

**MITIGATING EFFECTS OF THE HOME ENVIRONMENT
ON INATTENTION AND OVERACTIVITY IN CHILDREN
ADOPTED FROM ROMANIAN ORPHANAGES: A
LONGITUDINAL STUDY**

by

Karyn Audet

B.A., Simon Fraser University 2001

M.A., Simon Fraser University 2003

THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

In the
Faculty of Education

© Karyn Audet, 2008

SIMON FRASER UNIVERSITY

Spring 2008

All rights reserved. This work may not be
reproduced in whole or in part, by photocopy
or other means, without permission of the author.

APPROVAL

Name: Karyn Audet
Degree: Doctor of Philosophy
Title of Thesis: Mitigating effects of the home environment on inattention and overactivity in children adopted from Romanian orphanages: A longitudinal study

Examining Committee

Chair: Jeff Sugarman, Associate

Lucy LeMare, Associate Professor
Senior Supervisor

Jeremy Carpendale, Professor,
Department of Psychology

Paul Neufeld, Assistant Professor
Committee Member

Dr. Arlene Young, Associate Professor,
Department of Psychology, SFU

Dr. Charlotte Johnston
External Examiner

Date Defended/Approved: April 4, 2008



SIMON FRASER UNIVERSITY
LIBRARY

Declaration of Partial Copyright Licence

The author, whose copyright is declared on the title page of this work, has granted to Simon Fraser University the right to lend this thesis, project or extended essay to users of the Simon Fraser University Library, and to make partial or single copies only for such users or in response to a request from the library of any other university, or other educational institution, on its own behalf or for one of its users.

The author has further granted permission to Simon Fraser University to keep or make a digital copy for use in its circulating collection (currently available to the public at the "Institutional Repository" link of the SFU Library website <www.lib.sfu.ca> at: <<http://ir.lib.sfu.ca/handle/1892/112>>) and, without changing the content, to translate the thesis/project or extended essays, if technically possible, to any medium or format for the purpose of preservation of the digital work.

The author has further agreed that permission for multiple copying of this work for scholarly purposes may be granted by either the author or the Dean of Graduate Studies.

It is understood that copying or publication of this work for financial gain shall not be allowed without the author's written permission.

Permission for public performance, or limited permission for private scholarly use, of any multimedia materials forming part of this work, may have been granted by the author. This information may be found on the separately catalogued multimedia material and in the signed Partial Copyright Licence.

While licensing SFU to permit the above uses, the author retains copyright in the thesis, project or extended essays, including the right to change the work for subsequent purposes, including editing and publishing the work in whole or in part, and licensing other parties, as the author may desire.

The original Partial Copyright Licence attesting to these terms, and signed by this author, may be found in the original bound copy of this work, retained in the Simon Fraser University Archive.

Simon Fraser University Library
Burnaby, BC, Canada



SIMON FRASER UNIVERSITY
THINKING OF THE WORLD

STATEMENT OF ETHICS APPROVAL

The author, whose name appears on the title page of this work, has obtained, for the research described in this work, either:

(a) Human research ethics approval from the Simon Fraser University Office of Research Ethics,

or

(b) Advance approval of the animal care protocol from the University Animal Care Committee of Simon Fraser University;

or has conducted the research

(c) as a co-investigator, in a research project approved in advance,

or

(d) as a member of a course approved in advance for minimal risk human research, by the Office of Research Ethics.

A copy of the approval letter has been filed at the Theses Office of the University Library at the time of submission of this thesis or project.

The original application for approval and letter of approval are filed with the relevant offices. Inquiries may be directed to those authorities.

Bennett Library
Simon Fraser University
Burnaby, BC, Canada

ABSTRACT

This longitudinal study examined the potential mitigating effects of the adoptive home environment on inattention and overactivity (I/O) in children adopted from Romanian orphanages. Three groups were studied: (1) Children who experienced at least 8 months of deprivation in an orphanage prior to being adopted to British Columbia (RO group), (2) Children adopted to British Columbia from Romanian orphanages prior to 4-months-of-age (EA group), and (3) Canadian born non-adopted children (CB group). Comparisons of rates of I/O among the 3 group revealed that at ages 4.5, 10.5 and 16-years RO children had more difficulties with I/O than either the EA or CB children. Within the post-institutionalized groups, I/O was related to duration of deprivation and this association was not found to significantly attenuate over time, indicating that duration of deprivation continued to have an influence on the children's I/O well into adolescence. Several aspects of the adoptive home environment (parenting practices, parent-child attachment, parent-child interaction styles and nurturance and stimulation) were found to significantly correlate with the children's I/O. Regression analyses indicated that parent-child attachment and parenting practices account for significant variance in I/O beyond that accounted for by duration of deprivation.

DEDICATION

This dissertation is dedicated to all the children and families who have shared their stories, lives and experiences to make this research possible and to contribute to the understanding of child development.

ACKNOWLEDGEMENTS

I am extremely grateful to Dr. Lucy Le Mare, my senior supervisor, for her continued guidance and support throughout my dissertation and related work. Her insightful advice, thoroughness, friendship and academic integrity has provided me with an exceptional mentor. I am also very grateful to Dr. Jeremy Carpendale and Dr. Paul Neufeld for their thoughtful suggestions and support as well as their dedication and quick responses to questions and draft reviews.

I would also like to extend my thanks the various other graduate students, work study students, and volunteers who have dedicated their time and effort to make this study possible. Specifically, I would like to express my gratitude for the friendship, support and countless hours of work offered by Karen Kurytnik, a fellow PhD candidate working on this study.

Additionally I would like to express my appreciation to my family who have all supported and encouraged me throughout my education. Their emotional and academic support over the past eleven years has been truly amazing.

Finally, I would like to thank all of the families who have participated in this research and shared their stories and experiences in order to provide others with a better understanding of the needs, challenges and strengths of post-institutionalized children.

TABLE OF CONTENTS

Approval	ii
Abstract	iii
Dedication.....	iv
Acknowledgements	v
Table of Contents.....	vi
List of Tables.....	viii
Introduction	1
Genetic contributions to I/O	3
Prenatal risk factors.....	4
Childhood Nutrition and Diet Risk Factors.....	5
Family Environment Risk Factors	5
Theoretical Positions.....	6
Developmental perspectives	6
Bowlby	10
Vygotsky	13
Empirical Research.....	16
Home environments and I/O.....	16
Inattention Overactivity in adopted children.....	25
Inattention/Overactivity in adopted children.....	26
Research on Romanian orphans.....	29
Post-institutionalized children with good physical care prior to adoption	33
Comparisons of Children Raised in Institutions and Children Reared in Foster Homes	34
Method	40
Participants	40
Procedures	42
Measures	44
Demographic Information	44
Indices of inattention/overactivity.....	44
Indices of the Home Environment	46
RESULTS	54
Preliminary Analyses	54
Demographic Information	54
Analysis of Phase 4 Attrition.....	55

Data Reduction.....	55
Gender differences in inattention/overactivity	56
Gender differences in Home Rearing Conditions	56
Group differences in Home Rearing Conditions	56
Main Results	57
Q1: Are rates of I/O higher in the RO than EA and CB groups and higher in the EA than CB group at Phases 2, 3 and 4?	57
Q2: Does I/O continue to relate to duration of deprivation approximately 14 years post-adoption and has the relationship attenuated over time?	59
Q3: Do positive aspects of the home rearing environment correlate inversely with I/O?	61
Q4: Do duration of deprivation and the adoptive home rearing environment make independent contributions to the prediction of I/O in children with early deprivation experience?	63
Discussion	70
Reference List	86
Appendices	94
Appendix A: Ethics Approval.....	95
Appendix B: Introductory Letter to Parents	96
Appendix C: Consent form for Parents	97
Appendix D: Consent form for Children	99
Appendix E: Table of Measures Used.....	101
Appendix F: Demographic Questionnaire	102
Appendix G: Child Behaviour Checklist Attention problems scale (parent and teacher forms)	103
Appendix H: Parenting Practices Questionnaire	104
Appendix I: Brief description of the Subscales of the Preschool Version of the Home Observation for Measurement of the Environment (HOME).....	107
Appendix J: Brief description of the Subscales of the Elementary School Version of the Home Observation for Measurement of the Environment (HOME).....	108
Appendix K: Egeland's Teaching Task Rating Scales	110
Appendix L: Marfo's Parent-child Interaction Scales	111
Appendix M: Inventory of Parent Attachment.....	112

LIST OF TABLES

Table 1: Means and Standard Deviations for Demographic Characteristics of All Groups, Phase 4.....	119
Table 2: Correlations Between Demographic Characteristics and I/O Measures.....	121
Table 3: Comparison of Participants who participated in Phase 4 with those who declined in Phase 4	122
Table 4: Results of Factor Analysis of Parent-Child Interaction Variables at Phase 2	123
Table 5: Gender Differences on all Measures of I/O.....	124
Table 6: Gender Differences on all Measures of the Home Rearing Environments.....	125
Table 7: Differences in Home Rearing Environments among Groups	126
Table 8: Correlations among all measures in the RO GROUP	130
Table 9: Correlations among all measures in the EA Group.....	132
Table 10: Correlations among all measures in the CB Group	134
Table 11: Phase 2, 3, and 4 I/O Scores Across Groups	127
Table 12: Correlations between Duration of Deprivation and Measures of I/O from Phases 2, 3 and 4 Within the RO/EA Combined Group	128
Table 13: Phase by Group means for I/O measures	129
Table 14: Partial correlations between Phase 2 Home variables and Phase 3 and 4 measures of I/O controlling for Phase 2 I/O within the RO Group.....	135
Table 15: Partial correlations between Phase 2 Home variables and Phase 3 and 4 measures of I/O controlling for Phase 2 I/O within the CB Group	136

