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When the Primary Caregiver is Missing: Investigating Proximal and Distal Variables Involved in Institutionalised Children's Adjustment

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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 institutionalisation, may affect the adjustment of institutionalised 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 the duration of institutionalisation; and the current quality of care, as represented by favourite caregivers' perceived helplessness in the caring task. Attachment shortcomings and cognitive impairments were reported for institutionalised children, independently of the duration of institutionalisation. 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 wellbeing 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.

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'The present study involved 100 Ukrainian children aged four- to eight-years old'

- Nevertheless, professional caregivers may partially buffer against these negative outcomes.
- How to support children by promoting professional caregiver's expertise is discussed.

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KEY WORDS: institutional care; attachment; cognitive development; Ukraine

'The absence of a primary caregiver figure and of a stable and continuing attachment bond... represents the main deprivation issue'

'They often lack instruction on how to promote children's wellbeing in spite of challenging working conditions'

'The child develops a mental representation of the caregiver's degree of availability and supportiveness'

Institutional rearing falls outside the range of the typical childhood environment, 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 *et al.*, 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 institutionalised children are faced with (Bowlby, 1988). [Q4]

The environmental distal variables related to institutionalisation such as age at admission, duration of institutionalisation, high turnover of caregivers and large child to caregiver ratios are known to affect the quality of children's adjustment (Barone and Lionetti, 2012; van den Dries *et al.*, 2009; van IJzendoorn *et al.*, 2011). By contrast, although dynamic and relational aspects of life in institutions deserve consideration, little attention has been paid to the more proximal dynamic of institutionalisation experiences (Soares *et al.*, 2014), and the role of professional caregivers has been widely neglected (Bastiaanssen *et al.*, 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 *et al.*, 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 maximise favourable outcomes.

Attachment Impairments in Institutionalised 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 summarised 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 disorganised (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. [Q5]

To develop an attachment relationship is a right for all human infants, but in institutional contexts this is a difficult task because the high child: caregiver ratio impacts on the opportunity of establishing a stable and continuing attachment bond with a caregiver. Among the variables contributing to the adjustment of institutionalised children, attachment is a fundamental one, given its relevance for the quality of subsequent social-emotional development: different attachment patterns are involved in actualising developmental potential both in family-reared (FR) and previously institutionalised children (Cassidy and Shaver, 2008; Lionetti, 2014; Torres *et al.*, 2012). So far, a few but noteworthy studies have investigated attachment distribution towards the favourite caregiver in institutionalised children, reporting higher rates of insecure, disorganised and cannot classify attachment patterns (Vorria *et al.*, 2003; Zeanah *et al.*, 2005). However, large variations in social-emotional outcomes between studies have also been observed (Bakermans-Kranenburg *et al.*, 2012), suggesting that more attention needs to be paid to what may sustain or hamper children's adjustment in institutions.

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

Both insecure-disorganised attachments and indiscriminate friendliness are considered to be caused by the same factor, that is, the limited quality of caregiving. The latter has been defined as an extreme reaction to attachment-related trauma caused by institutionalisation (Albus and Dozier, 1999). Identifying insecure and disorganised 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 programmes.

Cognitive Impairments in Institutionalised Children

From a developmental perspective, the emotional and cognitive domains are two key components in a child's development and both are influenced by the quality of the rearing environment (Bakermans-Kranenburg *et al.*, 2011; Nelson *et al.*, 2007). The degree of cognitive impairments in institutionalised 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 institutionalised children (Bos *et al.*, 2009). In a randomised study in which the selection bias was controlled, Nelson and colleagues (2007) showed that the cognitive outcome of children who were reared in institutions was markedly lower than both that of never-institutionalised 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 (McLaughlin *et al.*, 2010; Merz *et al.*, 2013; van IJzendoorn *et al.*, 2005). It is assumed that the institutional environment deprives children of the required input for optimal brain development, which

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'Both insecure-disorganised attachments and indiscriminate friendliness are considered to be caused by the same factor'

'The cognitive outcome of children who were reared in institutions was markedly lower'

in turn impacts on attention to a significant extent (Slopen *et al.*, 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 institutionalised 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 Institutionalised Children's Adjustment?

