

**EMOTION REGULATION IN CHILDREN  
FOLLOWING SEVERE EARLY  
DEPRIVATION**

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## ABSTRACT

Past research has demonstrated the effects of adverse rearing environments on children's emotion regulation but in most studies it has been difficult to distinguish the effects of early experiences from continuity in risk exposure. This study aimed to disentangle emotion regulation processes following severe early deprivation and to examine their associations with children's previous attachment disturbances and concurrent peer relationships. The participants, 96 children adopted from Romanian institutions between the ages of 0-4 years and 24 non-deprived UK children adopted in early infancy, were assessed at age 11 years. Information on emotion regulation was derived from observations of children's social interaction during an interview situation. Data on children's peer relationships were gathered using standardised assessments. Previous data on children's attachment disturbances at age 6 years were also available. Factor analysis revealed four dimensions of maladaptive emotion regulation. ANOVA and correlational analyses indicated a significant association between duration of deprivation and maladaptive patterns of emotion regulation. In addition, attachment disturbances partially mediated the association between early deprivation and emotion regulation. Furthermore, emotion regulation fully mediated the association between early deprivation and social competence with peers. The discussion focuses on the critical role of early experiences in the development of emotion regulation and its impact on subsequent adaptation, including attachment disturbances and peer relationships. Possible mechanisms underlying children's interpersonal difficulties are suggested in the light of existing literature and theoretical perspectives. Some of the study's limitations and its' empirical and clinical implications are also discussed.

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**CHAPTER ONE: INTRODUCTION****Overview**

Following the fall of the Ceaucescu regime in Romania in 1989, media coverage depicted the fate of many children whose parents, overwhelmed by poverty and other major difficulties, were unable to care for them. These children were placed in institutions where they, as a result of wretched conditions, suffered severe physical, nutritional, social, and psychological deprivation. One of the results of this historical event was that a large number of these children were adopted into UK families. This raised a range of practical, clinical, and theoretical issues. It also created a unique research opportunity. One crucial research question that these unusual circumstances were able to examine is how early experiences shape subsequent development.

A longstanding debate in the developmental psychology literature relates to the extent to which the first few years of life determine subsequent developmental outcome (Cicchetti & Lynch, 1995; Clarke & Clarke, 2000; Lewis, 1990; Sroufe, 2000). These questions are central to developmental theory, but are difficult to assess directly. That is because, for many children, there is substantial continuity in risk exposure and as a result, it is difficult to distinguish the exact impact of their early experiences from cumulative effects of other stressful and adverse experiences (O'Connor, Rutter, Beckett, Brophy, et al., 2001). The adoption of children from Romanian institutions provided a 'natural experiment' to assess this fundamental question, due to the dramatic environmental discontinuity; from profound



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deprivation, confined to their early months or years of life, to normal rearing environments in low-risk family settings.

One of the main deficits that was observed and reported in previous studies on the social development of Romanian adoptees was a pattern of seemingly 'odd' social behaviour, manifested as inappropriate social approach, lack of awareness of social boundaries, difficulties in picking up social cues, emotional over-excitement and extreme 'silliness' (Chisholm, 1998; O'Connor, Rutter, et al., 2000a; O'Connor et al. 2001). These social deficits appeared to be heterogeneous in their manifestation and did not seem to fit into a single construct, such as Asperger's syndrome, or Attention Deficit disorder.

The purpose of the present study is to explore whether maladaptive patterns of emotion regulation in social situations may be a common mechanism underlying these apparent social deficits and to examine their associations with early institutional deprivation. The rationale for this hypothesis is twofold: First, these reported social behaviours seem to fit with different dimensions of emotion regulation strategies in social situations, namely, affect expression, attentional control, and behavioural control (Cole, Michel & Teti, 1994; Eisenberg, 2001; Thompson, 1994). Second, research in child development has established that emotion regulation develops in the context of the parent-child relationship (Sroufe, 2000). Different lines of research have documented the role of an emotionally available caregiver in regulating the infant's emotion and in helping the infant to gradually develop the capacity to self-regulate emotions (Barrett & Campos, 1987; Fuchs & Thelen, 1988; Hardi, Power & Jaedicke, 1993; Malatesta & Haviland, 1987;

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Parke, Cassidy, Burks, Carson & Boyum, 1992; Saarni, 1993; Saarni, Mumme & Campos, 1998). The long-term deleterious effects of atypical or impoverished early rearing environments on social and emotional development, including emotion regulation skills, have also been established (Murray, Sinclair, Cooper, Ducournau & Turner, 1999; Pollack, Cicchetti, Klorman & Brumaghim, 1997; Shields & Cicchetti, 1998, 2001; Shields, Cicchetti & Ryan, 1994; Shipman, Zeman & Penza, 2000).

The introduction proceeds as follows: The aim of the first and second sections is to review theoretical and empirical literature on the relationships between the early rearing environment and the development of emotion regulation. The first section focuses on parent-child relationships, whilst the second focuses on biological changes in the organism. The third section reviews the debate concerning the importance of the early rearing environment to subsequent development. In the fourth section, previous findings on children who have suffered institutional deprivation are reviewed. The final section focuses on the construct of emotion regulation and the different dimensions it encompasses. The introduction concludes with the aims of this study.

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## **Parent Child Relationships and the Development of Emotion Regulation**

### *The Importance of Emotion Regulation in Development and the Role of Parents*

Research in children's emotional development has emphasised the importance of emotion regulation skills to children's healthy social and psychological adjustment (Barrett & Campos, 1987; Cole et al., 1994; Garber, Braafladt & Weiss, 1995; Parke et al., 1992; Rubin, Coplan, Fox & Calkins, 1995; Saarni, 1999). Consistent with the functionalist theory of emotion (e.g., Campos, Mumme, Kermoian & Campos, 1994; Thompson, 1994), it has been established that the development of culturally appropriate strategies of self-regulation of emotion enable children to adapt successfully within their social environment, and that deficits in emotion regulation skills place children at risk for subsequent maladjustments (Cook, Greenberg & Kusche, 1994; Rogosche, Cicchetti, & Aber, 1995). Within this context, emotion regulation has often been defined in relation to children's ability to monitor, modulate, and modify emotional reactions in order to achieve individual or interpersonal goals, and to facilitate optimal engagement with the social environment (Campos et al., 1994; Cicchetti & Lynch, 1995; Eisenberg, 2001; Thompson, 1994). This suggests that children have to learn to manage their emotional responsiveness in order to function adaptively in social situations and that the acquisition of these skills is a major developmental task (Cole et al., 1994; Cicchetti & Lynch, 1995; Eisenberg & Fabes, 1992).

Extensive theoretical and empirical work in children's emotional development has demonstrated that emotion regulation skills develop within the parent-child relationship, and that it is largely within this relationship that children learn about

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emotion regulation in the service of attaining their goals (Barrett & Campos, 1987; Fuchs & Thelen, 1988; Hardi et al. 1993; Malatesta & Haviland, 1987; Parke et al., 1992; Saarni, 1993; Saarni et al., 1998; Zeman & Shipman, 1996, 1998). Caregivers help children develop emotion regulation skills in various ways. Parents have an important role in modulating and managing children's emotional arousal, and in modelling expressive behaviours that the child can imitate. Social referencing is another way in which parents teach children about emotion regulation. Here, parents, through their own emotional signalling and expression, help children interpret an ambiguous situation and alter children's emotionally relevant constructions of events (Walden, 1991). Thus, through their relationships with emotionally available caregivers, children learn how to manage their own emotional reactions, how to label and interpret emotions, and which of several emotion response options will be effective in attaining both their immediate goal and the more general goal of conforming to social demands (Saarni, 1999; Thompson, 1994). This suggests that exposure to atypical rearing environments, such as in the case of early institutional deprivation, may influence children's development of emotion regulation, due to the limited opportunities for learning how to self-regulate emotion, or the likelihood of developing atypical responses to emotionally arousing situations (Cicchetti, 1990; Thompson & Calkins, 1996).

### ***Early Parent-Infant Relationships***

According to existing theories, from the beginning of life, the infant and the primary caregiver form an 'affective communication system', in which the caregiver plays a vital role in modulating the infant's physiological and affective arousal (Cassidy, 1994; Murray, 1998; Sroufe, 2000; Stern, 1985; Trevarthen, 1979; Tronick, 1989).

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Infants are born equipped with rudimentary strategies for self-regulating their arousal level, such as gaze aversion or tactile stimulation (Rothbart & O'Boyle, 1992). However, in the first year of life they are, to a large extent, dependent on adults to regulate their physiological and emotional experiences (Field, 1994). By reading infants' signals and providing arousal modulation, to relieve distress and physiological discomfort, caregivers may enable infants to tolerate emotionally charged experiences within reasonable limits and may provide infants with critical training in regulation (Sroufe, 2000). Through repeated interactions in the relationship, infants in healthy caregiving relationships may learn that arousal in the context of the caregiver does not lead to unmanageable degrees of distress and when arousal is beyond the infant's coping capabilities, the caregiver will re-establish equilibrium (Sander, 2000).

With increasing intentionality in the second half of the first year, the infant assumes a more active role in initiating and maintaining engagement. An increase in specific affective expressions (e.g., fear when strangers approach) marks the coordination of affect and cognition and the beginning of the internalisation of experience (Sroufe, 1979). A particular attachment relationship emerges out of this early pattern of dyadic interaction. From an evolutionary perspective, attachment is conceptualised as a repertoire of preadapted behaviours (e.g., crying, smiling, clinging) that have evolved to promote proximity to a caregiver in order to increase survival; from a psychological perspective, proximity seeking aims to minimise distress and promote felt security (Bowlby, 1969/1982). It is suggested, that when emotion regulation is consistently achieved through active signalling and proximity seeking, this may allow infants to gain confidence in relationships and enables them to tolerate

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increased internal arousal as well as external novelty and challenge in the environment (Carlson & Sroufe, 1995, Sander, 2000).

Researchers have described this dyadic regulation process, including its changing form over time and variations between particular infant-caregiver pairs (Fogel, 1993; Stern, 1985). Studies of naturalistic play between mother and infant have shown that the infant's responsiveness and affective expressions are directly related to the mother's responsive behaviours, especially during the first 6 months of life (Stern, 1985; Tronick, 1989) and that the emotional tone of these early interactions provides the structure within which infants develop their own affective repertoire (Kogan & Carter, 1996). Several studies also suggest that infants whose mothers respond sensitively to their signals are more likely to be securely attached (Ainsworth, Blehar, Waters & Wall, 1978; Belsky & Isabella, 1984; Egeland & farber, 1984). Stern (1985) argues that even in earliest infancy, it is the parent's early designation of the baby's feeling states as meaningful and communicative that makes them real and coherent for the baby. He coined the term *attunement* to describe the phenomenon in which mothers 'infantize' their behaviour so that the infant can closely match it and together they can achieve synchrony. Stern and colleagues (Stern, Hofer, Haft & Dore, 1985) noted that 48% of the mother's behaviour consists of mirroring or echoing the infant's visual or vocal behaviour in either the same or a different modality.

### ***Infants and Variations in Caregiving Environments***

According to Main (1990), just as many biological systems have evolved to permit adaptation and a flexible response to a range of environmental circumstances, so

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infants have evolved with the capacity to respond to variations in the caregiving environment. Trevarthen (1979) proposed that infants possess an innate capacity of intersubjectivity, or an ability both to express and to directly apprehend in others rudimentary intentions and affects. Experimental studies of infant responses to contrived episodes of disrupted or perturbed maternal behaviour have established that infants are remarkably sensitive to the quality of adult communication with them and respond in distinctive forms to these, such as distress and withdrawal in response to a blank face in the mother (Cohn and Tronick, 1983; Murray & Trevarthen, 1985; Tronick & Cohn, 1989). Thus, when infants are faced with a particular type of caregiving and learn from these experiences, they are able to tailor their own behaviour accordingly, selecting behaviour that is expected to elicit known responses from the caregivers (Field, 1994). This suggests that differences in quality of care may lead to differences in the quality of dyadic regulation and that such differences in patterns of regulation may subsequently influence the capacity to self-regulate emotion. Taken from this perspective, exposure to early institutional deprivation is expected to influence children's development of emotion regulation.

Indeed, research has established that emotion dysregulation emerges in the context of disturbances in the caregiving environment (Field, 1994). This has been observed, for example, in the case of maternal depression (Field, 1994; Murray, 1998; Tronick and Giannino, 1987). Field (1994) reports that children of depressed mothers show persisting changes in physiology (heart rate, vagal tone, and cortisol level), in play behaviour, affect, activity level, and sleep organisation. She suggests that these changes occur because the infant is being deprived of an important external regulator of stimulation and thus fails to develop or sustain arousal modulation and balanced

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behavioural and physiological rhythms. Consistent with this, maltreated children appear to evidence atypical emotional development from the first months of life. As infants, these children show an early emergence of fear and patterns of angry/labile and flat/blunted affect (Gaensbauer, Mrazek & Harmon, 1981; Gaensbauer & Sands, 1979). In the Strange Situation task (Ainsworth et al., 1978), maltreated infants display a decreased range of emotional expression as well as less flexibility and sensitivity to environmental events and changing social contexts (Gaensbauer, 1982). There is also evidence that maltreatment is associated with the disorganised D category of attachment (Carlson & Sroufe, 1995), characterised by incoherent and inconsistent attachment strategies in the presence of a primary attachment figure (Main & Solomon, 1990).

#### ***Development of Self-Regulation of Emotion***

The movement towards acquiring self-regulation skills continues throughout the childhood years. During the toddler period, the child begins to acquire capacities for self-control, tolerance of moderate frustration, a widening range of emotional reactions, as well as a more developed understanding of self and other. The task of emotion regulation begins to move away from the context of caregiver-child relationships into the realm of autonomous functioning. Sensitive caregivers may allow children to master those circumstances within their capacity and help restore equilibrium when children are over-aroused (Sroufe, 2000). This pattern of 'guided self regulation' (Sroufe, 1996) is thought to be the foundation for the ability to self-regulate that will follow in middle childhood. As children mature, parents use direct interventions as well as indirect strategies, not only to maintain emotional well-being



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in their children but also to socialise emotional behaviour so that it accords with cultural expectations concerning feelings and their expression (Thompson, 1994).

By middle childhood, emotion regulation processes become more internalised. Children become more skilled at regulating arousal and emotion and its expression can become better integrated into the child's growing repertoire of strategic behaviour in social contexts (Thompson, 1994). Changes in cognitive and social development create the context for greater reliance on the self-regulation of emotion. Cognitive development influences the manner in which emotional events and emotions themselves can be perceived and understood (Malatesta & Wilson, 1988). Social influences, such as sex-role socialisation, and cultural display rules, teach children emotion-context relations (Campos, Barrett, Lamb, Goldsmith & Sternberg, 1983) and communicate parameters of emotionally expressive behaviour (Saarni & Crowley, 1990). Patterns of emotion dysregulation become more stable and less accessible to outside influences (Malatesta & Wilson, 1988). During these years, the manner in which children have internalised their experiences of emotion regulation may become more stylised and characteristic (Cole et al., 1994). From the transactional perspective of development (Cicchetti & Lynch, 1995; Sander, 2000; Cicchetti & Sroufe, 2000), the child's capacity for self-regulation can be compromised at any point in development, but the entire developmental process builds upon the foundation laid out in early childhood (Sroufe, 2000). Thus, disturbances in the early caretaking environment may have long-term effects on children's capacity to self-regulate emotion.

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***Long-Term Effects of Early Experiences on Emotion Regulation***

Theoretical predictions concerning the role of the caregiver's responsiveness in promoting the development of infant emotion regulation, together with supporting findings, raise the issue of the possible long-term consequences for children's development as a result of exposure to disturbances in their early interpersonal environment. The validity of the early relationship perspective lies in establishing predictive links between patterns of early dyadic regulation and subsequent differences in self-regulation (Sroufe, 2000). Research has confirmed that those with histories of effective dyadic regulation of emotion and arousal are later characterised by more effective emotion regulation. For example, in a series of studies, Sroufe and colleagues (Elicker, Englund & Sroufe, 1992; Sroufe, 1983; Sroufe, Carlson & Shulman, 1993; Sroufe, Egeland & Carlson, 1991) have found that pre-schoolers with a history of secure attachment were judged by teachers and observed to have higher self-esteem, be more self-reliant and be more flexible in the management of their feelings, as opposed to those with a history of insecure attachment. These effective emotion regulation patterns were carried forward into middle childhood and adolescence. In middle childhood these children were able to form close relationships with friends and to coordinate friendship with effective group functioning. In adolescence, this evolved into the capacity for intimacy, self-disclosure, and successful functioning in the mixed-gender teenage peer group.

Studies of atypical groups of children, such as in the case of maltreatment, or children whose mothers suffered post-natal depression, suggest that failure to develop emotion regulation skills, which is one of the major tasks of development, results in cumulative risk for future maladaptation and psychopathology (Murray et

al., 1999; Pollack et al., 1997; Shields & Cicchetti, 1998, 2001; Shields et al., 1994; Shipman et al., 2000; Shipman & Zeman, 2001). In a series of studies, Murray and colleagues (Murray, Fiori-Cowley, Hooper & Cooper, 1996; Murray et al., 1999) have examined the development of children who had been exposed to maternal depression in their early postpartum years. They found that exposure to maternal depression in the first few months of life had an enduring influence on children's socio-emotional development at 18 months, and later at 5 years, even though most mothers had no longer suffered depression during this time. In particular, diminished responsiveness in the child's interaction with the mother, behavioural disturbances, and certain aspects of play, all showed significant associations with the mother's postpartum experience, even when taking into account current circumstances likely to impinge on child adjustment (Murray et al., 1999).

Child maltreatment has been associated with a wide array of self-regulatory deficits (Carlson, 1998; Sroufe, 1997). Especially, there is evidence to suggest that maltreated children in toddlerhood, pre-school age, as well as middle childhood, evidence a greater prevalence of negative affect, affective lability, social withdrawal, situationally inappropriate affect, and a lack of self-control, during social interactions (Alessandri, 1991; Manly, Cicchetti & Barnett, 1994; Shields et al., 1994). Their hyper-arousal and hyper-vigilant states seriously hinder their capacity to make rational assessments of stressful or ambiguous situations (Reider & Cicchetti, 1989). They are also more likely to show anger, aggression, impulsivity, inattentiveness, and frustration, relative to their low socio-economic status and nonmaltreated peers (Cicchetti, Lynch, Shonk & Manly, 1992; Erickson, Egeland and Pianta, 1989; Shields & Cicchetti, 1998, 2001; Shipman & Zeman, 2001). For example, Shields

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and colleagues (Shields & Cicchetti, 1998, 2001; Shields et al., 1994) have found, in a series of studies in naturalistic play settings, that 6-12 year old maltreated children were deficient in emotion, behaviour, and attention regulation, relative to non-maltreated children. In their interactions during play with peers they displayed maladaptive patterns of emotion regulation, characterised by inflexible and contextually inappropriate emotion expressions. They were also more likely to engage in aggressive and disruptive behaviour, and show distractibility, overactivity, poor concentration, and poor attention modulation. Another important finding of these studies was that these children's peer relationships were seriously compromised and they were at increased risk for bullying and victimisation within their peer groups. In addition, in one of these studies (Shields et al., 1994) these self-regulatory deficits mediated the effects of maltreatment on children's social competence with peers. This highlights the adaptive importance of self-regulatory capacities and their enduring effects on subsequent developmental tasks, in this case, the establishment of peer relationships in middle childhood. Similar findings were reported by Shipman and colleagues (2000), who have found that 6-12 year old girls who had experienced familial sexual abuse demonstrated more dysregulated emotional behaviour and less adaptive emotion regulation, evidenced by affective lability, situationally inappropriate and inflexible emotional displays, as well as lower emotional self-awareness.

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## Early Experiences, Brain Development and Emotion Regulation

### *Emotion Regulation and Neurological Development*

The capacities for emotion regulation and self-management are based, in part, on neurophysiological constituents. These unfold during the first years of life and provide the basis for more complex forms of emotion regulation in later years (Shore, 1994). Early developmental changes in emotion regulation can be linked to some neurological advances in the first year of life. For example, the diffuse excitatory processes underlying arousal decline in lability throughout the first year (Thompson, 1994). This is partly due to postnatal changes in the functioning of the hypothalamic-pituitary-adrenocortical (HPA) system that governs reactions to stress (Gunnar & Nelson, 1994), and maturational changes in parasympathetic regulation as indexed by vagal tone (Izard, Porges, Simons, et al., 1991). As a consequence, arousal becomes more graded and emotionally more complex as the infant develops.

It has been established, largely through animal studies, that the limbic system (e.g., the hypothalamus, amygdala, septal nucleus, cingulate, and hippocampus) provides the foundation for social and emotional functioning (Devinsky, Morrell & Vogt, 1995; Gloor, 1992; Joseph, 1999; Kling, 1972; Kling & Brothers, 1992; LeDoux, 1992) and is the site of developmental changes associated with attachment behaviours and emotion regulation (Joseph, 1999; Kraemer, 1992; Schore, 1994). These limbic system nuclei play different roles in social and emotional development and also mature at different time periods (Benes, 1994; Joseph, 1999).

Kennedy and colleagues (Kennedy, Bakay, & Sharpe, 1992; Kennedy, Sakurada, Shinohara, & Miyoako, 1982), based on studies of monkeys, concluded that the time during development when a particular brain region becomes metabolically active marks the time when that structure begins to contribute to the behavioural repertoire of the individual. For example, the maturation of the cingulate and septal nuclei in the second half of the first year corresponds to the development of a wider range of emotion expressions such as fear, and the development of a close attachment to a specific caregiver (Joseph, 1999). Kling (1972) described how non-human primates who have undergone bilateral amygdaloid removal, lost all interest in social activity and avoided any contact with others. They became emotionally 'blind' and no longer responded to or seemed to understand emotional or social nuances. Conversely, rats with septal nuclei lesions became socially disinhibited and sought out contact with animals they normally avoid such as mice, or cats (Meyer, Ruth & Lavond, 1978). In longitudinal studies on inhibited and uninhibited children, Kagan and his colleagues (Kagan, Reznick & Snidman, 1987; Kagan & Snidman, 1991) have argued that inhibited children have a generally lower threshold of reactivity in limbic structures mediating fear and defence and that these differences can be found in both physiological and behavioural measures through early childhood. Fox and Calkins (1993) have compared groups of infants who differed on similar indices of behavioural inhibition early in infancy and found predictable later differences on measures of emotion regulation and attachment.

