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The construction of child-caregiver relationship in childcare centre: Adaptation of *Parent Attachment Diary* for professional caregivers

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From their origins, Italian early childhood services paid attention to the transition from family to childcare centre, explicitly referring to attachment theory. In the present study, the *Parent Attachment Diary* was adapted and applied within a childcare centre context to examine the development of infants' relationship with their professional caregivers during the earliest months of attendance. The research focuses on two studies, using the adapted version of PAD, the *Professional Caregiver Attachment Diary* (PCAD). The two studies involved a total of 87 professional caregivers and 222 infants aged between 4 and 35 months (M= 16 months). After both 2 and 4 months after starting the childcare centre, children show a significant decrease of *Avoidant* and *Resistant* attachment behaviours, but *Secure* behaviours do not increase over time. However, behaviours coded as *Non Distressed* significantly increase, which could indicate children feel more secure in the new setting of care over time. These results demonstrate the utility of the PCAD to describe the *process* of adaptation in the new context.

Keywords: childcare centre; *inserimento* (settling-in phase); Parent Attachment Diary (PAD); Professional Caregiver Attachment Diary (PCAD); multiple attachments.

Introduction

From their origins (1971)[1], Italian early childhood services paid attention to the transition from family to childcare centre, explicitly referring to attachment theory (Mantovani, 1987, 2001; Mantovani, Restuccia-Saitta and Bove, 2008). In childcare centre, infants open their eyes to a new setting, new people and new routines, and need a secure base from which they are able to explore, play, and feel protected. However, this transition is delicate, not easy and rarely without any conflicts. Their secure base develops progressively, the relationship with a new caregiver is significant to bridge mother-child separations during this process (Anderson, 1980) and the *inserimento* (*settling-in phase*) is thought up for this. During the *inserimento*, that generally lasts for two weeks, a familiar person (the mother or others main caretakers, such as fathers or grandparents) stays at the childcare centre to support the child building new relationships, to gradually manage the separation, offering him/her the possibility to experience separation and reunion.

The two weeks of *inserimento* are not enough to be familiar with the new context. Relationship building is a process that needs time, in which the child and the professional caregiver understand and get to know each other (Goossens and van IJzendoorn, 1990; Raikes, 1993). At the beginning, the toddler views the caregiver as a stranger, but over time, the new figure will be the main caretaker in the new context, preferred play partner and then his/her secure base (Lee, 2006). The literature mixes

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[1] The 1944 Law (*Piano Quinquennale per l'istituzione di asili-nido comunali con il concorso dello stato*) establishes public nurseries for the first time, managed by the municipalities with the contribution of the State.

different opinions about this point: some studies found that in general it takes around 6 to 8 weeks to build a firm relationship with the new supportive caregiver (i.e. Lee, 2006); others argue that more than 4 months are needed to observe secure attachment increasing (Datler et al., 2012; Howes & Oldman, 2001; Ereky-Stevens et al., 2018; Raikes (1993) observed that at least nine months attending the childcare centre are needed to develop secure child-teacher relationship.

However, to our knowledge, little empirical research (for instance, see Dalli, 2000) addresses the development of relationship with the professional caregiver(s) during this time; moreover, the tools evaluating the *process* of child familiarization to the new context are very scarce, and research on attachment to professional caregivers use tools conceived for the measure of attachment to mother, such as the *Strange Situation Procedure* (SSP: Ainsworth, Blehar, Waters and Wall, 1978) or the *Attachment Q-Sort* (AQS: Waters and Deane, 1985), which are not totally adequate to the day-care context (Friedman and Boyle, 2008). Based on these considerations, our purpose was to adapt and apply the *Parent Attachment Diary* (Stovall and Dozier, 2000) to the childcare centre context.

The *Parent Attachment Diary* (PAD) was developed to assess infant's attachment behaviours based primarily on Ainsworth's observations during the Strange Situation (Ainsworth et al., 1978), and it was designed to study the construction of attachment relationship in the U.S. context of foster care. It is a structured diary, filled daily by foster parents for 2 months from the arrival of the child in the foster family. The diary is structured to record the daily attachment behaviours that the child shows in specific stressful situations, that elicit attachment behaviours, in order to follow the early attachment developments in the new context (Molina, and Casonato, 2012, 2013).

A similar process of attachment building may be observed during the settling-in phase, addressed to the professional caregiver that welcome the child in the new environment. Therefore, we hypothesized that an adaptation of PAD could be a useful tool to assess the process of building the new relationships infant- professional caregiver. The *Professional Caregiver Attachment Diary* (PCAD) consists of a structured diary that is filled daily by professional caregivers during and after the settling-in process. Then, our research question was: can this adapted version of PAD be useful to study the construction of a secure base in a childcare centre?

