When the primary caregiver is missing: Investigating proximal and distal variables involved in institutionalized children's adjustment

Lavinia Barone, Antonio Dellagiulia, Francesca Lionetti

Department of Brain and Behavioral Sciences, University of Pavia, Pavia, Italy

Corresponding author: Lavinia Barone lavinia.barone@unipv.it

Department of Brain and Behavioral Sciences, University of Pavia, Piazza Botta 11, 27100 Pavia, Italy

Abstract

Institutional rearing and structural neglect represent a primary caregiver deprivation experience and fall outside the range of the average expected typical childhood environment. Research indicates that variables related to proximal processes, such as the quality of care, rather than only distal variables, such as the duration of institutionalization, may affect the adjustment of institutionalized children. The present study involved 100 Ukrainian children aged four to eight years old (39 institution-reared and 61 family-reared) and investigated children's adjustment as a function of two distal variables and one proximal variable: age at admission and duration of institutionalization; and current quality of care, as represented by favourite caregivers' perceived helplessness in the caring task. Attachment shortcomings and cognitive impairments were reported for institutionalized children, independently of duration of institutionalization. Low scores for professional caregivers' helplessness were associated with better scores for indiscriminate friendliness and non-verbal reasoning in children. We conclude that caregiving variables matter and need to be given attention for improving the well being of children in potentially neglectful contexts.

KEY PRACTITIONER MESSAGES:

• Institutionalisation is a structural neglect condition, increasing the risk for children's social-emotional and cognitive impairment.

• Professional caregivers often lack information on how to support children and are faced with challenging working conditions, resulting in an emotionally distant caregiving.

• The study showed that institutionalised children's attachment and cognitive development are two compromised domains.

Key-words: Institutional care, attachment, cognitive development, Ukraine

Introduction

Institutional rearing falls outside the range of the typical childhood environments, due to the neglect condition embedded in the structure of the institution itself negatively influencing two key domains of a child's development: cognitive and emotional (St. Petersburg-USA Orphanage Research Team, 2008) with potentially long-term negative outcomes (Fitzpatrick, Carr, Dooley, Flanagan-Howard, Flanagan, Tierney, White, Daly, Shevlin, & Egan, 2010). The absence of a primary caregiver figure and of a stable and continuing attachment bond, even when health and nutritional needs are met, represents the main deprivation issue that institutionalized children are faced with (Bowlby, 1988). The environmental distal variables related to institutionalization such as age of admission, duration of institutionalization, high turnover of caregivers and large child to caregiver ratios are known to affect the quality of children's adjustment (van den Dries, Juffer, van IJzendoorn & Bakermans-Kranenburg, 2009; van IJzendoorn *et al*., 2011). By contrast, although dynamic and relational aspects of life in institution deserve consideration, little attention has been paid to the more proximal dynamic of institutionalization experiences (Soares *et al.*, 2014), and the role of professional caregivers has been widely neglected (Bastiaanssen, Delsing, Kroes, Engels & Veerman, 2014).

Although professional caregivers represent one of the main sources of children's quality of care, they often lack instruction on how to promote children's wellbeing in spite of challenging working conditions (Groza, McCreery Bunkers & Gamer, 2011). This increases the risk of job stress leading to emotionally distant caregiving (St. Petersburg-USA Orphanage Research Team, 2008). Focusing on professional caregiver-child

interactions may help to improve the quality of care in institutions and thus maximize favourable outcomes.

Attachment impairments in institutionalized children

Children are biologically predisposed to seek comfort and care from a primary caregiving figure (usually the parent or a substitute), which is supposed to make a child safe, secure and protected. Depending upon the adult's responses over time, the child develops a mental representation of the caregiver's degree of availability and supportiveness in times of need (Bowlby, 1969/1982, 1973, 1980), that can be summarized in different attachment patterns: secure (when the primary caregiving figure is perceived as available), insecure-avoidant (when the child perceives the caregiver as consistently distant or rejecting), insecure-ambivalent (when there is an inconsistent primary carer) and disorganized (when the caregiver is the source of threat and shows frightening or frightened behaviour). If no specific pattern is identifiable, a 'cannot classify' category is applied.

To develop an attachment relationship is a right for all human infants, but in institutional contexts this a difficult task because the high child: caregiver ratio impacts on the opportunity of establishing a stable and continuing attachment bond with a caregiver (Miller, 2005). Among the variables contributing to the adjustment of institutionalized children, attachment is a fundamental one, given its relevance for the quality of subsequent social-emotional development: different attachment patterns are involved in actualizing developmental potential both in family-reared and previously institutionalized children (Cassidy & Shaver, 2008; Torres, Maia, Verissimo, Fernando & Silva, 2012; Barone & Lionetti, 2012; Lionetti, 2014). So far, a few but noteworthy studies have investigated

attachment distribution towards the favourite caregiver in institutionalized children, reporting higher rates of insecure, disorganized and cannot classify attachment patterns (Vorria *et al*., 2003; Zeanah, Smyke, Koga & Carlson, 2005). However, large variations in social-emotional outcomes between studies have also been observed (Bakermans-Kranenburg, Dobrova-Krol & van IJzendoorn, 2012) suggesting that more attention needs to be paid to what may sustain or hamper children's adjustment in institution.