### *Early Experiences and The limbic System*

The development of some neurological systems, including the limbic system, are thought to be 'experience-expectant' (Greenough, Black & Wallace, 1987), that is,

they require considerable stimulation and interaction with the environment during the first years of life in order to develop normally and mature fully (Bremner, 1999; Joseph, 1999; Kraemer, 1992; Shore, 1994). Abnormal rearing conditions, when normal 'experience-expectancies' fail to be met, may adversely affect the limbic system's development. Joseph (1999) contends that exposure to depriving or other impoverished rearing environments during early development may result in failure of the limbic system nuclei to function or develop normally, thus producing disturbances identical to those found following destruction or removal (Joseph, 1999). These limbic system neurons may atrophy, or develop aberrant activity and in consequence function abnormally (Finley & Slattery, 1983; Greenough & Black, 1992). Thus, the caregiving environment may influence the development and organisation of this neurological system (Bremner, 1999). Such influences during a period of rapid neurological growth and maturation may have long-term effects on the organisation and development of the infant's brain (Cicchetti & Lynch, 1995).

### ***Long-Term Effects of the Early Rearing Environment on the Brain***

Most evidence for the long-term negative impact of early adverse rearing environments on neurobiological changes in the organism comes from animal studies. To date, it has been difficult to establish the long-term effects of early adverse experience on the somatic structure of the human brain. However, studies in animals have demonstrated that exposure to early depriving rearing environments alters the neurobiology of the stress response and that these alterations persist into adulthood (Benes, 1994; Coplan, Andrews, Rosenblum, Owens, et al., 1996). Adult monkeys who have been socially deprived early in development evidenced various neural structural abnormalities (Siegel, Ginsberg, Hof, Foote, et al., 1993). Ladd,

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Owens & Nemeroff (1996) have found in rats an association between early maternal deprivation and persisting alterations in the corticotrophin-releasing-factor (CRF) neural system, which is the primary physiological regulator of the endocrine stress response. These were still apparent subsequently when the rats matured, testifying to the long-term effects of early stress. Similar findings of persisting overactivity of CRF containing neurons, came from studies on grown nonhuman primates, who were exposed to early adverse rearing conditions (Coplan et al., 1996).

The degree to which animal findings can be extrapolated to humans is uncertain. However, research findings have shown an association between certain environmental disturbances and neurobiological activity. It is suggested that stressful experiences influence, in the child, the development of neuroendocrine responses to stress and lead to neurobiological alterations in the hypothalamus-pituitary-adrenal (HPA) system, which governs reactions to stress (Caldji, Diorio & Meaney, 2000; Graham, Heim, Goodman, Miller, & Nemeroff, 1999). High glucocorticoid levels, for example, have damaging effects on hippocampal neurons, which can be permanent if the stress continues for a prolonged period of time (McEwen & Stellar, 1993). Elevated stress hormones have been found in atypical groups of children. Abnormal levels of cortisol have been found in insecurely attached infants and also in sexually abused girls, implicating altered glucocorticoid functions in the HPA axis (Nachmias, Gunner, Mangelsdorf, Parritz & Buss, 1996; Putnam, Trickett, Helmers, Susman, Dorn & Everett, 1991). Infants of depressed mothers have been found to have elevated levels of cortisol and noradrenaline and have also been shown to display more negative affect expressions (Field, 1998; Jones, Field, Davalos & Pickens, 1997). Three to six months old infants of depressed mothers showed right



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frontal electroencephalogram (EEG) asymmetry compared to controls (Field, Fox, Pickens & Nawrocki, 1995). A very similar pattern persisted after three years, suggesting stability of the system across time (Jones et al., 1997).

Recent evidence of the long-term deleterious effects of adverse early experiences on the human brain came from Chugani and colleagues (Chugani, Behem, Muzik, Juhasz, et al., 2001). They have examined the brain function of 7-11 year old children who were adopted from Romanian institutions into the US. Compared to controls, these children showed evidence of bilateral dysfunction in the limbic regions known to be activated by stress, as indicated by decreased glucose metabolism. Specifically, the Romanian adoptees showed significantly decreased metabolism bilaterally in the orbital frontal gyrus, the infralimbic prefrontal cortex, the medial temporal structures, including the amygdala and hippocampus, the lateral temporal cortex, and the brain stem. Overall, these studies provide valuable insight into the sensitivity of the infant brain to early adverse rearing environments, and the possible long-term effects this may have on the development of emotion regulation.

### **How important are early experiences to subsequent development?**

This study aims to test the hypothesis that early experiences are important for subsequent development, by assessing the effects of early severe institutional deprivation on subsequent patterns of self-regulation of emotion in a group of Romanian adoptees. This study is well positioned to answer this question due to the sharp environmental change, from an extremely depriving environment to a normal

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one in low-risk family settings. This is, however, not the case in most developmental psychology studies. A core problem of many studies is their difficulty in distinguishing early experiences from cumulative effects, because in most circumstances, there is substantial continuity in risk exposure (Rutter, 1981). These difficulties are highlighted in the ongoing debate in the developmental psychology literature concerning this crucial theoretical question.

### ***Different Views Regarding the Role of Early experiences in Development***

Theorists in this area hold differing views about the relative importance of the first years of life to subsequent adaptation. Bruer (1999) for example, maintains that early experiences do not, in themselves, determine later functioning. He argues that although sensitive periods do exist for specific functions and limited kinds of learning (e.g., the acquisition of a first language), most types of learning are not subject to sensitive period constraints and developmental processes and brain plasticity continue well into early adult life. Indeed, research has shown the remarkable plasticity of the brain in adulthood, both in humans (Maguire, Gadian, Johnstrude, Good, et al., 2000) and animals (Greenough, Volkmar & Juraska, 1973).

In contrast to this view, the trait model holds that early experiences bring about lasting changes in the organism. Thus, once a trait is acquired, it remains relatively unaffected by subsequent interactions with the environment. For example, Bowlby's (1969/1982) attachment theory holds that the child's early relationship with his primary caregiver, and the type of attachment that is formed as a result of this relationship at the end of the first year of life, is crucial for the child's later adjustment. The type of attachment established affects the child's subsequent

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functioning and ability to deal with subsequent environmental stress, with secure attachment acting as a protective factor against subsequent stress experiences and insecure attachment as a risk factor. Consistent with this model, Bowlby (1951) also maintained that children reared in institutions in their early years, without a consistently available maternal figure, will have permanent damage to their capacity to establish meaningful relationships with others, resulting in a syndrome he referred to as the 'affectionless character'. Bowlby believed that there is an early sensitive period during which, if the child is deprived, no amount of good parenting at a later stage will be effective in restoring the damage due to the permanent effects of early experiences. Animal studies were able to substantiate this theory by showing an association between early maternal deprivation and lasting changes in the somatic structures and functions in the organism (Coplan et al., 1996; Ladd et al., 1996). However, this has been more difficult to prove in humans.

Studies on children who have been exposed to atypical rearing environments, such as maltreatment, or depression in the mother, have shown the adverse long-term effects of such early experiences (e.g., Murray et al., 1996; 1999; Shields et al., 1994; Shipman & Zeman, 2000). These studies have clearly made major theoretical and clinical contributions to this area, but some of their inevitable methodological problems cannot be overlooked, in particular the issue of environmental continuity. Under ordinary circumstances children experience some continuity of care. As argued by various authors (e.g., Clarke & Clarke, 2000; Lewis, 1990), any early effects are likely to be reinforced subsequently by a similar pattern. One example is the association found between insecure attachment in infancy and subsequent developmental outcome. In this respect, it is difficult to determine the exact role of

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early attachment experiences, as children usually remain in the same environment in which attachment was formed and so continue to experience poor parenting (Lewis, 1990). As argued by Lewis (1990), persisting psychopathology in the child may be a function of a consistent psychopathogenic environment.

Similarly, Clarke and Clarke (2000) argue that a simple cause-and-effect model that only takes into account the early adverse experience and a later outcome is clearly misleading, due to the potentially modifying role of other environmental influences that are often being overlooked. One possible explanation for the effects of early experience on subsequent maladaptation is the chain effect. That is, early adversity can set up a chain of consequences and can produce new environmental effects. Studies of children who had been exposed to early adverse environments have demonstrated that many feel they have no control over their lives. Consequently, they tend to respond impulsively to difficulties and put themselves in stressful and damaging situations (Pawlby, Mills & Quinton, 1997a; Pawlby, Mills, Taylor & Quinton, 1997b). Even improved circumstances, following early adversity might still leave the child more vulnerable to later stress. For example, many children with a history of maltreatment, who are placed in alternative care, continue to experience relationship difficulties with their adoptive or foster carers which, in some cases, result in placement breakdown (Minty, 1999; Quinton, Rushton, Dance & Mayes, 1998). This persisting lack of stability and continued exposure to stress, in turn, puts these children at further risk. Early experiences then, may not exert their effect in isolation but in interaction with other variables.

### *The Transactional Model of Development*

Perhaps the most widely held modern viewpoint among theorists in developmental psychology, concerning the way in which early disturbances effect later outcome, is typified by the transactional model, also termed organisational, or elsewhere interactional model (e.g., Cicchetti & Lynch, 1995; Sameroff, 2000; Sander, 2000; Sroufe, 2000). Although these vary to some degree, what they have in common is the role of both the organism and the environment in determining the course of development. From this perspective, development is conceived as a dynamic multidetermined process. Variables and processes at many levels operate in transaction with one another to contribute to individual functioning. Thus, the strong relations between early relationship experiences and later self-organisation are best thought of as dynamic systems terms as opposed to linear causality (Sander, 2000).

Fundamental to this perspective is the negotiation of the central tasks of each developmental period (Cicchetti & Lynch, 1995). Child development is viewed as a series of negotiations of age and stage appropriate tasks. Effective resolution of earlier stage-salient developmental tasks, such as attainment of effective emotional regulatory processes in toddlerhood and early childhood, potentiate competence at later developmentally salient tasks, such as the establishment of peer relationships among school-age children (Cicchetti & Lynch, 1995). Conversely, early disruptions in the development of self-regulation would increase the risk for later self-regulatory deficits. Thus, early experiences are the foundation for individual development and the way early tasks are handled plays a pivotal role in influencing subsequent adaptation. However, developmental trajectories may be altered at many points as individuals continue to be affected by new biological and psychological experiences

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and thus changing conditions in their lives and modifications in the course of adaptation remain possible. Research has shown, for example, that changes in the life stress, social support, or level of depression of caregivers may have profound influences on the functioning of the child (Sroufe, Carlson, Levy & Egeland, 1999). Nevertheless, variation in individual functioning becomes increasingly restricted as the child develops. There is evidence to suggest that for most problems, the earlier circumstances improve, the more readily change in the child occurs. Some problems, for example aggressive behaviour, become more difficult to change after the elementary school years (Sroufe, 2000).

Taken from this perspective, in respect of this study, children who have suffered early institutional deprivation would be at increased risk for disruptions in the acquisition of developmental tasks related to emotion regulation, and conceivably would be placed on a poor footing for meeting later developmental tasks such as the establishment of peer relationships. Recent studies in both clinical and non-clinical populations provide evidence for this theory. For example, Shields and colleagues (1994) have shown that emotion regulation mediated the relationship between early maltreatment experiences and subsequent social competence with peers. Similarly, Eisenberg and colleagues (Eisenberg, Fabes, Bernzweig, Karbon, et al., 1993), in normative populations, have linked adaptive emotion regulation with general social skills and peer competence.

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## **The Effects of Institutional Deprivation on Children's Development**

### ***Early Research***

Early research on the effects of depriving early experiences was supported by the notion of the irreversible effects of early experiences on children's cognitive, social, and emotional development (Bowlby, 1951; Goldfarb, 1945; Provence & Lipton, 1962). Institutional deprivation was considered during those earlier days to be profoundly and irreversibly detrimental to psychological growth and accounted for, in part, by lack of an attachment figure in the first few years of life (Bowlby, 1951). Goldfarb (1943, 1945) for example, examined children who had been institutionalised in their early years of life and were subsequently placed in foster homes. In follow-ups at preadolescence and adolescence, the previously institutionalised children had persistent cognitive and affective deficits and difficulties in forming attachments with their substitute parents. However, conflicting findings posed questions regarding the irreversible and universal effects of early deprivation. For example, Skeels (1966) found that children reared in orphanages, who were later transferred to institutions for learning disabled adults, where they received affection and attention, were more likely to develop normally than those who remained in the orphanages. Dennis (1973) studied 89 children adopted from Lebanese institutions by Lebanese and US families and found that children placed in adoptive homes after the first two years of life showed impairments of intellectual and social abilities greater than those placed before their second birthday.

In the early work, the experiences included under 'deprivation' varied considerably and were loosely applied to include the mere fact of not having a mother around

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(Marcovitch, Goldberg, Gold, Washington, et al., 1995). Early research also varied in terms of methodological rigor (e.g., sample loss and children who had spent as little as two weeks in the institution in Dennis' study, 1973; contaminating influences through multiple foster placements in Goldfarb's study, 1945). This made the evaluation of the causal link between deprivation and maladaptive outcome more difficult.

### *The Effects of Institutionalisation*

Tizard and colleagues' (Hodges & Tizard, 1989a; Hodges & Tizard, 1989b; Tizard & Hodges, 1978; Tizard & Rees, 1975) series of studies on children who spent their early years in residential nurseries, provided evidence of the profound long-term effects of early institutionalisation, where it was clear that children were not deprived of adequate physical care and social stimulation, but were brought up under impersonal conditions where a specific consistent and responsive caregiver was entirely absent. During their time in institutions, these children were cared for by such a large number of different people that they had virtually no opportunity to form a close relationship with anyone and displayed indiscriminate, yet 'shallow' attachment to all carers. Following placement in families, most children were markedly attention seeking and over friendly to strangers. This pattern of social behaviour was also observed in a follow-up at age 8 years. In a further follow up at age 16 years, the ex-institutionalised adolescents persistently showed a pattern of social relationships which differed from that of matched comparisons; they were more oriented towards adults for approval or attention, more likely to have difficulties in peer relations and tended to be more aggressive towards other children.



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*Recent Research on the Effects of Institutional Deprivation: Findings on the Romanian Adoptees*

More recent longitudinal studies have further confirmed the adverse effects of early institutional deprivation on children's development. Specifically, the English and Romanian Adoptees (ERA) study team in the UK and a parallel study in Canada, have followed the development of Romanian children who spent their infancy and early childhood in institutions where they suffered profound physical, nutritional, social, and psychological deprivation (Ames, 1997; Marcovitch et al., 1997, Rutter et al., 1998). In the research based in the UK, Romanian children who were adopted into UK families at varying ages from less than 6 months old to 42 months old, were developmentally assessed and followed up at age 4 years and later on at age 6 years. A number of important findings were drawn from these studies. They have found overall a remarkable catch-up following placement into well-functioning families (Rutter et al., 1998; Rutter, Kreppner, & O'Connor, 2001). They have also highlighted, however, long-term pervasive developmental deficits associated with exposure to early institutional deprivation (Chisholm, Carter, Ames & Morison, 1995; Kreppner, O'Connor, Rutter, et al., 2001; O'Connor et al., 2000a; O'Connor, Rutter, Beckett, Kreppner, Keaveney, et al., 2000b; O'Connor et al., 2001; Rutter, Anderson-Wood, Beckett, Bredenkamp, et al., 1999). In addition, they have established that these pervasive patterns of difficulties showed a significant dose-response association with the duration of institutional deprivation (Rutter et al., 1998).

*Condition on arrival into the UK and subsequent catch-up*

As reported by Rutter and colleagues (1998), on arrival in the UK, these children proved to be severely developmentally impaired and malnourished, with almost half below the 3<sup>rd</sup> percentile on height, weight, head circumference, and IQ, with over half functioning in the severely learning disabled range. Many suffered health problems, with recurrent intestinal and respiratory infections and various skin disorders (Johnson, Miller, Iverson, Thomas, et al., 1992). However, an immense physical catch-up had taken place by age 4 and 6 years; whereas originally 51 percent of the Romanian adoptees were below the 3<sup>rd</sup> percentile for weight, only 2 percent were so impaired at age 4 years. An immense cognitive catch-up had also taken place, as measured by the Denver Developmental Quotient (Frankenburg, van Doorninck, Liddell & Dick, 1986) and the McCarthy General Cognitive Index (McCarthy, 1972). By age 4 years, in the Romanian group as a whole, the developmental quotient on the Denver Scales rose from a mean of 63 to a mean of 107, and for the sub-group who left the institutions after the age of 6 months from 45 to 90. Within-group differences were found, however, with 7 out of the 59 children adopted after 6 months functioning at the learning disabled range. Similar findings, showing immense physical and cognitive catch-up, were obtained in a parallel Canadian study (Ames, 1997). This dramatic catch-up following a major environmental change provided evidence that the initial severe developmental impairment was caused by the profound deprivation of institutional rearing. In addition, the remarkable degree of resilience shown runs counter to the notion of irreversible damage following prolonged early institutional deprivation (Rutter et al., 2001).

*Persisting cognitive deficits*

Although the degree of recovery was remarkable, substantial cognitive deficits persisted for those whose institutional care continued for 6 to 24 months and for those whom it continued for 24 to 42 months, regardless of the degree of nutrition (O'Connor et al., 2000b). At age 6 years, late-placed Romanian children exhibited, as a group, lower cognitive scores and general developmental impairment compared with earlier-placed Romanian children, with a substantial percentage of children in the former group scoring 70 or lower on the Denver scale. Correlational analysis revealed that duration of deprivation was the key predictor of differences between groups in cognitive development rather than the time spent in the adoptive home, beyond approximately the 2 years in which catch-up took place (O'Connor et al., 2000b).

*Persisting social deficits: Inattention and impulsivity and quasi-autistic patterns*

Follow-ups at age 4 and 6 years revealed that about a third of the children who came to the UK above the age of 6 months, showed patterns of inattention and impulsivity accompanied by restless overactivity. This pattern did not fit with the clinical picture of 'ordinary' attention/hyperactivity disorders (Kreppner, et al., 2001) and it was suggested that it may reflect a problem in dealing with social group situations rather than with overactivity as such (Rutter et al., 2001). In addition, a small minority of Romanian children (about 1 in 16) showed a pattern of autistic-like behaviours, including quasi-obsessive and repetitive stereotyped behaviours (Rutter, et al., 1999). However, these autistic features were atypical in respect of what is usually found in 'ordinary' autism. Specifically, they showed greater interest in social approach and greater flexibility in their communication skills. Another difference with 'ordinary'

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autism was that their socio-emotional difficulties, instead of becoming more marked, as expected in 'ordinary' autism, showed substantial improvement between 4 and 6 years of age (Rutter et al., 2001).

*Persisting social deficits: Attachment disturbances*

Attachment disturbances were another social deficit found in Romanian children who had suffered severe institutional deprivation. These disturbances were strongly related to duration of deprivation (Chisholm et al., 1995; Chisholm, 1998; O'Connor et al., 2000a.). These attachment disturbances did not fit with any of the established patterns of attachment insecurity (i.e., avoidant, ambivalent, or disorganised) but resembled more disinhibited attachment behaviour (O'Connor et al, 2001). These patterns were similar to those identified in previous studies, concerning atypical attachment and social behaviour of children exposed to institutional, though not necessarily depriving, care (e.g., Hodges & Tizard, 1989), perhaps indicating that the critical causal factor may be the absence of a relationship with a consistent and responsive caregiver (O'Connor et al., 2001).

According to reports from parents at both age 4 and 6 years, Romanian adoptees were more likely than comparisons to show indiscriminate social approach to people whom they did not know. They seemed to lack adequate social boundaries and there were concerns that they might go off with a stranger because they seemed to lack the normal inhibition against doing so (O'Connor et al., 2000a). Odd social behaviour was also observed. This included physical contact seeking, a superficial interest in others, difficulty picking up social cues about what is socially appropriate or acceptable to other people, emotional over-exuberance, extreme 'silliness', and

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excessive playfulness (O'Connor et al., 2001). These seemingly positive behaviours did not appear to have the goal of engaging the adult in a mutual interaction, whether a parent or a stranger (O'Connor et al., 2001). General lack of engagement or reciprocity from the child was also observed in the interaction with their adoptive parents (Croft, O'Connor, Keaveney, Groothues, et al., 2001).

#### *Possible mechanisms underlying these attachment disturbances*

In thinking about the possible mechanisms that may underlie these reported 'odd' social behaviours, it is possible that the common factor may be certain deficits in self-regulatory processes of emotion in social situations. The reasoning for this hypothesis derives, first, from the similarity between these reported social behaviours and various emotion regulation strategies. This will be discussed in more detail in the next section. Second, the reasoning derives from existing theories about the effects of disturbances in the early rearing environment on the development of emotion regulation skills.

One of the most striking observations made about the children in the Romanian institutions was the absence of crying (Ames & Carter, 1992). As a result of their experience with extreme neglect and minimal human interaction, a majority of the institutionalised children lacked many of the adaptive, communicative behaviours that aim to bring the caregiver closer, such as crying, smiling or, making eye contact. According to previous reports, at the time their adoptive parents first met them, fewer than half of the children would smile back at someone who smiled at them (McMullan & Fisher, 1992), and parents reported behaviour in their children that seemed to indicate an inability to let their needs be known. For example, they did not

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seem to experience pain and would lie quietly and not signal when they were awake (Ames & Carter, 1992).

As noted previously, from an attachment perspective, infant proximity seeking is not automatically activated but depends on the infant's evaluation of a range of environmental cues and past experience with the environment (Carlson & Sroufe, 1995). Thus, having had no one responding to their needs and managing their emotional arousal and other signals of need, may have resulted in these children adopting alternative strategies in an effort to cope with extreme distress. These strategies may have been integrated and internalised, and consequently may have become maladaptive in the long-term, as the environmental setting changed.

## **The Concept of Emotion Regulation**

### ***Emotion and Emotion Regulation***

Interest in the role of emotions in developmental psychology has grown in recent years because of the recognised importance of emotions in normal and abnormal development. First, it has been suggested that emotions are motivational and hence may be involved in explaining the causes of certain normal and abnormal behaviour. Second, evidence from both normal and abnormal populations suggests that emotion and cognition constitute separate, albeit interdependent, developmental systems (Hess & Cicchetti, 1982; Izard & Malatesta, 1987). Although cognitive processes (e.g., appraisal, attribution, belief) can generate emotions, it is suggested that emotion can also be generated by non-cognitive processes, such as one emotion

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activating another, and facial expressions (Izard & Harris, 1995). Third, from an evolutionary-developmental perspective, emotions are essentially functional and adaptive. However, they may, in the course of development fail to be appropriately integrated with other systems, possibly leading to psychopathological outcomes (Izard & Harris, 1995).