Discussion about the question of whether the relationship with the caregiver in childcare is actually an attachment relationship (Ahnert, Pinquart and Lamb, 2006; Howes, 1999), but we do not want in this context to address this topic: rather, our goal is to verify if the child behaviour observed by the professional caregivers using the PCAD, expressed in terms of *Secure*, *Resistant* and *Avoiding* behaviours, can be an indicator of adaptation to the childcare setting, describing the *process* and not just the *outcome*.

Materials and methods

Aims of the study

The aims of our project were to:

(1) Verify the applicability and the possibility to use the PCAD in the childcare centre context, offering to professional caregivers a method and a tool to supervise the settling-in phase on their own;

(2) Observe the formation of children's relationship to caregivers during the earliest months in childcare centre;

In other words, we want to verify the adaptation of the PCAD to childcare centre situations, assessing its ability to catch child's good adaptation over time, and how children's behaviours change within the new context. After a pilot study, in which the original version of the PAD was utilized to be able to understand how to adapt it to childcare centre context (Macagno, 2016), in this research we applied the revised versions of PCAD, that we further adjusted and revised to better adapt it (the adaptation of the tool is reported in Appendix 1).

Our hypothesis was to find significant changes in children's behaviours over time. Stovall and Dozier' studies (2000, 2004) using the PAD with foster families found significant changes in child's attachment behaviours after two months in the new context: secure behaviours increase over time, whereas avoidant and resistant behaviours decrease. Moreover, considering the childcare centres and nursery schools, Lee (2006) found that normally it takes around 6 to 8 weeks to build a firm and positive relationship with the professional caregiver, and Howes and Oldham (2001) affirm that children in *settling-in phase* tend to show a rapid decrease in avoidance behaviour. The hypothesis of the present research is that using the PCAD at childcare centre we can find the same changes in infant's attachment behaviours towards the caregiver during the earliest months of attendance.

Measures and procedure

Our tool is an adaptation of the PAD created by Stovall and Dozier (Stovall, Dozier, and Lindhiem, 1997; Stovall and Dozier, 2000) and translated to Italian by Molina, and Casonato (2012, 2013). Attachment behaviours are coded based on Ainsworth's (Ainsworth et al., 1978) observations during the SSP. Compared with the SSP, the PAD shows a significant concordance, especially considering secure and avoidant scores, confirming the validity of the PAD: children classified as secure in the

SSP, get lower scores of avoidance and higher scores of security with PAD, and vice versa, children classified as avoidant by SSP get higher scores of avoidance and lower of security by the diary (Stovall-McClough & Dozier, 2004).

The PCAD is a structured diary filled by professional caregivers, in which they keep daily records of children's behaviour during three stressful situations, which could elicit attachment behaviours, in order to follow the early attachment behaviours developments in the new context.

This final version encompasses three different situations:

(1) child's reaction, addressed to professional caregiver, when parents leave the childcare at morning time;

(2) a generic stressful situation in which the child is upset or distressed (gets hurt, fights with another child for a toy, has difficulty eating or sleeping during nap time, etc.);

(3) child's reaction when there is separation from the professional caregiver during the day.

As in the original tool, in the revised version each situation is divided into two parts:

A) how the child responded to the stressful situation (for example, turns to caregiver for help or not?);

B) child's subsequent response to the caregiver's intervention, for the first and the second stressful situation (for example, is easily soothed by the caregiver or not?), or child's reaction when reuniting with the caregiver in the third situation.

The behavioural sequence is scored depending on child's responses summarized in the following categories, based on the attachment pattern described by Ainsworth (Ainsworth et al., 1978):

- *Security*: the child actively seeks caregiver's close proximity and contact when he/she need it (*Proximity*), and he/she is easily soothed by the caregiver (*Calm*). Examples: 'came to me', or 'was soon calmed or soothed';
- *Avoidance* (AV): the child ignores the caregivers or goes away even when he/she needs them, acts as if he/she does not need to be taken care of. Example: 'looked at me very briefly then looked away and went on';
- *Resistance* (RE): include reactions of anger, frustration and difficulty to be soothed by the caregiver. Examples: 'pushed me away angrily or in frustration', or 'remained upset, was difficult to soothe'.

