

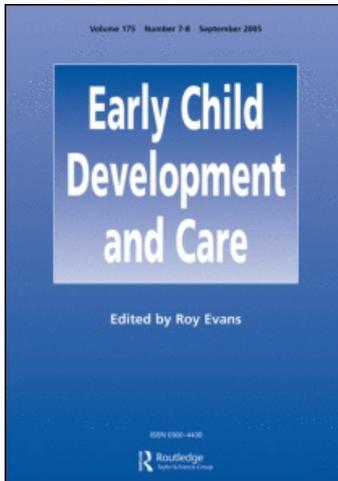
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Brazilian children's behavioural differentiation between the mother, unfamiliar adults and professional caregivers

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Brazilian children's behavioural differentiation between the mother, unfamiliar adults and professional caregivers

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This study took place in two organisations with opposite socio-economic characteristics which gather children (one to four years), their mothers (or nannies), unfamiliar adults and professional caregivers. Pursuant to attachment theory, the children clearly differentiated their mothers from unfamiliar adults according to proximity indicators and time in oriented behaviours. Children's behaviours towards the professionals were assessed on the same criteria: interactions with the professionals were characterised by availability without great proximity; no difference appeared between mothers and nannies. Children's behaviours towards adults were mirrored by adults' behaviours towards children. Implications in the qualification of the relationship to non-parental caregivers are discussed.

Keywords: mother; unfamiliar adults; professional caregivers; nanny; attachment; Brazil

Introduction

Bowlby (1969) enumerated five behaviours revealing attachment: sucking, clinging, crying, following and smiling. These behaviours aim to obtain proximity with the attachment figure. As Feldman and Ingham (1975) emphasised, to be considered as an attachment behaviour, a behaviour should be directed, exclusively, or at least more frequently towards an attachment figure rather than towards an unfamiliar adult. In a validation study, they investigated the frequency of the behaviours indicated by Bowlby (1969) as attachment behaviours. Children aged 1 or 2.5 years participated in the Strange Situation with their mothers or with an unknown adult with whom they just had half an hour of interactions before the procedure. The authors then assessed the frequencies of behaviours with the mother and the other adult. Proximity seeking was the only measure that differentiated significantly between the two kinds of adults, for children aged 1 or 2.5 years old, throughout the procedure, among the five behaviours which Bowlby enumerated. Farran and Craig (1977) studied 14-minute films registering children's behaviours (9–31 months) in a room with the mother, a well-known professional caregiver from the child's daycare. The experimental situation was conceived to be mildly stressful. Children clearly favoured their mothers on the criteria of proximity, physical contact and time in oriented behaviours around an object. No difference appeared between the professional caregiver and the stranger.

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Stroufe and Waters (1977) criticised Feldman and Ingham's approach which was based on frequencies of attachment behaviours, presenting, on the contrary, attachment as an organisational construct in which discrete behaviours do not have a significance in themselves. This qualitative approach based on evaluation procedures as the Strange Situation has relegated the question of the behavioural differentiation between the mother and other kinds of adults to the background.

The approach in terms of behavioural differentiation was reemployed in studies of the attachment to a non-parental caregiver. The question was considered first comparing children's behaviours towards the mother and then towards a non-parental caregiver. In the study of Farran and Craig (1977), the children clearly differentiated these two kinds of adults. Ragozin (1980) compared the frequencies of 17–38 month old children's behaviours towards the mother and non-parental caregivers in naturalist observations in a daycare, during four time frames: arrival, immediate post-separation, free-play (one hour after the mother's departure) and reunion. At the arrival and reunion, proximity, touching, following and communication were preferentially directed towards the mother, while give/take objects did not reach significance. In the immediate post-separation episode, the frequencies of behaviours directed to the non-parental caregivers increased slightly, without reaching the levels observed with the mother. However, the brevity of the episodes of arrival and reunion might have created a bias towards mother in this comparison. Pierrehumbert (2002), in a non-experimental situation, among children aged 3–24 months, found that from nine months onwards the child interacted with his mother in a more proximal way, in opposition to the interactions with a professional caregiver which remained more distal.

A second way the question of differentiation of behaviours towards the non-parental caregiver was considered by comparing behaviours towards non-parental caregivers to behaviours towards unfamiliar adults. In the study of Farran and Craig, although the mother was clearly differentiated, children did not differentiate non-parental caregivers from unfamiliar adults. According to Cummings (1980) in Farran and Craig's study, the mother may have monopolised the attention of the child, preventing the study from bringing to light the difference between non-parental caregivers and unfamiliar adults. Cummings, with children aged 12–28 months, designed a pre-test situation in a playroom with the three kinds of adults and four test situations: mother with stranger; stable caregiver with stranger; non-stable caregiver and stranger and, finally, stable and non-stable caregiver. In pre-test and test situations, proximity behaviours were clearly always directed more towards the mother than towards the other kinds of adults, confirming the studies previously cited. Nevertheless, non-parental caregivers were preferred to unfamiliar adults although the difference was far less important than the difference between the mother and the non-parental caregivers. There was no significant difference between stable and non-stable caregivers on proximity behaviours. The conclusions of these studies cannot, however, be generalised to all non-parental caregivers. In the case of Kibbutz (when children slept together and not with their mothers), the metapelet and the mother appeared largely interchangeable on the criterion of proximity-seeking behaviours (Fox, 1977).