Over the years there has been a shift in emotion research from viewing emotions as a static state to focusing on the processes of emotional responding and the multiple modes that are connected with it. Research in the area of emotion has focused primarily on normal development of skills within three emotion categories: a) emotion encoding and decoding; b) emotion understanding; c) emotion regulation.

### ***Difficulties Defining Emotion Regulation***

Despite a growing interest in emotion regulation as an essential component of emotional development, and important theoretical and empirical advances in this field, there are some basic difficulties in defining what is meant by emotion regulation (Fox, 1994; Thompson, 1994; Eisenberg, 2001). Different authors have offered diverse portrayals of emotion regulation processes and have formulated this concept to include different meanings (Dodge & Garber, 1991). For example, emotion regulation has been formulated as a) exclusively pertaining to the inhibition of emotional arousal, b) to include emotional experiences, such as anxiety, depression, or as c) the maintenance and enhancement of emotional behaviour, or alternatively, as d) concerning with the management of affect expressions. As Cole, and colleagues (1994) have noted, various clinical approaches emphasise different facets of emotion regulation and most are difficult to operationalise. Some focus on

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regulatory functions of emotions in organising processes such as attention and social communication. Others emphasise the ways in which emotion is regulated (e.g., internalisation of social expectations) that allow the individual to monitor and adjust emotion reactions to situational demands (Izard, 1990).

Although authors share a common intuitive understanding of what emotion regulation means, difficulties in defining this construct primarily stem from the complexity of the processes involved in emotion regulation. This is particularly so in respect of the heterogeneity of these processes, the complexity of their development, and the challenges of identifying their origins (Thompson, 1994). Fox (1994) points out that the most problematic aspect in defining emotion regulation is the difficulty in differentiating between emotion regulation strategies and the emotional experience per se. For example, if one child cries in the presence of a frightening object whereas another child does not, it is difficult to determine whether the latter is better able to regulate fear or whether he is simply less fearless in the first place (Fox, 1994, p. 22). Theorists recognise that individual differences in emotion regulation are the norm. The issue is how to differentiate normative variability from variations that are indicative or predictive of maladjustment.

Many different definitions of emotion regulation are offered in the literature (e.g., Cicchetti & Lynch, 1995; Dodge & Garber, 1991; Eisenberg, 2001; Thompson, 1994). In all of them, emotion regulation is viewed as being at least somewhat under the effortful control of the individual. Eisenberg (2001, p. 120) offers the following definition of emotion regulation: ‘...the process of initiating, maintaining, modulating, or changing the occurrence, intensity, or duration of internal feeling



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states, emotion-related physiological processes, and the behavioural concomitants of emotion'. Examples of emotion regulation include internal psychological and physiological reactions such as attention shifting, as well as the ability to inhibit or activate ongoing behaviour as needed. It may also involve cognitions and actions aimed at changing an emotional arousing situation. (Eisenberg, 2001). One of the main defining features of emotion regulation according to this functional view addresses the adaptive nature of emotion regulation, that is, different strategies may be used to regulate emotions in order to achieve one's goals within a given context. The goal-oriented aspect of emotion regulation also implies that the strategies chosen to regulate ones' emotions may vary according to contexts and situational demands.

#### ***Recent Suggestions as to How to Define Emotion Regulation***

Many current formulations of emotion regulation regard optimal emotion regulation in terms of its outcome. That is, the individuals are capable of managing themselves successfully, such as by keeping emotions under control, or by appropriate prosocial behaviour, to allow for interpersonal engagement and relatedness to take place. Signs of emotion dysregulation, on the other hand, are commonly perceived as the absence of these capacities (Thompson, 1994). Cole and colleagues (1994) provide a useful explanation for what is meant by emotion dysregulation. Essentially, it refers to certain emotion patterns that jeopardise appropriate or productive functioning. This interference may involve the disruption of attention, or engagement with others, or failure to regulate emotion expression or emotional arousal. The specific context provides the frame of reference by which dysregulation is determined. Accordingly, emotion dysregulation does not mean that emotion regulation is not present. Rather,

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normal regulatory processes are operating, but in a dysfunctional manner in relation to a specific context (Cole et al., 1994).

### *Dimensions of Emotion Regulation*

As discussed above, emotion regulation does not refer to a unitary phenomenon. Rather, it covers a heterogeneous set of processes (Thompson, 1994). It encompasses a variety of behavioural strategies that can be displayed in different ways. Therefore, individual differences in emotion regulation are likely to occur along multiple dimensions rather than on a single axis. From the functionalist perspective of emotion regulation, there are several strategies that may be employed to self manage and regulate emotion in a social situation (Cole et al., 1994; Eisenberg, 2001; Thompson, 1994). Space limitations preclude an extensive discussion of all of them (e.g., positive cognitive framing). Those relevant for this study are summarised as follows:

#### *Affect expression*

Affect expression is one possible strategy for the regulation of emotion. This idea could be traced to Darwin (1872/1965) who believed that there was a direct relation between voluntary expressive behaviour and the subjective experience of emotion. It has been shown that exaggerating or suppressing affect expressions increases or decreases, respectively, both the subjective experience of emotion and accompanying physiological arousal (Izard, 1990). In addition, individuals who can effectively regulate affect expressions, can exercise considerable control over their emotion experiences (Izard & Harris, 1995). From birth, the emotional experiences of the infant are influenced by expressive behaviour. The young infant learns about the

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caregiver through the affective exchange mediated by vocal and facial expressions (Izard & Harris, 1995). The young infant shares the emotional life of the caregiver through direct imitation of emotion signals and vicariously through social referencing and observational learning (Walden, 1991). Parents influence the emotional life of the infant through selective reinforcement of the infant's expressions. The socialisation of emotion expressions in children contributes to the regulation of emotion, as children learn the adaptive or indeed, maladaptive techniques for the regulation of emotion. For example, if a child assumes the expression of a depressed parent, the expression itself may induce depressive affect (Izard & Harris, 1995).

Managing the expression of emotions, in the service of self-regulation, promotes optimal engagement with the environment. The most adaptive means of expressing emotion is usually situation specific, and is based on the child's emotion repertoire, and the goal. For example, crying in an older child can be maladaptive in some settings (e.g., when a child is refused something by a parent) but is a useful strategy in other settings (e.g., when calling for help). Research has shown that individuals may minimise, or alternatively, intensify their emotion expression, depending on their goal and the specific social situation, and that this has emotion-management consequences (Saarni, 1993). Thus, emotion regulation is often best accomplished by altering how one expresses emotion in order to accomplish one's goal. This may involve the discrete expressions or, the qualitative features of emotional responding, that is, the intensive or temporal features of it (Thompson, 1994).

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As children, with increasing age, acquire a broader repertoire of modes of expressing emotion, their capacities for emotion regulation are likely to be enhanced. Research has demonstrated that, when compared to younger school children, children in mid-to later elementary school report greater socialisation pressure to regulate emotional expressions (Fuchs & Thelen, 1988) and that children learn to manage their emotional displays based on expected interpersonal consequences (Shipman et al., 2000; Zeman & Garber, 1996).

Emotion regulation is undermined when emotion expressions are used inappropriately to the context, consequently leading to undesirable outcomes (Thompson, 1994). For example, while most positive emotion in social situations is regulatory in that it engages the other and sustains interaction, silly, giddy behaviour in certain situations, such as in the classroom, or in peer interaction, disrupts the achievements of goals (Cole et al., 1994). Indeed, children with attention deficit disorder often experience peer rejection because of their poorly timed, poorly regulated positive affect (Barkley, 1990). In emotionally conflicted situations, disruptive children may deal with conflicts by laughing or acting silly. Their over-positive affect interferes with adult and peer relationships and the ability to solve problems effectively (Thompson, 1994). A pattern of inability to access a typical emotion in a pertinent situation due to a very limited range of emotion expressions, may also indicate emotion dysregulation (e.g., the ability to express fear when threatened). Fluid, smooth shifts or transitions from one emotion state to another is an important regulatory strategy. Abrupt, unexpected changes, or too high a degree of emotion reactivity underlie instability (Cole et al., 1994). For example, research has shown that maltreated children are more likely to display emotional lability, lack

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of flexibility of emotional displays, and contextually inappropriate expressions of emotion, and that these deficits affect their relationship with peers (Shields et al., 1994; Shipman et al., 2000).

### *Behaviour control*

The functionalist view of emotion regulation suggests that social interaction provides the most salient context to exercise skills in emotion regulation. The well-regulated person interacts with others within the boundaries of social and cultural display rules (Saarni, 1979). Individuals coordinate their affect with the social standards of display behaviour in their cultural group (Ekman, 1984). Over the course of development, people develop rules about the appropriate contexts and forms of the expression of behaviours, such as aggression. It is suggested that the primary process whereby emotion regulation influences competence in social interaction is via the individual's ability to motivate socially appropriate or inappropriate behavioural responses in social interaction (Dodge, 1991; Eisenberg, 2001), and that this ability is dependent on the individual's maintenance of emotional stability (Cicchetti & Lynch, 1995; Shields, et al., 1994). Evidence suggests that individuals who can effectively manage their expressive behaviour can exercise considerable control over their emotional experience (Izard, 1990).

Emotion regulation strategies can significantly influence the course of social interaction and the development of social relationships. Children who have difficulties regulating their emotions often behave in socially unacceptable ways. For example, children who display affective intensity, poor frustration tolerance, and angry reactivity tend to be aggressive, impulsive, or disruptive (Cole, Zahn-Waxler,

1992; Eisenberg, Cumberland, Spinard, Fabes, et al., 2001). Maltreated children, who are at risk for deficits in emotional balance (Cicchetti & Lynch, 1995) have been shown to exhibit a wide variety of behavioural dysregulation, such as aggression, social withdrawal, disruptive acts, and inattentiveness, relative to matched controls (Cicchetti, Caniban & Barnett, 1991; Cicchetti & Toth, 1995; Shields et al., 1994). Similarly, it has been shown that in a group of 8-12 year old maltreated children, emotion dysregulation mediated the effects of maltreatment on reactive aggression and on bullying and victimisation (Shields & Cicchetti, 1998, 2001). Dodge and his colleagues (Dodge, 1991; Dodge & Somberg, 1987) have found that aggressive children tend to be deficient processors of social cues, especially when threatened, and consequently construe hostile intent in ambiguous social encounters with peers. It is suggested that problems in their emotion management contribute to their social dysfunction, especially under emotionally arousing situations. Overall, these suggest that emotion regulation plays a key role in the organisation of behaviour in social situations.

#### *Attention control*

Another way that emotion can be regulated is by means of focusing or shifting of attention, which helps to manage the intake of emotionally arousing information. Attention processes assume an emotionally regulating function from very early in life. Infancy studies have found that visual disengagement from emotionally arousing situations was associated with soothability (Rothbart, Posner, & Boylan, 1990; Rothbart et al., 1992). These 'self-directed regulatory behaviours' (Gianino & Tronick, 1988) of attention shifts help infants to manage negative affects. With increasing age, children use this regulatory strategy in more complex ways. In

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stressful or anxiety provoking situations they may use such attention management strategies as closing their eyes or ears, or looking away from the emotionally arousing stimuli, or leaving the situation altogether (Altschuler & Ruble, 1989). These strategies, for example, have been observed in children in the presence of adults arguing (Cummings, 1987). Visual disengagement as a strategy to regulate emotion, may also be used by older children and adults. For example, intense and acute embarrassment in a social situation is likely to produce temporary avoidance of others in terms of decreased gaze, or possibly even turning or moving away from others (Edelmann & Hampson, 1981).

Attention modulation takes on an increasingly significant regulatory function as children develop voluntary or effortful control in middle childhood (Derryberry & Rothbart, 1988; Ruff & Rothbart, 1996). During this time, children acquire psychologically oriented concepts of emotion, which enable them to also use strategies of internal redirection of attention, such as disengaging their attention from a stressful interaction, or shifting their thinking to more pleasant thoughts in emotionally arousing circumstances (Altschuler & Ruble, 1992). Children who acquire these higher level attention controls can flexibly shift and disengage attention in the service of emotion regulation, promoting positive mood and coping with negative emotional experiences (Eisenberg, Fabes, Murphy, Maszk, et al., 1995; Ruff & Rothbart, 1996). Deficits in this type of strategy, on the other hand, have been related to emotional lability and aggression in normative populations (Eisenberg et al., 1995; Eisenberg et al., 2001; Rothbart, Posner & Rosicky, 1994). Atypical patterns of attention shifting and focusing are also suggested by abused children's hypervigilance to environmental cues that may signal danger or threat (Pollack, et al.,

1997). Shields & Cicchetti, (1998) have found that impaired capacities for attention modulation, similar to non-pathological dissociation (e.g., distractibility, disengagement, detachment, confusion, day dreams, blank stares) contributed to emotion dysregulation in 6-12 year olds maltreated children.

### ***Previous Studies on the Measurement of Emotion Regulation***

Overall, research on emotion regulation in children is scarce. In existing research, a wide range of measures and operational definitions of emotion regulation can be found, indicating the lack of clarity that exists in the literature regarding what emotion regulation actually means. Existing studies have normally looked at each dimension (i.e., affect expression, behaviour control, and attention control) as distinct variables rather than as a measure of a single construct (e.g., Eisenberg et al., 1993; Eisenberg, et al., 1995; Eisenberg, et al., 2001; Shields & Cicchetti, 1998, 2001; Shields et al., 1994;; Shipman et al., 2000). However, their findings highlighted a great degree of overlap and showed that a high score on one of them was strongly associated with a high score on the others. For example, Shields and colleagues (1994, 1998, 2001) have used affect regulation, behaviour regulation, and attention regulation separately, but concluded that one seemed to contribute to the other and so a comprehensive measure that accounts for all of them simultaneously would be valuable. Similar conclusions, were drawn from other studies (e.g., Eisenberg et al., 1993).



**Aims of the Study**

The purpose of this study is twofold:

First, to disentangle patterns of emotion regulation in children with a history of institutional deprivation. Previous studies examining the social development of this clinical population have reported puzzling social behaviours that do not seem to fit with any one specific construct. This study wishes to examine whether maladaptive patterns of emotion regulation are involved in explaining these particular social behaviours. In view of the lack of clarity in the literature as to how emotion regulation is defined and manifested, this study hopes to shed some light on the construct of emotion regulation and how it is manifested in this group of children.

Second, a major aim of this study is to examine the effects of early institutional deprivation on the development of emotion regulation in children. In reviewing the literature, it seems that early rearing environments play a key role in the development of emotion regulation and may have long-term developmental implications. However, as noted previously, in much of the available research on the effects of early experiences on subsequent development, environmental continuity is confounded with previous adverse experiences, consequently making the effects of early experiences difficult to assess. In contrast, the dramatic environmental discontinuity that characterised the adoption of children from severely depriving Romanian institutions into low-risk family settings provides a platform to examine whether early adverse experiences indeed have deleterious effects on subsequent emotion regulation.

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In addition to examining the effects of early deprivation on subsequent emotion regulation, this study also has two subsidiary aims. The first is to examine whether the attachment disturbances reported in previous studies in this clinical population, mediate the relationships between early deprivation and emotion regulation. As noted previously, effective emotion regulation processes develop within the context of the early caregiver-child relationship. Therefore, disruptions in this attachment relationship, as would be expected in children who had an absence of an attachment figure in their earlier years, would be expected to disrupt the development of emotion regulation. Second, another secondary aim is to examine whether emotion regulation mediates the relationships between early deprivation and subsequent social competence with peers. As the transactional perspective on development suggests, emotion regulation serves as the foundation for the development of effective relationships with peers, whereas an inability to effectively negotiate this earlier developmental task may inhibit the attainment of peer competence at a later stage. Very few studies, however, have provided evidence for this theory (Shields & Cicchetti, 1998; Shields et al., 1994). This study aims to find out whether maladaptive emotion regulation may be a mechanism underlying impairment in interpersonal relationships, as they have been observed in previous studies, of children exposed to severe early institutional deprivation (Croft et al., 2001; O'Connor et al., 2001).

***Research Questions***

The primary questions that the current study sets out to address are as follows:

1. How is emotion regulation manifested in children who have suffered institutional deprivation?
  
2. Is early institutional deprivation associated with subsequent maladaptive patterns of emotion regulation? Are those who have suffered longer period of deprivation more likely to display maladaptive emotion regulation than those who have suffered a shorter duration of deprivation?
  
3. Do attachment disturbances mediate the relationships between early deprivation and subsequent emotion regulation?
  
4. Does emotion regulation mediate the relationships between early deprivation and subsequent social competence with peers?

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## CHAPTER TWO: METHOD

### **Context**

The present study is part of a wider longitudinal, multiple assessment project, called the English and Romanian Adoptees (ERA) study, which follows the development of children adopted from Romania into the UK (see Rutter et al., 1998 for details). Past assessments in the project were carried out when the children were 4 years and 6 years of age. The present study's assessment was carried out when the children were followed up at 11 years of age.

### **Participants**

The participants of the present study comprise a sub-sample of the large ongoing project. The selection process for the entire sample in the large project will be described because the same selection process applies to the sub-sample of this study.

### ***Romanian Sample***

The Romanian sample was drawn from the 324 children adopted from Romania into UK families between February 1990 and September 1992 who were processed through the Department of Health and/or the Home Office. An unknown number of children also entered the country illegally and these were not included in the sample. Also excluded, for practical reasons, were those not in England. A stratified random

sampling design was used for selecting the sample of the Romanian adoptees with the aim of obtaining 13 boys and 13 girls placed between the ages of 0 and 3 months, and 13 placed between 3 and 6 months, and thereafter 10 boys and 10 girls in each of the 6-month age band up to 42 months. In the older age band, the available numbers fell below target and so all children were included in the sample. Of the parents of Romanian adoptees who were approached to participate at the start of the project, when children were aged 4 and 6 years, 81% agreed to take part (Rutter et al., 1998).

### *UK Sample*

The UK sample was obtained through local authorities and voluntary adoption agencies. All children selected were placed in adoptive homes before the age of 6 months. It was not possible to determine the rate of participation for the assessments at age 4 and 6 years, among the within-country adoptees because the adoption agencies provided access to the families only after they had consented to participate. Available information suggests that around 50% of families who were approached agreed to take part in the project (Rutter et al., 1998).

### *The Sub-Sample for this Study*

In the large project, all participants are assessed at around the same age; shortly after their 11<sup>th</sup> birthday, in order to control for variations in age of assessment and thus to increase direct testing of the effects of deprivation. Because children's 11<sup>th</sup> birthdays spread between February 1988 to October 2002, it was not possible to include the entire sample (N = 217), due to time constraints in conducting this study. Accordingly, children whose 11<sup>th</sup> birthday was later than September 2001 were excluded from this study. Consequently, the initial sub-sample comprised 148

children. However, data were not available for 28 of the 148 children for the following reasons. First, 5 were severely developmentally delayed (e.g., too little language) and/or presented with severe clinical problems which meant that an ordinary assessment would be inappropriate. Another 11 families refused to participate in the study in the age-11-year follow-up assessment. These were largely the same families who had refused previously. Available data on 5 children could not be used for this study due to poor viewing quality of videotapes. Finally, data on 7 children were not available because the visits could not be scheduled on time to be available for this study.

The final sample of the present study comprised 120 children in total, divided into four groups: 36 late-placed Romanian adoptees who entered the UK when aged between 24-48 months; 38 middle-placed Romanian adoptees who entered the UK when aged between 6-24 months; 22 early-placed Romanian adoptees who entered the UK before the age of 6 months; and 24 within-country adoptees, all of whom were placed into adoptive families before the age of 6 months.

Because the present study comprised fewer children than the large project and was restricted to those children whose birthday was before September 2001, it was not possible to obtain equal numbers of children and gender in each of the study's age of entry bands. In addition, many children who entered the UK at an older age were also adopted earlier in time. Consequently, there is some bias in the sample, in that there is a relatively larger number of late placed children compared with children who were adopted before the age of 6 months. Table 1 presents the mean age of entry into the UK and child gender in each of the four groups.

Table 1: Mean age child joined household by adoptee group and child sex

Adoptee groups	Child sex	N	Age child joined household	
			Mean	Std. deviation
UK (0-6 months)	Female	8	3.25	1.67
	Male	16	2.56	1.26
	Total	24	2.79	1.41
Romanian (Entry 0-6 months)	Female	11	3.91	1.44
	Male	11	3.09	1.37
	Total	22	3.50	1.44
Romanian (Entry 6-24 months)	Female	20	15.20	6.01
	Male	18	14.94	4.96
	Total	38	15.08	5.47
Romanian (Entry 24-48 months)	Female	24	30.48	4.56
	Male	12	30.17	5.60
	Total	36	30.37	4.86

### *Conditions in Romanian Institutions*

Information on the quality of care in institutions is limited to mostly anecdotal reports, including accounts by adoptive parents who visited these settings and members of research teams. Conditions in institutions were overall extremely poor (see Rutter et al., 1998, for a details). The institutions were described as colourless, very quiet, with little visual or auditory stimulation available to the children and very few, if any, toys or play-things (Ames & Carter, 1992). None of the institutions was equipped with adequate funding, food, or medical supplies. In most instances, children were confined to cots for as many as 20 hours a day. Children looked uninterested, unresponsive, and spent most of their time lying or sitting immobile in their cots (McMullan & Fisher, 1992). Child-to-caregiver ratios ranged from 10:1 for infants to as high as 35:1 for children over 3 years of age (McMullan & Fisher, 1992). As a result of inadequate staffing, any human interaction children experienced was in the provision of minimal physical care and very little communication. Children were fed gruel by bottles with large teats that were often left propped up. The physical environment was sometimes harsh. For example, washing often consisted of being hosed down with cold water.

Information on why children were placed in institutions was not systematically available. Nevertheless, the fact that most children (85%) entered institutions in their first months of life indicates that developmental delay or disability was not one of the reasons. Available evidence suggests that severe economic adversity may have played a major role (O'Connor et al., 2000b).



### *Demographics and Family Background*

The adoptive families of UK and Romanian children were generally middle-class and had educational attainments and an occupational level above the general population. However, no statistically significant differences were found between the two groups in respect of these measures, both in the large sample and in the sub-sample. There were some differences between the families adopting from Romania and those adopting from the UK with regards to parental age and family composition. The adopting parents of Romanian children were slightly older at the time of placement than the adoptive parents of UK children (fathers: mean age 39 vs. 36 years; mothers: mean age of 36.6 vs. 34.2, respectively) and included a higher proportion of those who already had biological children of their own (34% vs. 2%, respectively) and a lower proportion of those who had adopted previously (4% vs. 40%, respectively). These demographic differences were attributable to adoption policy in the UK at the time. For example, because age differences between adoptive parents and children influence placement decisions, parents of UK adoptees (all of whom were adopted as infants), were significantly younger than parents of Romanian adoptees (who were adopted up to the age of 42 months). Also, these differences highlight the fact that infertility was not a primary motive for adoption among many parents adopting children from Romania, many of whom have adopted more than one child within a year of the first placement (25% compared to 1% in the group of parents adopting within-country children). Similar demographic differences were found in the sub-sample for this study. As these differences were not associated with measures of emotion regulation (see below), they will not be considered further.