Profound deviations from a low-risk normative environment may also lead to other disturbed attachment behaviours such as indiscriminate friendliness (Chisholm, 1998; Rutter, Kreppner, & Sonuga-Barke, 2009), broadly identified as one of the distinctive at-risk markers in children living in institutions and characterized by anomalous reactions toward stranger adults such as showing extremely friendly and open behaviours (Bakermans-Kranenburg *et al.*, 2011; Soares *et al*., 2014; Gleason, Fox, Smyke, Nelson & Zeanah, 2014).

Both insecure-disorganized attachments and indiscriminate friendliness are considered to be caused by the same factor, i.e. the limited quality of caregiving. The latter has been defined as an extreme reaction to attachment-related trauma caused by institutionalization (Stovall & Dozier, 1999). Identifying insecure and disorganized attachment rates, the degree of indiscriminate friendliness, and what may increase their chance can be of relevance both from a theoretical and applied perspective for implementing *ad hoc* prevention programs.

Cognitive impairments in institutionalized children

From a developmental perspective, the emotional and cognitive domains are two key

components in child's development, and both are influenced by the quality of the rearing environment (Nelson *et al*., 2007; Bakermans-Kranenburg *et al.,* 2011). The degree of cognitive impairments in institutionalized children will thus be the second focus of our paper.

Studies conducted so far have reported lower IQ, poorer executive functions and more attention problems in institutionalized children (Bos, Fox, Zeanah & Nelson, 2009). In a randomized study in which the selection bias was controlled for, Nelson and colleagues (2007) showed that the cognitive outcome of children who were reared in institutions was markedly lower than both that of never-institutionalized children and that of children assigned to foster care. Similar results were reported for attention problems that, unlike IQ, do not completely recover after adoption placement (van IJzendoorn, Juffer & Poelhuis, 2005; McLaughlin *et al.,* 2010; Merz, McCall & Wright, 2013). It is assumed that the institutional environment deprives children of the required input for optimal brain development, which in turn impacts on attention to a significant extent (Slopen, McLaughlin, Fox, Zeanah & Nelson, 2012), placing children at risk for subsequent school achievement (Pecora, 2012).

In this context, research can make a contribution by investigating the degree of impairment in institutionalized children and what influences it. Combining research evidence with the demands of practitioners and society may promote the development of new policies, increasing children's safety and wellbeing.

Distal and proximal environmental variables: what influences institutionalized children's adjustment?

Of the distal environmental variables, duration of institutionalization and age at admission, often difficult to disentangle from one other, have been investigated so far. A longer life experience in an institutionalization context was found to be associated with lower rates of secure attachments (van den Dries *et al.*, 2009), whereas data are more controversial concerning the incidence of duration of institutionalization on indiscriminate friendliness and disorganized attachment patterns (O'Connor, Rutter, and the ERA Study Team, 2000; Zeanah *et al*., 2005; van den Dries *et al*., 2009).

In terms of proximal variables, low quality caregiving is thought to be one of the reasons for the developmental delay in children in institutions (McCall, 2013). Conversely, good quality caregiving has been found to promote cognitive performance and social-emotional development (Smyke *et al.*, 2002; Zeanah *et al.*, 2005; Dobrova-Krol *et al*., 2010). The primary caregiver's perception of helplessness in the caring task represents a valuable risk factor able to concur in predicting the poor quality and effectiveness of caring behaviours (Vulliez-Coday, Obsuth, Torreiro-Casal, Ellertsdottir & Lyons-Ruth, 2013; Barone, Bramante, Lionetti & Pastore, 2014). Up to now, no study has investigated the role of professional caregivers faced with a challenging task such as working in orphanages (Groza *et al.*, 2011).

The current study

The study aimed at investigating children's attachment and cognitive impairments by analysing the separate and combined role of distal and proximal environmental variables related to life in institutions and professional caregiving quality. Of the distal environmental variables, we selected duration of institutionalization, a variable already

extensively investigated, and age at admission. The proximal variable we selected was derived from the attachment literature and identified as related to at-risk attachment relationships in biological families (George & Solomon 1989, 2008), i.e. the caregiver's perceived helplessness in the caring task.

Specifically, this is the first study investigating mental representations of attachment in Ukrainian children. Up to now only two studies investigated attachment in terms of mental representations, i.e. the one by Katsurada in Japan (Katsurada, 2007) and the study of Torres and colleagues (Torres *et al.*, 2012) in Chile.

The aim of the present study was twofold:

1) To investigate attachment (as evaluated in attachment mental representations and indiscriminate friendliness behaviour) and cognitive impairments (as evaluated in non-verbal reasoning and sustained attention) of Ukrainian institution-reared children compared with family-reared children.

2) To analyse the separate and/or combined contribution of specific distal and proximal environmental variables (i.e., age at admission, duration of institutionalization and favourite caregivers' perceived helplessness in the caring task) to individual variables (i.e. children's attachment and cognitive impairments) in the institution context.

The study was guided by the following hypotheses:

(1) Higher rates of insecure/disorganized attachments and more indiscriminate friendliness could be expected in children living in an institution.

(2) A greater impairment in non-verbal reasoning and sustained attention would be

expected in children living in an institution than in their family-reared peers.

(3) Longer duration of institutionalization, younger age at admission and favourite caregivers' perceived helplessness would be associated with an impaired adjustment in children. It was expected that the model representing a combined effect of duration of institutionalization, age at admission and caregivers' perceived helplessness would be the best for explaining children's adjustment.