In addition, in the first and in the third situations (separation from parents at morning and from the caregiver during the day) the checklist has also some items that if marked alone are coded as *Non Distressed* (Example: 'was happy to keep doing what he/she was doing'): it means that the child may not be distressed when parents or the caregivers leave, especially after attendance for some time, as professional caregivers are considered familiar people. *Non distressed* behaviour is different from *Avoidant* one, since avoidance means that the child shows in some way that he/she is upset, but does not seek out comfort from caregivers (Stovall et al., 1997).

We will present the two studies using the PCAD to evaluate the professional caregiver's relationships building in the first months of childcare centre attendance.

For both studies, protocol was approved by the Bio-ethical Committee of the University of Turin. Parents and professional caregivers were informed and asked to sign a consent form. Anonymity of data was guaranteed.

Data Analysis

Through the caregivers' completion of the daily diaries, in any given day, children can show 0-6 secure behaviours, 0-6 avoidant behaviours, 0-6 resistant behaviours and 0-3 non-distressed behaviours. Then, a daily score of *security*, *avoidance*, *resistance* and *non-distress* are calculated in a proportionate manner, depending on how many situations are filled each day. Means for each time-point (T1 and T2) are computed on daily scores on the basis of how many observations are available for each child during the week. The Attachment Diary scores range from 0.0 to +1.0. To compute the overall scores, we partially followed the procedure indicated by Stovall and Dozier (2000): see Appendix 1.

To examine changes in attachment behaviours over time, we created a chart for each child with daily scores of *Secure*, *Avoidant*, *Resistant*, and *Non-distressed* behaviours (see examples in *Figure 1* and *Figure 2*).

Figure 1. Example of a child's individual chart (Study 1) to view changes in attachment behaviours over time.

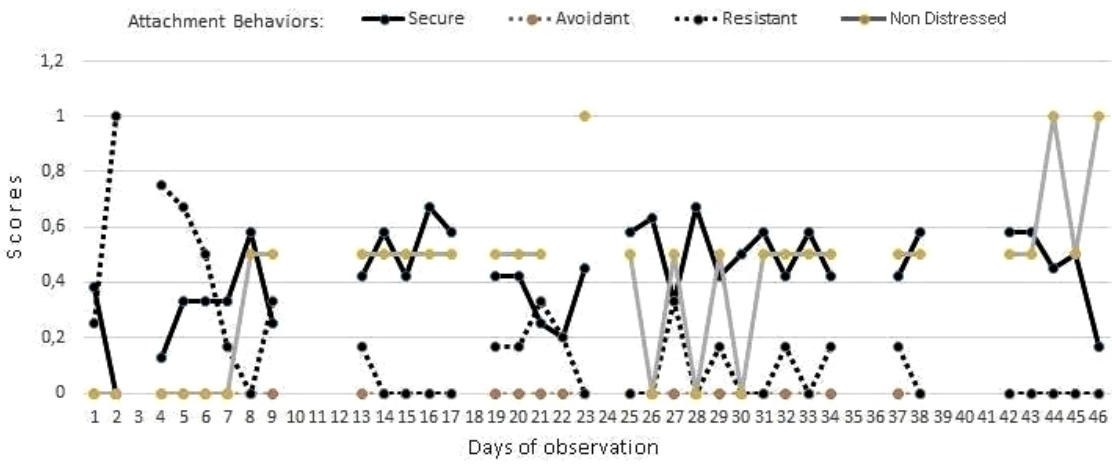
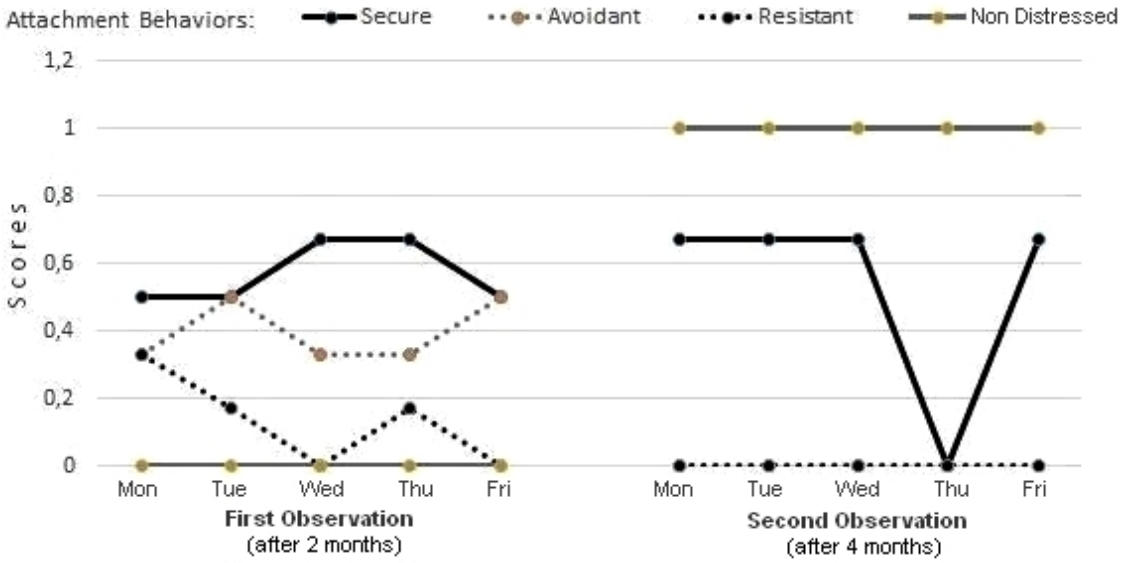