In the study of the differentiation of a child's behaviour as contingent on the kinds of adults, the context becomes of crucial importance. Indeed, according to Bowlby's (1969) theory the attachment system is activated by a contextual element and then deactivated when proximity with the attachment figure is attained. A stressful context is likely to trigger proximity seeking towards the attachment figure, a proximity,

which, in turn, allows a reduction of the stress level. This link between stress and proximity with the attachment figure is found at the level of the physiological structures underlying stress (Susman, 1998). It is also found in various species. In a series of experiments, the young ones of different species of guinea pigs were placed in a stressful novel environment (Graves & Hennessy, 2000; Hennessy, Neisen, Bullinger, Kaiser, & Sachser, 2006). For the guinea pig species in which the mothers were able to reduce the neuroendocrine stress response of their young ones more than unfamiliar females, the young ones differentiated behaviourally their mothers with proximity behaviours. Conversely, for the species whose mother's presence was not efficient to reduce stress, the young ones did not differentiate the mother from another unfamiliar female on proximity behaviours. Suomi (1999) concluded the same in monkey species and showed that stress reduction is directly linked to physical contact. Ainsworth, Bell, and Stayton (1979) showed that physical contact initiated by the mother was the more efficient way to stop infants' cries. This strong link between stress and proximity seeking suggests that proximity behaviours could only allow the differentiation of the attachment figure in more stressful situations, which was the case in the majority of the existing studies, conducted in a laboratory. The context also intervenes at the immediate level of the behaviours preceding and following the proximity behaviours. The study by Tracy, Lamb, and Ainsworth (1976) clarified this question in an empirical way. The study specified the approach behaviours according to the behavioural context (simultaneous behaviours or behaviours immediately preceding or following the approach behaviour). Their study aimed at differentiating the behaviours of children (aged 26–54 weeks), observed at home, towards their mothers and the researcher. Approaches without contextual distinction slightly differentiated the two kinds of adults, in favour of the mother ($p < 0.05$); however approaches terminating in a pickup appeal or accompanied by cries were directed almost exclusively to the mother ($p < 0.0001$). On the contrary, approaches in a context involving an object were more often directed to the researcher than to the mother ($p < 0.002$). This study seems to confirm Hay (1980) who emphasised that approach behaviour could also take place in contexts not pertinent from an attachment point of view as learning or aggression. As Schneider-Rosen (1990) reiterated, two behaviours, morphologically identical, can assume two different functions in two different contexts. These considerations seem to strongly reduce the possibility of differentiating the attachment figure from other kinds of adults by observing towards whom a child directs his proximity behaviours. This approach could only be valid in a stressful situation and limited to proximity behaviours taking place in specific behavioural contexts. Nevertheless, Hay (1980) wrote that it is possible to distinguish three functions in proximity seeking with the attachment figure: episodic, ontogenetic and phylogenetic. According to him, the episodic function consists in relieving the child's stress. The ontogenetic function is to build the attachment link. For that matter, in Suomi's study (1999), the Rhesus monkeys (*Macaca mulatta*) that were able to attain more proximity with their mothers succeeded in delaying their return to reproductive receptivity. Proximity seeking appeared then to reinforce the attachment link. The study of Anisfed, Casper, Nozyce, and Cunningham (1990) found that physical contact, artificially enhanced on a high-risk sample, influenced the quality of attachment, resulting in a doubled proportion of secure attachments (mothers were randomly assigned to a baby carrier group or an infant seat group). According to Hay, the phylogenetic function would be the protection against predators. Polan and Hofer (1999), following their studies on rats, suggested that the phylogenetic function included a body of physiological regulations

necessary to the survival of the young ones. Considering the aforementioned two functions, it seems possible to make the hypothesis that proximal behaviours are not related to attachment just in the case of stress and, therefore, that a child would seek proximity with the attachment figure more than with another kind of adult, even without an immediate stress stimulus.

Finally, the studies addressed above show that children clearly differentiate the mother from an unfamiliar adult on the criterion of proximity behaviours. For the non-parental caregivers, the studies appear more inconclusive. The children seem to differentiate non-parental caregivers clearly from the mother who is clearly privileged on proximity behaviours, the exception being non-parental caregivers who are intensely involved in the care of the children. However, the differences between non-parental caregivers and unfamiliar adults appear less clear and determined more by the context of the experience. These studies of the differentiation of children's behaviours according to the kind of adults are relatively scarce and were collected mainly in a laboratory setting. Even if studies outside the home setting are on the rise, still little is known about the relationship of children with non-parental caregivers (Ahnert, Pinquart, & Lamb, 2006; Goossens & van Ijzendoorn, 1990) and less on the question of behavioural differentiation. Indeed, procedures as the Strange Situation, designed to assess the relationship with the main attachment figure, were used for the non-parental caregivers (Ahnert, Lamb, & Seltenheim, 2000). Moreover, all these studies examine the attachment behaviours of the child, putting aside the behaviours of the adult partner. The interest in the caregiving system is less and more recent (Bell & Richard, 2000; George & Solomon, 1999). Bowlby (1969) noted that, despite their essential asymmetry, attachment and caregiving systems appear similar on two points: proximity seeking and a reaction of stress when this proximity cannot be attained. Laboratory procedures do not favour the study of the caregiving system as adults receive strict instructions regarding their behaviours, limiting their initiative.