Of the distal environmental variables, the duration of institutionalisation and age at admission, often difficult to disentangle from one other, have been investigated so far. A longer life experience in an institutionalisation 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 the duration of institutionalisation on indiscriminate friendliness and disorganised attachment patterns (O'Connor *et al.*, 2000; van den Dries *et al.*, 2009; Zeanah *et al.*, 2005).

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 (Dobrova-Krol *et al.*, 2010; Smyke *et al.*, 2002; Zeanah *et al.*, 2005). 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 (Barone *et al.*, 2014; Vulliez-Coady *et al.*, 2013). 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 to investigate children's attachment and cognitive impairments by analysing the separate and combined roles of distal and proximal environmental variables related to life in institutions and professional caregiving quality. Of the distal environmental variables, we selected the duration of institutionalisation, a variable already extensively investigated, and age at admission. The proximal variable that we selected was derived from the attachment literature and identified as related to at-risk attachment relationships in biological families (George and Solomon, 1989, 2008), that is, 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 have investigated attachment in terms of mental representations: one by Katsurada (2007) in Japan and the other by Torres and colleagues (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

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'The aim of the present study was twofold'

evaluated in non-verbal reasoning and sustained attention) of Ukrainian institution-reared (IR) children compared with FR children.

- (2) To analyse the separate and/or combined contribution of specific distal and proximal environmental variables (i.e. age at admission, duration of institutionalisation 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/disorganised 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 FR peers.
- (3) A longer duration of institutionalisation, 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 the duration of institutionalisation, 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. Thirty-nine (16 females, 13 males) of them belonged to the IR group, 61 (31 females, 30 males) to the FR group. The institutionalised children's favourite caregivers were also enrolled in the study.

IR Children Group

Children were recruited from three children's homes in the Ukraine where they had resided since admission. The children's homes child-caregiver ratio ranged from 8:1 to 6:1. Inclusion criteria into the IR group were: (1) a duration of institutionalisation of at least six months (estimated minimum length for an attachment bond to be established); (2) age at assessment: four- to eight-years old; (3) no medical diagnosis (i.e. no genetic or foetal alcohol syndromes or major physical disabilities); and (4) no diagnosis of mental retardation. All but six children were admitted to the institution after their first birthday (range: 1–75 months, $M=39.23$, $SD=21.85$) and the duration of institutionalisation ranged from six to 73 months ($M=32.23$, $SD=19.93$). Age at admission and the duration of institutionalisation correlated at $r=-.91$. According to data available from the children's homes, with the exception of one child who was an orphan, 80 per cent of them ($n=31$) were admitted because of emotional and physical neglect in their biological families; and 18 per cent ($n=7$) 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 ($t(37)=1.033$, $p=0.31$) or in time passed in the institution ($t(37)=-0.948$, $p=0.35$).

FR Children Group

Four primary schools located in different areas of the same Ukrainian region were used to identify eligible FR children. The children's inclusion criteria

'Institutionalised children's favourite caregivers were also enrolled in the study'

'80 per cent of them were admitted because of emotional and physical neglect in their biological families'

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 the 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 the 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 per cent of the videotaped test, was 83 per cent (Cohen's $k=0.87$) 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). [Q19]

Measures

Attachment Impairments

Attachment Mental Representations. IR children's attachment mental representations were investigated using the Manchester Child Attachment Story Task (MCAST) (Green *et al.*, 2000), recently tested for its psychometric properties in a large-sample Italian multicentre study (Barone *et al.*, 2009) and employed on children from different countries and cultures (Futh *et al.*, 2008). [Q20]
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 Disorganised (D). When multiple representations coexist in the same vignette, a Cannot classify (CC) category 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 disorganised category D/CC (Lyons-Ruth and Jacobvitz, 2008). [Q21]
[Q22]

'The children's favourite caregivers were then involved in the study'

'A story stem completion method with dolls, developed to elicit children's narratives in response to four attachment-related themes'

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; and (5) what the child typically did upon meeting new adults. For each question, a score of one 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, 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 an unbiased comparison of children of different ages.