Method

Participants

One hundred Ukrainian children participated in the study. 39 (16 females, 13 males) of them belonged to the institution-reared group (IR), 61 (31 females, 30 males) to the family-reared group (FR). Institutionalized-children's favourite caregivers were also enrolled in the study.

Institution-reared children group (IR). Children were recruited from three Children's Homes in Ukraine where they had resided since admission. Children's Homes child-caregiver ratio ranged from 8:1 to 6:1. Inclusion criteria into the IR group were: (a) duration of institutionalization at least six months (estimated minimum length for attachment bond to be established); (b) age at assessment: four to eight years old; (c) no medical diagnosis, i.e. no genetic, fetal alcohol syndromes or major physical disabilities; (d) no diagnosis of mental retardation. All but six children were admitted to the institution after the first birthday (range: 1-75 months, M = 39.23, SD = 21.85) and duration of institutionalization ranged from 6 to 73 months (M = 32.23, SD = 19.93). Age at admission and duration of institutionalization correlated at r = .-91. According to data available from

the children's homes, with the exception of one child who was an orphan, 80% of them (*n* = 31) were admitted because of emotional and physical neglect in their biological families; and 18% (*n* = 7) because of emotional and physical maltreatment. Age at assessment ranged from 54 to 92 months (*M* =71.46, *SD* = 9.15). Males and females did not differ either in age at admission (t(37) = 1.033, *p* = .31) or in time passed in the institution (t(37) = -.948, *p* = .35).

Family-reared children group (FR*).* Four primary schools located in different areas of the same Ukrainian region were used to identify eligible FR children. Children's inclusion criteria were the same as those of the IR group. Age at assessment ranged from 64 to 94 months (*M* = 78.51, *SD* = 7.82).

Procedure

Informed consent was obtained from the Head of each of the three Children's Homes involved in the study for the IR group and from the primary caregivers for the FR group. Preliminary interviews with children and professional caregivers were used to identify the favourite caregiver in the institutional setting.

The children's favourite caregivers were then involved in the study, by filling in a self-report questionnaire on perceived helplessness in caring; after three months they were also interviewed regarding the children's indiscriminate friendliness behaviour. Responses to each question were audiotaped and coded by two independent coders who were blind to the child's attachment category. Any disagreements between coders were resolved by discussion.

Trained Ukrainian students tested the children of the IR group on all measures in a quiet

room. Two trained coders (AD and FL) assessed children's representations of attachment and a third independent coder (LB) was involved to evaluate the inter-rater reliability. Inter-rater agreement, computed on a random selection of 20% of the videotaped test, was 83% (Cohen's k = .87) for the four-way match**.**

Children in the FR group were tested for non-verbal reasoning and sustained attention at school in a quiet, individual setting. For the comparison on attachment representations and indiscriminate friendliness behaviour, normative data from low-risk population were used, as no evidences for inter-cultural differences are expected in family reared children for the two variables of attachment and indiscriminate friendliness (Barone *et al*., 2009; Dobrova-Krol *et al*., 2010); Katsurada, 2007).

Measures

Attachment impairments

Attachment mental representations: IR children's attachment mental representations were investigated using the Manchester Child Attachment Story Task (MCAST, Green, Stanley, Smith & Goldwyn, 2000), recently tested for its psychometric properties in a large-sample Italian multicenter study (Barone *et al*. 2009) and employed on children from different countries and cultures (Futh, O'Connor & Carla, 2008). The MCAST is a story stem completion method with dolls, developed to elicit children's narratives in response to four attachment-related themes. The child is asked to select a doll representing him/her and a doll representing his/her primary attachment figure, which was identified with the favourite professional caregiver. The coding system is based on narrative and behavioural content and style and yields patterns of attachment according to four categories: Secure (B),

Insecure Avoidant (A), Insecure Ambivalent (C) and/or Disorganized (D). When multiple representations coexist in the same vignette, a Cannot classify category (CC) is given. According to the current convention, the D and CC classifications were collapsed because of potential commonalities in aetiology and outcome into a single disorganized category D/CC (Lyons-Ruth & Jacobvitz, 2008).

Indiscriminate friendliness behaviour: IR children's indiscriminate friendliness was assessed using a semi-structured interview (Chisholm, 1998) with the professional caregiver who knew the child best. Caregivers were asked whether the child (1) wandered without distress; (2) was willing to go home with a stranger; (3) was very friendly with new adults; (4) was ever shy; (5) what the child typically did upon meeting new adults. For each question a score of 1 was given if the caregiver gave a response indicating indiscriminate friendliness.

Cognitive impairments

Non-verbal reasoning: IR and FR children's non-verbal reasoning was evaluated through the Raven – Color Progressive Matrix (CPM) test (Raven and Court, 1962), a non-verbal test assessing non-verbal reasoning and specifically inductive reasoning. Previous research has shown that the Raven matrix is suitable to be used with children in different countries (Prozorovskaya *et al*., 2010). Raw scores were converted into percentiles (Belacchi, *et al*., 2008) to afford unbiased comparison of children of different ages.