Figure 2. Example of a child's individual chart (Study 2) to view changes in attachment behaviours over time.



Then, in both studies, we compared means scores obtained during the last week of observation (T2) with the first one (T1), using the paired-samples T-test (confidence interval: 95%).

Due to the revised version, we decided to analyse also *Non-distressed* items' trend, a sort of neutral behaviour, that means the child is not distressed by the separation from caregivers (both parents and professional caregivers); this may indicate a positive habit or adaptation within the new context, that is different from an avoidant behaviour (Stovall & Dozier, 2000).

In order to observe the relationship between the different attachment behaviours, we also calculated Pearson correlation coefficient.

Study 1

In this study, we observed how children's attachment behaviours changed during the first two months of attendance at the childcare centre. Professional caregivers filled daily the PCAD for a period of 2 months, and then we compared attachment behaviours'

means scores obtained during the first week of children sole attendance (T1) and after 2 months (T2) (M=59 days later).

Our hypothesis was find that after 2 months from entry into childcare centre there would be an increase in *Secure* and *Non-distressed* behaviours and a decrease of *Avoidant* and *Resistant* behaviours.

Sample

Professional caregivers filled the diaries during the year 2016-17, as a part of an in-service training financed by the cooperative that managed the childcare centre.

In this study, twenty-five professional caregivers filled the diaries, and each one observed 2-5 children for approximately 2 months (M=59 days). The children were observed by the professional caregiver who were their *reference person* (*key-person*) (Goldschmid & Jackson, 1994) during the settling-in phase.

Initially, a total of 80 children had been involved, but just 57 of them have been selected, since others did not have enough days of diary compilation (>40 days), mainly due to children's absences and illness. Of these 57 infants, 28 were boys and 29 were girls, aged between 4 and 30 months (M = 15.74, SD = 6.63) when they started to attend the childcare centre. Of the 24 excluded children, 18 were boys and 5 were girls (we did not receive any information about one child), aged between 7 and 27 months (M=17).

Results

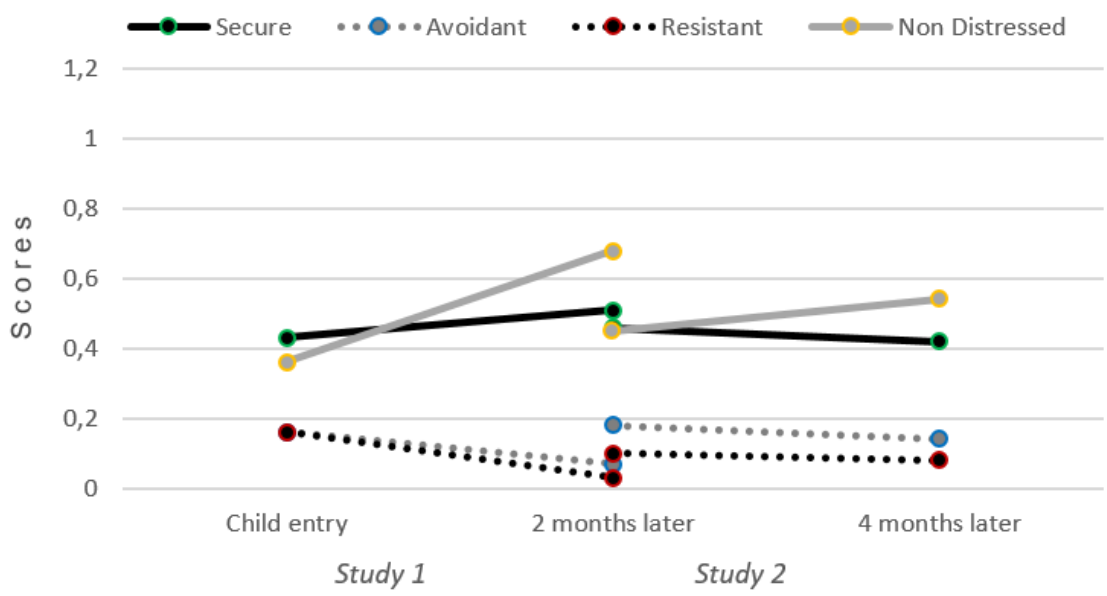
Considering the difference between the first (T1) and the last week (T2) of observation, i.e. after 2 months of childcare centre attendance, *Secure* behaviours do not change considerably (from .43 to .51) ($t(56) = -1.59$, p = NS). However, *Avoidant*, *Resistant* and *Non distressed* behaviours change significantly. Specifically, children show a significant decrease of *Avoidant* (from .16 to .07) ($t(56) = -3.52$, $p < .005$) and

