a third adult-person.

At the time of recording, investigators were not concerned with SEB. Thus, both the woman holding the camera and the participants were experimentally blind to the importance of blinking and of the mother's interaction outside of the dyad for subsequent studies. This also explains why blinks were not detectable at each moment of the session record: in such loosely restricted circumstances, the participants' face orientation was not contained, (see Figure 1). Likewise, the sequences of mother's interaction with a third, adult person were available by chance only. Records in such real-life situations are extremely time-consuming to obtain, hence they represent particularly precious data but they include unfortunate lacks. The experimental biases usually associated with field studies were prevented here by the use of a restricted double-blind procedure of sampling and scoring the final data, as described below.

Figure 1. Frame examples showing mothers in three interpersonal contexts.

Notes: Upper panels: eyes were visible, so blinks were countable; Bottoms panels: eyes were hidden, so blinks were not countable; Left panels: mother silent with her infant; Middle panels: mother talking to her infant (with visible eyes); Right panels: mother talking to a third person.

The mothers' SBR was investigated in three different *interpersonal contexts*: while being silent with her infant; while talking to her infant; while talking to a third adult person (the woman holding camera).

2.1.1. Ethics

All mothers voluntarily participated to a general study on non-verbal behavior, and agreed to be videotaped at home for a study on mother-infant dyad communication behaviors. Since the present study focused on blinking and talking activity—initiated 20 years after the recording—it is in line with this agreement. As all studies conducted in Grenoble Psychology department at the time, the practice was in accordance with the American Psychological Association code of conduct for the ethical treatment of human participants, and complies with the standards of the Helsinki declaration (see supplementary material). Independent variables are exclusively invoked variables. Social and health information were communicated verbally from mothers, and personal identification was deleted.

2.2. Data collection (general)

A total of over 23 h of videos records were viewed repeatedly with a 25fps—i.e. 40 ms—resolution. Data collection could not be automated (see Figure 1); therefore, the workload was shared between 10 appointees.

Appointees were associated in *pairs* divided into two teams: three pairs of "sequencers" and two pairs of "counters". The purpose of making appointees working systematically in pairs (i.e. two people together) was to reduce the variability due to individual judgments. Different appointees processed different session records, but pairs never split.

In a first step, the sequencer pairs selected the interpersonal contexts and they time-stamped sequences in which blinks could be identified. In a second step, the counter pairs independently counted the blinks within the time-stamped sequences attributed to them.

2.3. Data collection (sequencing)

Each of the 71 usable session records was viewed in its entirety and time-stamped into sequences by—at least—one pair of the sequencer team. Sequencers took a sequence into consideration only when it exceeded a minimum of four seconds of visible eye-lid in one identified interpersonal context. Sequences were parted and classified along the three *interpersonal context* modalities. Because the context was an invoked and not a provoked variable, the session records included unequal samples of sequences for each context. Because the context of talking with an adult was not planned at the time of recording, such sequences were less often available and their total sample duration was shorter than the duration of the other ones.

For a given session, five minutes (300 s) was considered a sufficient total sample duration to estimate the mother's SBR in a given context. When the sum of available sequence durations for the context was less or equal to this duration, they counted blinks along all the sequences for that session; else they counted only a random part totalizing 300 s.

Tables 2A and 2B provides the total duration of available sequences per mother in the different interpersonal contexts, and for each context, the number of sessions for which 300s-sequence sampling was available.

2.4. Data collection (counting)

The two *counter* pairs counted the blinks along time-stamped sequences, in a block-randomized order with the interpersonal classification being unknown to them. Within a pair, both counted silently; if they did not agree on the counts they exchanged at the end of the sequence, they started over again. A SEB was scored when the eyelid rapidly fell down, closed the eye, and lifted up immediately. Eye-closing that lasted more than six frames (>1/3 s), and exceptional reflex blinks associated with sudden stimuli (Charbonnier & Blanchi, 1995; Kaneko & Sakamoto, 1999; Stern, Walrath, & Goldstein, 1984) were excluded.