Sustained attention: A paper-pencil cancellation procedure (PPCP), usually employed for investigating sustained attention (Wang, Huang & Huang, 2006; van der Meere, *et al*., 1991), was administered to both IR and FR children. Children were asked to circle a bell

target scattered throughout a random array for a total of four papers. Number of correct responses and completion time were taken into account for the final score. Raw scores were converted into percentiles (Biancardi & Stoppa, 1997) to afford unbiased comparison of children of different ages.

Distal and proximal environmental variables

Distal environmental variables: Duration of institutionalization and age at admission in months were used as measures of the distal environmental variable. Given the high correlation (r = -.91) between the two measures only the first one was considered.

Proximal environmental variable: Favourite professional caregivers' helplessness was assessed using the Caregiving Helplessness Questionnaire and specifically the Helpless-Caregiver factor (CHQ, George & Solomon, 2008). A score from 1 to 5 on a Likert-scale is given to address the degree to which the primary caregiver perceived her/himself as helpless (e.g. "When I am with *name of the child* I often feel out of control"; "I feel that I am a failure as a caregiver with *name of the* child", "I feel that the situation needs to be changed but am helpless to do anything about it") in the relationship with the child. The Helpless-Caregiver factor measures a mental representation of caregiving associated with caregivers' withdrawals in the caring task due to a perception of being out of control, unable to sensitively discipline the child, helpless in improving the situation, and perceiving himself/herself as a failure (George & Solomon 1989, 2008).

Analytic plan

All analyses were performed using the statistical software R (R Development Core Team,

2012). Descriptive analyses were conducted to investigate institutionalized children's attachment and cognitive impairments in accordance with our first and second hypotheses, i.e. that in IR children attachment impairments would be over-represented compared to a normative population and that IR children's non-verbal reasoning and sustained attention would be lower than in FR children. In accordance with our third hypothesis, the single and combined role of both duration of institutionalization and professional caregivers' perceived helplessness on IR children's adjustment were tested, comparing different regression models to identify the best one. For attachment categorical variables, logistic regression was used. Explained variance, BIC and effect size were used for model comparison.

Results

Distribution of mental representations of attachment and indiscriminate friendliness rates

Distribution of mental representations of attachment is reported in Table 1. Compared with the low-risk normative population (Barone *et al*., 2009), children of the IR group were more at risk both for insecure and Disorganized/Cannot classify attachment mental representations (see Table 1). No association was found between Disorganized/Cannot classify attachment ($x^2(1) = .616$, $p = .43$) and children's gender, whereas for insecure attachment there was a prevalence in males ($x^2(1) = 4.32$, $p = .04$).

Indiscriminate friendliness in IR children ranged from 0 to 5 with a mean of 2.08 (*SD* = 1.58, Table 2) and it was more than double that found in studies with low-risk family-reared Ukrainian children (i.e. *M* = .63, *SD* = .90, Dobrova-Krol *et al*. 2010). The

effect size of the association between gender and indiscriminate friendliness in IR children was moderate but non-significant, with higher indiscriminate friendliness rates in males than females (Cohen's d = .42, t (37) = 1.19, p = .24, see Table 2).

Non-verbal reasoning and sustained attention

Scores on the CPM (non-verbal reasoning) and on the PPCP (sustained attention) were compared between the IR and FR groups. Results showed that Ukrainian institution-reared children scored lower both on non-verbal reasoning (t (97.882) = - 6.28, p <.001) and sustained attention compared with children in the FR group (t (97) = - 4.24, p <.001, see Table 2 for means and standard deviation values)

Table 1. Institution-reared (IR) children's attachment mental representations at MCAST

	Secure	Insecure Avoidant	Insecure Ambivalent	Disorganized	Cannot Classify	B vs. others X^2	D/Cannot Classify vs. others X^2
IR (n=39)	7 (17.9%)	8 (20.5%)	4 (10.3%)	15 (38.5%)	5 (12.8%)	27.59(1) p<.001	15.74(1) p<.001
Low risk normative data* (n=230)	145 (63%)	37 (16%)	23 (10%)	25 (11%)	0		

*=Barone *et al*., 2009

Table 2. Institution-reared (IR) and family-reared (FR) children's indiscriminate friendliness, non-verbal reasoning, sustained attention

	Indiscriminate Friendliness	Non-verbal reasoning	Sustained attention	n[1]
	M (SD)	M (SD)	M (SD)	
IR	2.08 (1.58)	26.82 (17.77)	-2.65(1.64)	38
Male	2.44(1.46)	28.00 (18.21)	-2.77(1.68)	13
Female	1.83(1.64)	26.00 (17.82)	-2.57(1.65)	15
FR		54.93(26.96)	-1.28(1.53)	61
Male	.63 (.90)[*]	55.60(27.72)	-1.84(1.29)	30
Female		54.29(26.64)	-.074(1.56)	31

[1] Number of cases with available data; [*] Dobrova-Krol *et al.,* 2010-Data for Indiscriminate Friendliness not available for gender

Regression models comparison: the roles of the proximal and distal variables

The regression models were then compared to analyse the separate and combined role of the distal and proximal environmental variables (i.e. duration of institutionalization and professional caregivers' perceived helplessness) on children's attachment and cognitive impairments. To assess the contribution of these variables, we conducted a series of regression analyses predicting attachment, indiscriminate friendliness, non-verbal reasoning and sustained attention. We entered the distal variable first, followed by the proximal caregiving variable.

Attachment impairments.