Sustained Attention. A paper-pencil cancellation procedure (PPCP), usually employed for investigating sustained attention (van der Meere *et al.*, 1991; Wang *et al.*, 2006), 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. The number of correct responses and the completion time were taken into account for the final score. Raw scores were converted into percentiles (Biancardi and Stoppa, 1997) to afford an unbiased comparison of children of different ages.

Distal and Proximal Environmental Variables

Distal Environmental Variables. The duration of institutionalisation and age at admission in months were used as measures of the distal environmental variable. Given the high correlation ($r = -0.91$) 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 (George and Solomon, 2008). A score from one to five 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 and 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 institutionalised children's attachment and cognitive impairments in accordance

'The Raven matrix is suitable to be used with children in different countries'

'All analyses were performed using the statistical software R'

with our first and second hypotheses: 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 roles of both the duration of institutionalisation 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

The 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 Disorganised/Cannot classify attachment mental representations (see Table 1). No association was found between Disorganised/Cannot classify attachment ($\chi^2(1)=0.616, p=0.43$) and children's gender, whereas for insecure attachment there was a prevalence in males ($\chi^2(1)=4.32, p=0.04$).

Indiscriminate friendliness in IR children ranged from zero to five with a mean of 2.08 ($SD=1.58$, Table 2) and it was more than double that found in studies with low-risk FR Ukrainian children (i.e. $M=0.63, SD=0.90$; Dobrova-Krol *et al.*, 2010). The effect size of the association between gender

'For insecure attachment there was a prevalence in males'

Table 1. Institution-reared (IR) children's attachment mental representations investigated using the Manchester Child Attachment Story Task

	Secure	Insecure Avoidant	Insecure Ambivalent	Disorganised	Cannot Classify	B vs. others χ^2	D/Cannot Classify vs. others χ^2
IR (n = 39)	7 (17.9%)	8 (20.5%)	4 (10.3%)	15 (38.5%)	5 (12.8%)	27.59 (1)	15.74 (1)
Low-risk normative data* (n = 230)	145 (63%)	37 (16%)	23 (10%)	25 (11%)	0	$p < 0.001$	$p < 0.001$

*Barone *et al.* (2009).

Table 2. Institution-reared (IR) and family-reared (FR) children's indiscriminate friendliness, non-verbal reasoning and 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	0.63 (0.90)*	54.93 (26.96)	-1.28 (1.53)	61
Male		55.60 (27.72)	-1.84 (1.29)	30
Female		54.29 (26.64)	-0.074 (1.56)	31

¹ Number of cases with available data.*Dobrova-Krolet *et al.* (2010).

and indiscriminate friendliness in IR children was moderate but non-significant, with higher indiscriminate friendliness rates in males than females (Cohen's $d=0.42$, $t(37)=1.19$, $p=0.24$, 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 IR children scored lower both on non-verbal reasoning ($t(97.882)=-6.28$, $p<0.001$) and sustained attention compared with children in the FR group ($t(97)=-4.24$, $p<0.001$, see Table 2 for means and standard deviation values).

Regression Models Comparison: The Roles of the Proximal and Distal Variables

The regression models were then compared to analyse the separate and combined roles of the distal and proximal environmental variables (i.e. duration of institutionalisation 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 the duration of institutionalisation and the role of professional caregiver's helplessness on children's insecure and disorganised/cannot classify attachment representations, and the Bayesian Information Criterion for comparing models. No effect of relevance was detected either for non-secure or disorganised 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

'The regression models were then compared to analyse the separate and combined roles of the distal and proximal environmental variables'

Table 3. Logistic regression: Influence of the duration of institutionalisation and the favourite caregiver's helplessness on institution-reared children's non-Secure (A, C, D) and Disorganised/Cannot Classify (D/CC) attachment mental representations