Resistant (from .16 to .03) (t(56) = -4.47, $p < .005$) behaviours, whereas *Non Distressed* behaviours increase significantly (from .36 to .68) (t(56) = 6.03, $p < .005$) (see *Table 1* and *Figure 3*).

Table 1. *Study 1*: Comparison between means scores at T1 (during *settling-in phase*) and at T2 (after 2 months attending the childcare centre). Paired-samples *t*-test (confidence interval: 95%). Sample: 57 children.

	Mean (SD)		**Mean Difference**	**t** (56)	**p** (Sig.)
	T1	**T2**			
Secure	.43 (.27)	.51 (.26)	-.08	1.59	.116
Avoidant	.16 (.18)	.07 (.11)	.08	-3.52	.001
Resistant	.16 (.20)	.03 (.07)	.13	-4.69	.000
Non distressed	.36 (.33)	.68 (.34)	-.33	6.03	.000

Figure 3. Summary graph of behaviour trends in both studies.



In relation to correlation analysis, it results that at T2 *Security* correlates significantly negatively with *Avoidance* ($r = -.44$, $p < .01$) as expected, but not with *Resistance* ($r = -.02$, p = NS). Furthermore, *Security* correlates significantly negatively also with *Non Distressed* behaviours ($r = -.81$, $p < .01$) (see *Table 2*).

Table 2. *Study 1*: Correlations between attachment behaviours at T2, after 2 months of child care attendance (N=57).

	Security	Avoidance	Resistance	Non Distressed
Security	1			
Avoidance	-.44**	1		
Resistance	-.02	.01	1	
Non Distressed	-.81**	.19	-.21	1

**Correlation is significant at level 0.01 (two-tailed)

Diaries filled during the second observation show the following distribution of behaviours: 6% *Avoidance* (A), 39% *Security* (B), 2% *Resistance* (C) and 53% *No distress*.

Frequently, not all the diary situations are filled every day: e.g. the child remains serene along all the day, there is no separation with the caregiver or the child is absent for 1-2 days during the week of observation. For this reason, compared to the total of possible situations to fill, diaries' compilation was about 74%.

Discussion

In this study, the results partially support the research hypothesis: over time, children in settling-in phase showed a significant decrease in *Avoidant* and *Resistant*

behaviours, but *Secure* scores did not increase.

About this, Datler and colleagues (2012) in their study with children in settling-in phase report that, after 4 months of observation, most children do not show a significant increase in secure behaviours, suggesting that attachment is a process that requires more time. Howes and Oldham (2001) affirm that children in settling-in phase tend to show a rapid decrease in avoidance behaviour at the end of the second month after joining the childcare centre, and do not show an increase of behaviours of secure attachment until 4-6 months. In addition, Stovall and Dozier (2000) in their studies with PAD suggested that two months of observations might be not enough for some children to develop a stable pattern of attachment to a new caregiver.

It is important to underline that *Secure* scores are already high and more frequent than the other ones (both in the first and the last observation). Moreover, we found a significant increase in behaviours coded as *Non distressed*: this may indicate that the child is positively adapting to childcare centre context over time, even without showing specific secure behaviours (as proximity seeking). Probably, *Non Distressed* behaviours' increase can compensate the non-increase of proximity behaviours (secure ones): in fact, the correlation analysis shows that *Security* and *Non Distressed* are negatively correlated ($r = -.81$, $p < .01$). For example, for the same child, in a diary we found this description during the first observation: 'G. cried as soon as her mother left, she looked for my physical contact' (*Secure*) and this same child referenced after two months: 'G. came in serene and immediately went to play' (*Non Distressed*).