The present study attempted to investigate, in a non-experimental situation, the differences in children's proximity behaviours towards several kinds of adults: the mother, non-parental caregivers more or less involved in the care of the child (staff of the organisation or nannies) and unfamiliar adults. It was hypothesised that, even in a non-experimental situation, the child would clearly differentiate the mother from unfamiliar adults. Conversely, children's behaviours towards the non-parental caregiver would depend on their involvement in the child's care. Moreover, it was hypothesised that the differences shown in the behaviours of children towards the different kinds of adults would also be observed in the behaviours of the different types of adults towards children.

Method

Participants

This study was conducted in two places dedicated to children in the state of Rio de Janeiro, Brazil. The two places, belonging to two different centres, C1 and C2, had several common points. Unlike in usual daycare centres, these children always have to be accompanied by a responsible adult, the mother most of the time. In C1 and C2, children could move freely in a play area where there were their mothers, professional caregivers and unfamiliar adults. Families were free to frequent those places and, thus, the regularity of the child's attendance was variable. As one of the aims of these structures is to foster parentality and child development, the professionals had all graduated

or were graduating in psychology. Moreover, every team of C1 came once a week, on a given day. In C2, the professionals worked various shifts a week. In these two centres, children therefore had access to the aforementioned different kinds of adults and to other children. Nevertheless, the places were essentially different on one point: the socio-economical level of the families attending them. C1 is situated in the neighbourhood *Ilha da Conceição*, in *Niterói* city. Low-class families inhabit this neighbourhood especially for those living in the favela-like areas (for a description of the favelas, a particular kind of shantytown, one can consult Perlman, 2003 and Valladares, 2000). C2 is situated on a country club's property in the neighbourhood *Jardim Botânico* and is attended by inhabitants of several wealthy neighbourhoods of the south of Rio de Janeiro. In C1, the tuition is free of charge. In C2, the monthly tuition fee for the C2 for one child is similar to the average monthly salary of the mothers of *Ilha da Conceição* who work as household service workers several times a week. This fee is equal to nearly two-thirds of their minimum wage. These different socio-economic contexts are reflected in the surface area of the centres themselves. C2 is larger and allows for more children.

The attendance was optional and thus variable from child to child, and only the children observed more than one hour were considered in the analysis. At C1, 22 children (12 girls, 10 boys) were observed for more than one hour ($M = 4.7$ h, $SD = 4$), and the mean age was 37 months ($SD = 14$). At C2, 25 children (11 girls, 14 boys) were observed for more than one hour ($M = 1.9$ h, $SD = 0.9$) and the mean age was 26 months ($SD = 8$). Among those 25 children at C2, 11 could also be observed with their nannies in the absence of the mother. Finally, 12 children were observed solely with their nannies. At C1, children did not have a nanny as the mothers could not afford it. The characteristics of the children observed with their nannies will be specified in the text when treating the question of the nanny. The influences of gender, age and time of observation per child will be examined in the 'Preliminary Results' section.

The mean number of professionals were 2.8 ($SD = 0.3$) at C1 and 5.1 ($SD = 0.5$) at C2. The children/professional ratio was low in the two centres: C1 ($M = 2.3$, $SD = 0.9$) and C2 (2.5 , $SD = 1$).

Given the fact that attendance was optional, beyond the control of the author, the samples of the two centres are not similar on the criterion of age, sex and time in observation. Also, the socio-economic characteristics of the families could not be collected uniformly, which did not permit the researcher to quantify the clear socio-economic opposition between the two structures. For these reasons, the data of the two centres will be considered as replications and the analysis will be conducted in parallel.

Measures

The data were collected using focal sampling (Lenher, 1997) which allows observation of behaviours of the focal subject towards a partner and, conversely, the behaviours received by the focal subject from the partner. The behaviours were registered on lined paper with time markers (Archer, 1992), and categories of behaviours and their duration were also collected. We were not allowed by the organisations to film in order to avoid interfering with the activities and for security reasons. Nevertheless, the study by Tracy et al. (1976) demonstrated that even detailed notes allow a reliable approach in terms of frequencies, reducing the variability inherent in short duration of observation.

In the first place, the duration of behaviours oriented towards different kinds of adults was noted, whether the child or the adult took the initiative of the interaction, and without distinction of the kind of behaviour. This duration was divided by the total time of observation for that child.

Pierrehumbert (2002) considered a behaviour as a proximal solicitation when the child moved towards the adult, called or cried until physical contact was established. This definition did not allow the differentiation between the interactions initiated by the child and those initiated by the partner, which was essential in the present study. This definition allowed Pierrehumbert to include in his study three month old children who were unable to reach the adult by themselves. Here, all children could walk properly. Consequently, a behaviour was considered proximal when it implied approaching and/or touching the adult. The same definition was used for a behaviour of the adult towards the child. The behavioural context, as defined earlier on the basis of Tracy et al. (1976) was crucial. Therefore, all approaches or touching in agonistic, control, object-related or play contexts were not considered. All approaches of adults that were not oriented, at least visually, were not considered either. Indeed, in a space where numerous adults are present, such a measure would have implied an important bias. Besides, Tracy et al. (1976) found that a mere approach without any orientation did not allow a child to differentiate the attachment figure from the other adult. Finally, the frequency consisted in the number of proximal behaviours as defined, divided by the time of oriented behaviours (in hours) towards a kind of adult.