Within the group of families adopting children from Romania, there were no significant differences in family characteristics with respect to the children's age at the time of entering the UK. There was also no evidence that the Romanian children adopted into the UK at a younger age were different from those Romanian children who were placed in the UK at an older age in terms of their physical condition at entry to the UK (most were severely malnourished; Rutter et al., 1998) and also in terms of their age when placed in institutions, as most children were institutionalised in their first weeks of life (mean age = 0.34, SD = 1.26). The great majority of Romanian children (87%) were adopted from institutions. However, the small number of children who were adopted from family settings also suffered severe neglect, primarily through poverty. Without exception, all children adopted from Romania experienced severe global deprivation, as reflected in their significant physical and developmental delay at entry into the UK (Rutter et al., 1998) and from reports on children who remained in institutions (Kaler & Freeman, 1994). Within the sub-sample, 9 of the 96 Romanian adoptees were adopted from family settings (not necessarily biological) and 87 from institutions. No significant associations were found between experience of institutionalisation (yes/no) and emotion regulation (see below). Therefore, history of institutionalisation will not be considered further.

## **Ethics**

Ethical approval was sought in 1996 for the entire project, of which this study is part. Ethical approval was obtained from the Institute of Psychiatry and the Bethlem and Maudsley NHS Trust, reference number 59/92. For the assessment phase at age 11

years, parents and children received information about the study and the kinds of assessments that were intended to be carried out. Informed consent was given by parents and children.

## Procedure

The assessment for this study was part of the large data collection for the entire project. Families were visited at home on two occasions, shortly after the child's 11<sup>th</sup> birthday. Visits consisted of a range of assessments of the child and the primary caregiver (usually the mother). The extensive assessment of the child included psychometric tests, a set of questionnaires and semi-structured interviews, conducted by trained interviewers of the English and Romanian Adoptees (ERA) study team. The interview of relevance to this present study is the *friendship interview* (Kreppner, Colvert & O'Connor, 2002) which was administered to the child during the second visit to the home. The behaviour of the child during the interview was video-recorded for subsequent observation, which formed the basis of the emotion regulation measure (see below). The interview consisted of a series of semi-structured questions and typically took around 20 minutes to administer. It focused on the child's current best friend, the aim of which was to assess the child's perception of friendship in a more natural setting and in a less structured format. Interviewers were trained to maintain a 'natural conversational style' with the child during the interview. The ten questions of the interview that are relevant to this study were: 'How would you describe your relationship with....?'; 'Does ... know a lot about what you are like?'; 'Does ....know a lot about how you feel about things?';

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‘Why are you friends with ....?’; ‘What do you like about ...?’; ‘What do you not like so much about....?’; ‘Why do you think ....is friends with you?’; ‘Are you sometimes worried that ....will stop being your friend?’; ‘If you feel sad or upset, would .... try to cheer you up?’; and ‘If other kids were teasing you, would...tell them to stop it?’ No significant differences were found between particular interviewers and measures of emotion regulation. Therefore the effect of interviewer style upon child’s behaviour during the interview will not be considered further.

Teachers were sent a set of behavioural and relationship questionnaires about the child after consent was obtained from the parents during the first visit. An addressed and stamped envelope was provided for teachers to return the questionnaires.

As the data was collected for the entire project by trained examiners, I was not able to be part of this process. However, I had a major involvement in devising the coding scheme for the emotion regulation measure (see below) and I acted as the main coder.

## **Design**

The present study is an observational study of emotion regulation in an interview situation. The design is a non-equivalent groups posttest-only design of four levels. The main dependent variable is emotion regulation. The main independent variable is deprivation and is based on the categorical variable of children’s group membership (x four groups). Children’s age of entry into the UK parallels the time they left the

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depriving institution. Hence, the Romanian adoptee group can also be assessed for duration of deprivation as a continuous variable. The within-country adoptees have not suffered early deprivation. They therefore provide a comparison group, controlling for the effects of adoption in the absence of early deprivation.

## Measures

### *Emotion Regulation*

The coding scheme used to rate children's emotion regulation was devised specifically for this study and with the population in question in mind. There were two reasons for devising the measure. First, for practical reasons it was not possible to add questionnaires to the large project's protocol so it seemed more reasonable to conduct an observational study. Second, there did not seem to exist any established coding manuals of emotion regulation that capture the dimensions I was interested in assessing and which were appropriate for this clinical population and for the specific context of assessment.

The coding scheme was developed to assess children's self-regulation of emotion during an interview situation with an adult who is relatively unfamiliar to the child. It was derived from a combination of literature on emotion regulation (e.g., Cole et al., 1994; Dodge & Garber, 1991; Eisenberg, 2001; Fox, 1994; Magai & Passman, 1998; Thompson, 1994), existing measures of various aspects of emotion regulation (Eisenberg et al., 1993; Eisenberg et al., 2001; Shields & Cicchetti, 1998; Shields et al., 1994), and research and literature on affect expression (e.g., Aronoff, Stollak &

Woike, 1994; Ekman, 1984; Ekman & Friesen, 1975; Gottman, 1993; Izard & Harris, 1995; Scherer, 1984) and social interaction (e.g., Feldman & Rime, 1991; Hargie, Saunders & Dickson, 1994; Patterson, 1994). In addition, previous studies (e.g., O'Connor et al., 2000a, 2001) and anecdotal reports from research team members on the social behaviour of the Romanian adoptees, and observations of a number of videotapes, were used.

The guiding principle in devising the coding manual was to capture those aspects of emotion regulation that would be observable in a mildly challenging interview situation with an adult relatively unfamiliar to the child. Observation had partly an exploratory aspect, in that one of the main aims was to get an understanding of the ways in which the 'puzzling' and 'odd' social behaviours of the Romanian adoptees, described in previous studies (e.g., O'Connor et al., 2001), were manifested and whether there were common patterns to it.

Coding was carried out by means of observation of videotapes of the *Friendship Interview* (Kreppner et al., 2002). Observation focused on children's spontaneous behaviour as they interacted with the interviewer during the course of the interview. Coding was carried out separately for each of the 10 question-answer episodes of the interview that were concerned with the quality of the friendship. The operational definition of emotion regulation for the study was largely based on the functional perspective of emotion regulation (e.g., Thompson, 1994) and other central authors in this field (e.g., Eisenberg, 2001). Adaptive emotion regulation was operationalised as the ability to manage and modulate one's affective reactions, shift and focus attention, and to inhibit or activate social behaviour as needed, such that an optimal

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level of engagement was fostered within the interview context. Conversely, maladaptive emotion regulation patterns were operationalised as patterns that jeopardise appropriate functioning of the child in the interview and/or jeopardise or interfere with the flow of the interview due to contextually inappropriate management of affect, attention, and/or behaviour. Three dimensions of emotion regulation were studied: a) affect expression, b) behaviour control, c) attention control. A copy of the full coding manual and the coding sheet are contained in Appendix 1. Here, I will briefly describe the dimensions and outline the items in each of them.

*a) Affect expression*

The aim was to capture the child's patterns of expressing affect in terms of the range and repertoire, the intensity, and the appropriate use of emotion for the context of the interview. In agreement with emotion regulation literature, more adaptive affect expression is reflected in contextually appropriate use of expressions, in moderate intensity, and in the ability to access a wide range of felt expressions (Aronoff et al., 1994; Cole et al., 1994; Eisenberg, 2001; Thompson, 1994). Ekman and Friesen's (1975) guidelines on the physical facial features of the basic emotions were used as illustrations of possible ways affect may be conveyed and recognised. Nevertheless, coding was largely based on a gestalt approach (Gottman, 1993), thus using cues from vocal expressions and body language as well (Scherer, 1984), and on a 'cultural informant' system (Gottman, 1993), thus, not restricting affect expressions to only those that satisfy the criteria of cross-cultural universality (Ekman, 1984), but including those that acceptably, in our culture, reflect certain affective states and that are conceptually meaningful in understanding patterns of emotion regulation. The

final version of the manual included 8 items: genuine positive affect; ingenuine positive affect; sad affect; anger affect; fear/apprehension/worry affect; high arousal/over excitement; exaggerated affect; unusual tone of voice. Apart from exaggerated affect and unusual tone of voice which were on a 2-point scale (yes/no), the other six items were on a 3-point scale as a measure of intensity (i.e., high intensity = 2; low intensity = 1; total absence = 0).

*b) Behaviour control*

This dimension was concerned with the overall interaction style of the child during the interview. In accord with the emotion regulation literature, the aim was to capture the child's ability to inhibit or activate behaviour as needed and to motivate socially appropriate behavioural responses, in order to encourage contextually appropriate social interaction (Eisenberg, 2001; Patterson, 1994). This had 9 items: engagement/cooperation; resistant/oppositional; controlling; non-voluntary; lack of verbal boundaries; lack of physical boundaries; fidgetiness; shiftiness; pulling faces to the camera. Apart from engagement/cooperation scale, the other seven items were on a 2-point scale (yes/no). Engagement/cooperation was on a 3-point scale, as a measure of quality (i.e., high quality = 2; low quality = 1; total absence = 0).

*c) Attention control*

This assessed children's use of focus and shifts of attention as a component of emotion regulation processes. In agreement with emotion regulation literature, attention control helps to regulate the flow of the interaction. Excessive shifts of attention disrupt appropriate social interaction. This had 2 items: eye contact and attention disengagement. Eye contact was on a 3-point scale as a measure of quality



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(i.e., high quality = 2; low quality = 1; total absence = 0). Attention disengagement was on a 2-point scale (yes/no).

In addition to the three dimensions of emotion regulation described above, a separate item was included which was termed '*Out of his/her Depth*'. This item was not directly related to emotion regulation but was included to account for the specific situation where children seemed to struggle with understanding the content of the interview. For example, they had difficulties understanding the questions or providing an answer due to seemingly a lack of conceptual understanding.

The development of the coding scheme was conducted by myself in discussion with my supervisor (Thomas O'Connor) and a team of two other researchers (Jana Kreppner and Anna Kleinspehn). The coding of videotapes commenced only after the team was in agreement on the operational definition of all the items and after thorough training sessions were carried out for the coders to ensure thorough understanding of items. Any further uncertainties of coding were discussed in the team. Coders were monitored continually to make sure they did not drift from the agreed operational definitions of items (Barker, Pistrang, & Elliott, 1994). I coded all videotapes included in the analyses. A second researcher (Anna Kleinspehn) coded a random selection of 36% of tapes (N = 43) for reliability analysis. We were both blind to children's group membership until all coding was finished. Reliability for each item was based on correlations between raters as outlined in Table 2.

Table 2: *Correlations for reliability analysis*

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Item	Correlations
Genuine positive affect	.89
Ingenuine positive affect	.84
Sad affect	.77
Anger affect	.74
Fear/worry/apprehensive affect	.17
High-arousal/over-excitement	.97
Exaggerated affect	.71
Tone of voice	.81
Engagement/cooperation	.65
Resistant/oppositional	.73
Controlling	.93
Non-voluntary	.45
Verbal boundaries	.77
Physical boundaries	.77
fidgetiness	.81
Shiftiness	.86
Pulling faces to camera	.67
Eye contact	.77
Attention disengagement	.87
Out of his/her depth	.88

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Variables with poor inter-rater reliability (less than .65) were dropped from further analysis (i.e., fear/worry/apprehensive affect; non-voluntary). The scores for each item were averaged across the 10 episodes. These scores were then standardised so that all items were on a common scale. Items were reversed as necessary, so that for all items a high score would indicate more maladaptive patterns of emotion regulation. Internal consistencies for the dimensions of affect expression, behaviour control, and attention control were:  $\alpha = .33, .73, .58$ , respectively. Poor internal consistency on two out of the three dimensions led to a decision to carry out factor analysis. The reasons for carrying out factor analysis will be discussed in more detail in the results section.

### ***Social Competence with Peers***

Two standardised measures were used to assess children's general relationships with peers, a self-report measure and other-report measure.

#### *The Loneliness and Social Dissatisfaction Questionnaire (LD)*

This widely-used, validated self-rating inventory (Cassidy and Asher, 1992) was filled in by the child with the examiner during the first home visit and is shown in appendix 2. For the present study only the ten questions relating to feeling lonely or dissatisfied within the peer group were administered. The 'filler' questions which focus on hobbies and interests that are part of the original version by Cassidy and Asher (1992) were not included in the large project of which this study is a part. The scoring for each item was made on a 3-point scale (i.e., the statement applies = 2; applies somewhat/sometimes = 1; does not apply = 0). Items which were phrased in a positive way were reversed so that for all items a high score indicated a greater

feeling of loneliness and social dissatisfaction within the peer group. Scores across all items were averaged to obtain a total score of feelings of loneliness and dissatisfaction. Internal consistency was:  $\alpha = .86$ .

#### *The Perceived Competence Scale for Children*

A shortened version of the original questionnaire (Harter, 1982) was completed by teachers. The original version is shown in Appendix 2. In the short version, only the 6 sub-scales for academic and social competence were included. The following six items comprised the social competence scale; 'This child finds it hard to make friends'; 'This child has a lot of friends'; 'This child would like to have a lot more friends'; 'This child is always doing things with a lot of children'; 'This child wishes more children her/his own age liked him/her'; 'This child is popular with others her/his own age'. The questionnaire followed the standard format of the Harter scales, that is, each item consisted of directly opposing statement, one phrased in a positive way and the other in a negative way. Teachers had to decide which of the two statements fitted more with the child and also whether the statement was 'sort of true' or 'really true' for the child. The items were coded on a 4 point scale with 0 = low social acceptance and 4 = high social acceptance. Scores for the 6 items were averaged to obtain a total social acceptance score. Internal consistency was:  $\alpha = .94$ . The perceived Competence Scale is a widely-used standardised measure for which validity has been established (Harter, 1982).

It was not possible to obtain the questionnaires back in time from all teachers. Accordingly, this data is based on a smaller sample size. The sample for this questionnaire comprises of 106 children. Of them, 23 UK adoptees, 17 early-placed

Romanian adoptees, 34 middle-placed Romanian adoptees, and 32 late-placed Romanian adoptees.

### *Attachment Disturbances*

Assessment of attachment disturbances was available from the data collected when children were 6 years old. This was based on a semi-structured interview with the parents, constructed specifically for the large project, to assess the child's behaviour towards the parent and other adults in both novel and familiar situations (see O'Connor et al., 2000a). The measure in its final form included 3 items that reflected attachment disturbances. These were: 1) definite lack of differentiating between adults; 2) clear indication that the child would readily go off with a stranger; and 3) definite lack of checking back with the parent in anxiety-provoking situations. For each of the three items, interviewers gave a score of 0 if there was no evidence of disturbance, a score of 1 was given if there was some or mild evidence, and a score of 2 if the disturbance was marked or pervasive. Internal consistency for the items was:  $\alpha = .77$ . Inter-rater reliability, based on 20 interview protocols from three interviewers, was 1.00, .94, and .86, respectively (O'Connor et al., 2000a).

### *Cognitive Ability*

This measure was included as a covariate. Cognitive ability was assessed using the Wechsler Intelligence Scale for Children, 3<sup>rd</sup> edition, UK version (WISC-III). This is the most commonly used standardised measure of children's cognitive ability. Two separate scores, for performance IQ and verbal IQ, were derived for each child. From the verbal inventory, two subset of measures were included; Vocabulary and Similarities. Thus, the verbal skills assessed were children's understanding of words,

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verbal concept formation, and verbal expression. In the Similarities task children were asked to relate pairs of verbal concepts (e.g. 'In what ways are a shirt and a shoe alike?'; 'In what ways are an apple and a banana alike?'). The Vocabulary task required children to describe the meaning of words (e.g. 'What is a bicycle?'; 'What does absorb mean?'). The scores were prorated in order to derive a total score. Two sub-set of measures were also taken from the performance inventory; Block Design and Object Assembly. Thus, the areas of cognitive ability assessed were perceptual-organisational skills, spatial visualisation and visual-motor coordinating. Block Design involved copying abstract designs with blocks. Object Assembly involved assembling cut-up puzzles of common stimuli (e.g. a car, a horse, a doll, etc.). The scores were prorated in order to derive a total score.

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**CHAPTER 3: RESULTS****Research Aims**

The aim of the present study was to investigate patterns of emotion regulation in children who have suffered early institutional deprivation. I was particularly interested in the long-term effects of severe early deprivation on 11 year old children's self-regulation and in the association between duration of deprivation and emotion regulation. I also wished to find out whether attachment disturbance symptoms at age 6 years were related to emotion regulation at age 11 years and the extent to which they accounted for the relationship between length of deprivation and emotion regulation. Finally, I was interested to find out whether emotion regulation was associated with social competence with peers and to examine whether it mediated the relationship between duration of deprivation and social competence with peers. The results of this study are presented in four sections. The first section covers analysis of the emotion regulation measure. In the second section I examine the connection between experience of deprivation and subsequent emotion regulation. In the third section, the role of attachment disturbances in mediating the effects of deprivation on emotion regulation is examined. The fourth section covers analysis of the mediating role of emotion regulation in the relationships between early deprivation and social competence with peers.

## **Emotion Regulation Measure**

Poor internal consistency on two out of the three emotion regulation dimensions ( $\alpha = .33$  and  $.58$ ), led to a reorganisation of the items from their initial order. Emotion regulation as a construct is a relatively new idea and there still does not exist one established theory on how to define it and how to distinguish amongst its different components. This was reflected in the measure for this present study. It was not clearly evident which dimension of emotion regulation best fitted some items. For example, shiftiness, was placed in the 'behaviour control' dimension, but it may also fit the 'affect expression' dimension, as excessive shiftiness may reflect a high level of anxiety. Thus, it was not entirely clear how the items should be conceptually organised. Therefore, in order to maximise the information in the different dimensions of emotion regulation and minimise redundancy between dimensions, a factor analysis was carried out.

### ***Factor Analysis***

Factor analysis examines the correlation between each variable with every other variable in the measure and arranges them into factors tapping their supposed underlying common dimensions (Kinnear & Gray, 2000). The purpose of factor analysis then, was to link the 18 remaining items into factors and to identify and quantify the psychological dimensions, or patterns of emotion regulation, that may underlie them.

In order to assess the adequacy of extraction of factors, several factor analyses were performed, using different extraction methods, different criteria for choosing number

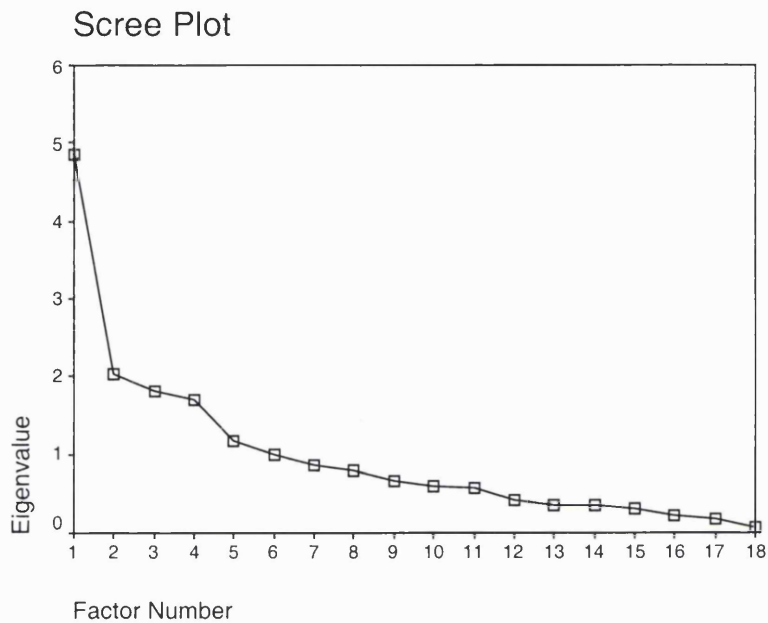


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of factors (i.e., either by eigenvalues' size of greater than 1 or by the scree plot), and different rotation techniques. In all of the analyses, there were four robust factors that appeared throughout. Principal components analysis and principal axis factoring were used to extract the factors from the correlation matrix. The scree plot for the principal axis factoring is shown in Figure 1. The scree plot provides a graphical representation of the eigenvalues (i.e., the variance that is accounted for by a particular factor) for each factor extracted. The scree plot is normally negatively decreasing, i.e., the eigenvalue is highest for the first factor and decreases as the values get smaller. In this method, to assess the number of factors, one has to look for the point where the line drawn through the points changes slope (Tabachnick & Fidell, 1996). As shown in the figure, this appears to be between point 4 and 5, indicating the existence of four factors in the data.

In order to maximise the relationships between the items and minimise associations with others (Kinnear & Gray, 2000), the factors were subjected to varimax rotation technique which assumes independence between factors. The factor loadings, based on varimax technique, are shown in Table 3. Where an item had loadings on more than one factor, the higher loading was considered. A combination of empirical support, together with theoretical considerations were used to create the final factors.

Figure 1:



As shown in the table, the first factor comprises three items. These are lack of verbal boundaries, lack of physical boundaries, and controlling. These items reflect a particular style of behaviour in social situations. Hence, the psychological dimension underlying this factor may be inappropriate social approach. The second factor comprises eight items. These are lack of engagement, lack of eye contact, attention disengagement, high arousal/over excitement, shiftiness, fidgetiness, out of his/her depth, and unusual tone of voice. These items reflect poor self-control in a social situation. Thus, the common dimension underlying this factor may be impaired modulation of attention, behaviour, and affect. Out of his/her depth does not seem to fit theoretically with this dimension as it taps into a cognitive dimension. Therefore it was removed from this factor. Because it also had rare frequency, it was removed from further analysis.

Table 3: *Rotated factor matrix based on varimax technique*

	Factor			
	1	2	3	4
Verbal boundaries	.942			
Physical boundaries	.894			
Controlling	.833			
Engagement/cooperation		-.736		
Eye contact		-.578		
Attention disengagement		.578	.328	
High-arousal/over excitement	.323	.535		
Shiftiness		.478		
Fidgetiness		.446		
Out of his/her depth		.357		
Tone of voice		.311		
Ingenuine-positive affect			.677	
Exaggerated affect			.675	
Pulling faces to the camera	.464		.655	
Genuine-positive affect				.637
Resistant/oppositional			.408	-.455
Anger affect				-.377
Sad affect				-.364

The third factor consists of three items. These are ingenuine positive affect, exaggerated affect, and pulling faces to the camera. These items reflect a particular style of expressive behaviour. Hence, the dimension underlying this factor may be an inappropriate display of affect. Finally, the fourth factor consists of four variables. These are genuine positive affect, lack of resistance, lack of anger and lack of sadness. This factor seems to represent a dimension of positive affectivity. Items in this factor were reversed so that a high score would reflect more negative affectivity.