With reference to the adaptation from the original PAD's structure, this PCAD revised version better reflects childcare centre everyday life and situations in which child's attachment behaviours could be activated. In effect, in this study, the percentage

of filled diary increase from 34% to 74% (see Appendix 1), which means the PCAD now is simpler for professional caregivers to fill in.

Study 2

Considering the results of our previous study and what research about the topic proposes (e.g., Datler et al., 2012; Howes & Oldham, 2001; Lee, 2006), in this study we decided to examine the development and changes of child-caregiver attachment relationship after two months more, that is, 4 months after child's entry into non-maternal care.

In this study, each caregiver observed 2-5 children at a time and filled the PCAD (version 1.2) for each child for one week at two time-points: after 2 months (T1) (M=66 days, SD=9) and after 4 months (T2) (M=140 days, SD=18) from child's sole attendance at the centre.

We expect that *Secure* and *Non Distressed* scores increase over time, whereas *Avoidant* and *Resistant* behaviours continue to decrease.

Sample

In this study, a new sample of children and professional caregivers from five different Italian childcare centres were involved.

A total of 62 caregivers used and filled the PCAD, and 165 children of 235 have been selected, since 69 infants had observations that did not meet the requirements to be included in the sample: 18 caregivers did not fill the second observation; 8 children were observed for less than 3 days per week; 3 children stopped attending childcare; 3 families did not provide the consent on research participation; 23 observations started too soon or too late; about 4 children we did not receive any personal data. Of these 69 children, 34 were boys and 35 were girls, aged between 3 and 27 months (M=17).

The final sample of our second study was composed by 165 children, 84 boys and 81 girls, aged between 4 and 34 months (M = 16.62, SD = 6.8).

Results

In this study, both *Avoidant* (from .18 to .14) (t(164) = -3.01, $p < .005$) and *Resistant* (from .10 to .08) (t(164) = -2.80, $p<.01$) behaviours decrease significantly as expected. We also found that *Non Distressed* scores increase significantly (from .45 to .54) (t(164) = 3.83, $p < .001$). Unexpectedly, children show a significant decrease of *Secure* behaviours (from .46 to .42) (t(164) = 2,41, $p < .05$) (see *Table 3* and *Figure 3*).

Table 3. *Study 2*: Comparison between means scores after 2 months (T1) and after 4 months (T2) attending the childcare centre. Paired-samples *t*-test (confidence interval: 95%). N = 165 children.

	Mean (SD)		**Mean Difference**	**t** (56)	**p** (Sig.)
	T1	**T2**			
Secure	.46 (.02)	.42 (.02)	.04	-2.408	.017
Avoidant	.18 (.16)	.14 (.15)	.04	-3.010	.002
Resistant	.10 (.11)	.08 (.10)	.03	-2.797	.006
Non distressed	.45 (.27)	.54 (.26)	-.09	3.831	.000

In relation to correlation analysis, it results that in T2: *Security* correlates negatively with *Avoidance* (r = -.25, $p < .01$) and *Non Distressed* (r = -.61, $p < .01$) scores, but not with Resistance (r = -.06, p = NS) (as in the Study1); *Avoidance* correlates positively with *Resistance* (r = -.17, $p < .05$) as expected; *Non Distressed*

behaviours also correlates negatively with both *Avoidance* (r = -.37, $p < .01$) and *Resistance* scores (r= -.28, $p < .01$) (see *Table 4*).

Table 4. Study 2: Correlations between attachment behaviours at T2, after 4 months of childcare attendance (N=165).

	Security	Avoidance	Resistance	Non Distressed
Security	1			
Avoidance	-.25**	1		
Resistance	-.06	.17*	1	
Non Distressed	-.61**	-.37**	-.28**	1

**Correlation is significant at level 0.01 (two-tailed)
*Correlation is significant at level 0.05 (two-tailed)

In the second observation (T2), that is, after 4 months attending the childcare, the sample shows the following distribution of behaviours: 12% *Avoidance* (A), 36% *Security* (B), 6% *Resistance* (C) and 46% *Non Distressed*.

The overall completion rate of the diaries was about 81% (considering the total of possible situations to fill in).

Discussion

In this study also, results support in part our research hypothesis: even after 4 months attending the childcare, as expected, *Avoidant* and *Resistant* behaviours still decrease, but children did not show *Secure* attachment behaviours increase.