Physical contact was estimated by time spent in physical contact with a type of adult divided by the time spent in oriented behaviours towards the same class of adult. This indicator could increase to above one because a child could be, for instance, in physical contact with his mother, without his behaviour being directly oriented towards her. This indicator differed from the proximal behaviours frequency in two ways. First, no distinction was made as to whether the adult or the child initiated the contact. Furthermore, physical contact was considered regardless of the behavioural context. This item was not collected for unfamiliar adults.

Statistics

Nonparametric statistics were used: Wilcoxon's test for matched samples, *U* Mann-Whitney for independent samples and Spearman's test for correlations. An alpha level of 0.05 was used for all statistical tests. In case of multiple comparisons on matched samples, Friedman's test was performed for global comparison; in cases of a significant result, the critical difference is given for alpha = 0.05 (see Siegel & Castellan, 1988, p. 180) and, for each comparison, the difference *d* of the rank sums. In coherence with the use of nonparametric statistics, the graphs show medians for central tendency and variability are indicated by interquartile ranges and the first and last decile.

Results

Preliminary results

The influence of three variables – gender, age and time of observation per child – was checked on the four retained measures – time in oriented behaviours, proximal behaviours towards adults, proximal behaviours received from adults and the indicator of

physical contact. Tests were conducted for these four items, for the three classes of adults – mother, professionals and unfamiliar adults – in the two centres.

Concerning gender, among all verifications, just one reached significance: proximal behaviours of the children towards professionals, in C2, with a weaker frequency for girls than for boys ($U = 38, p < 0.05$). Thus, gender did not seem to play a decisive role on the four measures.

There was a negative correlation between age and time in oriented behaviours with the mother which reached significance at C1 ($r_s = -0.62, p < 0.01$), and nearly reached significance at C2 ($r_s = -0.36, p = 0.076$). The physical contact diminished significantly at C2 in function of the child's age ($r_s = -0.60, p < 0.01$) and went in the same direction at C1, without reaching significance ($r_s = -0.36, p = 0.10$). Proximal behaviours given or received by the child did not vary with age, as far as interactions with the mother were concerned. Time spent with the professionals increased with age at C2 ($r_s = 0.48, p < 0.5$), a tendency not confirmed at C1. The indicator of physical contact with the professionals diminished at C1 ($r_s = -0.42, p < 0.5$), but this was not confirmed at C2. Proximal behaviours given or received by the child did not vary with age, for interactions with the professionals. For interactions with unfamiliar adults, only proximal behaviours received varied with age at C1 ($r_s = -0.43, p < 0.5$). Eventually, age seemed to influence in a coherent way only the time of interaction and the time in physical contact with the attachment figure, which diminished with age. Proximal behaviours did not vary with age.

As seen earlier, because of the optional attendance of the places, the variability of the time of observation per child was important, notably at C1. No significant effect appeared regarding interactions with the mother. However, the time of observation per child consistently influenced the four measures regarding the professionals at C1. The more time a child was observed, the proportion of his time spent with the professionals ($r_s = 0.46, p < 0.05$); the frequencies of proximal behaviours towards the professionals ($r_s = 0.48, p < 0.05$), as received from the professionals ($r_s = 0.52, p < 0.05$), and the indicator of physical contact with the professionals increased ($r_s = 0.54, p < 0.05$).

The total time of observation per child is itself strongly correlated with the attendance of the space ($r_s = 0.86, p < 0.0001$). Similar variations of interactions with the professionals were not found at C2, presumably because of the reduced variability of the time of observation per child. For the unfamiliar adults, only proximal behaviours from adults towards children increased significantly at C1 ($r_s = 0.60, p < 0.01$). However, given the number of zero frequencies (many children did not receive any proximal behaviour from an unfamiliar adult) this isolated result does not appear reliable.

The results presented thereafter concerned matched samples, i.e. different measures for the same child of a given age at the same observation time. As this study did not aim to compare the two places or different groups, age and observation time did not introduce a statistical bias. Nevertheless, they are of interest for the analysis and are discussed later.

In Figure 1b, it can be noticed that the median of the frequency of proximal behaviours towards unfamiliar adults is zero. Tracy et al. (1976) found that some behaviours are almost exclusively directed to the attachment figure with a very high significance ($p < 0.0001$). It seems then coherent that more than 50% of the children did not present any proximal behaviour towards unfamiliar adults, explaining a median of zero. The nonparametric tests used here should take into account this elevated number of null

frequencies (Weaver & de Waal, 2002). Besides, given the much reduced time devoted to unfamiliar adults, even a few proximal behaviours could lead to high frequencies in some cases, explaining the important variability.

As Figure 1a shows the proportion of time in oriented behaviours towards each category of adults varied extensively, with a global test highly significant ($p < 0.0001$). The critical difference for each possible comparison, with $n = 22$ was 15.9 and remained equal for each comparison of Figure 1. If the difference between rank sums for two classes of adults rose above this value of 15.9, then this difference was significant with $\alpha = 0.05$. No difference appeared in amount of oriented behaviours towards the mother in relation to the whole professionals at C1 ($d = 2$). However, the difference was significant between the mother and the unfamiliar adults ($d = 32$), as between the professionals and the unfamiliar adults ($d = 34$). Children spent an equal amount of time in behaviours oriented towards the mother and the professionals. The graph clearly shows a greater availability of professionals whereas time in oriented behaviours towards the unfamiliar adults remained almost inexistent.