Dependent variable	OR	B (SE)	<i>p</i>	BIC
Non-secure attachment*				
Model 1A				
Duration of institutionalisation	0.98	0.02 (0.02)	0.27	48
Model 2A				
Duration of institutionalisation	0.98	0.02 (0.02)	0.34	
Favourite caregiver's helplessness	0.96	0.03 (0.06)	0.60	52
Disorganised attachment**				
Model 1B				
Duration of institutionalisation	1.0	0.03 (0.02)	0.09	58
Model 2B				
Duration of institutionalisation	1.1	0.04 (0.02)	0.06	
Favourite caregiver's helplessness	0.93	0.07 (0.06)	0.18	60

*1 = Non-Secure; 0 = secure;**1 = Disorganised/CannotClassify, 0 = Non-Disorganised/Cannot Classify.

Table 4. Linear regression: Influence of the duration of institutionalisation and the favourite caregiver's helplessness on institution-reared children's indiscriminate friendliness, non-verbal reasoning and sustained attention

	B	B (SE)	R ²	ΔR ²	p
Indiscriminate friendliness					
Model 1C	0.17	0.01 (0.01)	0.03		
Duration of institutionalisation					
Model 2C					
Duration of institutionalisation	0.02	0.01 (0.01)			
Favourite caregiver's helplessness	0.63	0.16 (0.03)	0.45	0.42	< 0.001
Non-verbal reasoning (CPM)					
Model 1D					
Duration of institutionalisation	-0.04	-0.03 (0.14)	0.001		
Model 2D					
Duration of institutionalisation	-0.12	-0.01 (0.14)			
Favourite caregiver's helplessness	-0.32	0.86 (0.42)	0.10	0.10	0.05
Sustained attention (PPCP)					
Model 1E					
Duration of institutionalisation	0.04	0.01 (0.01)	0.01		
Model 2E					
Duration of institutionalisation	-0.03	0.01 (0.01)			
Favourite caregiver's helplessness	-.25	0.06 (0.04)	0.06	0.06	0.15

CPM = Color Progressive Matrix; PPCP = paper-pencil cancellation procedure.

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

As reported in Table 4, when the favourite caregiver's helplessness was added to the duration of institutionalisation 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 ($\beta = -0.25$).

Discussion

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

We identified a significant prevalence of attachment impairments, with high rates of both Disorganised/Cannot classify and insecure patterns of attachment, comparable to that found in previous studies investigating attachment in institutionalised

'Duration of institutionalisation was included as the only predictor variable'

'We identified a significant prevalence of attachment impairments, with high rates of both Disorganised/ Cannot classify and insecure patterns of attachment'

children using observational procedures (Dobrova-Krol *et al.*, 2010; Vorria *et al.*, 2003; Zeanah *et al.*, 2005). Rates of disorganised and insecure attachment were higher in our institutional group than those reported in a recent study on Ukrainian institutionalised 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 the 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 institutions by measures developed for family contexts is part of the debate in this field (Bakermans-Kranenburg *et al.*, 2011; Zeanah *et al.*, 2005), 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 disorganised/insecure rates in our study and in Bakermans-Kranenburg *et al.*'s (2012) study suggest that attachment representations and indiscriminate behaviours do not necessarily overlap, even if both pertain to the domain of attachment disturbances (Bakermans-Kranenburg *et al.*, 2011; Smyke *et al.*, 2002). Children who develop a selective mental representation of an 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 (Soares *et al.*, 2014; Zeanah *et al.*, 2005).

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 four to six 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 the duration of institutionalisation and the favourite caregiver's helplessness in the caring task. Results showed that the duration of institutionalisation 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 (Barone *et al.*, 2014; George and Solomon, 2008; Vulliez-Coady *et al.*, 2013) and suggest 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 the duration of institutionalisation 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 institutionalisation exceeds a specific window in the life cycle, impairment is independent of the duration of institutionalisation, at least as a linear function. Still with regard to cognitive

'We found impaired adjustment for both non-verbal reasoning and sustained attention'

'The professional caregiver who perceives more helplessness in the caregiving task may offer less social and cognitive stimuli'

development, it is worth noting that when helplessness in caregiving was added to the model, the variance explained increased significantly as it had for [Q43](#) indiscriminate friendliness and this was particularly true for the non-verbal reasoning domain. We can thus hypothesise 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 and Barone, 2014; Lionetti *et al.*, 2014; Schuengel *et al.*, 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 FR children is another [Q44](#) shortcoming.