2.5. Data collection (validation)

To validate between-pairs' judgments, a reduced sample of session records were sequenced twice, i.e. by two among the three different sequencer pairs, and counted twice, i.e. by the two different counter pairs. The pseudo-random choice of session records that were used for validation involved: four premature-born dyads (one for each of the four different ages); and four term-born dyads (one for each of the three different ages, plus one). For each of these eight session records, the sample of sequences yielded by one sequencer pair was counted by either one of the two counter pairs, and the other counter pair counted the sample yielded by the second sequencer pair. Note that for a

Table 2A. Time-stamped total duration of sequences per mother

Interpersonal context	Duration of sampled sequences		
	Silent with infant	Talking with infant	Talking with adult
Total duration M ± SD *(N = 22)*	18′35″ ± 7′10″	11′14″ ± 6′22″	1′22″ ± 2′47″
Mean duration M ± SD(*N* = 22)	40″24‴ ± 68″52‴	18″52‴ ± 18″13‴	13″20‴ ± 12″23‴

Table 2B. Sample size of session records with usable sequences

Session records including…	Interpersonal context		
	Silent with infant	Talking with infant	Talking with adult
Sequences totalizing more than 5 min:	60	26	1
At least one usable sequence:	70	70	47

given session record, the sample of sequences that were processed by one counter pair and the sample of sequences that were processed by the other were different.

For each session and each interpersonal context, the two resulting blink counts—each reported on their respective sampled sequences' total duration—provided two different final SBR scores. The two scores were therefore necessarily different even with a full agreement between raters. They were correlated, however, because they concerned the same mother and the same day. The scores were matched by use of a linear correlation between them. The correlation (Pearson's $r(18) = .698$, $p < .001$) appeared to be satisfactory considering the part of variance involved in the different sequence samples. Among 21 possible data issued from 7 sessions at 3 interpersonal contexts, 1 was not available, because a countable sequence in the *speaking with adult* interpersonal context was missing for 1 session record.

At the end of the data collection process, counters were asked if they had guessed any hypothesis. Since they had focused specifically on the eyes of the participants, they declared not having guessed any of them (age, prematurity, and context).

2.6. Analyses

For each interpersonal context, the total SEB count was divided by the total duration of all sequences, in each session. The ratio multiplied by 60 yielded a mean *session* SBR in spontaneous blinks per minute (SBM) for each interpersonal context in its session. The three SBR are thus comparable with each other and between sessions when available. On the other hand, assuming a possible effect of the context length on the SBR, we made sure that the durations of shootings were similar among them, in particular, for the two conditions *speaking*. The proportions of available individual scores are presented in the tables above.

According to Descroix et al. (2015), infants show no noticeable change in SEB with age, and no noticeable difference between premature and term-born. In addition, mothers' rates appear independent from those of their infants (no correlation was found between the mother's and her infant's SEB), an important point that will not be evaluated here again. Therefore, with no effect of age and prematurity on infants' blinking activity, we did not expect such on mothers' SEB. However, in case such unexpected effect existed, it would have to be taken into account in the present analyses on interpersonal context. So, we still checked if these two developmental variables acted on the mothers' SEB. Hence, we performed a mixed ANOVA, with two intra-subject factors and one inter-subject factor, respectively infants' age (birth, 3 months and 6 months), the type of context (silent with the child, talking to the child and talking with a third adult), and the child's maturational state at birth (premature vs. term-born). Only the effect of interpersonal context yielded a statistically significant effect on mothers' SBR ($F(2, 8) = 7.20$, $p < .05$, $\eta_p^2 = .64$). No other effect reached statistical significance in this analysis. Hence, we mixed mothers' scores indifferently along sessions (at various ages) so as to obtain an average individual mother's SBR in each interpersonal context.

NB: Depending on whether the infant was term or premature born, the dyad was recorded three or four sessions, thus the scores at the age of birth for term-infant mothers was compared to premature-infant with an average from the actual term (birth) and the theoretical term in this ANOVA.

To assess how exactly the interpersonal context had an effect on the mothers' SBR, we used paired Student's t-tests. First, we contrasted mothers' SBR when they were talking to their child with their SBR when they were giving silently attention to him/her. Second, we tested whether they displayed a different SBR when they were talking with the child vs. with an adult.