Logistic regressions were used to analyse the effect of duration of institutionalization and the role of professional caregiver's helplessness on children's insecure and disorganized/cannot classify attachment representations, and the Bayesian Information Criterion for comparing models. No effect of relevance were detected either for non-secure or for disorganized attachment representations (see Table 3). Afterwards, linear regression was used to investigate the influence of environmental variables on children's indiscriminate friendliness behaviour and the explained variance R^2 for comparing models. Results showed a significant improvement in the regression model when helplessness in caregiving was included as a predictor of indiscriminate friendliness behaviour with a large effect size (Table 4).

Cognitive impairments.

Finally, the single and combined effects of duration of institutionalization and favourite caregivers' perceived helplessness on IR children's cognitive adjustment were investigated.

First, duration of institutionalization was included as the only predictor variable. Afterwards, the combined effects of duration of institutionalization and favourite caregivers' perceived helplessness on children's non-verbal reasoning and sustained attention were investigated.

Table 3. Logistic regression. Duration of institutionalization and the favourite caregiver's helplessness on institute reared children's Non-Secure (A, C, D) and Disorganized/Cannot Classify attachment mental representations

Dependent variable	OR	B (SE)	*p.*	Bayesan Information Criterion
Non-secure attachment*				
Model 1A				
Duration of institutionalization	.98	.02(.02)	.27	48
Model 2A				
Duration of institutionalization	.98	.02(.02)	.34	
Favorite caregiver's helplessness	.96	.03(.06)	.60	52

Disorganized attachment**	OR	B (SE)	*p.*	BIC
Model 1B				
Duration of institutionalization	1.0	.03(.02)	.09	58
Model 2B				
Duration of institutionalization	1.1	.04(.02)	.06	
Favourite caregiver's helplessness	.93	.07(.06).	.18	60

*1=non Secure; 0=secure; **1=Disorganized/Cannot-Classify, 0=Non Disorganized/Cannot Classify

Table 4. Linear regression. Duration of institutionalization and favourite caregiver's helplessness on IR children's indiscriminate friendliness, non-verbal reasoning and sustained attention

Indiscriminate friendliness	B	B(SE)	R^2	ΔR^2	*p.*
Model 1C					

Duration of institutionalization	.17	.01(.01)	.03		
Model 2C					
Duration of institutionalization	.02	.01(.01)			
Favorite caregiver's helplessness	.63	.16(.03)	.45	.42	<.001
Non-verbal reasoning (CPM)	B	B(SE)	R^2	ΔR^2	*p*.
Model 1D					
Duration of institutionalization	-.04	-.03(.14)	.001		
Model 2D					
Duration of institutionalization	-.12	-.01(.14)			
Favourite caregiver's helplessness	-.32	.86(.42)	.10	.10	.05
Sustained attention (PCP)	B	B(SE)	R^2	ΔR^2	*p*.

Model 1E					
Duration of institutionalization	.04	.01(.01)	.01		
Model 2E					
Duration of institutionalization	-.03	.01(.01)			
Favourite caregiver's helplessness	-.25	.06(.04)	.06	.06	.15

CPM = Color Progressive Matrix; PPCP = Paper-pencil cancellation procedure

As reported in Table 4, when favourite caregiver's helplessness was added to duration of institutionalization in the regression model (see model 2D), the variance explained increased significantly for non-verbal reasoning but only slightly for sustained attention (model 2E), although a medium effect for helplessness in caregiving was detected ($\beta = -.25$).

Discussion

We investigated the degree of attachment and cognitive impairments in institutionalized Ukrainian children, and the relationship of these outcomes with two important environmental variables, i.e. duration of institutionalization and caregiver's helplessness. The main findings are summarized in relation to the hypotheses we posited and the issues we tackled.

We identified a significant prevalence of attachment impairments, with high rates of both Disorganized/Cannot classify and insecure patterns of attachment, comparable to that found in previous studies investigating attachment in institutionalized children using observational procedures (Vorria *et al*., 2003; Zeanah *et al*., 2005; Dobrova-Krol *et al.,* 2010). Rates of disorganized and insecure attachment were higher in our institutional-group than those reported in a recent study on Ukrainian institutionalized children assessed through a separation-reunion procedure (Bakermans-Kranenburg *et al*., 2012) where, however, indiscriminate friendliness was over-represented as it was in our study. Two points about methodology are relevant. First, we assessed attachment using a story-stem procedure instead of an observational one. Since the issue of investigating attachment in children in institution by measures developed for family contexts is part of the debate in this field (Zeanah *et al.*, 2005; Bakermans-Kranenburg *et al.,* 2011), further studies exploring attachment both at a representational and behavioural level could help to clarify whether attachment assessment procedures lead to differences in attachment distribution in this context. Second, the comparable frequencies of indiscriminate friendliness but differing disorganized/insecure rates in our study and in Bakermans-Kranenburg *et al*.'s study (2012)

suggests that attachment representations and indiscriminate behaviours do not necessarily overlap even if both pertain to the domain of attachment disturbances (Smyke *et al*., 2002; Bakermans-Kranenburg *et al*., 2011). Children who develop a selective mental representation of attachment relationship may thus present at the same time a high level of indiscriminate friendliness behaviour, suggesting that these two dimensions of attachment relationships are not mutually exclusive (Zeanah *et al*., 2005; Soares *et al.*, 2014).