To sum up, our results further stress the role of a neglectful environment, such as life in an institution, 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 institutionalised children.

Conclusion

Institutionalisation 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.

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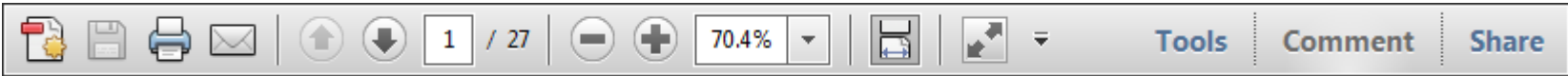
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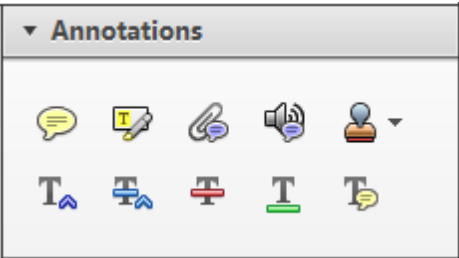
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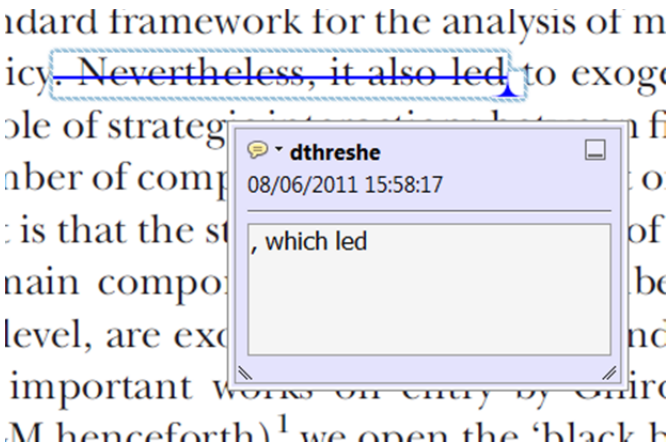
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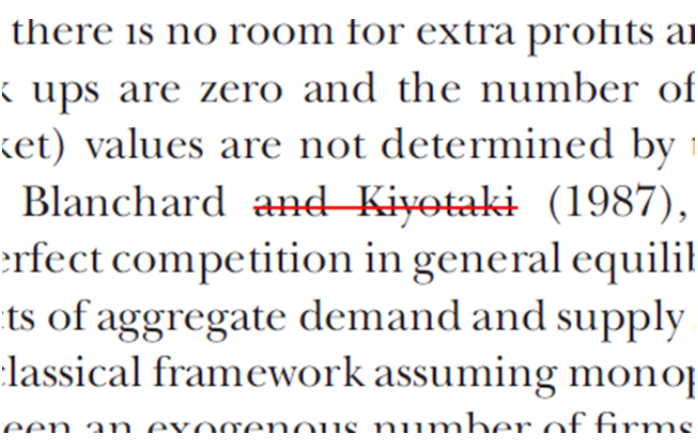