Table 16: Partial correlations between Phase 2 Home variables and Phase 3 and 4 measures of I/O controlling for Phase 2 I/O within the EA Group.....	137
Table 17: Partial correlations between Phase 3 Home variables and Phase 4 measures of I/O controlling for Phase 3 I/O within the RO Group	138
Table 18: Partial correlations between Phase 3 Home variables and Phase 4 measures of I/O controlling for Phase 3 I/O within the CB Group.....	139
Table 19: Partial correlations between Phase 3 Home variables and Phase 4 measures of I/O controlling for Phase 3 I/O within the EA Group	140
Table 20: Summary of Hierarchical Regression Analysis for Phase 3 Parent Reported I/O	141
Table 21: Summary of Hierarchical Regression Analysis for Phase 3 Teacher Reported I/O	143
Table 22: Summary of Hierarchical Regression Analysis for Phase 4 Parent Reported I/O	145

INTRODUCTION

Since 1991, as part of the Romanian Adoption project, researchers at Simon Fraser University have been following the development of a group of early-deprived children adopted from Romanian institutions by families living in British Columbia. The rearing conditions in the institutions were horrendous and are described in full detail elsewhere (Ames, 1990; Fisher, Ames, Chisholm, & Savoie, 1997). Briefly, at the time of the Romanian dictator Nicolae Ceausescu's fall, there were more than 100,000 children languishing in over 600 state-run institutions. The children were extremely deprived in all respects. Malnourished, they spent the majority of their days alone in cribs lacking in physical, social, auditory and visual stimulation. The findings emerging from this study are consistent with those of other such studies (see MacLean, 2003 for a review) and show that early institutional rearing is associated with an increased risk for a variety of disturbances in childhood and adolescence, including difficulties with inattention and overactivity (I/O). Moreover, the longer children are institutionalized prior to adoption the greater their risk for negative outcomes.

Although the impact of institutional deprivation on development remains a very important area of study, it is also of interest to address the potential of the adoptive rearing environment to support the development of previously institutionalized children, which to date, very few researchers have done. The number of international children adopted by Canadian families is approximately 2000 per year (<http://www.adoption.ca>). Almost all of these children spent some, if not all, of their lives prior to adoption in an

orphanage. Hence, it is of paramount importance that we investigate the role that their adoptive parents can play in supporting their development.

In this dissertation, I attempt to disentangle the contributions of early institutional and later adoptive home rearing environments to the development of inattention and overactivity, over time. Specifically, I examine, longitudinally, I/O in a sample of abandoned Romanian children who experienced extended severe early global deprivation prior to their adoption into Canadian families in relation to pre- and post-adoptive environment variables and in comparison with two other matched groups: (1) abandoned Romanian children who were adopted by Canadian families early in infancy and hence did not experience extended early institutional deprivation and (2) Canadian born non-adopted children.

Etiology of Inattention/overactivity

Inattention and overactivity are characteristics that can be viewed on continuums. Relatively extreme I/O is a central feature of one of the most prevalent childhood mental disorders in North America – attention deficit disorder or attention deficit hyperactivity disorder (ADHD). Therefore ADHD would be applied only to children within a restricted range on the I/O continuum that is children who are relatively extreme in this regard. As such, the etiology of I/O has most often been of interest to studies of ADHD. A multiple pathways model that provides predictions of how I/O develops over time, and how multiple risk and protective factors, including biology and family environments, transact to impact this development (Hinshaw, 1994; Kazdin & Kagan, 1994; Rutter & Sroufe, 2001) is gaining increasing recognition (Samudra & Cantwell, 1999). Johnston

and Mash (2001), explain that such a model allows for the possibility that, across children and across time, various influences weigh differently in the development of the disorder.

At one extreme, there may be children for whom ADHD is predominantly determined early in development by biological risk factors, with a relatively lesser role for subsequent contributions from the family or other environmental factor.

At another extreme, a high risk family environment may function as the primary determinant of the ADHD symptoms when combined with minimal child predisposition. In either instance, the child's nature and the family environment are likely to exert interactive influences" (p. 184).

As the focus of this dissertation is on the environmental contributions to I/O, biological risk factors are only briefly reviewed. These include genetic, prenatal, and childhood nutrition and dietary factors.

Genetic contributions to I/O

Studies of the genetic contribution to I/O are of three main types: comparisons of the rates of ADHD in first and second-degree relatives, comparisons of rates of ADHD in monozygotic and dizygotic twins, and examinations of the rates of ADHD in both the biological and adoptive parents of children with ADHD. Findings indicate a higher prevalence of ADHD in parents and other close relatives of children with ADHD than in non related relatives (Biederman et al., 1990; Farone & Doyle, 2001; Faraone, et al. 2000; Frick & Lahey, 1991; Samudra & Cantwell, 1999; Tannock, 1998; Thapar, 2003), a higher concordance rates of ADHD for monozygotic than dizygotic twins (Faraone & Doyle, 2001; Frick & Lahey, 1991; Goodman & Stevenson, 1989; Samudra & Cantwell, 1999; Tannock, 1998; Thapar, 2003), and that biological relatives of children diagnosed

with ADHD are more likely to have ADHD than adoptive relatives (Frick & Lahey, 1991; Samudra & Cantwell, 1999; Tannock, 1998; Thapar, 2003). Despite methodological limitations such as reliance on retrospective diagnosis, the possibility that the chaotic home environment of families who themselves have ADHD may cause the children's disorders, and reliance on parents to report if their twins are monozygotic or dizygotic, taken together, the research is supportive of some genetic contribution to I/O.

Prenatal risk factors

Prenatal risk factors for I/O can be classified into three categories: low birthweight, prenatal complications and exposure to alcohol, nicotine or drugs. A consistent finding across studies is an increased risk of ADHD in babies with low birthweights (Botting, Powls, Cooke, & Marlow, 1997; Faraone & Doyle, 2001; Szatmari, Saigal, Rosenbaum, & Campbell, 1993; The Scottish Low Birthweight Study Group, 1992; Whitaker et al., 1997). Researchers have also reported that pre- and perinatal complications are related to I/O, however findings are mixed with some researchers finding several prenatal complications related to ADHD symptoms and others finding an association between only select complications (Hartsough & Lambert, 1985; Samudra, & Cantwell, 1999; Stephen & Doyle, 2001; Minde, Webb, & Sykes, 1968). Lastly, exposure to nicotine, alcohol and drugs has been hypothesized to predict I/O (Faraone & Doyle, 2001; Samudra & Cantwell, 1999). However, in a review of the literature, Samudra and Cantwell (1999) conclude that studies of each of these substances and their association with ADHD are limited and may be confounded by polydrug exposure and by ongoing maternal substance use.

Childhood Nutrition and Diet Risk Factors

Studies of risk factors related to nutrition and diet have typically focused on general malnourishment or a deficiency in zinc (Arnold & DiSivestro, 2005; Colquhoun, 1994; Faraone & Doyle, 2001). In two separate literature reviews children diagnosed with ADHD were found to have deficient levels of zinc compared to controls (Arnold & DiSivestro, 2005; Colquhoun, 1994). However, in both of these reviews it was also noted that this association may in fact be related to the relationships between ADHD and malnourishment in general.

It is important to note that no single biological risk factor has been demonstrated to be solely responsible for I/O or diagnoses of ADHD nor have researchers made such a claim. This is consistent with the multiple pathways model explained above, which also includes consideration of environmental effects.

Family Environment Risk Factors

In comparison to the advancements in understanding the biological nature of I/O and the sheer number of studies investigating this issue, relatively little attention has been focused on environmental risk factors and thus our understanding of this possible component in the etiology of I/O is, as described by Johnston and Mash (2001), “less robust, less systematic, and even stagnant” (p. 183). In this dissertation not only is the environment investigated as a risk factor but also as a possible protective agent in the development of I/O.

Although there is a paucity of empirical research explaining the relationship between environmental variables and the development of I/O, several theoretical positions point to the importance of the home environment, the parent-child relationship

and parent-child interaction styles in the development of these skills (Bowlby, 1951, 1966; Kopp, 1982, 1989; Tronick 1989 & Vygotsky, 1978, 1987). Four such theoretical positions will be described followed by empirical studies investigating these links.

Theoretical Positions

Developmental perspectives

Developmental theorists typically regard children's social interactions, specifically with their parents, as paramount in the development of I/O (Kopp, 1982; 1989; Tronick, 1989). Most developmentalists concur that early forms of self-regulation are necessarily linked to caregivers' behaviour. It is generally believed that control or regulation of children's behaviour is first imposed externally by caregivers, and then gradually over time it becomes internalized by the child.

For example, Kopp (1982) explains that caregivers directly help children acquire self-regulation through specific behaviours and interaction styles throughout five specific phases of development. During the first phase, *Neurophysiological modulation*, (birth to 2-3 months of age) infants are able to modulate their arousal and "reflex movements are exhibited as organized patterns of functional behaviour" (p. 202). Initially, caregivers play an important role in soothing and facilitating children's emotional states. As caregivers help infants to rise and lower their states of arousal, infants start to discriminate and recognize the broad configuration of different feeling states. Moreover, as caregivers help infants regulate their arousal, infants begin to acquire associations between their own actions, those of others and their own feeling states (Kopp, 1989). Parent-child interactions also help infants focus on salient features of the environment

when they are awake and alert and routines also provide external support for endogenous control of sleep and wakefulness.

The second phase, *Sensorimotor modulation*, (3 months to 9 months of age) consists of the infants' ability to change ongoing behaviour in response to events and stimuli in the environment and to engage in voluntary motor acts (Kopp, 1982). The ability to engage in these types of behaviours is influenced by caregiver sensitivity and the salience of objects in the caregiving environment. Kopp explains that because of the infant's dependence on percepts, the absence of objects or limited caregiver sensitivity can lead to infant behaviours that are inappropriate for a given situation. Kopp specifically explains that children being reared in institutions by insensitive caregivers will not be aware of situational demands and thus their actions will seem erratic and unrelated to the events that are occurring nearby.