With regard to children's cognitive development, we found impaired adjustment for both non-verbal reasoning and sustained attention, in confirmation of our second hypothesis and of findings reported in studies involving infants (Nelson *et al.*, 2007). These data are in line with the notion that institutional rearing that exceeds the first 4-6 months of life is associated with a significant impairment of development in multiple domains, including the cognitive one (Zeanah *et al*., 2011).

To test our third hypothesis, we compared different regression models for the separate and combined roles of duration of institutionalization and favourite caregiver's helplessness in the caring task. Results showed that duration of institutionalization was not a linear risk factor, suggesting that concurrent proximal variables also influence the process of adjustment. Of relevance, when the proximal environmental variable, i.e. professional caregivers' helplessness, was added, the variance explained by the model increased significantly for the indiscriminate friendliness domain. These data are coherent with the theoretical construct of helplessness as being related to at-risk attachment relationships (George & Solomon, 2008; Vulliez-Coday *et al.*, 2013 Barone *et al*., 2014) and suggests that the behavioural level of attachment (i.e. the observed indiscriminate friendliness behaviour but not mental representations of attachment relationships) is the outcome most

affected by the proximal factor of caregiving.

Finally, considering children's cognitive adjustment, the effect size of duration of institutionalization was low for both non-verbal reasoning and sustained attention. Our results are comparable to those reported by Zeanah *et al*. (2005) and suggest that when institutionalization exceeds a specific window in the life cycle, impairment is independent of duration of institutionalization, at least as a linear function. Still with regard to cognitive development, it is worth noting that when helplessness in caregiving was added to the model, the variance explained increased significantly as it had for indiscriminate friendliness, and this was particularly true for the non-verbal reasoning domain. We can thus hypothesize that the professional caregiver who perceives more helplessness in the caregiving task may offer less social and cognitive stimuli because of a tendency to withdraw from the relationship and feel out of control, not sustaining children's cognitive development.

Future research will have to go further and investigate not only both distal and proximal variables related to life in institutions but also simultaneously take into account individual moderating mechanisms such as children's temperament, neurophysiological reactivity and gene-environment interaction (Lionetti & Barone, 2014; Lionetti, Pluess & Barone, 2014; Schuengel, Oosterman & Sterkenburg, 2009). This would likely enable identification of the subtle but important mechanisms involved in children's adjustment in multidimensional at-risk contexts such as institutions.

Before concluding, some of the limitations of the current study need to be mentioned. The quasi-experimental design, which did not allow for the random assignment of children to different rearing conditions, is of course the major limitation. In terms of sample

comparison, although normative data offer a reliable low-risk control group for comparing attachment rates, the absence of data on attachment variables in our groups of family-reared children is another shortcoming.

To sum up, our results further stress the role of a neglectful rearing environment as life in an institution as a risk factor for socio-emotional and cognitive development, and suggest that the caregiving environment in which a child grows should be targeted in order to improve children's adjustment in institutional rearing settings. Intervention programmes promoting positive caregiver-child relationships in institutions and sustaining professional caregivers faced daily with a challenging role would help limit the damage to the attachment and cognitive domains in institutionalized children.

Conclusion

Institutionalization is a risk factor for adverse children's development. Nevertheless, the caregiving context may partially buffer against negative outcomes. Studies conducted to date have given a significant contribution to our understanding of what puts the child at risk for maladjustment. To better identify protective and risk factors, multidimensional models investigating both distal and proximal environmental variables on several developmental outcomes need to be generated, with the quality of professional caregiving being taken into account. This would allow more reliable identification of protective factors, to be promoted through ad hoc interventions; and of risk factors to be prevented.

References

Albus KE, Dozier M. (1999). Indiscriminate friendliness and terror of strangers in infancy: Contributions from the study of infants in foster care. *Infant Mental Health Journal* 20(1): 30–41.

Bakermans-Kranenburg, M. J., Steele, H., Zeanah, C. H., Muhamedrahimov, R. J., Vorria, P., Dobrova-Krol, N. A., Steele, H., van IJzendoorn, M. H., Juffer, F., & Gunnar, M. R. (2011). Attachment and emotional development in institutional care: characteristics and catch up. *Monographs of the Society for Research in Child Development, 76*(4), 62-91.

Bakermans-Kranenburg, M. J., Dobrova-Krol, N., & van IJzendoorn, M. (2012). Impact of institutional care on attachment disorganization and insecurity of Ukrainian preschoolers: Protective effect of the long variant of the serotonin transporter gene (5HTT). *International Journal of Behavioral Development, 36*(1), 11-18.

Barone, L., Del Giudice, M., Fossati, A., Manaresi, F., Perinetti, B. A., Colle, L., & Veglia, F. (2009). Psychometric properties of the Manchester Child Attachment Story Task: An Italian multicentre study. *International Journal of Behavioral Development, 33*(2), 185-190.

Barone, L., & Lionetti, F. (2012). Attachment and emotional understanding: a study on late-adopted pre-schoolers and their parents. *Child Care Health and Development, 38*(5), 690-696.