In order to assess whether a common mechanism modulates a mother's SBR when she talks (either with her infant or with and adult), and/or whether a specific mechanism modulates it when she interacts (either talking or silent) with her child, we additionally performed two correlation analyses.

The mother's SBR while talking to her infant was first matched with her SBR while silent with him/her, then with her SBR while talking with a third adult.

Because the experiment design could not be fully balanced (mothers were not recorded silent with the adult operator), additional comparisons were conducted from results extracted from the literature. The scores are expressed in the form of logarithmic-transform statistics such as the geometric means and confidence intervals (Bentivoglio et al., 1997). For a sound comparison, we computed *geometric* means from our own data.

3. Results

3.1. Effect of the interactional context

When the mother was talking with the child, her average individual SBR ($M = 3.97$, SD = 3.70) was considerably lower than when she was talking with the adult ($M = 14.71$, SD = 12.23); $t(19) = 3.79$, $p < .002$, 95% CI = [4.66, 16.10], $\eta^2 = 0.43$. It was lower when talking than when she was silent with the child ($M = 5.17$, SD = 4.06); $t(21) = 3.19$, $p < .005$, 95% CI = [.41, 1.96], $\eta^2 = .32$.

3.2. Importance of the interaction partner

The correlation analyses showed that mothers' blinking activity while talking with their infants and while silent with their infants were substantially related ($r = .90$, $df = 20$, $p < .0001$, see Figure 2, top), whereas mothers' blinking activity while talking with their infants was not related to their blinking activity during the same activity (talking), performed with the adult ($r = .15$, $df = 18$ as two mothers were never recorded talking with the adult, $p < .52$, see Figure 2, bottom). However, since conventional null hypothesis significance testing is not adapted to corroborate the null hypothesis (Gallistel, 2009) we performed a Bayesian correlation analysis to corroborate this absence of the effect. We compared two models: *M1,* in which mothers' SBR when talking with to infant was predicted by their SBR when talking with the adult and *M0,* in which their SBR when talking to the infant was predicted solely by the mean. Bayes factor analysis with default objective priors yielded a $BF_{01} = 2.16$ in favor of the null model. Although it does not represent strong evidence (Jeffreys, 1961), it still indicates that this data would occur more than twice more likely under the null model than under the alternative model of correlation.

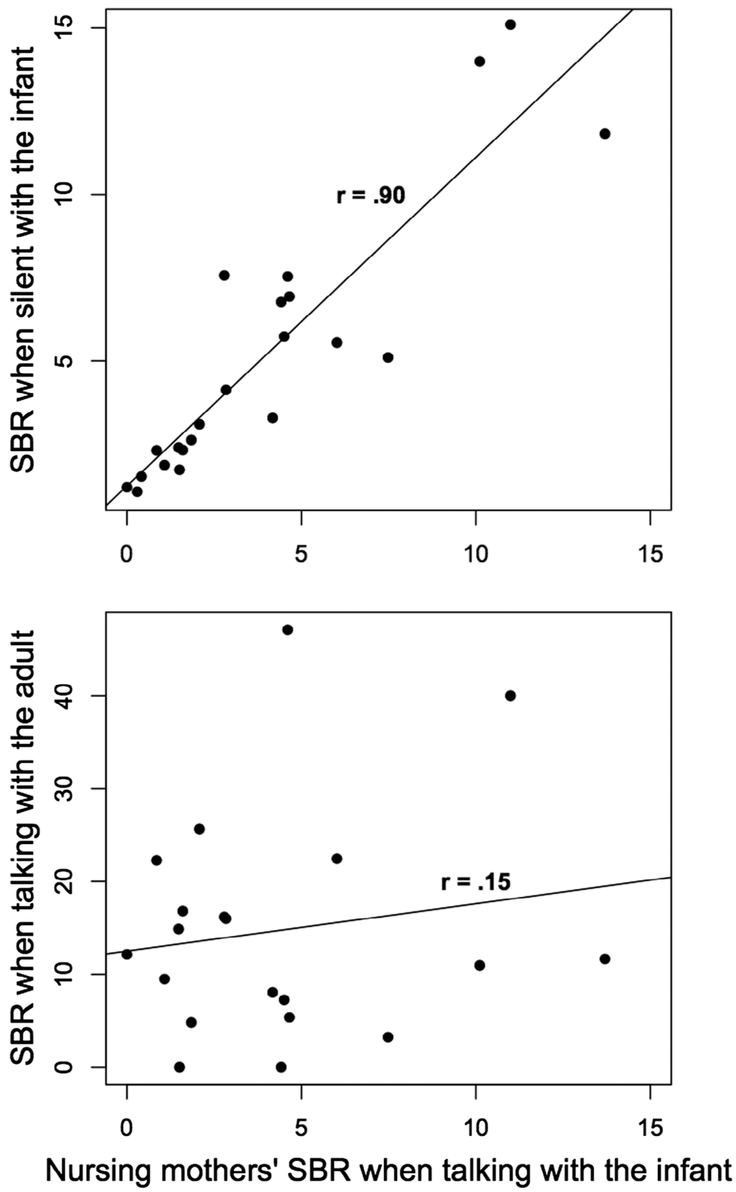
3.3. Comparison with other talking-adult SBR