In summary, the results of the factor analysis indicated four measures of maladaptive patterns of emotion regulation. These are: Inappropriate social approach (ISA); impaired modulation of attention, behaviour, and affect (ABA); inappropriate display of affect (IDA); and negative affectivity (NEG). Within each factor, items' scores were combined to create a composite score. Higher scores on these factors reflected more maladaptive emotion regulation. Internal consistencies for the four factors were:  $\alpha = .71; .75; .71; .50$ , respectively. Because negative affectivity (NEG) had poor internal consistency it was dropped from subsequent analysis.

### *Correlations of Factors*

A correlation matrix was computed to examine the relationship between the three remaining measures of emotion regulation. Pearson's  $r$  correlation coefficients and their significance are shown in Table 4. These correlations suggest that inappropriate social approach (ISA), impaired modulation of attention, behaviour, and affect (ABA), and inappropriate display of affect (IDA) are related significantly to one another, although the correlations are not very high. This may indicate that these measures reflect different dimensions of a similar construct. This is in accordance

with the theory since emotion regulation has several dimensions that are not mutually exclusive.

Table 4: *Correlations among measures of emotion regulation*

	ISA	ABA	IDA
ISA			
ABA	.360**		
IDA	.362**	.324**	

\*\* p < .01

ISA=Inappropriate social approach

ABA=Impaired modulation of attention, behaviour, and affect

IDA=Inappropriate display of affect

### *Correlations of Factors with Cognitive Ability*

A correlation matrix was also performed to assess the relationship between the three emotion regulation measures and IQ, the results of which are shown in Table 5. As seen from the table, the emotion regulation dimension of impaired modulation of attention, behaviour, and affect (ABA) is negatively associated with both verbal and performance IQ ( $r = -.29, p < .01$ ;  $r = -.19, p < .05$ ), respectively, indicating that children who exhibit more maladaptive patterns of emotion regulation characterised by impaired modulation of attention, behaviour, and affect, also tend to score lower on IQ. Conversely, inappropriate display of affect (IDA) has a negative association with verbal IQ ( $r = -.19, p < .05$ ), but not with performance IQ ( $r = -.12, p = .18$ ), indicating that children who display more maladaptive emotion regulation characterised by inappropriate display of affect tend to have more cognitive

difficulties in the verbal domain but not necessarily in the performance domain. In contrast, maladaptive patterns of emotion regulation characterised by inappropriate social approach (ISA) is not significantly related to either verbal or performance IQ ( $r = -.09, p = .30; r = .03, p = .69$ , respectively).

Table 5: *Correlations of measures of emotion regulations with verbal and performance IQ*

	Verbal IQ	Performance IQ
	N = 120	N = 120
ISA	-.09	.03
ABA	-.29**	-.19*
IDA	-.19*	-.12

\*  $p < .05$  \*\*  $p < .01$

ISA=inappropriate social approach

ABA=Impaired modulation of attention, behaviour, and affect

IDA=Inappropriate display of affect

## Early Deprivation and Emotion Regulation

### *Association between Emotion Regulation and Deprivation*

The main purpose of this study was to examine the relationship between early experiences of deprivation and emotion regulation at age 11 years. In order to test the effect of deprivation per se (rather than duration of) on emotion regulation, the group of Romanian children was compared to the group of within-country adoptees in an independent samples T-Test. A T-Test was performed for each of the emotion regulation measures separately. Table 6 depicts the standardised mean scores and

standard deviations, and the t-values, for the three emotion regulation measures for the two groups; adopted children from Romanian institutions and adopted children from the UK.

Table 6: *Group differences on emotion regulation measures*

	UK adoptees N = 24		Romanian adoptees N = 96		t-value	p
	Mean	SD	Mean	SD		
ISA	-.089	.056	.06	.724	-2.003*	.04
ABA	-.288	.376	.072	.663	-3.51**	.001
IDA	-.322	.242	.08	.088	-3.98***	.000

\* p<.05 \*\* p<.01 \*\*\* p<.001

ISA=Inappropriate social approach

ABA=Impaired modulation of attention, behaviour, and affect

IDA=Inappropriate display of affect

As indicated by the table, children who have suffered early deprivation significantly differ from children who have not experienced it on the three indices of emotion regulation. The T-Test indicates that at age 11 years, the two groups differ significantly on inappropriate social approach (ISA) ( $t(99.4) = -2.003$ ,  $p < .01$ ), on impaired modulation of attention, behaviour, and affect (ABA) ( $t(63.2) = -3.5$ ,  $p < .01$ ), and on inappropriate display of affect (IDA) ( $t(116.5) = -3.98$ ,  $p < .001$ ), with the group of Romanian adoptees scoring higher on these measures, indicating that as

a group they are more likely to exhibit maladaptive patterns of emotion regulation than the within-country adopted children.

### ***Emotion Regulation and Duration of Deprivation***

Following on from the findings above, the next step was to find out the effects of *duration* of deprivation upon emotion regulation. One-Way Analysis of Variance (ANOVA) was performed on each of the three emotion regulation measures to test the hypothesis that the children who have suffered deprivation for a longer period of time (i.e., late-placed Romanian adoptees = entry 24-48 months) would have more maladaptive patterns of emotion regulation, compared to those who have suffered deprivation for a shorter period of time (middle-placed Romanian adoptees = entry 6-24 months; and early-placed Romanian adoptees = entry 0-6 months), or those who are not known to have suffered any deprivation but who experienced adoption as well (UK adoptees). The standardised mean scores and standard deviations, univariate F-ratios, and post-hoc comparisons, using the Bonferroni correction to control for the type I error rate, are presented in Table 7. As indicated by the table, significant group differences were found comparing late-placed Romanian adoptees (24-48 months) with early-placed Romanian adoptees (0-6 months) and with UK adoptees, on measure of impaired modulation of attention, behaviour, and affect (ABA),  $F(3,116) = 7.85, p < .001$ . Post-hoc comparisons indicate that Romanian children who have suffered prolonged deprivation for two to four years, are more likely to exhibit maladaptive patterns of emotion regulation of impaired modulation of attention, behaviour, and affect, than those children who have suffered deprivation for up to 6 months and than those who have not experienced it at all.



Table 7: Group differences: Duration of deprivation and emotion regulation

	Adoptee group status				F-Ratio (df= 3,116)	Post-hoc Bonferroni
	UK N = 24	0-6 mths N = 22	Romanian 6-24 mths N = 38	24-48 mo N = 36		
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		
ISA	-0.08 (0.05)	-0.10 (.000)	0.15 (1.09)	0.06 (0.36)	1.05	Not significant
ABA	-0.29 (0.38)	-0.32 (0.34)	0.07 (0.63)	0.31 (0.73)	7.85***	UK<24-48 0-6<24-48
IDA	-0.32 (0.24)	-0.16 (0.44)	0.04 (0.79)	0.27 (1.08)	3.26*	UK<24-48

\*  $p < .05$  \*\*\* $p < .001$

ISA=Inappropriate social approach

ABA=Impaired modulation of attention, behaviour, and affect

IDA=Inappropriate display of affect

Significant differences were also found on the measure of inappropriate display of affect (IDA),  $F(3,116) = 1.95$ ,  $p < .05$ . The post-hoc comparisons indicate that children who have suffered prolonged deprivation (24-48 months) are more likely to exhibit maladaptive patterns of emotion regulation characterised by inappropriate display of affect, than children who have not suffered deprivation (UK adoptees). There were no significant differences, however, for inappropriate social approach (ISA),  $F(3,116) = 1.05$ ,  $p = 0.37$ .

In the analysis above I used a categorical measure of deprivation because it allowed for a direct test of duration of deprivation by comparing UK adoptees and the three Romanian adoptee groups. However, the categorical distinction is not meant to imply

a threshold effect. Accordingly, correlational analysis, based on a continuous measure of age of entry into the UK from Romanian institutions, was also conducted. This analysis was based on Romanian adoptees only, because it was not informative for the UK adoptees, all of whom were placed before the age of 6 months. To assess the relationship between the continuous measure of duration of deprivation and the three measures of emotion regulation, correlation coefficients were generated. The association between length of deprivation and impaired modulation of attention, behaviour, and affect was significant,  $r = .39$ ,  $p < .001$ , indicating a positive linear relationship between duration of deprivation and this index of maladaptive emotion regulation and suggesting that children who entered the UK later in life tended to exhibit more maladaptive patterns of emotion regulation characterised by impaired modulation of attention, behaviour, and affect. The association between duration of deprivation and the emotion regulation measure of inappropriate display of affect, however, was not significant,  $r = .14$ ,  $p = .15$ , although the means indicate a linear trend (see table 7). The association with inappropriate social approach was also not significant,  $r = .13$ ,  $p = .19$ .

***Early Deprivation, Emotion Regulation and the Effect of Cognitive Ability:***

To examine whether the established group differences found were independent of children's cognitive ability, further analyses were undertaken. First, I wished to assess whether deprivation was associated with verbal and performance IQ at age 11 years. Second, I examined the effects of duration of deprivation upon emotion regulation after controlling for the effects of IQ.

*Early deprivation and cognitive ability at age 11 years*

One-Way ANOVAs indicated group differences on both verbal IQ, ( $F(3,116) = 13.53, p < .001$ ), and performance IQ, ( $F(3,116) = 5.60, p < .01$ ). The standardised mean scores and standard deviations, univariate F-ratios and post hoc comparisons with Bonferroni corrections are presented in table 8. As indicated by the table, children who have suffered prolonged deprivation for up to four years were more likely to experience cognitive difficulties, both in the verbal and in the performance domains, than children who have suffered deprivation for a short period of time (up to 6 months), or from those who have not suffered early deprivation at all. Similarly, children who have suffered early deprivation for up to two years were more likely to have cognitive difficulties than children who have not suffered deprivation at all. Finally, children who have suffered a short period of deprivation for up to 6 months, were more likely to have cognitive difficulties in the verbal domain than children who have not suffered it at all.

*The effect of early deprivation after controlling for the effect of cognitive ability*

In order to find out whether the effects of duration of deprivation on emotion regulation were independent of cognitive ability, Analysis of Covariance (ANCOVA), in which verbal and performance IQ were treated as the covariate, was carried out. Standardised mean scores and standard deviations, univariate F-ratios and post hoc comparisons with Bonferroni corrections, after controlling for IQ, are presented in Table 9.

Table 8: *Group differences: duration of deprivation and cognitive ability*

	Adoptee group status				F-Ratio (df = 3,116)	Post-hoc Bonferroni
	UK	Romanian				
	N = 24	0-6 mths N = 22	6-24 mths N = 38	24-48 mo N = 36		
Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)			
Verbal IQ	116.75 (15.38)	103.95 (17.19)	97.42 (12.99)	90.50 (18.71)	13.53***	UK>0-6 UK>6-24 UK>24-48  0-6>24-48
Performance IQ	97.96 (14.97)	87.32 (20.20)	82.37 (16.30)	81.31 (16.30)	5.60**	UK>6-24 UK>24-48

\*\* p < .01 \*\*\* p < .001

Table 9: Group differences on emotion regulation after controlling for IQ

	Adoptee group status				F-Ratio (df = 3,78)	Post-hoc Bonferroni
	UK	Romanian				
	N = 24	0-6 mths N = 22	6-24 N = 38	24-48 N = 36		
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		
ISA	-0.89 (0.56)	-0.10 (0.00)	-0.15 (1.09)	0.06 (0.36)	0.90	
ABA	-0.28 (0.38)	-0.32 (0.34)	-0.07 (0.63)	0.31 (0.74)	4.57**	24-48>0-6 24-48>UK
IDA	-0.32 (0.24)	-0.16 (0.44)	0.04 0.79	0.27 (1.08)	1.86	

\*\* p < .01

ISA=inappropriate social approach

ABA=Impaired modulation of attention, behaviour, and affect

IDA=Inappropriate display of affect

Results suggest that for the emotion regulation measure of impaired modulation of attention, behaviour, and affect (ABA), between group differences remained significant,  $F(3,116) = 4.57$ ,  $p < .01$ . Results also suggest that for inappropriate display of affect (IDA), group differences previously found, were no longer significant once the effect of IQ was controlled for ( $F(3,116) = 1.87$ ,  $p = .13$ ). However, it is important to note that the p value was not much below .05 in the first analysis so the change overall was not large. The effects of deprivation on inappropriate social approach at 11 years, after controlling for the effects of cognitive ability remained non-significant ( $F(3, 115) = .76$ ,  $p = .56$ ).

In order to control for the effect of cognitive ability on the continuous measure of deprivation, partial correlations were computed. Results indicated that a positive

linear association between duration of deprivation and impaired modulation of attention, behaviour, and affect remained significant,  $r = .35$ ,  $p < .01$ , and associations between duration of deprivation and inappropriate social approach and with inappropriate display of affect, remained insignificant,  $r = .13$ ,  $p = .21$ ;  $r = .12$ ,  $p = .23$ , respectively.

### *Deprivation, Emotion Regulation and Gender Effect*

Because previous research has demonstrated significant sex differences on certain patterns of emotion regulation (Shields et al, 1994), Analysis of Covariance (ANCOVA) was performed to control for the effect of gender. A similar pattern of results remained after the effects of gender were controlled for. Specifically, duration of deprivation was significantly related to maladaptive patterns of emotion regulation of impaired modulation of attention, behaviour, and affect (ABA),  $F(3, 115) = 7.05$ ,  $p < .001$ . Children who have suffered longer duration of deprivation, between two and four years were more likely to exhibit impaired modulation of attention, behaviour, and affect, than children who have suffered early deprivation for up to 6 months and than children who have not suffered early deprivation. Duration of deprivation also remained significantly related to maladaptive patterns of emotion regulation of inappropriate display of affect (IDA) after the effects of gender were controlled for,  $F(3, 115) = 2.79$ ,  $p < .05$ . Late-placed Romanian adoptees, relative to UK adoptees, were more likely to exhibit a maladaptive pattern of emotion regulation of inappropriate display of affect (IDA). In respect of inappropriate social approach (ISA) results were not significant when controlling for gender alone ( $F(3,115) = 0.88$ ,  $p = 0.44$ ), but approached significance when controlling for gender and IQ together ( $F(3,115) = 2.31$ ,  $p = .08$ ).

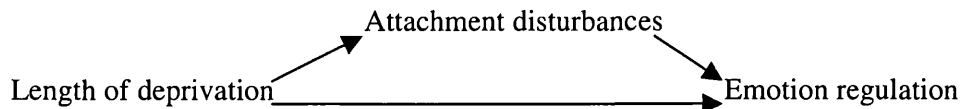
In order to control for the effects of gender on the continuous measure of duration of deprivation, partial correlations were computed. Results indicated that a positive linear association between duration of deprivation and impaired modulation of attention, behaviour, and affect remained significant,  $r = .37$ ,  $p < .001$ , and associations between duration of deprivation and inappropriate social approach and with inappropriate display of affect, remained insignificant,  $r = .11$ ,  $p = .25$ ;  $r = .14$ ,  $p = .18$ , respectively.

### **Early Deprivation, Emotion Regulation and Attachment Disturbances**

The aim of this section was to assess the extent to which attachment disturbances at age 6 years accounted for the relationship between duration of deprivation and emotion regulation at age 11 years. The mediational model (see figure 2) involves causal paths involving three variables (Baron & Kenny, 1986). One causal path is between duration of early deprivation and attachment disturbances at age 6 years. Another causal path is between attachment disturbances at age 6 years and emotion regulation at age 11 years. There is also a causal path between early deprivation and subsequent emotion regulation. The mediational model aims to test the notion that duration of deprivation affects emotion regulation via its effects on attachment disturbances (Baron & Kenny, 1986). To establish mediation, the following conditions have to hold (Baron & Kenny, 1986). First, early deprivation has to be associated with attachment disturbances. Second, early deprivation has to be associated with emotion regulation. This has already been established in the previous section. Third, attachment disturbances at age 6 years has to be associated with

emotion regulation at age 11 years. After these conditions are found to hold in the predicted direction, a mediation would then be examined. Thus, the final step involves the inclusion of both independent variables, i.e., early deprivation and attachment disturbances. Mediation would hold if duration of deprivation had no effect or a reduced effect upon emotion regulation when the effects of attachment disturbances were controlled (Baron & Kenny, 1986).

Figure 2: *Mediation model: Deprivation, attachment disturbances, and emotion regulation*



#### ***Relationships between Attachment Disturbances and Length of Deprivation***

The relationships between length of deprivation and attachment disturbances have been studied in more detail and are described at length elsewhere (O'Connor et al., 2000a). For the purpose of this study, correlation coefficients were generated, using the Romanian sample only, between duration of deprivation, based on age of entry into the UK, and attachment disturbances at age 6 years. As expected, a significant positive linear association was found,  $r = .30$ ,  $p < .01$ , indicating that children who have suffered prolonged early deprivation evidenced greater attachment disturbances symptoms at age 6 years. These associations remained significant after controlling for the effects of cognitive ability,  $r = .27$ ,  $p < .01$  and gender,  $r = .27$ ,  $p < .01$ .



The continuous variable of duration of deprivation was more relevant than the categorical one, because the main interest was mediation. However, I also assessed the effects of duration of deprivation upon attachment disturbances at age 6 years using the categorical variable because it also included the within-country adoptees who have not suffered deprivation. One-way ANOVA indicated significant group differences,  $F(3, 116) = 4.98, p < .01$ , with late-placed Romanian children significantly more likely, at age 6 years, to exhibit attachment disturbances than early-placed Romanian children. Significant group differences remained after controlling for the effects of cognitive ability,  $F(3, 114) = 3.74, p < .05$  and the effects of gender,  $F(3, 115) = 4.92, p < .01$ .

#### ***Relationships between Attachment Disturbances and Emotion Regulation***

To assess the relationship between attachment disturbances and emotion regulation, correlation coefficients were computed. Results indicated that attachment disturbances were related significantly to two measures of maladaptive emotion regulation; impaired modulation of attention, behaviour, and affect,  $r = .33, p < .001$ ; and inappropriate social approach,  $r = .21, p < .05$ . This suggests that children who exhibited greater degrees of attachment disturbances at age 6 years, tended to exhibit at age 11 years more maladaptive patterns of emotion regulation of both inappropriate social approach and impaired modulation of attention, behaviour, and affect. Attachment disturbances, however, were not significantly related to the emotion regulation measure of inappropriate display of affect,  $r = .12, p = .18$ .

Partial correlation analysis indicated that the associations between attachment disturbances at age 6 and emotion regulation of inappropriate social approach and

impaired modulation of attention, behaviour, and affect at age 11 years, remained significant after controlling for the effects of cognitive abilities,  $r = .21, p < .05$ ;  $r = .30, p < .01$ , respectively, and for the effects of gender,  $r = .21, p < .05$ ;  $r = .33, p < .001$ , respectively.

### ***Relative Effects of Duration of Deprivation and Attachment Disturbances upon Emotion Regulation***

Multiple linear regression was carried out to examine the mediating role of attachment disturbances in the relationship between duration of deprivation and emotion regulation. In accord with the mediational model, the only emotion regulation measure that showed consistently significant results in relation to both length of deprivation and attachment disturbances was impaired modulation of attention, behaviour, and affect and therefore the other two measures (inappropriate social approach and inappropriate display of affect) were excluded from this analysis.

Analysis showed that overall the regression was significant,  $F(2,92) = 12.79, p < .001$ . Moreover, it indicated that both duration of deprivation and attachment disturbances at age 6 years made an independent significant contribution towards predicting maladaptive patterns of emotion regulation of impaired modulation of attention, behaviour, and affect,  $\beta = .31, p < .01$ , and  $\beta = .27, p < .01$ , respectively. Thus, each variable continued to predict a unique amount of the variance in this index of emotion regulation, with attachment disturbances accounting for 8% of the variance ( $R^2 = 0.08$ ), and duration of deprivation explaining 10% of the variance ( $R^2 = 0.10$ ) in impaired modulation of attention, behaviour, and

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affect. This suggests that attachment disturbances' symptoms at age 6 years indeed predicted maladaptive patterns of emotion regulation at age 11 years. In addition, the reduction in the beta values, once both independent variables enter the equation, indicate that there may be partial mediation (see Table 10). That is, that the role of attachment disturbances may be potent, but not enough to produce a perfect mediating effect (Baron & Kenny, 1986). In order to assess the significance of the partial mediation, Sobel's method (1982; taken from Baron & Kenny, 1986), which assesses the significance of the indirect effect of the independent variable on the dependent variable via the mediator, was used. The result suggests that the partial mediation was significant,  $z = 2.27$ ,  $p < .05$ .

The significant effects of both independent variables in predicting emotion regulation at age 11 years remained after controlling for the effects of cognitive ability and gender. Specifically, when IQ and gender were entered into the regression equation, both duration of deprivation and attachment disturbances at age 6 years retained an independent predictive value upon maladaptive patterns of emotion regulation of impaired modulation of attention, behaviour, and affect (beta = .27,  $p < .01$ ; beta = .26,  $p < .01$ , respectively).

Table 10: *Relative effects of duration of deprivation and attachment disturbances on emotion regulation: Results of regression analyses*

Variables in the equation	Model	
	Beta value	R <sup>2</sup>
Duration of deprivation	.39***	0.15
Attachment disturbances	.37***	0.13
Duration of deprivation	.31*	0.10
& Attachment disturbances	.27*	0.08

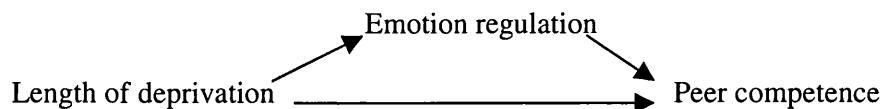
\* p < .05 \*\*\* p < .001

### **Early Deprivation, Emotion Regulation, and Social Competence with Peers**

The aim of this section was to examine the hypothesis that emotion regulation would mediate the relationship between duration of early deprivation and social competence with peers at age 11 years. As in the previous section, in order to test the mediational model (see figure 3), similar steps had to be undertaken. First, the associations between emotion regulation and peer relationships were assessed. Second, the associations between early deprivation and peer relationships were examined. In order to establish mediation, the effects of these first two analyses had to hold in the

predicted direction before proceeding any further (Baron & Kenny, 1986). The third step was to examine the mediating role of emotion regulation in the relationships between duration of deprivation and peer relationships. If the inclusion of the emotion regulation variable in the third step were to negate or to reduce the effects of duration of deprivation on peer competence, then a mediational model, which suggests that duration of deprivation affects peer competence via its influence on emotion regulation, would be supported.