The third phase, *Control*, (12 months to 18 months) features an awareness of the social demands of a situation and the ability to initiate, maintain, cease physical acts, and communication and thus compliance and self-initiated monitoring are possible. The ability to engage in these tasks however is highly dependent on the presence of key signals from caregivers, as the child does not have the capacity to recall events. Furthermore, the abilities featured during this phase are thought to "stem from reciprocal patterns of communication and interaction that evolve between infants and their caregivers. In reciprocal interactions, first one and then the other partner assumes an active initiating role" (p. 205). These types of interactions appear to direct the infants' attention first to their caregiver's acts and consequences and then to their own.

The fourth phase, *Self-control*, (24 months plus) and the fifth phase, *Self-regulation*, (36 months plus) are only different in degree and not in kind and thus are discussed together. Self-control is identified as the child having limited flexibility in their ability to adapt to new situations and demands as well as a limited capacity to wait and delay gratification (Kopp, 1982). Self-regulation proceeds a step further and is considered adaptive to changes and overall is a more mature form of control, “presumably implicating the use of reflection and strategies involving introspection, consciousness or metacognition” (Kopp, 1982, p. 207). Kopp describes that over multiple sensitive interactions the child is able to internalize their parent’s commands and use this internalized speech to monitor their own behaviour. Moreover, Kopp explains that caregivers also play an important role by modeling self-regulation to their children.

Overall, in each phase the development of the child’s self-regulation is determined, in part, by their caregivers. Specifically, the role caregivers play consists of providing regulation for their infants’ arousal, providing sensitive caregiving, providing salient objects in the infants’ environment, and engaging in reciprocal patterns of communication and interaction (Kopp, 1989). Kopp further explains that along with each of these specific skills caregivers engage in during each phase, the “how” of parental socialization is crucial. She states that sensitive and knowledgeable parenting is unquestionably related to children’s compliance with norms and the transmission of standards across age periods and thus to self-regulation. Parental structure and organization is also believed to facilitate children’s development of self-regulation. These activities are inherent in communication patterns between parents and children, and children’s processes of thinking are thought to develop from these shared activities.

Lastly, children's self-regulatory abilities are thought to develop out of specific types of control techniques used by their caregivers. Attention-getting procedures, the use of direct commands, task structuring, the simultaneous use of verbal and nonverbal messages, consistency, encouragement and the use of positive rewards are examples of typical techniques thought to facilitate children's self-regulation.

Tronick (1989) holds similar views to Kopp, claiming that through mutual exchanges between child and caretaker a child develops self-control, which enables regulation of attention and activity level. Tronick further maintains that when caregivers fail to appropriately facilitate their infant's goal-directed activities, positive affect and the regulation of behaviour also fail to occur. Parent-child interactions typically allow infants to elaborate their other-directed affective communications and self-directed regulatory capacities. However, psychopathology is likely to arise in situations where there is persistent and chronic interactive failure. In these situations the infant is forced to disengage from people and things because the infant has to devote too much regulatory capacity to controlling the negative affect he or she is experiencing. Tronick claims that problems children have with tantrums, impulse control, and conduct disorders and even the risk-taking of adolescents may then be viewed as arising out of children's experiences with mutual regulation and their ability to self-regulate. Furthermore, Tronick states that the regulation of emotions, self and other, interactive success and affective reparation are in fact lifetime issues.

In general, these perspectives view attention and activity level control as developing over time with a crucial role given to parents and caregivers. Specifically, parents are seen to facilitate the development of attention and activity level control

through a range of behaviours and interaction styles including sensitive and responsive care, introducing social standards, and providing “other regulation” and gradually relinquishing this control as their child’s capacity for self-regulation develops. Within this approach the effects of institutional care on the development of attention and activity level control have not been directly addressed. However, given the position taken that sensitive caregiving during infancy and early childhood is necessary for the development of these skills it follows that the deprived caregiving such as that found in Ceasceau era orphanages would increase the risk of children failing to develop self-regulatory skills and thus the presence of I/O.

Central to the developmental perspective of I/O is the work of both Bowlby (1951; 1966) and Vygotsky (1978, 1987). Both theorists contribute to furthering our understanding of how and why the home environment, specifically parent-child relationships and interaction styles, affect the development of children’s I/O both during infancy and later in childhood.

Bowlby

Similar to Kopp (1982, 1989) and Tronick (1989), Bowlby (1966) emphasized the importance of caregiver sensitivity during infancy in the development of children’s attention and activity level control. He adds to this discussion an emphasis on the importance of warmth in parent-child relationships to facilitate mental health (1966). Warmth can be described as giving and expressing affection (positive affective exchange, openness and accessibility, nurturance, understanding, empathy and acceptance) as well as behavioral expressions like hugging, kissing or holding (Keller, 2002).

Bowlby (1966) contends, that “the quality of parental care which a child receives in his earliest years is of vital importance for his future mental health” (p. 11).

Furthermore, he claims that children need a warm, intimate and continuous relationship with their mother (or permanent caregiver) for healthy development to occur. In terms of I/O, Bowlby’s attachment theory proposes that the early parent-child relationship serves as the foundation for the emergence of self-regulation skills. Infants are initially dependent on their caregiver’s ability to provide containment and regulation of their psychophysiological states, with the development of self-regulatory capacities viewed as contingent on the sensitive responsiveness of caregiver to infant signals (Cassidy, 1994). Through mutual exchanges between child and caretaker the child develops traits such as attention and activity level control. As Bowlby (1951) explains,

It is not surprising that during infancy and early childhood these (self-regulatory) functions are either not operating at all or are doing so most imperfectly. During this phase of life, the child is therefore dependent on his mother performing them for him. She orients him in space and time, provides his environment, permits the satisfaction of some impulses, restricts others... Gradually, he learns these arts himself, and as he does, the skilled parent transfers the roles to him” (p. 53)

Further emphasizing the importance of a warm, intimate and continuous relationship with a caregiver for facilitating children’s development, Bowlby directly addressed the impact that institutional rearing has on children by stating that children experiencing multiple changes of parent figures or who are reared in institutions with many attendants are most at risk for subsequent developmental difficulties (World Health Organization, 1966).

Although Bowlby emphasized the importance of parents and parenting in the development of the attachment relationship, he did not maintain that the child was entirely passive in the emergence of this relationship. Rather he characterized caregiver-

child interactions as a circular process in which the characteristics of babies can influence the way their mothers care for them, and mothers can influence the way their babies respond to them. Therefore, when hypothesizing causal relationships between aspects of parenting and I/O in children it is important not to forget that the child may also be affecting the relationship (e.g., the child's preexisting I/O may negatively affect the parent-child attachment and other aspects of parenting).

From attachment theory we can then hypothesize that parent-child relationships and interactions characterized by warmth and sensitivity are necessary in facilitating children's development of attention and activity level control. Furthermore, children who are able to form secure attachments with their caregivers will have greater competency in attention and activity level control. These ideas have been elaborated on by Erdman (1998) who argues that children's ADHD type behaviours have to be viewed within the context of the parent-child relationship. Erdman notes the striking similarity between children in therapy for ADHD and those for attachment. She explains these similarities as resulting from the type of family environments characteristic of both of these groups of children. Erdman reports that children diagnosed with ADHD typically have home environments that are characterized as "disorganized, chaotic or neglectful" (p. 180) and believes these may be the predisposing factors in diagnoses of ADHD as well as attachment problems. Furthermore, she argues that children raised in such homes may develop symptoms of ADHD in an attempt to "develop strategies to allow themselves to explore the environment in spite of their caregivers' unavailability" (p. 181).

Vygotsky

Vygotsky developed a similar developmental theory of attention and activity level control to that of Kopp (1982, 1989), Tronick (1989) and Bowlby (1951, 1966); however, unlike these theorists he did not limit his discussion to the infancy period. Vygotsky's theory is thus useful in conceptualizing how later rearing environments continue to support attention and activity level control.

Vygotsky (1978, 1987) theorized that the origins of independent functioning (e.g., self-regulation) are found in children's ability to learn within a social context. He believed that all human activity takes place in cultural settings and cannot be understood apart from the settings. In fact, "Vygotsky conceptualized development as the transformation of socially shared activities into internalized process" (John-Steiner & Mahn, 1996, p. 192). He assumed that "every function in a child's cultural development appears twice: first on the social level and later on the individual level; first between people (interpsychological) and then inside the child (intrapsychological)" (1978, p. 58). In other words, skills that are initially understandings mediated by and shared with other people, become internalized by the child and available for his or her own independent use.

Looking specifically at the development of attention and activity level control the child is thought to progress from co-regulation, where he/she is assisted by others, to self-regulation, where he/she is able to use the tools (e.g., language) acquired from others on his/her own. The psychological tools acquired from others then allow humans to move beyond the "elementary" mental processes we share with animals, such as involuntary attention and associative memory, to "higher level" mental processes such as voluntary attention and memory, abstract thinking, deliberate control and voluntary self-regulation

(Vygotsky, 1987). When individuals develop higher-level processes, they are able to use language and other symbolic tools to voluntarily control their own actions, thinking and attention. Moreover, Vygotsky (1987) believed that children do not have the full use of their higher intellectual functions, such as voluntary attention and deliberate control, until early school age. Until this point the child is slowly developing in awareness and mastery of these skills aided by their parents and other more capable members of society.

Vygotsky (1987) defined a specialized type of support that is necessary for parents to use in order to help their children successfully transition from co-regulation to self-regulation. This form of specialized support, first referred to as “scaffolding” by Bruner (1976), involves parents providing information and assistance in a manner that supports children’s more immature attention, memory, and language abilities and then slowly relinquishing this support. Through this scaffolding or “other regulation”, children gradually learn to take more regulatory responsibility for tasks and ultimately internalize skills that will allow them to solve problems independently. Vygotsky assumed that the child is active in this process and brings a desire to act effectively and independently and a capacity to develop higher-level mental functioning to her encounters with the culture, but that goals and the means to reach them are culturally determined and learned.