The frequencies of proximal behaviours performed by the child (Figure 1b) appeared highly different between the three classes of adults ($p < 0.0001$). With multiple comparisons, the difference between the mothers and the unfamiliar adults ($d = 32$) as well as the difference between the mothers and the professionals ($d = 28$) reached significance. On the contrary, the difference between the professionals and the unfamiliar adults was revealed to be nonsignificant ($d = 4$). The attachment figure was then clearly differentiated by the children whereas the difference between the professionals and the unfamiliar adults turned out to be nonsignificant. The contrast between the two first graphs is striking: if the class of the professionals appeared closer to the mother in term of quantity of oriented behaviours, it was revealed to be more similar to the unfamiliar adults in terms of proximity.

Time in physical contact divided by time in oriented behaviours in Figure 1c shows a very strong difference between mothers and professionals ($T = 0, p < 0.0001$). Thus, proximal behaviours like physical contact indicate coherently that proximity seeking and physical proximity are clearly stronger with the mother than with the professionals.

The graph of Figure 1d concerning the proximal behaviours received from the adults shows that, at C1, the hypothesis of reciprocity, made in the introduction, was confirmed. The global difference remained highly significant ($p < 0.0001$). A clear difference appeared between the mother and the unfamiliar adults ($d = 29.5$) as between the mother and the professionals ($d = 24.5$). The frequency of proximal behaviours of the mother towards the child was more elevated than the frequencies for both the professionals and the unfamiliar adults. On the contrary, the difference between the professionals and the unfamiliar adults appeared to be nonsignificant ($d = 5$). A clear similarity was thus observed in the behaviours of the children towards the adults and of the adults towards the children. In both instances, the proximity clearly differentiated the attachment figure from the other two kinds of adults. On the contrary, no difference appeared between the professionals and the unfamiliar adults within this criterion.

At C2 (Figure 2a), the graph of time in oriented behaviours followed the same scheme as at C1, the mother being clearly favoured and professionals being greatly available as compared with unfamiliar adults. The global difference between the three types was highly significant ($p < 0.0001$). The critical difference for the multiple comparisons was 16.9 for C2 ($n = 25$), equal for all multiple comparisons in Figure 2.

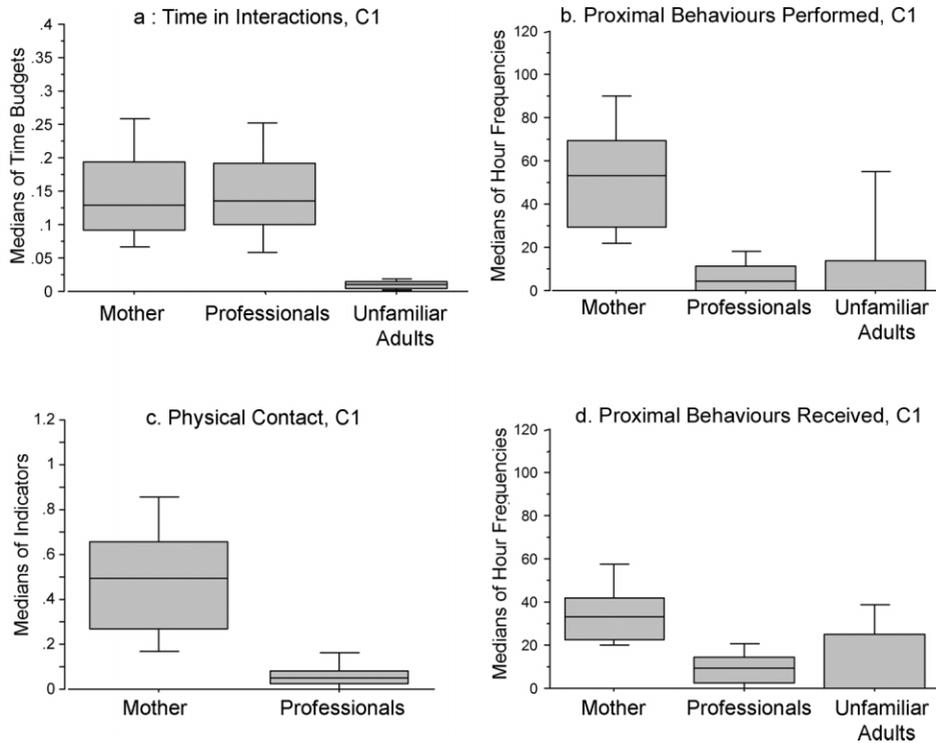


Figure 1. C1 ($N = 22$), medians, interquartile range, first and last decile, for time in oriented behaviours, indicator of physical contact, hour frequencies of proximal behaviours performed and received.

For time in oriented behaviours with the mother or the professionals, the difference, even more visible in the graph of Figure 2a than at C1, did not reach significance ($d = 9$). On the contrary, between the mother and the unfamiliar adults ($d = 42$) and between the professionals and the unfamiliar adults ($d = 33$), the differences were significant.

The global test for the frequencies of proximal behaviours of children towards adults in Figure 2b was strongly significant ($p < 0.0001$). As at C1, the difference between the mother and the unfamiliar adults was significant ($d = 42$) as it was between the mother and the professionals ($d = 27$). If the median frequency of proximal behaviours towards the professionals seemed more elevated than towards the unfamiliar adults (proximal behaviours were inexistent for that class of adults), the difference did not reach significance ($d = 15$).