Despite this, *Non Distressed* scores considerably increase: it is important to highlight the significant increase of items codified as *Non Distressed*, which could be considered

as an index of good adaptation of the child within the childcare centre. We find *Non Distressed* items in situations of separation of the child from parents and from profession caregiver, and these behaviours reflected a quite attitude during these episodes: the child was not distressed when left at childcare centre or with other familiar caregivers, so he/she not needed help or to be soothe anymore. For example, about the same child, in a diary we found this description during the first observation: 'The mother is holding R. that starts to cry. I talk to her, so R. stretches her arms towards me and I hold her. R. clung to me and then she calms down' (*Secure*) and this one at T2: 'R. came in smiling and went towards some children who were playing' (*Non Distressed*).

The concept of *secure base* imply a dynamic equilibrium between *attachment* and *exploration* systems: when the child feels safe, attachment behaviours are deactivated and explorative ones are activated, which allows the child to open up to the surrounding environment; when a stressful situation or some risk are present, the attachment system is activated and the child search protection from caregiver (Ainsworth, 1967). Bowlby (1969/1982) and Ainsworth (1967) identified the *exploration* as a behavioural scheme of a secure attachment system. The behaviours codified as *Non Distressed* in the PCAD refer to that: the child who comes at childcare centre or who stays in the classroom explores and plays quietly, without requiring the presence of the caregiver, because he/she feels protected and his/her proximity needs are satisfied. When the child feels safe and secure, he can dedicate his resources and energy to exploration.

This hypothesis is reinforced by correlations analysis, which shows, as in Study1, that *Security* and *Non Distressed* scores are negatively correlated ($r=-.61$, $p < .01$): therefore, even if child's specific secure behaviours (such seeking for proximity to

want to be soothed by professional caregiver) do not increase over time, these are compensated by *Non Distressed* behaviours that reflect a positive and good adaptation to childcare centre context.

Moreover, these ‘no-reactions’ are the purpose of professional caregivers: for them, when a child does not cry anymore when comes at childcare centre, but is calm and quiet to explore and play, it is a sign of a successful familiarization. Please note that in the PCAD these ‘no-reactions’ coded as *Non Distressed* are different from *Avoidant* behaviours: avoidance means that the child is upset or distressed, but, despite that, does not seek out comfort from caregivers (Stovall et al., 1997)

Therefore, the increase in the *Non Distressed* scores is an important data, which could mean that the child feels more secure in the new context of care over time, that is, the equivalent of a secure behaviour.

Conclusions and perspectives

In summary, the revised version of the Professional Caregiver Attachment Diary (PCAD 1.2) is a structured diary, in which professional caregivers record daily the behaviours that children show in specific stressful situations that could elicit attachment behaviours, in order to follow the relationship to caregiver development in childcare centre during the earlier months of attendance.

Concerning the adaptation of this tool, the first important result is that diaries’ compilation has increased from 34% in the Pilot Study to 74% in Study 1 and 81% in Study 2: this means that the revised version is better adapted to the childcare context. It is important to mention that it was useful to compare notes and experiences with professional caregivers that were filling the diaries, to discuss about PCAD’s compilation and how we can improve it. The work of reviewing the diary during the project reflects the importance to adapt the method to the reality of the specific context.

This consideration also reflects how is important and necessary to adapt a measurement method to a different context: an explanatory example are the behaviours coded as *Non distressed*, as explained above.

Concerning the results of the studies, our research hypothesis is supported: during early months of childcare centre attendance, children have a significant decrease in *Avoidant* and *Resistant* behaviours over time, and even if *Secure* behaviours did not increase, *Non distressed* behaviours (that are considered as an indicator of positive adaptation) significantly increased (see *Figure 3*). The adapted PCAD seems to be a useful instrument to observe and monitor children's adaptation progress within the childcare centre, from the perspective that in this context the secure base is provided by the caregiving environment (Mesman et al., 2016).

It would be interesting to explore if observing at a later time point, for example, 6 or 8 months after entry into childcare, more change in secure behaviours might have been seen, as other studies suggested (Datler et al., 2012; Howes & Oldman, 2001; Ereky-Stevens et al., 2018; Raikes, 1993).

In future studies, it will be interesting also to observe how behaviours change in each specific situation. A response about the issue of the attachment quality of child-professional caregiver relationship could be find comparing attachment behaviour trend in the stressful situation (i.e. when the caregivers' support is necessary, because the child is upset) with the same trend in situations that could be non-stressful as time passes and the child is able to find a secure base in the new context (i.e. separation from parents, separation from the professional caregiver).

Lastly, the findings of these studies must be interpreted with regard to its limits. Though the PCAD seem to be really useful and suitable for assess attachment behaviours, the main limitation of these studies is that the PCAD has not yet been

validated. After our work on adaptation of this method to childcare context, next step of our project will be to validate the PCAD comparing the scores with those of tools already validated, such as the AQS, to see if results show a significant concordance.