To be effective in promoting the development of the child’s own independent, self-regulated action, the assistance provided by the parent must be within the child’s “zone of proximal development”. The zone of proximal development is the area where the child is not able to do something alone but can be successful with help from a parent or more advanced peer (Wertsch, 1991). Therefore, in order for interactions to be most advantageous, parents have to be knowledgeable about their child’s abilities and should

not be overly controlling but also not uninvolved. This appropriate support will allow children to slowly take over some of the responsibility and eventually become autonomous in the regulation of their behaviours and emotions. For example, a parent will need to be aware of how much support is needed for their child to successfully master tasks requiring attention and activity level control and provide this support in such a manner that they can slowly remove it and allow their child to take on more and more of the responsibility for themselves.

Overall, Vygotsky's theory describes a process through which the child is able to slowly move from other-regulation to self-regulation and the mechanism (scaffolding within the zone of proximal development) by which this occurs. Moreover, Vygotsky discusses the importance of parenting for the development of attention and activity level control throughout childhood.

Taken together, the theoretical positions discussed above point to several aspects of parent-child relationships and interactions that facilitate the development of children's attention and activity level control. Specifically, important parent characteristics include being sensitive, warm and responsive to their children, and utilizing appropriate scaffolding within their child's zone of proximal development. Kopp (1982, 1987), Tronick (1989) and Bowlby (1951, 1966) appear to emphasize the importance of such interaction during the infancy period. It thus follows that if there is a lack of the specific types of parenting required during infancy to facilitate the development of these skills children may not develop these skills and therefore display high levels of I/O. However, Vygotsky's (1978, 1987) ideas extended beyond infancy suggesting that the processes important during infancy likely remain important throughout childhood. It then follows

that the interactions between older children and caregivers likely continue to have effects on the development of these skills and are not limited to the infancy period. An important question explored in this dissertation is, if children lack these specific types of parenting in infancy, and therefore do not develop attention and activity level control, can parenting after this time period continue to help children to develop these skills?

Empirical Research

There is much empirical research that is consistent with these theoretical viewpoints. The research will be divided into those findings pertaining to the importance of home environments for the development of attention and activity level control in general, and those looking at the home environments of adopted children specifically.

Home environments and I/O.

Findings from studies of the home environments of non-adopted children generally indicate that less sensitive and stimulating caretaking increases the likelihood of subsequent I/O in children (e.g., Carlson, Jacobvitz, & Sroufe, 1995; Erdman, 1998; Clark, Ungerer, Chahoud, Johnson, & Stiefe, 2002; Johnston et al., 2002, Kopp, 1989; Kopp, 1982; Ornoy, Segal, Bar-Hamburger & Greenbaum, 2001; Robson, & Cline 1998; Tronick, 1989).

Ornoy et al. (2001) explicitly state that the environments in which children are raised are among the most important factors determining their I/O. In their research they examined the effects of deprivation and heroin addicted parenting on I/O by studying five groups of children: children born with drug-dependent fathers, children born to and raised

by drug-dependent mothers, children born and raised in low SES (environmentally deprived) homes, and two control groups of children -- one born to families with average SES and one born to drug-dependent mothers but adopted by families not drug-dependent and of average SES. Results of this study showed that the children born and raised by heroin dependent mothers had the highest rate of I/O. Ornoy et al. concluded that abnormalities were mainly influenced by postnatal environmental factors, as the children born to heroin-addicted mothers and subsequently adopted did not experience the same degree of difficulty in I/O as those children who were born and raised by their heroin dependent mothers. Furthermore, they found that children raised in neglectful environments had deficits similar to those children born and raised by heroin-addicted parents, again providing support for the environmental component to these difficulties.

Robson and Cline (1998) also demonstrated how poor home environments can increase the likelihood of subsequent I/O in children. Their research included 83 children (55 girls) with a mean age of 5 years, 9 months and indicated that children with less appropriate environments in early childhood, as measured by the preschool version of the Home Observation for Measurement of the Environment (HOME) Inventory (Caldwell & Bradley, 1984), had significantly higher scores on an inattention measure. Of particular interest is that they found neither low birth weight nor prenatal growth patterns to have implications for attentional difficulties. On the basis of their findings, these authors concluded that despite a presumed organic contribution to attention difficulties, optimal caretaking has a compensatory effect, and less-than-optimal caretaking increases the risk for the later difficulties (Robson & Cline, 1998).

Carlson et al. (1995) also addressed the importance of the environment and child-caregiver interactions in understanding the development of I/O. In their prospective longitudinal study of 191 participants they followed firstborn children and their families at several different time points from 3 months of age to 11 years. At each phase comprehensive data were collected through parent and teacher reports, observation and direct assessments. Results indicated that quality of caregiving more powerfully predicted distractibility at age 11 than did early biological or temperamental factors. Similar to Robson and Cline (1998), they discovered that endogenous infant factors such as medical history, drug/alcohol history and composite motor maturity and adaptability ratings failed to predict distractibility or hyperactivity at age 11. Distractibility and hyperactivity were, however, found to be significantly predicted by maternal variables such as maternal anxiety/aggression and intrusive caregiving, and contextual variables such as mothers' relationship status and emotional support.

A specific aspect related to the home environment and the quality of the child-parent relationship is the attachment status of the child. Researchers have found that children who have secure relationships with their primary caregivers are typically found to exhibit more socially appropriate emotional expression and control and show more focused attention (Cassidy, 1994), whereas children with insecure relationships tend to be characterized by more externalizing behaviour problems, hyperactivation in stressful situations, being easily over-stimulated and presenting as reactive, impulsive, and restless (Sroufe, Fox, & Pancake, 1983).

Clarke et al. (2002) explain these associations by suggesting that the symptoms of ADHD may develop in the context of an insecure attachment relationship. They further

assert that insecurely attached children are more vulnerable to problems with affective and behavioural regulation. In their study comparing the quality of attachment in five ten-year-old boys with a diagnosis of ADHD to a group of same-age controls without ADHD they found that the boys diagnosed with ADHD had lower scores on various attachment measures. About half of the children with ADHD described predominantly negative parent-child relationships. The overall pattern of attachment for the boys diagnosed with ADHD was an anxious-ambivalent or disorganized style. Even though these relationships were found, it was unclear whether attachment style was the cause or the consequence of children's ADHD. In other words did the insecure attachments cause the children's ADHD or did the children's ADHD cause the insecure attachments? Of course, a third possibility would be that another variable (e.g., parent interaction styles, some earlier experiences or child temperament) might be responsible for both the children's ADD and/or ADHD and the insecure attachments.

Several researchers have looked specifically at the relationship between parent-child interaction styles and children's later I/O (Feldman & Klein, 2003; Johnston et al., 2002; Olson, Bates, Sandy, & Schilling, 2002). In general these studies indicate significant negative relationships between positive maternal behaviours such as scaffolding, warmth and emotional support, and cognitive support and stimulation and children's I/O.

Johnston, et al. (2002) investigated the role of maternal interaction styles in children's I/O by observing 7- to 10-year-old boys with ADHD interacting with their mothers. Each interaction was seventeen minutes consisting of free play (4-min), a parent busy episode (3-min), a paper and pencil task (5-min), and a clean up task (5-min). Six

dimensions of maternal behaviour thought to be related to I/O were assessed, including; authoritative control, sensitivity of control, responsiveness, positive affect, acceptance of the child and involvement with the child. Despite theoretically based predictions, Johnston et al. failed to find significant relationships between any of the maternal behaviours and children's ADHD symptoms but did find significant relationships between the maternal behaviours and children's conduct problems. The authors suggested the reason for these findings may be that maternal behaviours are most closely related to the conduct problems that children with ADHD frequently experience and not the actual symptoms of ADHD. However, another explanation may be that because all the children in their study had diagnoses of ADHD there was simply not enough variation within the group for the differences in I/O to be significantly accounted for. Similarly, it could be that the variation in maternal behaviours was not large enough to account for or contribute to the development of ADHD symptomatology. Another possibility is that other reasons such as genetics might have been responsible for some, or all, of the children's ADHD in this study thus the effects of maternal interaction styles were not as important and thus unable to be identified.

In a longitudinal study, Olson, Bates, Sandy, and Schilling (2002) investigated the precursors of impulsivity and inattention in school-aged children. Olson et al. assessed measures of caregiver-child interactions at six, thirteen and twenty-four months of age in relation to children's I/O at eight years of age. Measures of caregiver-child interactions consisted of the following variables when the infants were 6 months old: Mother Affectionate Contact (warm maternal responsiveness to the infant), Object Stimulation (maternal cognitive stimulation of the infant). Measures of caregiver-child interactions

consisted of the following variables when the infants were 13 months old: Mother Teaching (mother names objects, asks questions, offers and demonstrates toys for the infant and draws attention to objects), Mother Management (mother prohibits, scolds or warns the infant, directs infant's behavior, and/or takes objects away from infant), Affection and Caregiving (mother kisses infant, smiles at infant, engages in social-expressive speech and provides physical needs caregiving). Measures of caregiver-child interactions consisted of the following variables when the infants were 24 months old: Mother Verbal Stimulation (mother requests information, refuses requests, corrects child's speech, answers questions, complies with child's requests, praises child, makes maturity demand), Mother Negative Control (mother scolds, warns, physically punishes, restrains, prohibits, repeats prohibition), and Mother Affection (mother laughs/smiles at child, engages in playful conversation, praises child, holds child, plays game). When children were eight years of age they were assessed on various measures of I/O, namely: inhibitory control, behavioural control and attentional disengagement. Olson et al. (2002) reported that infants and toddlers who experienced relatively high levels of cognitive stimulation and low levels of maternal restrictiveness achieved the highest scores on later laboratory measures of self-regulatory competence.

Lastly, to compare children's socialized behaviour to parents and non-parental agents, Feldman and Klein (2003), examined self-regulated compliance to parents and caregivers. Ninety toddlers (mean age = 26.4 months) were videotaped in three interactive sessions with either their mother or father separately or both together as well as with the child's caregiver from the day-care center they attended. Sessions consisted of a free play session lasting for 10 minutes, a structured play (teaching) session lasting for

10 minutes and a toy-pick up task (compliance situation) lasting for 8 minutes or until the task was completed.