At C2, time in physical contact divided by time in oriented behaviours in Figure 2c showed a very strong difference between the mother and the professionals ($T = 0$, $p < 0.0001$), as at C1.

The situation was the same for proximal behaviours received from the adults, Figure 2d: a global test highly significant ($p < 0.0001$), clear differences between the mother and the professionals ($d = 32$), the mother and the unfamiliar adults ($d = 34$), whereas the difference between the professionals and the unfamiliar adults remained nonsignificant ($d = 2$). The conclusions were similar at C2 and C1. The professionals appeared closer to the mother as to time in oriented behaviours but did not differ

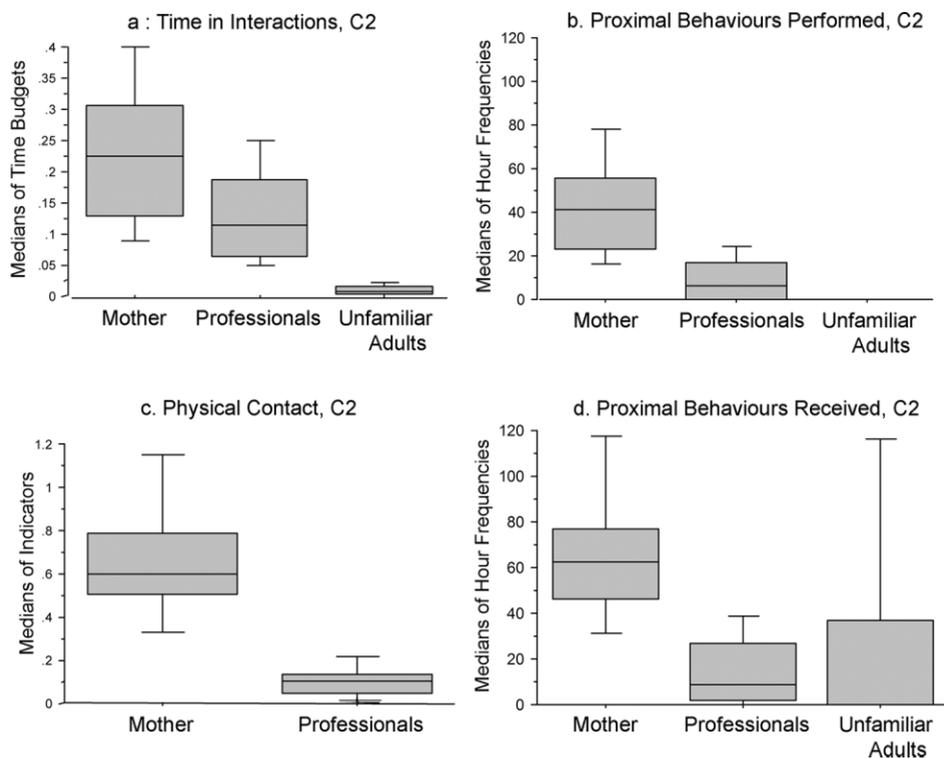


Figure 2. C2 ($N = 25$), medians, interquartile range, first and last decile, for time in oriented behaviours, indicator of physical contact, hour frequencies of proximal behaviours performed and received.

significantly from the unfamiliar adults in regards to the frequencies of proximal behaviours given or received.

Finally, the differences between mothers and nannies were investigated. As stated in the introduction, out of the 25 children observed with their mothers at C2, 14 were observed only with their mothers but 11 children were also observed with their nannies. Moreover, 12 children were observed only with their nannies. Figure 3 indicates the results for children observed in the two conditions, on the matched sample ($n = 11$) and on independent samples ($n = 14$ with the mother and $n = 12$ with the nanny). For the matched sample, age and gender were identical. Nonetheless, as children were observed at different moments with their mothers or with their nannies, the total time of observation per child in the two conditions differed (with the mother: $M = 1.9$ h, $SD = 0.9$; with the nanny: $M = 2.4$ h, $SD = 0.9$), but not significantly. For the independent samples, the gender repartition between the two groups was equal (with the mother: 7 boys, 7 girls; with the nanny: 6 boys, 6 girls). Neither age (with the mother: $M = 25$ months, $SD = 7$; with the nanny: $M = 21$ months, $SD = 4$) nor the time of observation (with the mother: $M = 1.8$ h, $SD = 1$; with the nanny: $M = 2.3$ h, $SD = 1$) differed significantly between the two groups.

As for the time in oriented behaviours with the mother or the nanny in Figure 3a, no difference appeared on independent samples ($U = 50$, $p = 0.08$), which was confirmed with the matched sample ($T = 31$, $p = 0.86$). As for the proximal behaviours