Bentivoglio et al. (1997) provided SBRs from adults in three prototypical contexts: *reading* considered as a concentration situation, *speaking*, and *at rest*. When silent with her child, our sample mothers' score ($M = 3.96$ SBM, geometric mean computed from individual scores, $N = 22$) resembled that of reading women ($M = 6.20$ SBM) or at least fell within their 10% confidence intervals (0–20 SBM).

When speaking to the child, their score not only remained low, but it got even lower ($M = 3.04$ SBM, geometric mean, one null-value discarded for the logarithmic transform, $N = 21$); it had nothing to do with referenced speaking adults' SBR ($M = 26$ SBM), as it fell far away from the 5% confidence interval (11–53 SBM).

Even when speaking to a third person, the mothers' rate did not reach scores generally referred to those typical of adults, whether in conversation or performing other cognitive tasks reported in the literature (Cruz et al., 2011). This low score ($M = 12.68$ SBM, geometric mean computed from individual scores, $N = 18$ because of two missing values, and discarding two null-values) fell just outside the 10% confidence intervals (13–47 SBM), but inside the 5% confidence interval (11–53 SBM) of adult speaking boundaries. It maybe noticed that just replacing the logarithm of null-values by zero yielded an even lower score ($M = 9.83$ SBM, geometrical mean, $N = 20$).

Figure 2. Correlation between feeding mothers' spontaneous blinking rates (SBR) in blinks per minute when talking with their infant, and: top, when silent with the infant; bottom, when talking with another adult.



4. Discussion

In the particular situation of feeding, mothers displayed a rate of spontaneous eye-blinking (4–5 SBM) that was really lower than those measured in typical adults at rest (17 SBM) or speaking (26 SBM) according to Bentivoglio et al. (1997) and other authors (Al-Abdulmunem & Briggs, 1999; Doughty, 2001; Karson et al., 1981). Their SBR was higher (15 SBM) when they interacted verbally with the adult operator, although not as high as typical speaking adults (26 SBM, Bentivoglio et al., 1997). When they interacted with the infant, it remained an order of magnitude below normal, whether talking (5 SBM) or not. It was then even lower when talking (4 SBM). Thus, during conversation with the adult, blinking was actuated as usually observed in conversations. But with the infant it seemed inhibited even when talking. Increased blinking has been related to specific acts of conversation, while reduced blinking has been observed in various other contexts related to attention. Mother-infant interaction may of course be related to numerous other dimensions.

In line with interactional mother-infant theories, and because feeding is such an intimate moment, we initially considered that the mother's blinking tended to resemble that of her child (Korja, Latva, & Lehtonen, 2012). Infants blink very little, so the mothers focusing on them would drop their own SBR in a similar way. However, our prior investigations in this direction could not support a mimicry effect between the two interacting individuals: no correlation could be shown between the two SBRs among dyads (Descroix). This excludes the mere hypothesis of mimetic resonant blinking and confirms that "blink entrainment is not an automatic imitation" (Nakano & Kitazawa, 2010). Thus, it may remain idiosyncratic under different conditions (Bentivoglio et al., 1997; Ponder & Kennedy, 1928; Zametkin, Stevens, & Pittman, 1979), but not always.