The free play session was coded for three factors on five-point scales: Adult sensitivity, adult's limit setting and child's social involvement. The teaching session was evaluated on the frequency of two adult mediation strategies: regulating behaviour and decontextualization, which consisted of fostering the child's awareness of the similarities between the task at hand and other tasks in situations familiar to the child. The compliance situation was coded for child compliance, and adult discipline. Lastly, across all sessions, the proportion of time in which the caregiver demonstrated positive affect, maintained visual contact with the children and used a relaxed and warm tone of voice was assessed at 30-second time intervals (Feldman & Klein, 2003).

Feldman and Klein (2003) reported that in an examination of the relationship between the various parent and child variables that were assessed and the children's self-regulated compliance and emotional regulation, children's self-regulated compliance to each of the three adults was related to the children's emotion regulation and adult warm control discipline as well as parent's sensitive regulation of the free play. Maternal sensitivity was related to children's cognition and emotion regulation, to maternal mediation, and to child social involvement. Maternal and paternal warm control tactics were also related to child emotion regulation. However, the caregiver's sensitivity and warm control was unrelated to children's cognition or emotion regulation. Because the children in this study were only 2-years-old, child outcome variables were limited to self-regulated compliance and emotional regulation. However, significant relationships were still found between elements of maternal interaction styles and these child variables.

Overall, these empirical findings support the theories of Kopp (1982, 1987), Tronick (1989), Bowlby (1951, 1966) and Vygotsky (1978, 1987) that the home environment and, more specifically, aspects of the parent-child relationship are important in the development of children's attention and activity level control. Specifically, home environments that are characterized by warmth, cognitive stimulation and support, secure attachments between children and their parents and specific maternal behaviours such as scaffolding, warmth, emotional support and cognitive support and stimulation have been identified as important elements in the development of these skills. Although each of the studies reviewed here supports the connection between children's I/O and the various aspects of the home environment and parent-child relationships and interaction styles, for the most part, casual relationships are difficult to ascertain. It is difficult to know if poor home environments and parenting practices lead to children's I/O or if children's I/O leads parents to react in a less warm and more controlling or directive manner in an attempt to control their children's behaviours.

Researchers have tried to investigate this direction of effect issue in two ways; by either having children with ADHD undergo stimulant drug therapy or providing parents of children with ADHD training in child management techniques and then assessing the difference these two treatments make in regards to parent-child interactions. The assumption of these studies is that if by changing the behaviour of either the mother or the child improves their overall interactions, the earlier difficulties can be attributed to the person whose behaviour has just been modified. Although considerably more research has been conducted utilizing child medication than having parents undergo training, studies utilizing either approach are reviewed here.

Studies comparing the parent-child interaction styles with children diagnosed with ADHD before and after children undergo stimulant drug therapy have found significant improvement in these interactions after the drug therapy. For example, Barkley (1988) found that the interaction styles of mothers and their children with ADHD were significantly improved when the children were on high doses of methylphenidate (Ritalin) in comparison to when the children were not on any form of stimulant drug. Other authors have concluded that these findings suggest that the greater directiveness and negative behaviour of mothers towards their children with ADHD may be a reaction to their children's non-compliance and poor self-control rather than a cause of it (McLaughlin & Harrison, 2006).

However, studies of the effect of parent training show similar results (e.g., Pollard, Ward & Barkley, 1983, Wells et al. 2000). Pollard et al. report that child medication and parental training have the same effect on improving parent-child interaction styles. More specifically, in their case study 2 mothers received instruction in child behaviour management while their sons remained off medication. Subsequently these boys returned to medication to evaluate whether the drug further enhanced the effects of parent training. A third child received the drug treatment first and then remained on medication while his mother underwent the same parent-training program. Results indicated that both treatments alone decreased the amount of commands given by the mother as well as parent ratings of deviant child behaviour in the home and duration of compliance per command. Interestingly, only parent training resulted in increases in the mothers' use of positive attention following child compliance. Moreover, the

combination of treatments failed to produce any further improvements in mother-child interactions than that achieved by either treatment alone.

Although this study included only 3 mother-child dyads, the results highlight that either child medication or parent training can improve parent-child interaction styles and therefore previous studies looking only at child medication may be misleading. Even though these studies indicate that interaction styles can be improved by either targeting the child or the parent, it is not clear which variable, if either, caused the disturbed interaction to begin with. In other words, from these studies we are unable to determine if it was the child's behaviour that initially caused the negative and directing parenting or if it was these elements of parenting that caused the children's ADHD symptoms or if there was a third variable accounting for both. However, Pollard et al. (1983) explicitly state that their findings clearly demonstrate "that parent-child interactions are reciprocal in their influence and that, in the interactions of disturbed children with their parents, the parents' behaviour may be as much a result of the child's deviant behaviour as the cause of it" (p. 66). The most reasonable conclusion thus seems that a reciprocal relationship is most probable with both parenting affecting the symptoms of ADHD and the children's ADHD also affecting the manner in which the parents interact with their children.

Inattention Overactivity in adopted children

This section is organized under several sub-headings in an attempt to organize the vast amount of data pertaining to I/O in adopted children. First, I/O in adopted children will be examined, second I/O in post-institutionalized children will be explored, third I/O in post-institutionalized children adopted specifically from Romanian institutions will be explored, fourth, I/O in adopted children with good physical care prior to adoption will be

reported, and lastly a comparison of I/O in children raised in foster care and orphanages will be discussed.

Inattention/Overactivity in adopted children

Four studies have looked specifically at the prevalence of diagnoses of attention deficit disorder (ADD) in adopted children with varying degrees of quality of care prior to adoption (Brodzinsky, Radice, Huffman, & Merkle, 1987; & Deutsch, Swanson, Bruell, Catwell, Weinberg, & Baren, 1980; Hindshaw, 2002; Simmel, Brooks, Barth, & Hinshaw, 2001). Simmel et al. (2001) investigated 1,268 families with adopted children in California. None of the children had experienced severe global deprivation but their pre-adoptive environments ranged in the extent and length of neglect they experienced. Simmel et al. hypothesized that these children would, on average, have higher rates of externalizing symptomatology than in the general population of youth and that the children's pre-adoptive experiences would distinguish the adopted children with and without these difficulties. Overall they discovered that 21.8% of the children were reported by their parents to have symptomatology of ADHD as reported on various measures. Interestingly, Simmel et al. reported differences in the children's pre-adoption backgrounds that accounted for much of the variation in the children's rates of ADHD. Specifically, they found that histories of pre-adoption neglect and a later age of placement (mean of 1.4 years in comparison to a mean of 7 months in the whole sample) were much more common in children exhibiting symptoms of ADHD in comparison to children without these symptoms.

With strikingly similar findings, Deutsch et al. (1980) studied two populations of patients with ADD; both samples were randomly drawn from cases diagnosed from either

the Child Development Clinic of the Hospital for Sick Children in Toronto or the Educational, Behavioral, and Developmental Pediatric Clinic in California and both had a sample size of one hundred. In addition, two non-ADD control populations were studied. The researchers discovered that the overall rates of adoption in the ADD samples were approximately 20% with most being non-relative adoptions. From their analyses they suggest that approximately 23% of all adopted children would be expected to have ADD. Almost identical findings were reported by Hinshaw (2002) who examined 140 girls with ADHD and a comparison group of girls matched on age and ethnicity. Specifically, he reported that of the girls with a diagnosis of ADHD, more than 20% were adopted, which was 5 to 6 times more likely than the girls in the comparison group. These results could suggest that adoption, in and of itself, leads to higher rates of ADHD or that the children had early, pre-adoptive, rearing environments that were not supportive to the development of attention and activity level control.

Brodzinsky et al. (1987) also looked at the rates of ADD in the adoption population. They looked at data from a total of 260 children, 130 who were adopted and 130 who were living with their biological parents. Half the children were boys with their ages ranging from six to eleven years old. They found the adopted children to be significantly more likely to be rated as hyperactive and inattentive. Although they purposefully excluded the more disturbed and delayed children from the adopted group they still found 14 % of adoptees were within the clinical range for ADD. Perhaps if they did not exclude the more disturbed and delayed children from their study they would have found the percentage of children within the clinical range to be closer to 20% as was found in the previous three studies. Deutsch et al. offered both environmental and

biological hypotheses to account for their finding. The environmental components they hypothesized were stress placed on the adoptive family and effects from separation anxiety faced by the adoptees. Substance abuse by the biological mothers and poor nutrition were among the biological hypotheses provided by the authors.

Overall, each of the above mentioned studies has reported higher rates of ADHD or hyperactivity in adopted children in comparison to children living with their biological families. Even though relatively few of the children were raised in poor quality institutions prior to adoption two of the authors did examine environmental contributions and found negative preadoptive experiences such as neglect and their biological mother's abusing substances to be possible factors contributing to the increase in their rates of ADHD. Another possibility is that the less than ideal environments provided by the biological parents may be a result of the parents own ADHD and thus they have passed these symptoms on to their children genetically.

Inattention/Overactivity in Post-Institutionalised children

Given the findings reported in the previous sections that there is a relationship between several aspects of the home environment and children's I/O, combined with the theoretical viewpoints presented previously, and the fact that children living in orphanages or institutions typically receive impoverished care, reports of I/O in post-institutionalized children are not surprising (O'Connor, Bredenkamp, & Rutter, 1999; Provence & Lipton, 1962; Tizard, 1991; Tizard & Hodges, 1978).

In Tizard's (1989) review of intercountry adoption, hyperactivity emerged as one of the major problems facing post institutionalized adopted children. In this review many

studies were examined with children ranging from infancy to ten years of age at the time of adoption. Similarly, Tizard and Hodges (1978) found that according to parents the main areas of concern for adopted post-institutionalized children (adopted between 2 and 4 ½ years of age) were restlessness, lack of concentration and impulsiveness. Work by O'Connor et al. (1999) is also consistent with these claims. Reporting two case studies looking at attachment disturbances early in life and the implications for childhood disorders, O'Connor et al. described how low attention and poor concentration were two of the main concerns expressed by the parents, and confirmed by the teachers, of post-institutionalized children.