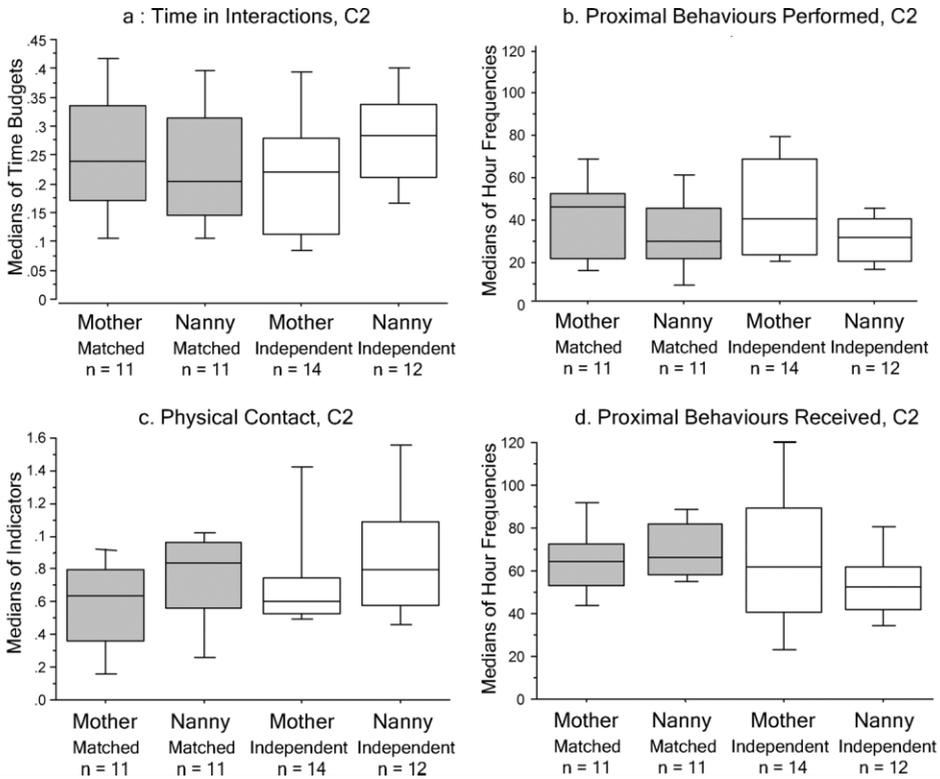


Figure 3. Comparisons mother–nanny, C2 (matched samples $n = 11$; independent samples, mother: $n = 14$, nanny: $n = 12$), medians, interquartile range, first and last decile, for time in oriented behaviours, indicator of physical contact, hour frequencies of proximal behaviours performed and received.

from children towards adults in Figure 3b, no difference appeared on independent samples ($U = 51, p = 0.09$) nor with the matched sample ($T = 23, p = 0.38$). The results were the same for physical contact in Figure 3c with independent samples ($U = 61, p = 0.24$) or the matched sample ($T = 13, p = 0.076$). Proximal behaviours from adults towards children, in Figure 3d, did not show any difference with independent samples ($U = 65, p = 0.33$) nor with the matched sample ($T = 22, p = 0.33$). No difference was found here between the two classes of adults accompanying the child: mother or nanny.

Discussion

First, this study confirms that, even in a non-experimental situation in a non-domestic place characterised by the presence of several types of adults at the same time, children clearly direct more proximal behaviours to the mother. Furthermore, this study confirms the hypothesis that the differences in the child's behaviours towards different kinds of adults would be reflected in the adults' behaviours towards the child. There is thus a real interaction profile which emerges: reciprocal high frequency of proximal behaviours with the mother and reciprocal low frequency of proximal behaviours with

the unfamiliar adults. Gender does not seem to influence the items examined here, confirming Tracy et al. (1976). With age, time in oriented behaviours and physical contact with the mother tend to diminish. The other indicators are not affected by children's age.

Regarding the non-parental caregivers, the conclusions appear very different depending on their involvement in the care, confirming the hypothesis made in the introduction. The notion of non-parental caregiver includes heterogeneous realities.

As we saw in the introduction, no significant difference appeared in proximity behaviours towards the mother or the metapelet in the specific case of the Kibbutz (Fox, 1977). The relationship with the nanny, in this study, seems to follow the same model: no significant difference appears between the mother and the nanny. In Brazil, because of the strong inequalities, domestic work is cheap for wealthy families who, in certain cases, can offer one nanny per child. Therefore, nannies are present all day with the children and, most of the time, at night too, at least during the week. Nannies may then be as present as mothers, and sometimes more so. Specifically, attachment seems to build mainly on social interactions, the child selecting as attachment figure the individual who has interacted more with him (Main, 1999). For this reason, it is possible that the primary attachment figure of the child is not the mother (Ainsworth, 1979). For instance, among the Hausa, the primary figure is the adult who holds the infant more or interacts more with him, not necessarily the mother (van Ijzendoorn & Sagi, 1999).

The present study did not aim to ascertain the primary attachment figure. Furthermore, children were observed separately with the mother or the nanny and not simultaneously. Nevertheless, such close results between the two groups suggest that, in some cases, the nanny could be the primary attachment figure. Some anecdotal results from this sample show that, in one case, a child spent weekends at the nanny's house (keeping in mind what this means in terms of socio-spatial context). The mother blamed the nanny for being 'glued' to this child, a reproach that nannies who were interviewed by the sociologist Cheever in the USA mentioned too. The mothers get angry because the children become 'attached' (Cheever, 2003, p. 34) to the nannies. This child and several others at C2 used to show a high distress when the nannies went on vacation, wishing to stay with the nanny rather than with the parents. The present results seem to be the behavioural equivalent of what Russell Hochschild (2003, 2005) described from a sociological point of view: The transference of the maternal love of the nannies immigrating to the USA, from their own children to the American children they have to care for. In conclusion, this would be a Brazilian version of the 'care drain' (Russell Hochschild, 2003, p. 17): wealthy families offering to their children the care of poor women (at the expense of their own children notably in the case of regional immigration in Brazil where some women leave their infants in Nordeste and migrate to the bigger towns in the southeast).