Figure 3: *Mediational model: Deprivation, emotion regulation, and peer competence*



The self-report measure and the teacher's report measure of peer relations correlated with each other ( $r = -.33, p < .001$ ), suggesting that children who reported more loneliness and dissatisfaction also tended to be viewed by teachers as being less socially competent. Both measures were used separately, however, because of the potentially different information that can be derived from internal versus external reporters.

### ***Relationship between Emotion Regulation and Social Competence with Peers***

In accord with the mediational model, the first step was to assess the relationships between emotion regulation and social competence with peers in the Romanian group. Pearson's  $r$  correlation coefficients and their significance are shown in Table

11. As indicated by the table, the emotion regulation measure of impaired modulation of attention, behaviour, and affect (ABA) was significantly related to both the teacher's report and the self-report measures of peer relations,  $r = -.35$ ,  $p < .01$ ;  $r = .33$ ,  $p < .01$ , respectively. This indicates that children who exhibited more maladaptive patterns of emotion regulation, characterized by impaired modulation of attention, behaviour, and affect, also tended to be rated by teachers as less socially competent with peers and to report more loneliness and social dissatisfaction within their peer group. The emotion regulation measure of inappropriate display of affect (IDA) approached significant associations with both peer relations' measures,  $r = -.21$ ,  $p = .06$ ;  $r = .18$ ,  $p = .07$ , respectively. The emotion regulation measure of inappropriate social approach (ISA) was not significantly related to either peer relations' measure,  $r = -.16$ ,  $p = .14$ ;  $r = .04$ ,  $p = .69$ , respectively.

The associations between peer relations, as rated by teachers, and maladaptive patterns of emotion regulation of impaired modulation of attention, behaviour, and affect, of inappropriate display of affect, and of inappropriate social approach, remained similar after controlling for the effects of cognitive ability: partial  $r = -.33$ ,  $p < .01$ ; partial  $r = -.19$ ,  $p = .06$ ; partial  $r = -.17$ ,  $p = .11$ , respectively, as well as after controlling for the effects of gender: partial  $r = -.34$ ,  $p < .01$ ; partial  $r = -.21$ ,  $p = .06$ ; partial  $r = -.16$ ,  $p = .14$ , respectively. In respect of the self-report measure of peer relations, associations with impaired modulation of attention, behaviour, and affect remained significant after controlling for the effects of cognitive ability, partial  $r = .32$ ,  $p < .01$ , and gender, partial  $r = .35$ ,  $p < .01$ , and remained non-significant with inappropriate display of affect (IQ: partial  $r = .16$ ,  $p = .13$ ; gender: partial  $r = .19$ ,  $p =$

.07) and with inappropriate social approach (IQ: partial  $r = .04$ ,  $p = .69$ ; gender: partial  $r = .04$ ,  $p = .70$ ) when cognitive ability and gender were controlled for.

Table 11: *Correlations of emotion regulation measures and peer relations' measures*

	Peer relations' measures	
	Self-report N = 96	Teacher-report N = 83
ISA	.04	-.16
ABA	.33**	-.35**
IDA	.18	-.21

\*\*  $p < .01$

ISA=inappropriate social approach

ABA=Impaired modulation of attention, behaviour, and affect

IDA=Inappropriate display of affect

### ***Relationship between Duration of Deprivation and Social Competence with Peers***

The second step was to examine the associations between duration of deprivation and children's peer competence. Using the continuous measure of duration of deprivation in the Romanian sample only, correlational analysis indicated that duration of deprivation was related significantly to peer relations at age 11 years, as reported by the children themselves,  $r = .30$ ,  $p < .01$ , but not when social competence with peers was reported by teachers,  $r = -.16$ ,  $p = .14$ . Partial correlation analysis indicated that these associations remained similar after controlling for the effect of gender: self-report:  $r = .33$ ,  $p < .01$ ; teacher report:  $r = -.16$ ,  $p = .14$ . and also after controlling for the effects of cognitive ability: self-report:  $r = .27$ ,  $p < .05$ ; teacher-report:  $r = -.13$ ,  $p = .24$ .

Although the continuous variable of duration of deprivation is more relevant to testing the mediational model than the categorical variable of deprivation, I examined the effects of the latter as well because I was interested to see whether different findings would be generated once the comparison group of the UK adoptees was included. One-Way Analysis of Variance (ANOVA) suggested that duration of deprivation was significantly related to peer competence at age 11 years, both as reported by the child ( $F(3, 116) = 2.74, p < .05$ ), as well as when reported by teachers ( $F(2, 102) = 5.79, p < .01$ ). Post-hoc comparisons indicated that for the former, although the main effect was significant, differences between groups were not. In respect of the latter, results suggested that teachers rated children who were adopted from Romania between the ages of 6 and 24 months as significantly less socially competent than children adopted from Romania up to the age of 6 months and children adopted within the UK. Analysis of covariance (ANCOVA) indicated that for teacher-report on peer competence, the association with early deprivation remained significant after controlling for the effects of gender ( $F(3, 101) = 5.59, p < .01$ ) and the effects of cognitive ability ( $F(3, 100) = 3.82, p < .05$ ). In respect of the self-report measure of peer competence, the association with early deprivation remained significant when controlling for the effects of gender ( $F(3, 115) = 2.90, p < .05$ ) but not when cognitive ability was controlled for ( $F(3, 114) = 1.27, p = .28$ ).

### ***Relative Effects of Length of Deprivation and Emotion Regulation upon Social Competence with Peers***

To determine whether or not duration of deprivation affected children's social competence with peers via its influence on emotion regulation, multiple linear regression analysis was conducted. Because the teacher-report measure of social



competence with peers and also the emotion regulation measures of inappropriate display of affect and inappropriate social approach, were not significantly related to the continuous variable of duration of deprivation, only the self-report measure of social competence with peers and the emotion regulation measure of impaired modulation of attention, behaviour, and affect, were entered into the regression equation. Results indicated that overall the regression was significant,  $F(2, 92) = 7.69$ ,  $p < .01$ . Moreover, with the inclusion of emotion regulation, duration of deprivation was no longer a significant predictor of children's social competence at age 11 years,  $\beta = .20$ ,  $p = .06$ , although it approached significance. In contrast, emotion regulation continued to be a significant independent predictor of social competence with peers,  $\beta = .25$ ,  $p < .05$  and accounted for 6 % of the variance in social competence with peers ( $R^2 = 0.06$ ). This indicates that maladaptive patterns of emotion regulation of impaired modulation of attention, behaviour, and affect, indeed mediated the effects of duration of deprivation on children's relationships with peers. Table 12 depicts the beta values and the  $R^2$  for each independent variable on its own and together.

The mediating effect of emotion regulation remained significant after controlling for the effects of cognitive ability and gender. Specifically, when IQ and gender were entered into the regression equation, maladaptive patterns of emotion regulation characterized by impaired modulation of attention, behaviour, and affect, retained a significant predictive value upon social competence with peers ( $\beta = .24$ ,  $p < .05$ ) and duration of deprivation remained a non-significant predictor of social competence with peers ( $\beta = .13$ ,  $p = .09$ ).

Table 12: *Relative effects of duration of deprivation and emotion regulation on social competence with peers: Results of regression analysis*

Variables in the equation	Beta value	Model
		R <sup>2</sup>
Duration of deprivation	.30**	0.09
Emotion regulation	.33**	0.11
Duration of deprivation	.20	0.04
& emotion regulation	.25*	0.06

\* p < .05 \*\* p < .01

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**CHAPTER 4: DISCUSSION****Overview**

The extent to which early adverse experiences impact on subsequent development is an issue of considerable debate in the developmental psychology and psychopathology literature. In this study I attempted to shed light on this fundamental theoretical question by examining the effects of early institutional deprivation on children's patterns of emotion regulation. This study also wished to contribute to an understanding of the concept of emotion regulation more broadly. As indicated in the introduction, there is still much confusion regarding how emotion regulation should be defined, how it is manifested, and which are its components. I attempted to disentangle some of the emotion regulation components in respect of children who have suffered early deprivation. Finally, this study wished to examine the association between emotion regulation and other aspects of socio-emotional development, namely, peer relationships and attachment disturbances, and thus to illuminate the possible common processes and mechanisms underlying these children's difficulties.

120 11-year-old adopted children participated in this study. They were divided into four groups; three represented varying lengths of early institutional deprivation in Romania, and one UK adoptee group, without early deprivation, acted as a comparison group. Children were observed in their spontaneous interaction with an adult examiner during an interview situation at their home. Their patterns of emotion regulation were coded based on observations of their behaviour during this social

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situation. In addition, children filled in a questionnaire about their relationships with peers and a questionnaire on the same subject was also filled in by teachers. Previous available data on children's attachment disturbances when they were 6 years old were also included.

Four main findings emerged from this study. These are the following:

1. Children's behaviour during their social interaction with the examiner indicated the existence of four dimensions of maladaptive patterns of emotion regulation. These were a) inappropriate social approach, b) impaired modulation of attention, behaviour, and affect, c) inappropriate display of affect, and d) negative affectivity.
2. Children who have suffered early institutional deprivation evidenced greater maladaptive patterns of emotion regulation than children who had not suffered deprivation in their early years of life. In addition, of the group of children who had suffered early deprivation, those who were exposed to it for a longer period of time evidenced more maladaptive patterns of emotion regulation than children who had suffered deprivation for a shorter period of time.
3. Attachment disturbances at age 6 years predicted at age 11 years maladaptive patterns of emotion regulation and partially mediated the relationship between early institutional deprivation and emotion regulation at age 11 years.

4. Maladaptive patterns of emotion regulation mediated the effects of early institutional deprivation on children's social competence with peers at age 11 years.

This chapter proceeds as follows: First, this study's main findings will be discussed. Second, some of the limitations and methodological considerations this study generates will be outlined. The discussion concludes with consideration of the wider scientific and clinical implications of this research.

#### **Four Dimensions of Emotion Regulation**

In this study I wished to explore the way in which patterns of emotion regulation are manifested in children who have experienced early institutional deprivation. For the purpose of this study, maladaptive emotion regulation was operationalised as patterns characterised by the use of contextually inappropriate management and modulation of affect, attention, and behaviour, in ways that jeopardise appropriate functioning in the interview. Emotion regulation was initially thought about in terms of three separate dimensions, namely, affect expression, behavioural control, and attentional control, in accord with existing theories in this field. However, this was not successful in that low internal consistency indicated unacceptable levels of reliability. Consequently, factor analysis was carried out which organised the items differently. Whereas previous studies have usually measured the components of affect expression, behaviour control, and attention control separately, this study, based on factor analytic findings, has combined these three components. Although

theoretically, these components may be separate dimensions of the emotion regulation system, empirically, it appears that they act in a coordinated, correlated fashion. Thus, postulating mechanistically separable dimensions does not necessarily imply that they will behave independently in practice. This is consistent with current discussions of emotion regulation in the literature. It is still not clear which is the best method to capture the components of emotion regulation. Several studies, based on their findings, have highlighted the difficulty in isolating certain dimensions (e.g., affect expression and behaviour control) due to overlap and uncertainty as to which aspect is actually being observed (Eisenberg et al., 1993; Shields et al., 1994).

From observation of children's spontaneous social interaction with an adult examiner, factor analysis indicated four dimensions of maladaptive patterns of emotion regulation. These were inappropriate social approach; impaired modulation of attention, behaviour, and affect; inappropriate display of affect; and negative affectivity.

### *Inappropriate Social Approach*

This dimension represented behaviours characterised by inappropriate personal boundaries and a controlling style. Examples of such behaviours were children who asked intrusive or other inappropriate questions of the interviewer, or told the interviewer how to conduct the interview and what to ask. Some children were observed to act in a denigrating or a dismissive-like manner. Other children were over-friendly and tried to touch the interviewer or sit too close to her/him, or touch personal objects belonging to the interviewer such as a necklace or spectacles' case. Although these inappropriate social behaviours varied in their manifestation, what

they seemed to have in common was a difficulty in the use of social display rules and the inhibition of behaviour needed to facilitate contextually appropriate social interaction.

This pattern of social behaviour is consistent with previous studies on the social behaviours of children adopted from Romania into the UK (O'Connor et al., 2000a; O'Connor et al., 2001) and Canada (Chisholm et al., 1995; Chisholm, 1998). These studies have similarly described socially inappropriate behaviours, such as indiscriminate friendliness, excessive physical contact seeking, and disinhibited behaviour. In all of these studies, poor appreciation of social cues and a lack of awareness of social boundaries were evident. Earlier studies on children reared in institutions (Hodges & Tizard, 1989b; Tizard & Rees, 1975) have similarly described these children as having atypical social behaviours in which lack of personal boundaries was apparent. Impaired social behaviours are also described in studies on the social deficits of children with autism (e.g., Mundy, Sigman, Ungerer & Sherman, 1986; Sigman, Mundy, Sherman & Ungerer, 1986). Yet, these are of quite a different nature. Whereas the main social deficits in children with autism seem to be in initiating and maintaining interaction, children in this study were clearly interested in the interaction but appeared to use social display rules inappropriately.

Inappropriate social approach, as a component of self-regulatory capacities, has also been described in studies of emotion regulation in non-clinical populations (e.g., Eisenberg et al., 1993; Eisenberg et al., 1995; , Eisenberg et al., 2001; Murphy et al., 1999) and also in studies on the emotion regulation of maltreated children (e.g., Shields et al., 1994; Shipman et al., 2000.) Yet, these studies have identified different

aspects of inappropriate social behaviours than the ones observed in this study. Studies of maltreated children have found high levels of behaviours like aggression, impulsivity, disruption and non-compliance. There may be several reasons for the differences. First, this may be due to the relatively fluid definition of emotion regulation that somewhat varies from study to study and affects the choice of observation observational setting and the focus of measurement. Second, socially inappropriate behaviours may be manifested quite differently in different clinical and non-clinical populations. Thus, the pattern of inappropriate social approach found in this study may be typical of children who have suffered institutional deprivation and less so in, for example, children who have experienced abuse and neglect. An alternative reason for the different manifestations of inappropriate social approach may simply be the different settings, in that what is observed in a social interaction during an interview situation with an adult may be different to the types of social behaviours observed when children are interacting with their peers. Comparing institutionalised children with maltreated children using the same measurement instruments and testing procedures would help to answer this question.

### ***Impaired Modulation of Attention, Behaviour, and Affect***

This dimension included the largest number of items in the emotion regulation measure and was more congruent with previous research on the dimensions of emotion regulation. It was characterised by excessive shifts of attention, difficulties engaging with the interviewer or in the interview process, high arousal or over-excitement, excessive shiftiness and fidgetiness, and a tone of voice that was either unusually high or intermittently high and low. Examples of such behaviours were; children who laughed hysterically; expressed a high intensity of affect; could not sit



still but kept on jumping up and down, or climbed on furniture; could not stay on-task and remain attentive; displayed little if any cooperation such as turned their back away from the interviewer, or covered their face with a cushion; continuously shifted in their seat; and avoided looking at the interviewer. It was noticeable that some children spoke with a shaky-like tone of voice that kept on reaching extreme high and low pitch. One child displayed such a high degree of what appeared to be embarrassment, that she went on to hide under the table until persuaded by the interviewer to get back in her seat. Many children seemed to lack the communicative function of eye contact and the ability to reciprocate engagement. Although the manifestations of these behaviours varied, what they seemed to have in common was a difficulty in modulating situationally appropriate affective and behavioural responses and in the effortful control of attention.

Similar behaviours have been described in previous studies on the Romanian adoptees (e.g., Kreppner et al., 2001; O'Connor et al., 2001), which have also highlighted inattentiveness, restlessness, difficulties in regulating arousal, and impaired engagement in a social situation with an adult. This pattern of maladaptive emotion regulation found in the present study is also consistent with findings on the emotion regulation of maltreated children (Shields & Cicchetti, 1998, 2001; Shields et al., 1994; Shipman et al., 2000; Shipman & Zeman, 2001). These studies have found maltreated children to display contextually inappropriate affective responses, to show affective over intensity, social withdrawal, distractibility, impulsivity, inattentiveness, and poor concentration. The modulation of attention, behaviour, and affect, as components of emotion regulation has also been outlined in non-clinical populations (Eisenberg & Fabes, 1992; Eisenberg et al., 1993; Eisenberg et al., 1995;

Eisenberg et al., 2001; Murphy et al., 1999). Specifically, these studies have associated moderate emotional intensity, ability to focus attention, and to use appropriate behavioural control (e.g., can lower his/her voice when asked to do so) as components of adaptive emotion regulation in social situations. This indicates that this dimension of emotion regulation found in this study, may not be specific to children who have suffered early deprivation but may be generalised to other populations and settings as well. It also supports conclusions drawn from previous studies (e.g., Shields et al., 1994) regarding the overlap between components of affect, behaviour, and attention in the regulation of emotion and the need to attend to them simultaneously.

### *Inappropriate Display of Affect*

This dimension was characterised by the display of ingenuine-positive affect, exaggerated affect and pulling faces. Examples of such behaviours were children who appeared to over-dramatise their feeling-states, grimaced in excess, exhibited seemingly positive affectivity that appeared false and not genuine and pulled faces to the video camera. On observing these behaviours it appeared as if the children were seeking attention from the interviewer. Yet, in accord with the emotion regulation literature, underlying these seemingly attention seeking behaviours may have been inappropriate management of their own internal feeling states (Eisenberg, 2001). These seemingly attention seeking behaviours have also been found in previous studies on the Romanian adoptees (e.g., O'Connor et al., 2001) and in earlier studies on institutionally reared children (e.g., Hodges & Tizard, 1989b) which have also described these children's 'false' behaviours and their seemingly great desire for adult attention.

In respect of the emotion regulation of children who have suffered maltreatment, inappropriate display of affect has usually been looked at from a different angle, more in relation to anger outbursts, and inflexible and labile affect displays (e.g., Shields & Cicchetti, 1998; Shipman et al, 2000). The types of affect display found in this study have not usually been looked at. It is possible that this may partly be due to the different measures used in studies, in that the sort of information that can be derived from a questionnaire on emotion regulation may be quite different from the information gained through direct observation. It is also possible that this is a reflection of the differences between the two clinical populations, in that the 'false', exaggerated and 'goofy-like' displays are more typical of children with a history of institutional deprivation, whereas children with a history of abuse may be more likely to display inappropriate affective gestures of a different nature, such as the ones outlined above. It is also possible that the differences are due to the different contexts of interaction, in that the types of displays seen when a child interacts with an unfamiliar adult may be quite different from the spontaneous interaction of children within their peer groups.

### *Negative Affectivity*

This dimension included negative emotional expressions of sadness and anger, the lack of positive emotional expressions and the displaying of resistant and oppositional behaviour. Examples from observation of children included a withdrawn or listless appearance and alternatively, expressions of anger towards the interviewer, or when describing a friend, refusal to answer questions, or being cheeky towards the interviewer. Negative affectivity, as a component of emotion regulation has also been described in relation to children with a history of

maltreatment (e.g., Shields & Cicchetti, 1998; Shields et al., 1994; Shipman et al., 2000). These studies have described maltreated children as displaying a high level of negativity in social interactions, mood lability, verbal assaults, and exhibiting more internalising difficulties (e.g., sadness, anxiety) and externalising difficulties (e.g., anger). Similar findings of negative affectivity, as indicating less adaptive emotion regulation, have been obtained from normative studies (e.g., Eisenberg et al., 2001).

The reliability of the dimension of negative affectivity in this study was questionable, as indicated by the relatively low internal consistency. Consequently it was removed from further analysis. As proposed in the literature, negative affectivity is an important aspect of emotion regulation. Therefore, it would be valuable, in future research, to measure this component of emotion regulation more reliably.

## **The Effects of Early Deprivation on Subsequent Emotion Regulation**

### *Early Deprivation and Emotion Regulation*

The findings of this present study confirm theoretical predictions of the association between early deprivation and subsequent emotion regulation and extend those of previous work, demonstrating the effects of early deprivation on children's socio-emotional development (e.g., Chisholm et al., 1995; O'connor et al., 2000a). This study has found that 11 year-old children who have suffered early institutional deprivation overall displayed more maladaptive patterns of emotion regulation during spontaneous interaction with an adult interviewer, than children who have not suffered early deprivation. Specifically, greater degrees of inappropriate social

approach, impaired modulation of attention, behaviour, and affect, and inappropriate display of affect, were evidenced in the group of children adopted from Romanian institutions, more than in the group of children adopted within the UK. Although numerically, the mean differences were not substantial, clinically, they illustrate important qualitative differences in the children's patterns of social interaction. These findings are consistent with studies on the emotion regulation of children who have suffered maltreatment (Carlson, 1998; Erickson, et al., 1986; Shields & Cicchetti, 1998, 2001; Shields et al., 1994; Shipman et al., 2000; Shipman & Zeman, 2001; Manly, et al., 1994), which have found pre-school and school age children with a history of maltreatment to display overall more maladaptive emotion regulation than non-maltreated children.

#### *Inappropriate social approach and deprivation*

Although inappropriate social approach was found to be related to deprivation when the Romanian adoptees, as a group, were compared to the UK adoptees, when the Romanian children were divided into three groups, significant differences were no longer evident. This is possibly due to effect size in that the differences on this dimension were smaller to begin with, consequently, making differences between the four groups harder to detect. It is also possible that this was not as reliable a measure as the other two dimensions or not sensitive enough to detect group differences in this sample size.

#### *Duration of Deprivation and Emotion Regulation*

Consistent with previous findings on the development of children adopted from Romanian institutions into the UK (e.g., Croft et al., 2001; Kreppner et al., 2001;

O'Connor et al., 2000a, b), within the group of children adopted from Romania, correlational analyses revealed a linear pattern of dose-response association between duration of deprivation and increased maladaptive patterns of emotion regulation. Specifically, children who had been exposed to a longer duration of deprivation for up to four years, evidenced significantly more maladaptive patterns of emotion regulation, manifested as impaired modulation of attention, behaviour, and affect, than children who had been exposed to a shorter period of deprivation for up to six months. This indicates that a longer exposure to institutional deprivation increases the risk for impaired self-regulation of emotion.

#### *Inappropriate display of affect and duration of deprivation*

Within the Romanian group, the dose-response relationship in respect of inappropriate display of affect was not evident. This is possibly due to effect size, in that the differences on this dimension were smaller to begin with, consequently, making dose-response relationships harder to detect.