Research on Romanian orphans

In addition to studies examining post-institutionalized children in general, there have been several studies looking specifically at I/O in post-institutionalized children reared in Romanian institutions (Groze & Ileana, 1996; Groze & Ryan, 2002; Kreppner, et al., 2001; Rutter, Kreppner, & O'Connor, 2001). These studies provide a direct comparison to the children in the current study as the children in these studies were adopted from the same country, Romania, from similar types of institutions and at approximately the same time as the children in the current study.

Groze and Ileana's (1996) study included 475 children adopted from Romania between 1990 and 1993 with ages ranging from infancy to 18 years (average age of 4.6 years). In relation to I/O, they reported that the post-institutionalized Romanian adopted children were more likely than adopted children who did not experience deprivation to experience difficulties such as responding to environmental stimuli (over reactive or

under reactive) and displaying inappropriately high activity levels for their age. More specifically, Groze and Ileana state that along with bed wetting, being more active than expected for his or her age was the most frequent problem behaviour reported by the adoptive parents. Furthermore, looking at differences in activity level between Romanian orphans with and without pre-adoption institutional experience, a significant difference was found. Of the 98 children found to display activity levels too high for their age, 83% had been institutionalized prior to adoption.

Groza and Ryan (2002) also compared 230 children adopted by Americans from Romania to 61 children domestically adopted in the United States. The Romanian group consisted of 122 children that had been reared in an institution prior to adoption and 108 children adopted without institutional experience. Groza and Ryan found that among other serious behaviour problems, children with a history of institutionalization had significantly greater attentional difficulties than the domestically adopted children or those children adopted from Romania without institutional experience. Groza and Ryan also reported that 36% of the entire Romanian adopted sample (including those with and without institutional experience) scored above the clinical range on the attention problems subscale of the CBCL in comparison to only 5% in the domestically adopted comparison group. Because the Romanian adopted sample included both those with and without institutional experience it is possible that the percentage of children scoring in the clinical range on the CBCL may have even been higher if it had only included those children with institutional experience.

Although these studies all touched on the impact of early deprivation on I/O, only two studies have focused specifically on how I/O is related to deprivation (Kreppner, et

al., 2001; Rutter, Kreppner, & O'Connor, 2001). Rutter et al. compared 165 children adopted from Romania by families living in the United Kingdom to 50 British-born children adopted within the UK. The authors reported that at age 6 I/O was much more common in the Romanian adoptees than for the UK sample and, further, I/O was significantly associated with age at entry to the UK, which was a proxy measure for the amount of time spent in an institution. Rutter et al. concluded that the elevated level of I/O in the Romanian group was a result of institutional experience and was not strongly influenced by genetic factors. In support of this claim, Rutter et al. reported that of the children who were adopted from institutions prior to 6 months of age, 70% were within the normal range of functioning (which was nearly as high as the rate within the UK adopted sample) whereas of those adopted beyond 6 months of age only a fifth to a quarter showed normal functioning.

Examining the same sample, Kreppner et al. (2001) extended these findings, reporting I/O to be significantly higher in the Romanian group than the within-UK adoptees as measured by both teachers' and parents' reports. Post-hoc comparisons showed that the Romanian children who were adopted before 6 months of age were rated as significantly lower in I/O by both parents and teachers than those adopted between 6 and 24 months and over 24 months. The mean differences among the adoptee groups suggested a trend for I/O to increase with length of deprivation and correlational analysis within the Romanian sample at age 6 years indicated a significant positive linear relationship between age at entry to the UK and I/O for both parent and teacher reports. Kreppner et al. also found that weight at the time of adoption failed to make a significant contribution to the variance in I/O once duration of deprivation was accounted for

suggesting that the increased rates of I/O in the post-institutionalized sample were not specifically related to malnourishment.

Kreppner et al. (2001) further reported continuity of I/O determined by the significant correlation between age 4 and age 6 parental ratings. They suggested that as the effect of duration of deprivation did not diminish over time, these children would likely face difficulties in dealing with a formal group setting once they began school.

One critique of studies examining post institutionalized children is that it is difficult to tease out the effects of the various elements of institutional life in order to understand what aspects are accounting for the developmental delays and difficulties. Although Kreppner et al. (2001) examined the role of malnourishment in I/O and reported that weight at adoption did not relate significantly to I/O after duration of deprivation was accounted for it could be that these two constructs are confounded with those children being institutionalized for longer also experiencing greater malnourishment and thus lower weights at adoption for their age. Overall, from the studies reviewed it is unknown whether I/O resulted from malnutrition, genetic or hereditary difficulties, pre- or peri-natal care or, as argued throughout this dissertation, deprivation in relation to interactions with caregivers. Two types of studies have been conducted that enable a better understanding of the various elements of institutionalization that may affect children's I/O. The first type looks at children adopted from institutions with good physical care but a lack of one-on-one caregiving. The second type compares institutionalized children to children reared in foster care.

Post-institutionalized children with good physical care prior to adoption

Researchers have investigated the development of children reared in institutions where the physical care was good but caregiving was impersonal and routinized. Such studies allow us to begin to understand what aspects of institutional experience impact children's I/O. If children raised under these conditions also demonstrate elevated I/O it suggests that these difficulties are not due to poor nutrition but may rather be because of the lack of opportunity to develop close relationships with a caregiver. Hodges and Tizard (1989) and Tizard and Rees (1975) studied three groups of children: 26 children who, since early infancy, had been continuously reared in institutions which were in many respects of high quality; 30 children who were non-adopted and living with their biological parents; and 39 children who were either adopted or restored to their natural mothers after spending their first 2-4 years in a residential nursery. Tizard and Rees found that at age 4.5 years both groups of institutionally reared children (those still currently living in an institution and those recently restored to their birth families or adopted) demonstrated higher levels of restlessness and lower levels of concentration than the biologically reared children.

In a follow up study of the same groups of children Hodges and Tizard (1989) reported that by the time the institutionalized children were 7-years-old they had almost all been adopted. According to their adoptive parents, at 8-years-old the post-institutionalized children did not present more problems than a comparison group who had never been in care. However, according to their teachers the post-institutionalized

children did have more difficulties, most notably in attention seeking behaviour, restlessness, disobedience and poor peer relationships.

Follow-up data were collected on the children until they were 16-years-old, although there was much attrition in the sample. Of the 28 children seen at age 8, 26 were still in their adoptive homes. Further, of the 13 children who at age 8 had been restored to their biological families all but one was still with their parents. Only one child had remained in residential care for the entire period (i.e., up to age 16), the rest of the children who had been in residential or temporary foster care at age 8 had experienced many changes but five were back in residential care (Hodges & Tizard, 1989).

Hodges and Tizard (1989) reported that by age 16 the post-institutionalized children had more behavioural difficulties, including being impulsive, in comparison to a control group of non-institutionalized children. The post-institutionalized children were also rated as more restless and less able to settle than the children in the comparison groups. From these findings we can conclude that children being reared in institutions with relatively good physical care still experience an increased rate of I/O in comparison to children reared by their biological parents. Based on these findings it appears that lack of appropriate physical care received in institutions is not what causes the children's increased rates of I/O.

Comparisons of Children Raised in Institutions and Children Reared in Foster Homes

A few studies have compared I/O in children reared in institutions with children reared in foster homes in order to study the extent that these difficulties arise from genetic risks and adverse experiences before receiving substitute care, or from the risks

associated with specific types of substitute care (Goldfarb, 1943, 1944, 1945; Roy, Rutter, & Pickles, 2000). Interestingly, these studies indicated that the children reared in foster homes did not have the low attentional abilities or the high levels of hyperactivity that were found in the children reared in institutions.

Goldfarb (1943, 1944, 1945) reported that children reared in institutions, in comparison to those raised in foster care and biological homes, were more restless and hyperactive, with high levels of distractibility combined with a lower ability to concentrate. Goldfarb (1943) attributed the findings to the institutionally reared children's lack of warm, frequent, individualized adult contact, which the foster children were able to receive. Furthermore, Goldfarb (1944) highlighted the impact of deprivation and the absence of stimulation as factors affecting the institutionally reared children but not the foster care children,

Roy et al. (2000) also examined differences between children reared in institutions and children raised in both foster care and biological families. In this study both groups of children reared in substitute care had been separated from their biological parents, but while one group, the children reared in institutions, was prevented from forming an attachment to an adult caregiver, the other group was presumably able to form an attachment to their foster parents. The main differences found between these two groups of children concerned hyperactivity and unsociability, with the children reared in institutions demonstrating more problematic behaviours. Furthermore, both inattention and hyperactivity were observed more frequently in the substitute care groups than in the comparison children reared by their biological parents. Data were obtained from teachers, caregivers and by observation. All three sources showed similar results, with

I/O significantly higher in the institutional group than either of the other two groups and the foster care group slightly higher than the biologically reared group (Roy et al., 2000).

The common finding in these studies is the link between early deprivation and later I/O. Indeed, there is considerable consistency across studies regarding the association between institutionalization and I/O. It appears that being deprived of individualized care early in life, even when the physical care is good, results in elevated rates of I/O. These findings are not surprising and are in accordance with the theories of Kopp (1982, 1989), Tronick (1989) and Bowlby (1951, 1966). However, what remains to be determined, and is of considerable theoretical and practical significance, is the extent to which the difficulties in I/O can be mitigated by rearing in adoptive homes subsequent to institutionalization. In other words, is there a sensitive time period for the development of these skills or, as derived from Vygotsky's theory, can the caregiving environment continue to influence the development of attention and activity level control into later childhood. Although it has been concluded that I/O resulting from institutional rearing has "the features of a relatively persistent disorder" (Kreppner et al., 2001, p. 525), this was based on longitudinal analyses over a relatively short period of time (from ages 4 to 6 years). It would therefore be beneficial for studies to examine the continuity of I/O over a longer period of years. Moreover, although some studies have found a moderately strong association between attachment problems in the adoptive home and I/O (Kreppner et al., 2001), for post institutionalized children, attachment is, at best, an indirect measure of the adoptive rearing environment as we know it is importantly influenced by pre-adoptive institutionalization (see Chisholm, 1998). Therefore, to more comprehensively determine the impact the adoptive home environment may have on I/O,

it would be desirable to directly examine several aspects of the adoptive caregiving environment in relation to I/O over time. To date, neither extensive longitudinal examination of the continuity of I/O nor more specific aspects of the adoptive home environment in relation to I/O have been reported for post-institutionalized children.