Based on what research suggests, Howes (2016) underlines the importance to improve childcare programs focused to move professional caregivers toward responsive care and teaching. Relationship with professional caregiver at childcare influences child social and emotional experiences outside of family, as well the future relationships with teachers and peers (Howes, 2016; Howes, Hamilton & Matheson, 1994; Howes, Phillips & Whitebook, 1992). Definitely, as childhood is a sensitive period for social and emotional competences, the role of relationships both in and out-of-home context are critical for future healthy development. For this reason, responsive teaching is more and more important in order to ensure a positive climate within the childcare context, where child can trust the caregivers and have a favourable development (Howes, 2016; Biringen et al., 2012).

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Appendix: revised version of the tool

Our Pilot Study involved a total of 23 children, aged from 14 to 28 months, from two different Italian childcare centres, daily observed during two months by 23 professional caregivers who filled the original version of the PAD. These caregivers participate also in the Study 1 and 2.

After the Pilot Study, during the discussions with caregivers involved in the project, it emerged that PAD's situations were difficult to fill daily. The three situations to observe were: (1) when the child is physically hurt; (2) when the child is frightened or scared by something; (3) when there is a separation from the caregiver. Above all, children do not get hurt and get scared so often; if these situations are more easily observed at home, are not so representative of what happens in everyday life within the childcare centre. The situation that was most filled was the third one (separation from the caregiver), but not for all children and not daily. Since these PAD's situations are too much specific and do not occur every day within a childcare centre, diaries' compilation was difficult and partial. In fact, at the end of the 2 months of observation, diaries' compilation was rather low, about 34%. For this reason, we decide to change the situations to observe.

Based on the pilot study, we decided to modify the situations to observe, to get a more adequate version of a childcare experience. The stressful situation considered by the new adapted version of PCAD are: (1) when parents leave the childcare at morning time; (2) a generic stressful situation in which the child is upset or distressed; (3) when there is separation from the professional caregiver during the day.

The first revised version that we applied in the Study 1 was the *Professional Caregiver Attachment Diary 1.1* (PCAD 1.1); in the Study 2, we utilised a slightly

modified version (PCAD 1.2), mainly to clarify the difference between *No distressed* and *Avoidant* items (see below).

Coding of diaries. In PCAD 1.2 we partially changed the scoring system; discussing with professional caregivers involved in the study, we realized that third situation's checklist (separation from caregiver) was not completely representative of child behaviours at childcare centre. Specifically, we found "No distressed" behaviours just in part A (when caregivers leave the classroom) and not in part B (reunion between caregiver and child), where the most marked item was "*continued doing what he/she was doing before*" that is coded as *avoidant* behaviour (Stovall & Dozier, 2000). However, caregivers interpret this item as a *positive* behaviour, since it means that children remain calm and not distressed even in their absence. Therefore, our doubt was: could this behaviour in childcare be not always really avoiding, but be a consequence of child's positive adaptation to contextual practices? In childcare, infants are supposed to get used to receiving care from all caregivers of the classroom, forming with all of them attachment relationships. Moreover, caregivers often have to leave the classroom and come back a few minutes later. Therefore, one can doubt if this specific item really expresses an avoidant attitude of child, or if it simply reflects a good adaptation within the context. Our hypothesis is that, seeing often caregivers who leave the classroom and having always another familiar figure to refer to, children may not be distressed by this situation of separation, and so do not show particular reactions even when caregivers comes back. For this reason, we divided the item in two different sentences with two different coding: "*continued quietly doing what he/she was doing before*" coded as *No distressed* behaviour, and "*continued doing what he/she was doing before, ignoring me (as if he/she didn't notice me)*" coded as *Avoidance*.

Score's calculation. For each child, we computed the scores adding up the occurrences of *Secure* (differently to the PAD, *Proximity* and *Calm* are not divided, but are counted together), *Avoidant*, *Resistant* and *No distressed* behaviours marked in the three situations for each day. The child can have a maximum of 6 occurrences for each attachment behaviour (two occurrences for each situation, since these are divided into 2 parts, A and B). To get a proportionate score, raw scores of *Security*, *Avoidance*, *Resistance* and *No distressed* are divided by the number of observations completed. For example: if the caregiver filled all the 3 situations (and both parts A and B) the raw scores will be divided by 6; if the caregiver filled just 2 situations, the raw scores will be divided by 4.

Please contact the corresponding author to have a copy of the tool, English or Italian version.