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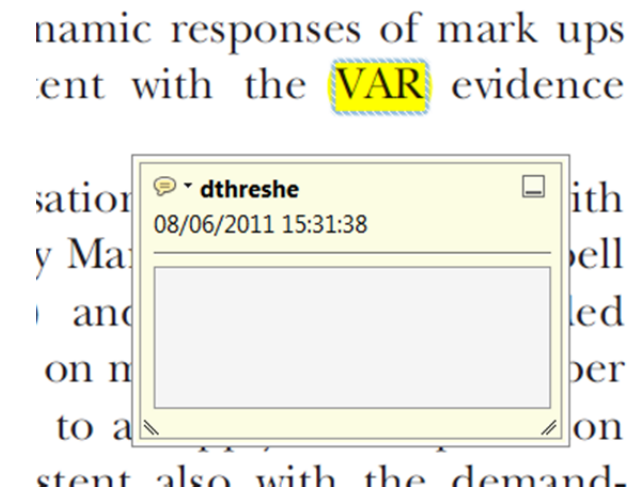
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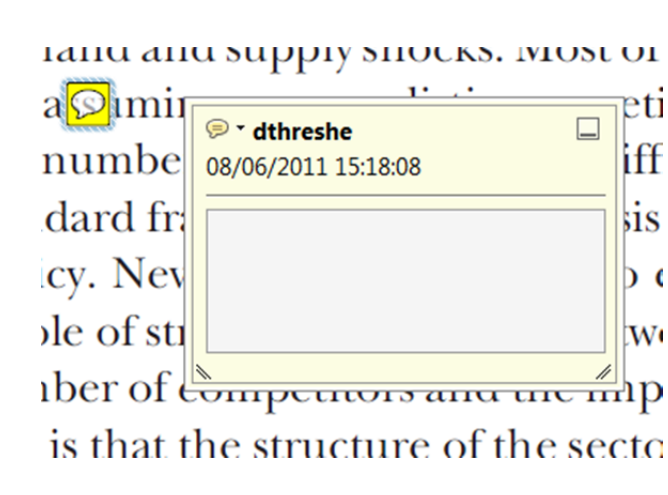
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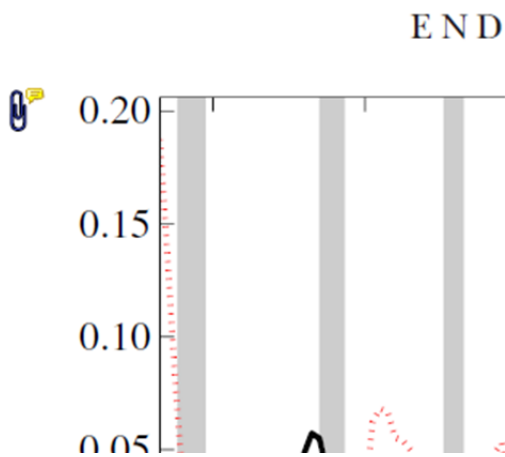
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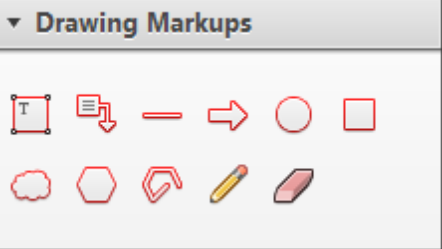
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of the business cycle, starting with the
on perfect competition, constant return
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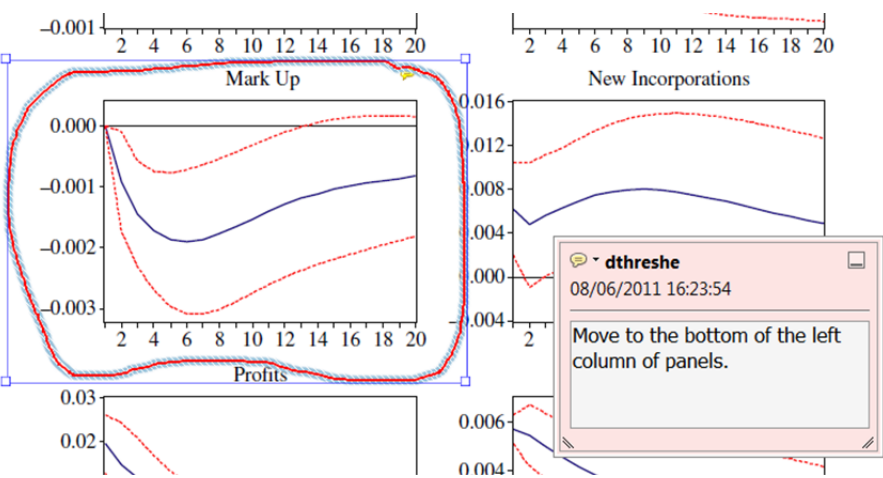


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