I began to address these issues in my Master's thesis research in which I examined the same group of children as reported in this dissertation; 36 children adopted from Romania after spending at least 8 months in an institution prior to adoption (RO group), in comparison to 25 children also adopted from Romania but with less than 4 months early deprivation (EA group) and 42 Canadian born non-adopted children (CB group). When the children were on average 10 ½ years-of-age, the three groups significantly differed in reported rates of I/O with the greatest problems found in the RO group and the least in the CB group. Further it was found that the rates of I/O were stable over time (from age 4.5 to age 10.5) except in the EA group in which the rate of I/O was found to increase between these two time points.

Similar to Kreppner et al. (2001), I found that within both the RO and EA groups, I/O was significantly correlated with duration of deprivation. Moreover, appropriate stimulation and nurturance in the home rearing environment at age 4.5 was negatively related to I/O at age 10.5 in all groups. Hierarchical regression analyses revealed that within the RO and EA groups, the association between I/O and the adoptive rearing environment was independent of duration of deprivation. The current study builds on these findings using the same group of participants to examine more specific contributions of various aspects of the home environment to I/O as well as extending the findings into adolescence (when the children were on average 16 years-of-age).

The purpose of this dissertation is thus to replicate aspects of previous work on I/O as an institutional deprivation syndrome and to extend that work by examining the potential of the post-institutional rearing environment to ameliorate those effects. It adds to the literature on the relationship between deprivation and children's I/O by examining I/O in post-institutionalized children longitudinally over a period of approximately 13 years. Additionally, and most central to this dissertation, indices of post-adoptive caregiving were assessed such that both their concurrent and predictive association to I/O could be examined. To address these issues, the following research questions/hypotheses were addressed:

1. Are rates of I/O higher in the RO than EA and CB groups and higher in the EA than CB group?

It was hypothesized that the rates of I/O would continue to be higher in children with extensive early institutional experience than children with less experience of deprivation and children without such experience when the children were on average 16 years-of-age.

2. Does I/O continue to relate to duration of deprivation approximately 14 years post-adoption and does the relationship attenuate over time?

It was hypothesized that the impact of institutional experience on children's I/O would diminish with the amount of time they spent in their adoptive homes and thus there would be a weaker relationship between duration of deprivation and children's I/O at Phase 4 than at Phases 2 and 3 and a weaker relationship at Phase 3 than at Phase 2.

3. Do positive aspects of the home rearing environment correlate inversely with I/O?

It was hypothesized that features of the home rearing environment indicative of a positive parent-child relationship and warm and sensitive interactions would relate inversely with I/O concurrently and predictively in children with and without early institutional experience whereas punitive and insensitive parenting would be positively correlated with children's I/O.

4. Do duration of deprivation and the adoptive home rearing environment make independent contributions to the prediction of I/O in children with early deprivation experience?

Both early (institutional) and later (home) rearing environments were hypothesized to relate to I/O but a hypothesis was not made as to whether or not each would make independent contributions to the prediction of I/O. If both early and later rearing environments made independent contributions to the prediction of I/O support would be provided for the idea that although infancy and early childhood is an important time for the development of these skills, parenting later in life can continue to help children develop skills of attention and activity level control as well. If, however, early and later rearing environments did not make independent contributions to the prediction of I/O, support would be provided for the view that infancy and early childhood is an essential time for parents to support the development of these skills and beyond this point parenting cannot continue to make a difference.

METHOD

Participants

Findings reported in this dissertation are based on data from 4 time points of assessment with slightly different numbers of children at each time because of attrition. At Phase 4, the most recent time point, data were analyzed for 22 Romanian orphanage (RO) children (12 boys), each of whom had lived in an orphanage for a minimum of 9 months (range 9 to 53 months, $M = 24$ months) prior to adoption by a Canadian family. These 22 children's ages at adoption and their total time in institution were almost perfectly correlated at .99 indicating that they had been institutionalized since birth. Data were also analyzed for a Canadian born (CB) non-adopted, non-institutionalized comparison group ($n = 33$), 22 of which were individually matched to ROs on sex and age (± 3 months) and an Early-adopted (EA) comparison group ($n = 15$) individually matched to the youngest RO and CB children. There are more Canadian born children than Romanian orphans because although some RO families chose not to participate in this phase of the study, the Canadian born children were needed as matches for the Early-adopted group. The EA children, also from Romania, were adopted prior to 4 months of age and came from hospitals, orphanages, or their biological parents. These children share similar birth family histories and pre- and peri-natal care with the RO children and would have been raised in orphanages similar to those from which the RO children were adopted had they not been adopted early in life.

The design of the study is longitudinal and as such there has been some attrition over time. The study began in 1991, when the RO children had been in their adoptive homes for 11 months, with 43 RO children, 43 CB and 22 EA children. At Phase 2, when the children were on average 4 ½ years of age there were 43 RO children, 43 CB children and 26 EA Children. At Phase 2, three RO children could not be located so three new RO children were added. Within the CB group two participants declined to participate at Phase 2 and a third could not be included due to being inadvertently tested one year too early. Three new CB children were added to serve as matches for the three new RO families. Four additional EA children were added at Phase 2 to serve as matches for two RO families who did not have an EA match at Phase 1 and two of the new RO families. No EA children were lost at this phase.

At Phase 3, when the children were on average 10 ½ years of age, there were 36 RO children, 42 CB children and 25 EA children. Attrition from Phase 2 to Phase 3 occurred for a number of reasons. Some families declined to take part in Phase 3 because they no longer felt the research was of assistance to them. Others said they and their children felt like they had been “studied to death” and just wanted to get on with their lives and put the adoption issue behind them. One family dropped out because a parent was gravely ill while another family chose not to participate because the parents had not told their child she was adopted. Some families had moved to other cities or countries and were not accessible for this phase of assessment, while we were unable to locate others. In all, 11 RO families, 5 CB families, and 5 EA families who participated at Phase 2 did not take part in Phase 3. Five new CB families were added in Phase 3 in order to provide matches for EA children who did not have RO matches.

Attrition from Phase 3 to Phase 4, when the children were on average 16 years of age, also occurred for a number of reasons. The main reason for RO families declining to participate was because their children were no longer in their care. Several of the RO parents found themselves unable to care for the growing demands of their adopted children or found that it was no longer safe to either themselves or other children in their home to keep their children at home. Other reasons included family conflict such as divorce and parents reporting that the children would not be able to complete any questionnaires on their own as they were too low functioning. Differences between participants who stayed in the study at Phase 4 and those who did not were examined and are reported in the results section.

Procedures

At Phase 4 an introductory letter was sent to the parents of all previous participants to explain the research and ask for their continued participation (see Appendix B). Consent forms from both parents and children were obtained at a later date (see Appendices C and D). The parents were asked for confirmation that they and their child would participate (written consent was obtained later). In April 2006 packages containing questionnaires for both parents and children and stamped and addressed return envelopes were mailed to each family. Follow up phone calls were made to ensure that every family received the package and to address any questions. Periodic phone calls were made to families who had not returned their questionnaires until January 2007, when it was assumed that all families wishing to participate had returned their packages.

At Phases 1, 2 and 3, instead of mailing out questionnaires for parents and children to complete, appointments were made with each family for a home visit. At

Phases 2 and 3 parents were also asked for permission for the researchers to contact their children's school administrators in order to collect data from teachers. Administrators and teachers provided written consent for research in the schools. Visits to both homes and classrooms took place approximately half way through the school year, typically between January and June.

Child assessments were done during the home visits. These visits were typically scheduled for two to three hours on two separate days at the end of the school day or on a weekend. A female graduate student in Counselling Psychology conducted the assessments. Parent interviews were also conducted during the home visits. These interviews typically took about one hour and were audio taped with the permission of the parents. The parents were also asked to complete a package of questionnaires on their children's social, emotional, intellectual, and physical development and return it by mail in stamped, self-addressed envelopes.

Finally, teachers were asked to complete three short questionnaires on the children's academic performance and social behaviour. The measures were left with the teachers in stamped, self-addressed envelopes to be mailed to the research team upon completion.

All participants, at each phase of the study, were told that their participation was voluntary and that they could withdraw at any time. They were also informed that if they had any questions or concerns about the research they could contact the principal researcher or the Dean of the Faculty of Education at Simon Fraser University by telephone or email.

Measures

Data for this thesis came from four sources: parents, teachers, children, and researcher observations. See Appendix E for a depiction of the various measures utilized in terms of the informant, phase, construct and measure.

Demographic Information

At Phase 3 Parents completed a 13-item questionnaire to report on their socio-economic, educational, and marital status, type of residential area, ethnicity and religious affiliation to assess demographic characteristics of the three groups. The following 5 items relating to socio economic status were analyzed for this thesis: highest level of education of mothers and fathers, annual family income and ages of mothers and fathers (see Appendix F). Mothers and fathers were asked to indicate their highest level of education using a 6-point scale where one equaled elementary school and six equaled graduate or professional school. Annual family income was answered using a 10-point scale where one equaled less than \$20,000 and 10 was equal to above \$100,000.

Indices of inattention/overactivity

Parent reports

The Child Behaviour Checklist/4-18 (CBCL; Achenbach, 1991). At Phases 2, 3 and 4 parents completed the CBCL, a self-administered standardized measure of behavioural problems and competencies of children aged 4 through 18. The questionnaire consists of 118 behaviour problem items (answered using a 3-point Likert scale) from which five subscale scores (externalizing behaviours, internalizing behaviours, social problems, thought problems, and attention problems) and a total

behaviour problem score are derived. For this thesis the attention problems scale was used as an index of I/O for the children in the study (see Appendix G). This measure was chosen based on its reported reliability and validity as well as its frequent use as a measure of I/O in the literature.