Barone, L., Bramante, A., Lionetti, F., & Pastore, M. (2014). Mothers who murdered their child: An attachment-based study on filicide. *Child Abuse and Neglect,* doi: 10.1016/j.chiabu.2014.04.014

Bastiaanssen, I.L.W., Delsing, M.J.M.H, Groes, G., Engels, Rutger C.M.E. & Veerman, Jan

W. (2014). Group Care Worker Interventions and Child Problem Behavior in Residential Youth Care: Course and Bidirectional Associations. *Children and Youth Services Review, 39*, 48-56.

Belacchi, C., Scalisi, T. G., Cannoni, E. & Cornoldi, C. (2008). *CPM - Coloured Progressive Matrices. Standardizzazione Italiana. Manuale*. Firenze: Giunti O.S. - Organizzazioni Speciali.

Biancardi, A., & Stoppa, E. (1997). Il test delle Campanelle modificato: una proposta per lo studio dell'attenzione in etá evolutiva. *Psichiatria dell'infanzia e dell'adolescenza, 64*(1), 73-84.

Bos, K. J., Fox, N., Zeanah, C. H., & Nelson, C. A., (2009). Effects of early psychosocial deprivation on the development of memory and executive function. *Frontiers in Behavioral Neuroscience, 3*, 7.

Bowlby, J. (1969/1982). *Attachment and loss: Vol. 1. Attachment* (2nd ed.). New York: Basic Books.

Bowlby, J. (1973). *Attachment and loss: Vol. 2. Separation: Anxiety and anger*. New York: Basic Books.

Bowlby, J. (1980). *Attachment and loss: Vol. 3. Sadness and depression*. New York: Basic Books.

Bowlby, J. (1988). *A secure base: Clinical applications of attachment theory*. London: Routledge.

Cassidy, J., & Shaver, P. R. (2008). *Handbook of attachment: Theory, research, and clinical applications (2nd ed.)*. New York: Guilford Press.

Chisholm, K. (1998). A three year follow-up of attachment and indiscriminate friendliness

in children adopted from Romanian orphanages. *Child Development, 69*(4), 1092-1106.

Dobrova-Krol, N. A., Bakermans-Kranenburg, M. J., van IJzendoorn, M. H., & Juffer, F. (2010). The importance of quality of care: effects of perinatal HIV infection and early institutional rearing on preschoolers' attachment and indiscriminate friendliness. *Journal of Child Psychology and Psychiatry, 51*(12), 1368-1376

Fitzpatrick, M., Carr, A., Dooley, B., Flanagan-Howard, R., Flanagan, E., Tierney, K., White, M., Daly, M., Shevlin, M. & Egan, J. (2010), Profiles of adult survivors of severe sexual, physical and emotional institutional abuse in Ireland. Child Abuse Review, 19, 387–404

Futh, A., O'Connor, T. G., Matias, C., Green, J., & Scott, S. (2008). Attachment narratives and behavioral and emotional symptoms in an ethnically diverse, at-risk sample. *Journal of the American Academy of Child and Adolescent Psychiatry, 47*(6), 709-718.

George, C., & Solomon, J. (1989). Internal working models of caregiving and security of attachment at age 6. *Infant Mental Health Journal, 10*(3), 222-237.

George, C., & Solomon, J. (2008). The caregiving system: A behavioral systems approach to parenting. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications, 2nd edition,* pp. 833-856. New York: Guilford Press.

Green, J., Stanley, C., Smith, V., & Goldwyn, R. (2000). A new method of evaluating attachment representations in young school-age children: the Manchester Child Attachment Story Task. *Attachment & human development, 2*(1), 48-70.

Groza, V. K., Bunkers, K. M., & Gamer, G. N. (2011). Ideal components and current characteristics of alternative care options for children outside of parental care in low-resource countries. *Monographs of the Society for Research in Child Development, 76*(4),

163-189.

Katsurada, E. (2007). Attachment representation of institutionalized children in Japan. *School Psychology International, 28(3),* 331-345.

Lionetti, F. (2014). What promotes secure attachment in early adoption? The protective roles of infants' temperament and adoptive parents' attachment, *Attachment and Human Development,* doi: 10.1080/14616734.2014.959028.

Lionetti, F. & Barone, L. (2014). Do children's temperament and adoptive parent's attachment matter with adoptees' attachment? *6th International Attachment Conference,* August 30th-September 1st, Medimond International Proceedings.

Lionetti, F., Pluess, M., & Barone, L. (2014). Vulnerabilità, resilienza o differente permeabilità? Un confronto tra modelli per lo studio dell'interazione individuo ambiente. *Psicologia Clinica Dello Sviluppo, 18(2),* 163–182.

Lyons Ruth, K. & Jacobvitz, D. (2008). Attachment disorganization. In J. Cassidy & P. Shaver, (Eds). *Handbook of attachment: Theory, research, and clinical applications, 2nd edition,* pp. 666-697. New York: Guilford Press.

McCall, R. B. (2013). Review: The consequences of early institutionalization: can institutions be improved? should they? *Child and Adolescent Mental Health, 18*(4), 193-201.

McLaughlin, K. A., Fox, N. A., Zeanah, C. H., Sheridan, M. A., Marshall, P., & Nelson, C. A. (2010). Delayed Maturation in Brain Electrical Activity Partially Explains the Association Between Early Environmental Deprivation and Symptoms of Attention-Deficit/Hyperactivity Disorder. *Biological Psychiatry, 68*(4), 329-336.