Sagi, Koren-Karie, Gini, Ziv, and Joels (2002) showed nonetheless that, on an Israeli sample, the fact of being cared for by a paid caregiver did not seem to compromise the attachment to the mother. But the study did not mention the length of the care nor tried to compare the attachment to the mother and to the paid caregiver. Moreover, it seems that, if this would lead to any damage, it would be at the departure of the nanny. Indeed, as long as the nanny is there, the child has two potential attachment figures who should aid in his development. Nonetheless, the children consider the nanny's presence as definitive as Cheever (2003) reported. When the nannies leave permanently, the children can appear 'devastated' (Cheever, 2003, p. 35). The present

study cannot conclude on these matters but highlights the interest to study them more deeply, notably the questions of the primary attachment figure and the potential consequences of separation with nannies.

Regarding the other kind of non-parental caregiver discussed in this study, the conclusions are quite different. The time in oriented behaviours is similar towards the mother and towards the professionals. On the contrary, the frequency of proximal behaviours, given and received, is similar for the professionals and the unfamiliar adults. Clearly, the great availability manifested in the relationship with the professionals does not mean a greater proximity.

Two aspects of this study may have reinforced the absence of a differentiation between the professionals and the unfamiliar adults regarding proximal behaviours. First, as Cummings (1980) noted about the study of Farran and Craig (1977), this absence of difference might be attributed to the competing presence of the mother. Nevertheless, the results of Farran and Craig (1977) did not show any difference between the professionals and the unfamiliar adults, whereas here a clear difference appears as to the time in oriented behaviours. Thus, the mother did not capture all the child's attention.

Second, the turnover of the professionals in the two centres may have rendered difficult the familiarisation with any professional in particular. Furthermore, in the 'Preliminary Results' section it was noted for that matter that the greater the total time of observation per child (associated with a higher attendance of the centre), the more the four measures – time in oriented behaviours, proximal behaviour towards the professionals and, reciprocally, from the professionals towards the child, and physical contact – increased at C1, which can be seen as a sign of a progressive familiarisation. Valaik Barnas and Cummings (1994) showed similarly that children in a daycare centre, in cases of distress, directed more proximal behaviours, proximity seeking and distal interactions towards the caregivers who were stable in the structure rather than towards unstable caregivers. Nevertheless, Cummings (1980) results showed that in the laboratory the children did not distinguish between stable and non-stable caregivers and, moreover, the distinction between the professionals and the unfamiliar adults was clearly weaker than the distinction between the mother and the professionals. Furthermore, 40% of the children failed to approach either the caregiver or the stranger during any caregiver trial and, thus, did not differentiate them. Finally, the greater differentiation of proximal behaviours seems to remain between the mother and the other kinds of adults as to proximal behaviours. Pierrehumbert's study (2002) showed that, from nine months onwards, children presented more proximal solicitation to the mother. Nevertheless, the quantity of positive contacts (proximal and distal together) did not differ significantly between the mother and the professional caregiver. Thus, it confirms that availability does not necessarily indicate proximity. This author concluded that there was no 'competition' (Pierrehumbert, 2002, p. 242) between the mother and a professional caregiver because, despite the numerous positive contacts with the professional, the child made a clear qualitative distinction (an absence of competition that we did not observe in the mother–nanny comparison, as mentioned earlier).

If the relationship with the nanny seems to foster an attachment difficult to distinguish from the attachment to the mother, the nature of the relationships with the professionals appears less obvious. The relationship with the professionals is clearly important, but does not indicate necessarily an attachment. A study by Howes (1999) clarifies the question. Indeed, Attachment Q-Sorts were conducted in daycare centres

with professional caregivers. The result was 50% of avoidant attachments, a proportion higher than expected. With a more precise review of the results they realised that these children in fact showed great interactions and negotiations with the caregiver. The children used the caregivers as a base to explore their social environment and as a base for learning but without spending much time with them, confirming that interactions with professional caregivers seem more distal. Furthermore, according to Lamb and Ahnert (2000) the professionals are relatively helpless to buffer the distress of the children in the first six months in a daycare centre, which an attachment figure should otherwise be able to do. Moreover, antecedents and consequences of the relationships to the professional caregivers do not seem to be similar to the attachment to the mother (Ahnert & Lamb, 2000; Ahnert et al., 2000).

It remains then to qualify the relationship to professionals of daycare centre regarding attachment. Cummings (1980) states that children seem to form an intermediate attachment with these caregivers. On the contrary, Ahnert and Lamb (2000) consider that the relationship with professionals may be functionally and developmentally different from the relationship with the mother. According to these authors, some children may simply view them as companions or guides, rather than as intimates or attachment figures. As Bowlby (1969) noted, it is necessary to differentiate the different classes of interactions and partners, without talking of attachment behaviours for all behaviours and of attachment relationship for all partners. Some figures, he added, can sometimes play the role of subsidiary attachment figure, whereas their principal mode resides in social interactions and play. Attachment as a template thus might be confusing more than enlightening. The heterogeneity of forms of non-parental caregiving and their implications on children/non-parental caregivers relationships represent another difficulty. Certain modes of care foster an attachment similar to the attachment to the mother, others foster relationships with specific characteristics, which implies to avoid generalisation across circumstances as Lamb and Ahnert highlighted (2006).

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