#### *The effect of cognitive ability*

The correlations found between measures of cognitive ability and measures of emotion regulation speak to the wide range of difficulties these children may be experiencing, both in the social-emotional domain as well as in the cognitive domain and that those with more maladaptive patterns of emotion regulation are also likely to experience cognitive difficulties. However, findings also show that, at least in respect of impaired modulation of attention, behaviour, and affect, maladaptive patterns of emotion regulation were independent of cognitive ability. Specifically, the effects of early deprivation on impaired modulation of attention, behaviour, and affect

remained significant even after the effects of cognitive ability were controlled for. This suggests that maladaptive emotion regulation cannot be explained solely by cognitive difficulties, indicating distinct, albeit interrelated, developmental systems, that individually affect children's development (Izard & Malatesta, 1987). In respect of inappropriate display of affect, there was no evidence of the independent effect of deprivation on this dimension of emotion regulation, after controlling for the effects of cognitive ability. However, this is probably again a function of the weaker association between deprivation and inappropriate display of affect found in the first place and hence the likely lower statistical power to detect independent associations.

### *Possible Mechanisms Underlying these Long-Term Effects*

The finding of the deleterious influence of early deprivation on subsequent emotion regulation at age 11 years is striking particularly because of the longevity of the effect. The children were rescued from the pathogenic environment many years ago and have been living in normal rearing environments for a minimum period of 7 years already. Nevertheless, the late-placed adoptees in particular, still evidenced marked difficulties in the area of emotion regulation.

In drawing on the possible mechanisms that may underlie these long-term effects of early institutional deprivation on subsequent maladaptive emotion regulation, a few hypotheses may be considered. First, it is possible that early deprivation has brought about lasting changes at the level of the organism. Various authors (e.g., Devinsky, et al., 1995; Kling & Brothers, 1992; Joseph, 1999) have linked the development of the limbic system in the brain, in the first few years of life, with concurrent social and emotional development, such as the development of emotion regulation. The

'experience-expectant' (Greenough et al., 1987) nature of the limbic system implies that insufficient environmental stimulation, such as in the case of institutional deprivation, may lead the limbic system to develop abnormally (Joseph, 1999). Consistent with this, Chugani and colleagues (2001) have found in a group of children adopted from Romanian institutions into the US, abnormal function in the limbic region known to be activated by stress, as indicated by decreased glucose metabolism. Other studies, both in humans and animals have demonstrated the remarkable sensitivity of the infant's brain to adverse rearing environments. Animal studies (e.g., Benes, 1994; Coplan et al., 1996; Ladd et al., 1996) have linked early stressful experiences with alterations in the neurobiology of the stress response (CRF) that persisted well into adulthood. Studies on the effects of adverse early experiences on the human brain have shown abnormal neurobiological alterations in the hypothalamus-pituitary-adrenal (HPA) system that governs reactions to stress (Caldji et al., 2000). Elevated levels of stress hormones have been found in children with a history of maltreatment and also in those who have been exposed to maternal depression in their early years (Nachmias et al., 1996; Putnam et al., 1991). In the latter, persisting reduced right frontal EEG activity has also been identified (Jones et al., 1997). Overall, these studies indicate the potentially negative long-term impact of early adverse experiences on the brain. Further information at the level of brain function and processing in this specific clinical population would be valuable to ascertain the degree to which emotion regulation is accounted for by specific brain functions.

Another possible mechanism underlying these long-term difficulties may be related to the restricted human interaction and lack of dyadic relationships in the institutions.



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A wide range of theories have been offered about the important role of the primary caregiver, particularly in the first few years of life, in helping the child to develop emotion regulation skills (e.g., Carlson & Sroufe, 1995; Field, 1994; Saarni, 1999; Sander, 2000; Stern, 1985; Walden, 1991). Primary caregivers can help children develop adaptive self-regulation of emotion in different ways, such as by modulating and managing children's emotional arousal, by modelling expressive behaviour, and by social referencing. Through their relationship with an emotionally available caregiver, children may learn how to manage and modulate their own emotional reactions and how to motivate behavioural and affective responses, that are socially acceptable, contextually appropriate, and effective in attaining their goals (Saarni, 1999). Thus, exposure to early institutional deprivation, where no attachment figure was available and children's needs were not met in any respect, perhaps may have led them to develop atypical strategies of self-regulation in emotionally arousing situations and maladaptive ways of relating to people in social situations, as was evidenced in the interview situation. Further evidence for this hypothesis is provided by another of this study's findings, namely, that earlier attachment disturbances mediated the relationship between deprivation and emotion regulation. This will be discussed next.

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## **Associations between Emotion Regulation, Attachment Disturbances and Early Deprivation**

### *Attachment Disturbances and Emotion Regulation*

This study's findings support theoretical predictions of the associations between attachment disturbances and emotion regulation. Results have shown that attachment disturbances at age 6 years predicted, at age 11 years, maladaptive patterns of emotion regulation, characterised by inappropriate social approach and impaired modulation of attention, behaviour, and affect. These findings support previous findings of the association between early attachment patterns and subsequent emotion regulation (Elicker et al., 1992; Shipman & Zeman, 2001; Sroufe et al., 1993) and is consistent with suggestions of the attachment relationship acting as either a protective factor or a risk factor for particular patterns of emotion regulation (Carlson & Sroufe, 1995; Cassidy, 1994). For example, Sroufe and colleagues (1983) have found that assessments of infant attachment at 12 and 18 months predicted affective expression and control at pre-school. Those who were rated as securely attached were able to use affect in a more effective and flexible way than those with insecure attachments.

### *The Mediating Role of Attachment Disturbances*

Another important finding of this study was that attachment disturbances partially mediated the relationship between early deprivation and emotion regulation. Thus, part of the impact of early deprivation on emotion regulation was via its effects on earlier attachment disturbances. The association between early experiences, attachment, and emotion regulation is consistent with existing theories (Carlson &

Stroufe, 1995; Cassidy, 1994; Stroufe, 2000). However, the possible mechanisms underlying the continuity between patterns of attachment and patterns of emotion regulation found in this study, are less obvious. The dyadic regulation between parent and infant, in which the parent plays a vital role in modulating and managing infant's physiological and psychological arousal, is seen as providing the foundation from which both the formation of attachment and the capacity to self-regulate emotion eventually develop (Carlson & Stroufe, 1995; Cassidy, 1994; Sander, 2000; Stroufe, 2000), with emotion regulation becoming organised around the relationship with the attachment figure (Carlson & Stroufe, 1995; Cassidy, 1994). Caregiving relationships help the child develop expectations about the parent in regulating arousal and to select behaviours that are expected to elicit known response from the parent. What is internalised from the caregiving experience are not specific behavioural features, but the quality and patterning of interpersonal style, mediated by affect (Stroufe, 1996). From this perspective then, specific patterns of attachment, internalised from the relationship with the primary caregiver, influence specific patterns of emotion regulation. Yet, what is internalised when there is a total absence of a primary caregiver and no opportunities at all to form a selective attachment in infancy?

The fact that, at age 6 years, many of the children who had suffered a prolonged period of institutional deprivation experienced attachment disturbances even after having been placed in a normal rearing environment for a substantial period of time, implies that the absence of an enduring relationship with a specific attachment figure may have compromised these children's ability to form a selective attachment relationship with their adoptive parents (O'Connor et al., 2000a). It is possible that

pre-existing deficits in emotion regulation, due to adverse early experiences, may have compromised the children's ability to form a selective attachment to their adoptive parents. From a transactional perspective (Cicchetti & Lynch, 1995), continuity in both environmental influences and individual traits support stability in individual functioning over time. Children actively participate in constructing their experiences. They behave in ways that elicit from the environment responses that support prior adaptation and selectively engage aspects of the environment that support a particular adaptive style (Carlson & Sroufe, 1995). It is possible then, that the experience of early deprivation and the absence of an attachment figure have led to difficulties in both attachment formation and emotion regulation and that these, in turn, have compromised their subsequent interpersonal relationships in their adoptive homes, leading to further attachment disturbances and maladaptive emotion regulation. It is possible that the continuity between attachment disturbances at age 6 years and patterns of emotion regulation at age 11 years stems from stability in a common pathway, a common underlying mechanism likely to be related to the absence of a close relationship with a particular special person in their earlier years.

### **Associations between Emotion Regulation, Peer Relationships, and Early Deprivation**

#### ***Findings***

The findings of this study confirm the hypothesis of the mediating role of emotion regulation in the relationship between early deprivation and social competence with peers. Results have shown that children who have suffered early deprivation were at

greater risks for impaired peer relationships than children who have not suffered deprivation and that there was a positive linear association between duration of deprivation and difficulties in relationships with peers. Results have further shown a linear positive association between maladaptive patterns of emotion regulation characterised by impaired modulation of attention, behaviour, and affect and difficulties in relationships with peers. Of special import was the finding that maladaptive patterns of emotion regulation mediated the effects of early deprivation on children's social competence. Specifically, when patterns of impaired modulation of attention, behaviour, and affect were entered into the regression equation, predicting children's feelings of loneliness and social dissatisfaction within their peer group, they accounted for a unique amount of the variance in this dependent variable after controlling for early deprivation. Furthermore, these maladaptive patterns of emotion regulation rendered early deprivation an insignificant predictor of children's perceived relationships with peers, suggesting that emotion regulation fully mediated the association between early deprivation and subsequent social competence with peers.

#### *Teacher's report measure of peer relationships*

It is not clear why the teacher report measure of peer relationships did not detect significant group differences in respect of duration of deprivation. This meant that the mediational model was based on a self-report measure of peer relationships. External-report would be valuable as corroborating evidence of the mediating role of emotion regulation in the relationships between early deprivation and social competence with peers.

### *Consistency with other Findings*

The finding of an association between emotion regulation and peer relationships supports previous findings in non-clinical populations which have found that emotion regulation predicted children's general social skills and peer competence (Eisenberg & Fabes, 1992; Eisenberg et al., 1993; Eisenberg et al., 1995). These findings also support previous findings in other clinical populations. For example, studies on children with a history of maltreatment have similarly found associations between emotion regulation and social competence with peers (Shields & Cicchetti, 1998, 2001; Shields et al., 1994;). Specifically, it was found that self-regulatory deficits, characterised by behavioural dysregulation, inflexible and situationally inappropriate affective displays, and impaired capacities for attention modulation, predicted peer competence in a group of school age children with a history of maltreatment and increased their risk for bullying and victimisation within their peer group. The findings of the mediating role of emotion regulation in the relationship between deprivation and peer relationships are also consistent with previous studies, which demonstrated self-regulatory processes as mediating the relationship between history of maltreatment and peer competence in school age children (Shields et al., 1994). This highlights the significant relationships between emotion regulation and social competence with peers that go beyond early experiences. It also indicates that the maladaptive patterns of emotion regulations observed in this study in children's spontaneous interaction with the examiner, may not be unique to the interview situation but may also be present in their interaction with peers. This provides important evidence regarding the validity of this new measure of emotion regulation as well.

*Possible Mechanisms Underlying these Effects*

In demonstrating that emotion regulation appears to mediate early deprivation's effects on social competence with peers at age 11 years, this study delineates important developmental mechanisms and processes that place children who have suffered early deprivation at risk for subsequent disruptions in interpersonal relationships. However, the direction of causation is less clear; whether interpersonal difficulties contribute to emotion regulation deficits, or whether these deficits influence difficulties in peer relationships. One possible hypothesis could be that underlying these children's difficulties in their relationships with peers, are difficulties in sustaining interaction and managing affect and engagement with others, due to impaired capacity to regulate internal emotional states. This theory is in agreement with Eisenberg (2001), who proposes that emotion regulation is at the core of affective social competence because managing one's own internal feeling state probably contributes substantially to competence in both the ability to receive and send messages, as well as to social behaviour. Individuals impaired ability to manage and modulate their internal states may lead them to send inappropriate messages due to insufficient regulation and emotional over arousal and may also lead them to misinterpret messages from others.

From a different perspective, this hypothesis is also in accord with the transactional model of development (Carlson & Sroufe, 1995; Cicchetti & Lynch, 1995), which suggests that maladaptation on earlier stage-salient developmental tasks, in this case, emotion regulation in infancy and early childhood, place children at risk for impaired developmental outcomes at later critical tasks, in this case, the establishment of effective peer relationships during the school age years. Thus, an inability to

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negotiate this early developmental task may have had pervasive effects on later development, including the impairment of interpersonal relationships.

### **Limitations of the Study and Methodological Considerations**

#### *The Emotion Regulation Measure*

The measure of emotion regulation was devised specifically for this study because no accepted observational protocol existed. It was developed for this specific clinical population and with a limited repertoire of observed behaviours. The reliability of the measure was acceptable, as indicated by the inter-rater reliability for the items and the internal consistency of the three dimensions. In terms of validity, this study has provided some positive evidence of validity by finding significant associations between the measure of emotion regulation and related measures, namely, peer relationships and attachment disturbances. However, this study raises certain questions regarding measurement validity. The measurement system was designed to match current operational definitions of emotion regulation, largely within a functionalist approach. Accordingly, emotion regulation processes were based on inferences from observed behaviours to putative internal mechanisms like attention, modulation of affect expression, and the inhibition of behaviour. It is difficult to assess whether the observed dimensions adequately and meaningfully captured the different aspects of emotion regulation processes they set out to measure. One cannot be absolutely certain that the observed behaviour was indicative of these underlying internal mechanisms.



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This is a problematic issue that is related to the field of emotion regulation in general. This field remains limited in that there is a lack of clarity about the actual internal mechanisms involved in the processes of emotion regulation and how best these should be measured. It is difficult to assess whether what is observed is variations in emotion regulation processes or simply variations in the subjective experience of emotion (Fox, 1994). As discussed by Eisenberg and colleagues (1993), social behaviour is the outcome of both emotional arousal and the regulation of that arousal and related desires, needs, actions and tendencies. For example, it is difficult to know whether emotional responsiveness is occurring but is well regulated, or masked, or whether it is simply not occurring at all. This is especially the case when using observational measures. In order to assess emotion regulation more closely, it would be valuable in future research to use a variety of measures that more closely tap the psychological processes involved, such as measures of psychophysiological responses, or more focused tasks measuring cognitive processes, such as impulse inhibition or sustained attention. In order for the emotion regulation research to move forward, it seems that a multi-faceted, multidisciplinary approach is needed that taps the physiological and psychological processes involved in emotion regulation.

Still on the issue of validity, this was an observational study in a particular social context. Thus, the presence of the video camera, as well as the interview itself, may have, to some extent, altered children's behaviour in this specific social situation. For example, one cannot rule out the possibility that the video camera may have affected children's sense of confidence, which may, or may not be related to emotion regulation, which in turn affected the way in which they came across in observation.

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Due to the nature of the study it was not possible to use other measures of emotion regulation in combination (e.g., questionnaires). A multi-reporter system of emotion regulation would be valuable in future research in order to extend an understanding of the link between this specific measure and the wider functioning of the child in a variety of settings.

### *Causality*

Another important issue to consider relates to the degree to which causality can be inferred. It is not entirely clear in which direction emotion regulation was related to attachment disturbances and peer relationships variables; whether the cause or the effect. In addition, early deprivation was based on varying lengths of times in Romanian institutions. Although in all institutions children were exposed to grossly pervasive depriving conditions, there are no systematic data available regarding variations within the institutions. Consequently, it is not possible to determine exactly whether it is the gross experiential deprivation, or rather particular aspects of institutionalisation, such as variations in staff-to-child ratio, or absence of individualised care, that may have influenced emotion regulation. Castle and colleagues (1999) for example, have found in a previous study on the Romanian adoptees, that variations in cognitive attainment were related to variations in the quality of individualised care within the institutions, as reported by adoptive parents (Castle, Groothues, Bredenkamp, Beckett, et al., 1999).

### *Possible Effects of Other Variables*

There were no systematic data on the characteristics of the biological parents and hence, no information on possible genetic influences that may have played a role.

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Although patterns of emotion regulation were related to length of deprivation, some children did better than others. The variations imply that the hypothesis of universal sensitive periods may not hold and that other variables may play a part in explaining why some children are more resilient than others. It was not possible, in this study's design, to integrate other variables that may have played a role, such as individual temperament, neurobiological functions, representational models of self and other, or current relationships with adoptive parents. As indicated in the literature, there are various paths suggested from early experiences to subsequent outcome in emotion regulation. Therefore in future research, it would be valuable to examine the association of emotion regulation with children's HPA system, stress hormone level, variations in temperament, and subjective interpretations of experiences, in order to get a better understanding of the underlying developmental mechanisms involved.

## **Wider Scientific and Clinical Implications**

### *The Effects of Early Experiences*

In this study I sought to examine questions concerning risk in development and the causal role of early experiences on later outcome. This study was well positioned to examine these issues due to an unusual set of circumstances that provided a 'natural experiment'. As opposed to most circumstances, where there is substantial continuity in risk exposure, for the children in this study, deprivation experiences were confined to their early months or years of life and they were subsequently placed in low-risk family settings. This dramatic discontinuity allows one to make inferences about the role of early deprivation experiences to subsequent development.

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The findings of the present study provide evidence for the long-term deleterious effects of adverse early experiences and testify to the importance of the first years of life to subsequent abilities to self-regulate emotions. However, this does not necessarily imply that a single cause-and-effect model is operating. Although one cannot rule out the possibility of brain damage as a result of severe early deprivation, it is also possible that early deprivation has set up a chain of consequences that produced further maladaptive outcomes and that the experience of deprivation may have left these children more vulnerable to later maladjustment.

This is consistent with the transactional view of development (e.g., Carlson & Sroufe, 1995; Cicchetti & Lynch, 1995; Sander, 2000) which views early experiences as the foundation for, though not determining in themselves, subsequent development. From this view, early disruptions in the development of self-regulation results in cumulative risks for future maladaptation. The sooner circumstances improve, the more readily change in the child occurs but variations in individual functioning become increasingly restricted as the child develops, as was seen in relation to the effects of duration of deprivation on emotion regulation. This has implications for prevention and intervention efforts in children who have suffered disturbances in their caretaking environment. Intervention efforts should be targeted for the earliest possible time. This may help to curtail the pattern of one developmental failure leading to another that is seen in many clinical populations of children (Cicchetti & Lynch, 1995).

### *The Concept of Emotion Regulation*

The need to clarify emotion regulation processes is a current theme in emotion regulation literature. In this study I attempted to disentangle some of the components of emotion regulation and have suggested a possible way of looking at emotion regulation in a social context. However, there is still much to be learned and studied about the concept of emotion regulation and which are the most reliable and valid ways to measure it. Thus, a comprehensive assessment tool of children's affective processes is needed. It would be valuable for further research to broaden the investigation of emotion regulation in children who have suffered deprivation to include a more thorough assessment of children's functioning across social contexts. In particular it would be helpful to complement observational techniques with tasks and measures that tap the specific psychological processes involved. It would also be valuable to gain information from parents and teachers. Gathering multiple sources of data is of particular importance given that children are likely to manage their behaviour differently across social contexts (Zeman & Shipman, 1996).

### *Intervention*

In highlighting the association between emotion regulation and attachment disturbances and with peer relationships, this study offers a possible mechanism underlying children's interpersonal difficulties. These associations suggest that interventions targeting social behaviours in children may do well to focus on more than the behaviour itself. Integrating the child's wider system in the therapeutic process would be valuable. Adoptive/foster parents and teachers should be helped to understand the developmental consequences associated with early environmental disturbances and be supported in fostering positive development. Children's

emotional experiences and their self-regulatory capacities may also serve as a focus of intervention. Treatments may foster more effective self-regulatory strategies in children, which would facilitate, in turn, the establishment of positive relationships with others, whether parents or peers, among children at risk for maladaptive outcomes.

### **Conclusion**

It has long been suggested that experiences of deprivation early in life can bring about significant long-term difficulties in cognitive, emotional and interpersonal functioning. The current study yields further evidence that severe early deprivation affects children's subsequent development. The degree to which the profound deprivation suffered by the children in this study can be generalised to less extreme forms of early environmental disturbances is not clear. However, the findings of this study raise important questions about the effects of early experiences on later development. An understanding of the impact of early adverse experiences and the nature of its causal influence is critical for the provision of effective strategies of prevention and treatment of psychological maladaptation and distress.

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**Appendix 1:**

Emotion Regulation Coding Manual

Coding Sheet

## **EMOTION REGULATION CODING SCHEME**

June 2002

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**Introduction:**

The Emotion Regulation Coding Scheme was developed to assess children's patterns of self-regulation of emotion in an interview situation with a relatively unfamiliar adult. Coding is carried out by means of observation of videotapes of the *Friendship Interview* (Kreppner, Colvert & O'Connor, 2002). Observation is focused on children's behaviour, as they interact with the interviewer during the course of the interview. 3 dimensions of emotion regulation are studied: a) affect expression, b) behaviour control, c) attention control. These dimensions were chosen based on existing literature on emotion regulation (e.g., Cole et al., 1994; Dodge & Garber, 1991; Eisenberg, 2001; Fox, 1994; Magai & Passman, 1998; Thompson, 1994), existing protocols assessing various aspects of emotion regulation (Eisenberg et al., 1993; Eisenberg et al., 2001; Murphy et al., 1999; Shields et al., 1994), and research and literature on affect expression (e.g., Ekman, 1984; Ekman & Friesen, 1975; Gottman, 1993; Izard & Harris, 1995; Scherer, 1984) and social interaction (e.g., Feldman & Rime, 1991; Hargie, Saunders & Dickson, 1994; Patterson, 1994). In addition, previous studies and anecdotal reports from research team members on the social behaviour of the Romanian adoptees, and observations of a number of videotapes, were used. In accord with the functionalist view of emotion regulation (e.g., Thompson, 1994), and other central authors in this field (e.g., Eisenberg, 2001) adaptive emotion regulation is operationalised as the ability to manage and modulate one's affective reactions, to shift and focus attention, and to inhibit or activate social behaviour as needed, such that an optimal level of engagement is fostered within the interview context. Conversely, maladaptive emotion regulation patterns is operationalised as patterns that jeopardise appropriate functioning of the child in the interview and/or jeopardise or interfere with the flow of the interview due to contextually inappropriate management of affect, attention, and/or behaviour.

Coding is carried out separately for each question-answer episode of the overall 10 questions of the interview that are concerned with the quality of the friendship. Thus, coders ignore questions 1-5 of the interview, which deal with the frequency and duration of interaction and commence with the coding in question number 6. Thereafter, coders observe children's behaviour as they interact with the interviewer during each question-answer episode.

**General Coding Issues:**

- ◆ Coders should note if a question is not asked or if through other interruptions the child does not answer a question (e.g., the tape stopped, another person walked in etc.).
- ◆ Coders should note if there are obstacles to observations and specify which these are (e.g., the tape was too dark, the child hid his/her face, etc.).