Merz, E. C., McCall, R. B., Wright, A. J., & Luna, B. (2013). Inhibitory Control and

Working Memory in Post-Institutionalized Children. *Journal of Abnormal Child Psychology, 41*(6), 879-890.

Nelson, C. A., Zeanah, C. H., Fox, N. A., Marshall, P. J., Smyke, A. T., & Guthrie, D. (2007). Cognitive recovery in socially deprived young children: The Bucharest early intervention project. *Science, 318*(5858), 1937-1940.

O'Connor, T. G., Rutter, M., & English Romanian Adoptees Study, T. (2000). Attachment disorder behavior following early severe deprivation: Extension and longitudinal follow-up. *Journal of the American Academy of Child and Adolescent Psychiatry, 39*(6), 703-712.

Pecora, P. J. (2012). Maximizing educational achievement of youth in foster care and alumni: Factors associated with success. *Children and Youth Services Review, 34*(6), 1121-1129.

Prozorovskaya, I., Grigoriev, A., & Lynn, R. (2010). Gender Differences in Means and Variability on the Standard Progressive Matrices for 15-year olds in Ukraine. *Mankind Quarterly, 50*(4), 297-310.

R Development Core Team (2012). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. http://www.R-project.org

Rutter, M., Kreppner, J., & Sonuga-Barke, E. (2009). Emanuel Miller Lecture: Attachment insecurity, disinhibited attachment, and attachment disorders: where do research findings leave the concepts? *Journal of Child Psychology and Psychiatry, 50*(5), 529-543.

Schuengel, C., Oosterman, M., & Sterkenburg, P. S. (2009). Children with disrupted attachment histories: Interventions and psychophysiological indices of effects. *Child and Adolescent Psychiatry and Mental Health, 3*(1), 349-365.

Slopen, N., McLaughlin, K. A., Fox, N. A., Zeanah, C. H., & Nelson, C. A. (2012). Alterations in Neural Processing and Psychopathology in Children Raised in Institutions. *Archives of General Psychiatry, 69*(10), 1022-1030.

Smyke, A. T., Dumitrescu, A., & Zeanah, C. H. (2002). Attachment disturbances in young children. I: The continuum of caretaking casualty. *Journal of the American Academy of Child and Adolescent Psychiatry, 41*(8), 972–982.

Soares, I., Belsky, J. Oliveira, P., Silva J., Marques S., Baptista, J. & Martins, C. (2014). Does early family risk and current quality of care predict indiscriminate social behavior in institutionalized Portuguese children? *Attachment & Human Development, 16*(2), 137-148.

St. Petersburg – USA Orphanage Research Team. (2008). The effects of early social-emotional and relationship experience on the development of young orphanage children. The St. Petersburg-USA Orphanage Research Team. *Monographs of the Society for Research in Child Development, 73*(3), vii-viii, 1-262, 294-265.

Torres, N., Maia, J., Verissimo, M., Fernandes, M., & Silva, F. (2012). Attachment security representations in institutionalized children and children living with their families: links to problem behaviour. *Clinical Psychology & Psychotherapy, 19*(1), 25-36.

van den Dries, L., Juffer, F., van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2009). Fostering security? A meta-analysis of attachment in adopted children. *Children and Youth Services Review, 31*(3), 410-421.

van der Meere, J., Wekking, E. & Sergeant, J. (1991), Sustained Attention and Pervasive Hyperactivity. *Journal of Child Psychology and Psychiatry*, 32, 275–284.

van IJzendoorn, M. H., Juffer, F., & Poelhuis, C. W. K. (2005). Adoption and cognitive development: A meta-analytic comparison of adopted and non-adopted children's IQ and

school performance. *Psychological Bulletin, 131*(2), 301-316.

van IJzendoorn, M. H., Palacios, J., Sonuga-Barke, E. J. S., Gunnar, M. R., Vorria, P., McCall, R. B., Le Mare, L., Bakermans-Kranenburg, M. J., Dobrova-Krol, N. A. & Juffer, F. (2011). Children in institutional care: delayed development and resilience. *Monographs of the Society for Research in Child Development, 76*(4), 8-30.

Vorria, P., Papaligoura, Z., Dunn, J., van IJzendoorn, M.H., Steele, H., Kontopoulou, A., & Sarafidou, Y. (2003). Early experiences and attachment relationships of Greek infants raised in residential group care. *Journal of Child Psychology and Psychiatry, 44*(8), 1208-1220.

Vulliez-Coady, L., Obsuth, I., Torreiro-Casal, M., Ellertsdottir, L., & Lyons-Ruth, K. (2013). Maternal Role Confusion: Relations to Maternal Attachment and Mother–Child Interaction from Infancy to Adolescence. *Infant Mental Health Journal*, *34*(2), 117-131.

Wang, T-Y, Huang, H-C. & Huang, H. S. (2006). Design and implementation of cancellation tasks for visual search strategies and visual attention in school children. *Computers & Education*, *47*(1), 1-16.

Zeanah, C. H., Smyke, A. T., Koga, S. F., & Carlson, E. (2005). Attachment in institutionalized and community children in Romania. *Child Development*, *76*(5), 1015-1028.

Zeanah, C. H., Gunnar, M. R., McCall, R. B., Kreppner, J. M., & Fox, N. A. (2011). Sensitive periods. *Monographs of the Society for Research in Child Development, 76*(4), 147-162.