Because mothers' SBRs were unexpectedly low during feeding in a first study, we tested them when they quitted the dyad and interacted with an adult. Because the interaction was then verbal, we selected a situation as comparable as possible with the child, since adults usually increase their SBR when speaking (Bentivoglio et al., 1997; Karson et al., 1981; Ponder & Kennedy, 1928). Why such an increase was not observed when they talked to the infant can be explained based on finer studies of SEB within adult verbal interaction.

Indeed, the mothers' SBR was atypical because they were not in typical verbal interaction, neither judging by the content, nor by the rhythm. We observed for instance, that mothers often used a different case than the second person singular ("you"), a common trait of "baby talk" used for these ages (Bates, 1990; Ferguson, 1975). Out of 37 sessions tested for it, we counted 20 in which such grammatical forms were used occasionally, and 9 sessions in which they were used preeminently. Of course the word content was also different. This difference in content easily explains a difference in rhythm. Because the mother couldn't expect—and never received—verbal answers, the exchange lacked some of the processes commonly involved in discussion between adults: speech turns and other breakpoints of attention (Cummins, 2012; Nakano & Kitazawa, 2010). It is precisely such salient events that are usually timely linked with blink occurrence within a speaking adult dyad. Here, they were not present to increase the rate above baseline. But there is more to it, considering that the rate remained even lower than the 17 SBM typical baseline of the literature (Bentivoglio et al., 1997; Karson et al., 1981; Ponder & Kennedy, 1928). This suggests an additional, inhibitory component.

Levels of SBR below the baseline have already been observed in other contexts of high attention states (Holland & Tarlow, 1972; Ponder & Kennedy, 1928; Shultz et al., 2011), even when speaking. As quoted above, SBR decreases during lying (Fukuda, 2001; Leal & Vrij, 2008), which is peculiar mode of speaking with enhanced attention. Similarly, with her infant, the mother maybe considered in a peculiar mode of speaking with enhanced attention. Along the feeding session, this attention maybe fluctuating. In particular, when speaking with her infant—who could not respond verbally—the mother may have expressed an increased concern for it, correlated with SEB inhibition due to higher attention.

Even when speaking to a third person, the mothers' rate did not reach scores generally referred to those typical of adults, whether in conversation or performing other cognitive tasks reported in the literature (Cruz et al., 2011). The low score we observed with the operator (12.7 SBM, or 9.83 SBM when using transformed null values as zero) were below adult speaking reference values. Given the conditions in which the mothers were recorded speaking with the operator, the difference with those of other—documented—adult speaking (11–53 SBM, Cruz et al., 2011) may appear of limited significance. By contrast, the difference observed between child-addressed and adult-addressed speaking by the same mothers represents a solid result.

Previous investigations on SEB have focused on cognitive tasks, arousal and behavior. The affective dimension of the mother-child exchange maybe suggested as another determinant in the specific, low, SBR recorded in our experiment. Indeed, the duration of the sessions (M = 19 min 50 s, SD = 8 min 44 s) was quite long to imagine such a long time of intense concentration without signs of exhaustion at the end. Records of SBR in other affective situations or emotional states are lacking in the literature to allow comparison. Emotion and affection are hard to manipulate in the lab or to gather through observational designs because they emerge spontaneously. It is likely indeed, that in a different context of mother-infant interaction, such as playing with the child, the same mothers would speak and blink on a different mode. Similarly, the *intentional dimension* of a conversation maybe of importance. In the absence of a specific content to address, especially by information chunks, with acknowledged receipt, certain mechanisms may have not been activated in this context.

5. Conclusion

Our results are in agreement with the idea that adults' higher SEB highly contributes to meta-communication accompanying verbal exchange (Cummins, 2012). In a real-life interactional situation, the observation of feeding mothers provides evidence for previous theories about SEB and interpersonal exchange that have been developed on typical speakers in more controlled conditions: During conversation, the SBR does not rise or fall because of motor processes involved in talking, or by mimicking, but according to the flow of information and its breakpoints. It can be inhibited by inwards concentration or outwards attention; it is modulated by the expectations about the partner's ability to converse. The affective or intentional dimension of the interaction may also explain the low rate observed in mothers; our results await comparable reports that will link SEB with relevant.

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