**I) Affect Expression:**

This dimension focuses on children's observed expression of emotion. The aim here is to capture the child's patterns of expressing affect in terms of the range and repertoire, the intensity, and the appropriate use of emotion for the context of the interview. In agreement with emotion regulation literature, more adaptive affect expression is reflected in contextually appropriate use of expressions, in moderate intensity, and in the ability to access a wide range of felt expressions (Aronoff et al., 1994; Cole et al., 1994; Eisenberg, 2001; Thompson, 1994).

There is a consensus that the face is the main medium through which emotion is conveyed. Accordingly, Ekman and Friesen's (1975) descriptions of the physical facial features of the basic emotions are used here as general guidelines of possible ways these may be conveyed. However, these physical features are only illustrative, not exhaustive, as emotion may also be communicated in channels other than the face. The voice and body movements may also convey emotional information (Izard, 1982; Scherer, 1984). Hence, in observing the child, coders should be sensitive to any cues of affect expression using a gestalt approach (Gottman, 1993). In addition, the choice of affect expressions is not limited to those emotions that satisfy the criteria of cross-cultural universality (Ekman, 1984), but includes affects that reflect aspects of regulation and that acceptably, in our culture, represent certain emotional states. Thus coding is largely based on a 'cultural informant' system (Gottman, 1993).

For each question-answer episode, coders note if they observe on the child the presence of the following items and code these on the basis of degree of intensity:

**1. *Genuine-positive affect:***

This item includes a smile, a chuckle, or a laugh that appears to be meaningful and represent a positive emotional state of happiness, joy, contentment, etc. The distinctive appearance of this expression is in the eyelids and lower face, while the brow/forehead is usually not involved. The corners of the lips are drawn back and slightly up and the cheeks are raised. The mouth may be parted and the teeth may be exposed. There may be wrinkle lines running from the nose out and down to the area beyond the corners of the mouth (naso-labial folds). The skin below the lower eyelid is pushed up, and lines are formed below the eye.

This item is on a 3-point scale of **intensity**:

**Scale point 0 =**

Total absence of this item during a question-answer episode.

**Scale point 1 =**

Mild or hinted presence of this expression. For example, the lips remain together in a smile, or there is a slight movement of the corners of the lips upwards and the cheeks are slightly raised.

**Scale point 2 =**

Clear and pronounced presence of this expression. For example, the lips may be parted with the teeth and jaws together in a grin, or the mouth may be opened and the teeth parted in a wide grin. In a wide-mouth grin the teeth and gums may show. The more pronounced the smile, the more pronounced is the naso-labial folds, the raising of the cheeks, and the lines under the eyes. With the wide-mouth grin, the cheek may be lifted far enough to actually narrow the eyes.

## **2. *Ingenuine-positive affect:***

This item involves a smile, a chuckle, or a laugh that communicates a false, rather than felt, subjective experience. The positive affect does not appear genuine or meaningful, but is used to communicate to the interviewer information about a subjective state that is not, in fact, being felt. As opposed to a genuine positive affect that is usually intermediate in duration, fairly symmetrical in appearance, varies in intensity of the emotion being felt, and ebbs away gradually, an ingenuine positive affect is abrupt and brief in onset and offset (Aronoff et al., 1994). It appears suddenly at near maximum intensity and is usually held at that level without marked modulation. In addition, it may be asymmetrical in appearance and it usually disappears abruptly.

This item is on a 3-point scale of **intensity**:

### **Scale point 0 =**

Total absence of this item during a discrete question-answer episode.

### **Scale point 1 =**

Mild or hinted presence of this expression. For example, a hinted movement of the lips upwards that is brief in onset and offset with the rest of the face, particularly the eyes, neutral or uninvolved.

### **Scale point 2 =**

Clear and pronounced presence of this expression. For example, a nervous laughter, or a wide grin which may involve the eyes that ebbs away abruptly.

## **3. *Sad Affect:***

This item reflects a withdrawn appearance, which may be accompanied by a drooping, listless pose. In sadness, the inner corners of the eyebrows are raised and may be drawn together. The inner corner of the upper eyelid is drawn up, and the lower eyelid may appear raised. The corners of the lips may be drawn down, or the

lips appear in tremble. Alternatively, other distinctive features of sadness are an apparent loss of muscle tone in the face. Often in sadness the gaze is down rather than straight ahead. Closed up posture may also accompany these facial clues, as may a shakier voice and a slower speed of speech.

This item is on a 3-point scale of **intensity**:

**Scale point 0 =**

Total absence of this item during a discrete question-answer episode.

**Scale point 1 =**

Mild or hinted presence of this expression. It may be manifested only in one of the three distinctive parts of the face involved (i.e., the eyebrows, the mouth, and the lower eyelids). For example, the inner corners of the eyebrows are drawn up but the mouth and lower eyelid are uninvolved. Because the context of observation is an interview situation about friendship, it is anticipated that children will not readily demonstrate much sad affect. Therefore, when a mild presence of sad affect appears continuously throughout a specific question-answer sequence, coders should consider this as a pervasive sad affect and should give it a 2 on the scale, rather than a 1.

**Scale point 2 =**

Clear or pronounced presence of the expression. For example, clear raising of the lower eyelid and clear drawing down of the lips. Or, the child appears as if he/she is about to cry or is trying to withhold crying.

**4. Anger affect:**

The manifestation of anger involves the following facial clues: the eyebrows are lowered and are drawn together, the eyelids are tensed, and the eyes appear to stare in a hard fashion. The drawing together of the inner corners of the eyebrow usually produces vertical wrinkles between the eyebrows. The lips are either tightly pressed together or parted in a square shape. Dismissive-like facial, tone, and body expressions may also reflect anger.

This item is on a 3-point scale of **intensity**:

**Scale point 0 =**

Total absence of this item during a discrete question-answer episode.

**Scale point 1 =**

Mild or hinted presence of this expression. For example, the lowered, drawn together eyebrows may appear alone with the rest of the face neutral or uninvolved. Or, the lower eyelid could be tensed or raised and the hard, fixed stare could occur alone. The closed, lip-pressed-against-lip mouth may also appear on its own. As with sad affect, children are not expected to show much anger in this specific situation, therefore, mild but pervasive will be coded as point 2.

**Scale point 2 =**

Clear and pronounced presence of this expression. For example, there is some registration of the anger in all three facial areas (i.e., eyebrows, eye, mouth). The open square mouth may also show. Tone of voice, body posture, and hand movement (e.g., clenched fists) may accompany these facial expressions.

**5. *Fear/apprehensive/worry affect:***

This item involves signals of tension, reservation, inhibition and cutting back. Such affect expressions may be conveyed through a withdrawn-anxious appearance, muscular tension and stiffness. For example, an anxious looking gaze and a nervous wringing movements of the hands. There is a distinctive appearance in each of the three facial areas during fear. The eyebrows are raised and drawn together; the eyes are open and the lower lid is tensed; and the lips are stretched back. The lips are not relaxed. There is tension in the upper lip and the beginning trace of the corners of the lips being drawn back. Usually, there are horizontal wrinkles across the centre of the forehead. An open mouth whilst the rest of the face is neutral may reflect worry or apprehension and may refer to a momentary feeling at the beginning of a fear experience. When the eyes and brows are involved but not the mouth, this may be a sign of apprehension.

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This item is on a 3-point scale of **intensity**:

**Scale point 0 =**

Total absence of this item during a discrete question-answer episode.

**Scale point 1 =**

Mild or hinted presence of this expression. For example, one of the three distinctive facial areas appears on its own, with the other two parts neutral. For example, a brief fear expression involving the appearance of the fear eye in which the upper eyelid is raised and the lower eyelid is tensed and drawn up, without the involvement of the fear brow and the fear mouth. The stretched and tense fear mouth may also occur with the rest of the face uninvolved, but when this happens it will usually be a brief expression in which the lips are stretched back and then return. As with the other two negative emotion expressions, mild but pervasive presence of fear during a question-answer sequence will be coded as point 2.

**Scale point 2 =**

Clear and pronounced presence of the expression. In clear expression the raising of the upper lid and the tensing of the lower lid will be intensified. Also, there will be involvement of the three parts of the face (i.e., brows, eyes, mouth). Higher intensity will also be registered in the mouth, with the mouth increasingly stretching and opening.

**6. High arousal/over-excitement:**

This item involves signals of emotion in excess. When observing, there is a sense that this child finds it difficult to contain his/her own emotions and/or that he/she can not sit still and calm down. For example, the child is revved-up, acts in a marked silly way, laughs uncontrollably, and/or present with a too high degree of energy.

This item is on a 3-point scale of **intensity**:

**Scale point 0 =**

Total absence of this item during a discrete question-answer episode.

**Scale point 1 =**

Mild or hinted presence of this item. For example, the child laughs more than seems appropriate for the situation but not uncontrollably.

**Scale point 2 =**

Clear and pronounce presence of the item. For example, the child clearly finds it difficult to manage his/her emotions. For example, the child goes under the table in fear, or climbs on the chairs in excessive excitement, or laughs uncontrollably.

**7. Exaggerated affect:**

This item involves the over intensifying and exaggeration of affect expressions in a voluntary way. Thus, the child seems aware of exaggerating affect, as if dramatising it, such as exaggerated laughter or histrionic-like behaviour.

This item is on a 2-point scale.

The coder ticks the **Yes** box when this item is observed during a discrete question-answer episode and ticks the box **No** when this item is not observed.

**8. Unusual Tone of Voice:**

This item includes an unusually high pitched or low pitched tone of voice. It also includes a forced tone of voice or a shaky voice that goes high and low intermittently. This item is on a 2-point scale. If it is observed during a discrete question-answer episode, the coder ticks the **Yes** box. If it is not observed, the coder ticks the **No** box.



## **II) Behaviour Control:**

This dimension is concerned with the overall interaction style of the child during the interview. The aim here is to capture the way in which the child comes across interpersonally to another person. In accord with emotion regulation literature, the focus here is on the child's ability to inhibit or activate behaviour as needed to encourage appropriate social interaction (Eisenberg, 2001; Patterson, 1994).

### ***1. Engagement/Cooperation:***

This item reflects the child's engagement in the process of the interview and his/her ability to collaborate with the interviewer. The emphasis is on the child's ability to motivate socially appropriate behavioural responses and to engage in a smooth give-and-take in the conversation about a shared and imposed topic. Coders should observe the child's non-verbal and verbal behaviour during each question-answer episode with emphasis on behaviours that are designed to facilitate or inhibit social interaction, such as head nods, physical direction in respect of the interviewer and proximity, and general flow of the conversation during each question-answer episode.

The coding is of a 3-point scale as follows:

#### **Scale point 0 =**

Absence of any engagement and cooperation with the interviewer. For example, the child turns his/back away from the interviewer and/or refuses to answer the question, or the child talks about a completely different topic, ignoring the interviewer's attempts at engaging, or the child walks away from the situation.

#### **Scale point 1 =**

Mild form of engagement and cooperation. Although the child answers the question, the coder gets a sense that the interviewer has to 'work hard' to contain the child in the interview process. The interviewer seems to struggle with getting the child's full attention, or to get the child to stay on-task, or to elaborate on the answer. For

example, the child responds but only very briefly and does not reflect further or explains his/her answer to the interviewer. Or, the child answers the question but he/she is not facing the interviewer or his/her back is turned away from the interviewer. Or, the child responds but is showing little interest in the interview, or is interrupting the interviewer, or changing the topic of the conversation half way through his/her answer.

**Scale point 2 =**

Clear, free flow dyadic interchange and reciprocity between the interviewer and the child. The coder observes a free flow give-and-take in the conversation. The child is clearly aware of the purpose and the context in which he/she is in and displaying the appropriate social behaviours. The interviewer in turn, has no difficulty to move ahead with the interview and to get the child's full attention.

**2. Specific Categories:**

This refers to certain types of interaction style where inappropriate social behaviour is displayed. These do not represent an exhaustive list of inappropriate social behaviours but were gathered from previous observations of the social interaction of the population in question. Although these usually reflect certain maladaptive social behaviours, a child could still get a score of 2 on engagement and fit into one category at the same time. For example, the child engages in the conversation but then says 'I actually want to talk about something else. This child may fit into the controlling category (see below). The following items are on a 2-point scale: Coders tick the **Yes** box when any of the following items are observed and the **No** box when an item is not observed:

**2.1. Resistant/Oppositional:**

This item refers to errors of commission. Thus, the child is actively showing the interviewer that he/she is not interested in the interview or in a specific question, usually by providing verbal clues. Examples of what the child might say: 'I'm tired';

'I don't want to do it'; 'I don't want to talk about it'; 'why do I need to do it'; 'how am I supposed to know that', and so forth.

### **2.2. Controlling:**

This item refers to attempts of the child to take control of the interview by trying to impose different rules on the interviewer, or trying to talk about a different topic. For example, the child might say to the interviewer 'but I want to talk about ....'. The child might also ask the interviewer questions, or might try to take the lead role, or ask to exchange seats with the interviewer, or to look through the video camera during the interview.

### **2.3. Non Voluntary:**

This item refers to errors of omission. Thus, the child seems reluctant to answer the question seems to be retreating from the interviewer. The child might also provide brief answers with minimal information and he/she would not elaborate on them.

### **2.4. Lack of Verbal Boundaries**

This item refers to a child who asks the interviewer personal or intrusive questions during the course of the interview, or is asking the interviewer other inappropriate questions, or is making other sarcastic and/or inappropriate comments. For example, the child swears, or says to the interviewer something like 'you finally got it' in a denigrating tone).

### **2.5. Lack of Physical Boundaries**

This item refers to a child who seems to be violating the interviewer's personal space. For example, the child may sit or stand too close to the interviewer, or may

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touch the interviewer, or touch objects belonging to the interviewer (e.g., pen, glasses case, necklace). Alternatively, the child may sit in the interviewer's seat.

### **3. *Fidgetiness:***

The aim here is to capture the child's uneasiness with the interaction and with the interview situation. It is expected that in an interview situation children would show some degree of fidgetiness. However, this item refers to fidgetiness in excess. Thus, the coder observes repetitive and continuous fine motor movements, such as movements of the hand and/or of the fingers. For example, a child might be rubbing her hand and leg through the course of the question-answer episode. If the child seems slightly fidgety to start with but stops half way through her response this will not be coded as fidgetiness as the coder should observe dominance of fidgetiness. This item is on a 2-point scale. If coders observe fidgetiness they should tick the **Yes** box. The **No** box will be ticked when this item is not observed.

### **4. *Shiftiness:***

As with fidgetiness, the aim here is to capture the child's uneasiness in this social interaction. This item refers to excessive and continuous gross motor movements during the question-answer episode. For example, the child might move her legs, her arms, or her whole body. Alternatively, the child might get up from her seat and walk about, or stamp her feet etc. As with fidgetiness, the coder looks for dominance of shiftiness in the course of the question-answer sequence, rather than a single occurrence. If this is observed, the coder ticks the **Yes** box. If this is not observed, then the coder ticks the **No** box.

### **5. *Pulling Faces:***

This item refers to a child who is being goofy with the camera and is pulling faces to the camera or, alternatively, to the interviewer. The coder observes whether during

the course of the question-answer episode the child pulls faces to the camera or to the interviewer. If this is observed, the coder ticks the **Yes** box. If this is not observed, the coder ticks the **No** box.

### **III) Attention Control:**

This scale assesses children's use of shifts of attention as a component of emotion regulation processes. In agreement with emotion regulation literature, adaptive emotion regulation is reflected in the ability to maintain appropriate social interaction in a given context. Accordingly, excessive shifts of attention in an interview situation are viewed as maladaptive emotion regulation strategies. There are two distinct components of shifts of attention: eye contact (i.e., attentional reorientation) and attention disengagement.

#### ***1. Eye Contact:***

This item refers to the direction of the gaze of the child during the question-answer sequence. Eye gazing during a social interaction is used to synchronize and control the flow of a conversation and to regulate the flow of the interaction. It is related to turn taking. It is expected, as shown by research, that children would look more at the interviewer as they listen than as they speak. In addition, the duration of gazing would be longer during listening than during talking (Abele, 1986; Kleinke, 1986). When punctuating a point, a person's gaze will usually be directed at the other person in the conversation. In a typical interactive sequence, when person A comes towards the end of his utterance he looks at person B to signal that it is B's turn to speak. Person B, in turn, will tend to look at person A at this point and will usually look away sometime after he begins his response but the gaze will come back from time to time, to facilitate the interaction and to check the other person's focus (Hargie et al., 1994).

This item is on a 3-point scale.

**Scale point 0 =**

Total absence of eye contact with the interviewer during the question-answer sequence.

**Scale point 1 =**

Presence of some eye contact with the interviewer but this seems to be asynchronised, and poorly regulated. The coder observes that although there is some eye contact, it is unclear in that it does not seem to reflect communication and turn taking, as described above. For example, the child gazes at the interviewer sporadically, or shifts his eyes predominantly. Alternatively, the child makes minimal eye contact and tries to avoid gazing at the interviewer for the majority of time.

**Scale point 2 =**

The child makes a synchronised and well-regulated eye contact with the interviewer. The coder gets a sense that this pattern of gazing facilitates the flow of the interaction, as outlined in the typical pattern above. The child does not have to make continuous eye contact to receive this code, but there should be some evidence that the gaze has a communicative function and that this helps the flow of the interaction with the interviewer. For example, a child may look elsewhere whilst responding but his gaze comes back to the interviewer when punctuating a point and/or towards the end of his utterance and when listening to the question.

**2. *Attention Disengagement:***

The child appears to disengage his/her attention from the interview and the interviewer. The child appears to be inattentive during the question-answer episode and/or is going off-task. Alternatively, the child appears distracted. He/she does not pay attention to the interviewer or to what he/she is being asked. For example, the child may talk about something else or may do something else, unrelated to the interview.

This item is on a 2-point scale. Coders should tick the **Yes** box if there is evidence of attention disengagement and the **No** box if this item is not observed during a question-answer episode.

**IV) Out of His / Her Depth:**

This item is not directly related to emotion regulation but is included to rule out situations in which there is a clear indication that the child finds it hard to conceptually understand the content of the interview. Specifically, it refers to instances where the child appears to have difficulties understanding the questions or is unable to provide an answer due to a lack of conceptual understanding, even though the child appears socially engaged and pleasant. This item is on a 2-point scale. The coder ticks the **Yes** box if there is evidence for this item during the question-answer sequence and ticks the **No** box if there is no evidence that this is the case.

**Emotion Regulation Coding Sheet**

Child ID: \_\_\_\_\_

I) Affect Expression:

- |                                   |                            |                              |                             |
|-----------------------------------|----------------------------|------------------------------|-----------------------------|
| 1. Genuine positive affect        | 0 <input type="checkbox"/> | 1 <input type="checkbox"/>   | 2 <input type="checkbox"/>  |
| 2. Ingenuine positive affect      | 0 <input type="checkbox"/> | 1 <input type="checkbox"/>   | 2 <input type="checkbox"/>  |
| 3. Sad Affect                     | 0 <input type="checkbox"/> | 1 <input type="checkbox"/>   | 2 <input type="checkbox"/>  |
| 4. Anger affect                   | 0 <input type="checkbox"/> | 1 <input type="checkbox"/>   | 2 <input type="checkbox"/>  |
| 5. Fear/apprehension/worry affect | 0 <input type="checkbox"/> | 1 <input type="checkbox"/>   | 2 <input type="checkbox"/>  |
| 6. High arousal/over-excitement   | 0 <input type="checkbox"/> | 1 <input type="checkbox"/>   | 2 <input type="checkbox"/>  |
| 7. Exaggerated affect             |                            | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 8. Unusual tone of voice          |                            | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

II) Behaviour Control:

- |                                  |                            |                              |                             |
|----------------------------------|----------------------------|------------------------------|-----------------------------|
| 1. Engagement/cooperation        | 0 <input type="checkbox"/> | 1 <input type="checkbox"/>   | 2 <input type="checkbox"/>  |
| 2. Specific Categories:          |                            |                              |                             |
| 2.1. Resistant/oppositional      |                            | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2.2. Controlling                 |                            | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2.3. Non-voluntary               |                            | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2.4. Lack of verbal boundaries   |                            | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2.5. Lack of physical boundaries |                            | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2.6. Fidgetiness                 |                            | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2.7. Shiftiness                  |                            | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2.8. Pulling faces               |                            | Yes <input type="checkbox"/> | No <input type="checkbox"/> |





**Appendix 2:**

Loneliness and Social Dissatisfaction Questionnaire

Teacher's Harter

# Loneliness and Social Dissatisfaction (Cassidy et al.)

[short version]

Name: \_\_\_\_\_

ID: \_\_\_\_\_

Date: \_\_\_\_\_

	Yes	Sometimes / somewhat	No
1. Is it easy for you to make friends at school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Do you have other kids to talk to at school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Are you good at working with other kids at school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Do you feel alone at school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Can you find a friend when you need one?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Is it hard to get kids in school to like you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Do you have kids to play with at school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Do you feel left out of things at school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Are there kids you can go to when you need help in school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Do you have friends at school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## Teacher's Harter

Name of the child: \_\_\_\_\_ Male \_\_\_\_\_ Female \_\_\_\_\_

Please read the statements carefully and tick the one that is the most appropriate on each line.

Really true	Sort of true		OR		Sort of true	Really true
1 _____	_____	This child feels s/he is very good at school work.	OR	This child worries about whether s/he can do her/his school work	_____	_____
2 _____	_____	This child finds it hard to make friends	OR	This child finds it is very easy to make friends	_____	_____
3 _____	_____	This child feels s/he is just as clever as other children	OR	This child is not so sure and wonders if s/he is as clever	_____	_____
4 _____	_____	This child has a lot of friends	OR	This child does not have very many friends	_____	_____
5 _____	_____	This child is very slow in finishing her/his work	OR	This child can do her/his school work quickly	_____	_____
6 _____	_____	This child would like to have a lot more friends	OR	This child has as many friends as s/he wants	_____	_____
7 _____	_____	This child often forgets what s/he has learned	OR	This child can remember things easily	_____	_____
8 _____	_____	This child is always doing things with a lot of children	OR	This child usually does things by herself/himself	_____	_____
9 _____	_____	This child does very well at her/his classwork	OR	This child does not do very well at her/his classwork	_____	_____
10 _____	_____	This child wishes more children her/his own age liked her/him	OR	This child feels that most children her/his own age do like her/him	_____	_____
11 _____	_____	This child has trouble working out the answers in school	OR	This child almost always can work out the answers	_____	_____
12 _____	_____	This child is popular with others her/his own age	OR	This child is not very popular	_____	_____