CBCL norms for girls and boys are available, along with clinical and borderline cutoffs. This measure was standardized upon both clinical and non-clinical populations. The initial principal components analysis was performed on a sample of children drawn from mental health service providers in the Eastern United States. Several different types of service providers were chosen to increase the variability in the sample with respect to race and socioeconomic status (Achenbach & Edelbrock, 1981). Norms for the factor-based scales were derived from the non-clinical population. The combination of these two sample types allowed for clinical cut-offs to be devised. A total score of 70 or above is considered to be in the clinical range, with 98% of children generally scoring below this number, and scores from 67-69 in the clinical borderline range.

The CBCL has high validity and reliability. Achenbach and Edelbrock (1981) have carefully documented that clinically-referred children obtain higher scores on the Problem Scales than non-referred children. In fact, with the exception of allergy and asthma, each item has been shown to distinguish referred from non-referred children. The inter-rater and test-retest reliabilities of the CBCL item scores are supported by correlations in the .90s (Achenbach, 1991). Inter-parent agreement is also high, and over 1- and 2-year periods, the mean score changes are not significant (Achenbach, Phares, Howell, Rauh, & Nurcombe, 1990).

Diagnosis of ADD or ADHD. From a list of various disorders including Attention Deficit Disorder and Attention Deficit with Hyperactivity Disorder, parents were asked to check off those of which their child had been diagnosed at both Phases 3 and 4. A diagnosis of ADD or ADHD is an extreme index of I/O and thus was used as another means to compare rates of I/O across the three groups. Moreover, as opposed to parent or teacher reports, a diagnoses of ADD or ADHD is from an independent trained medical practitioner.

Teacher reports

The Child Behaviour Checklist Teacher's Form/4-18 (CBCL; Achenbach, 1991).

At Phases 2 and 3 teachers completed the teacher's form of the CBCL, which contains the same items as the parent form and is also a highly reliable and valid measure. As with the parent form, only the items comprising the attentional problems scale were analyzed for this thesis as an index of the children's I/O.

Indices of the Home Environment

Parent Reports

Time in Institution/Duration of Deprivation. At Phase 1, parents completed an interview, which included questions regarding their child's birth date, and in the RO and EA groups, date of adoption. Age at adoption was used as the index of duration of deprivation for both the RO and EA children because these children either went directly from an orphanage or, as in the case of some EA children, another deprived setting (e.g., hospital, impoverished birth home) to their Canadian family, or had only a very brief intervening period.

Parenting practices. Data on parenting were obtained at Phase 3 with the Parenting Practices Questionnaire (Robinson et al., 1995), a 62-item self- and spousal-report instrument that yields scores for mothers and fathers on Authoritative, Authoritarian, and Permissive parenting practices (see Appendix H). Single mothers headed a number of families in this study; hence, to maximize sample size, for this measure mother's self-report data was used in the statistical analyses. Note that mothers' self-reports and fathers' reports of spouses' parenting practices were moderately to strongly correlated (Authoritarian: $r = .70$; Authoritative: $r = .63$; Permissive: $r = .45$).

This measure was used as it assesses parenting behaviours along the dimensions that have been theorized to relate to I/O. Specifically, a high score on the Authoritative scale indicates a parent who both sets reasonable expectations and is responsive. Authoritative parents are assertive, but not intrusive and restrictive and their disciplinary methods are supportive, rather than punitive. High score on the Authoritarian scale indicates parents who are highly demanding and directive and not responsive to their children. These parents are also obedience- and status-oriented, and expect their orders to be obeyed without explanation. It was predicted that Authoritarian parenting would be positively related to children's I/O, whereas Authoritative parenting would be inversely related to children's I/O.

Researcher Observation

The Home Observation for Measurement of the Environment Inventory (HOME; Cadwell & Bradley 1984) was designed to assess the quality of stimulation and support available to a child in the home environment. In Phase 2 the Preschool version of the HOME was used with the children who were 4 ½ years-old and the Elementary school

version was used with the eleven children who were older than this. The Preschool version contains 55 items clustered into eight subscales: (a) toys and learning materials, (b) language stimulation, (c) physical environment, (d) pride and affection, (e) stimulation of academic behaviour, (f) encouragement of maturity, (g) variety of stimulation, and (h) acceptance (use of punishment). The Elementary School Version contains 59 items clustered into eight similar but not identical subscales: (a) emotional and verbal responsibility, (b) encouragement of maturity, (c) emotional climate, (d) growth fostering materials and experiences, (e) provision for active stimulation, (f) family participation in developmentally stimulating experiences, (g) paternal involvement, and (h) aspects of the physical environment (see Appendices I and J). In the present study the total scores from both the older and younger versions were used in order to maximize the sample size for which HOME data were available. Internal consistency and inter-observer agreement have been shown to be high in both versions (Bradley, 1989). In the present study, Cronbach alphas across the subscales of the Preschool version and the Elementary school version were .82 and .94, respectively.

Parent-child interactions. At Phase 2 information was gathered from a parent-child interaction task and used to code various aspects of the parent-child relationship. For this dissertation four different aspects of the parent-child relationship were used; parental intrusiveness, quality of the relationship, parental warmth and parental encouragement of initiative. Based on the literature reviewed above it was hypothesized that all of these aspects would be inversely related to children's I/O, except parental intrusiveness which was hypothesized to be positively related to children's I/O.

Parent-child interactions were assessed at Phase 2 while the child tried to solve the Tower of Hanoi (TOH) puzzle (Simon, 1975). The TOH task has been used with children five years and older, and has been found to be quite a difficult task for young children to carry out independently. It was chosen, therefore, as a challenging parent-child interaction task, in which the child would require help from the parent. The standard version of the TOH consists of three vertical pegs and three disks of graduated diameters to fit on the pegs. At the outset, all the disks are arranged by size on the right peg with the largest disk on the bottom. The task is to move all the disks to the left peg, with two constraints: only one disk can be moved at a time, and at no point can a larger disk be placed on top of a smaller disk.

Prior to the Tower of Hanoi session, parents were given an explanation of how to solve the task and also asked to help their child figure out the game so that he/she may be able to do it on his/her own, although it was made clear that the expectation was not that the child would be able to solve it as it is quite a hard game. The parent and child were presented with the TOH after a free play session and were told “Here is another game that mommy/daddy will show you how to play”.

Teaching Task Rating Scales (Egeland & Hiester, 1993). Two scales from the Teaching Task Rating Scales were used to rate parent-child interactions from the videotaped TOH sessions. These included one parent variable (intrusiveness) and one dyadic relationship variable (quality of the relationship) (see Appendix K). The *Parental Intrusiveness* scale captures the degree to which the parent intruded on the child’s play or performance during the teaching task. Intrusiveness could be seen in the parent redirecting the child in a poorly timed fashion or intervening before the child needed

help. At the high end of this scale was a parent whose own agenda took precedence over the child's wishes and who failed to understand or to recognize his/her precedence over the child's wishes and failed to understand or to recognize his/her child's efforts to gain autonomy. At the low end of the scale there was no sign of intrusiveness. Intrusiveness is related to Vygotsky's construct of Scaffolding. A parent engaging in scaffolding behaviour would receive low scores on this scale as they would be alert and sensitive to their child's needs and desires, provide help only when their child needed it and in the appropriate amount.

The *Quality of the Relationship* scale focused on the affective and reciprocity aspects of the parent-child relationship. A high score gives evidence of a relationship in which there was a strong sense of relatedness and mutual engagement between the parent and child. A low score on this scale reflects a parent-child dyad in which a core sense of emotional relatedness was absent and participants did not interact responsively to each other. Each of these variables was rated on 7-point scales. The constructs being measured on these scales are similar to parenting characteristics highlighted by Bowlby (1951). Specifically, Bowlby explains that it is through the sensitivity and responsiveness of the caregiver during mutual exchanges with the child that the child develops traits such as attention and activity level control.

Parent-child Interaction Scales (Marfo, 1994). Two parent variables (Warmth, and Encouragement of Initiative) from Marfo's Parent-child Interaction scales were coded during the TOH task (see Appendix L). These variables were rated on 5-point scales with high ratings indicating a high degree of either warmth or encouragement of initiative and low ratings indicating either low warmth or controlling behaviour respectively. The

Parental Warmth scale focuses on the affection the parent shows the child during the interaction. A high score reflects a parent who displays a great deal of affection toward the child throughout the interaction, touching, kissing, and praising the child. A low score on the scale reflects a parent who interacts with the child in a cold manner, showing little affection toward the child. These aspects are thought to represent some of the elements discussed in Bowlby's (1951, 1966) theory on attachment. Bowlby argued that children need warmth in their relationship with their mother (or permanent caregiver) for healthy development to occur which, is clearly assessed by this scale.

The *Parental Encouragement of Initiative* scale measures the extent to which the parent encourages the child to tackle the task(s) on his/her own, while at the same time giving help and guidance when appropriate, which, like the Parental Intrusiveness scale (Egeland & Hiester) is closely related to Vygotsky's (1978, 1987) notion of scaffolding. A high score reflects a parent who encourages the child to initiate problem-solving, while providing guidance in a non-controlling way when appropriate. A low score on the scale represents a controlling parent who directs every step of the task, without letting the child initiate any moves on his/her own. A parent scoring at the midpoint of the scale uses either some controlling and some encouraging behaviour, or is neither controlling of the situation nor encouraging the child to do the task on their own.

All the interactions were coded at Phase 2 of this longitudinal study for Sarah Morison's dissertation (Morison, 1997). Coders consisted of 14 undergraduate students. Coders were required to rate 4 to 6 tapes of sessions not included in their sample of tapes-to-be-coded, until they reached 80% reliability. Cohen's kappas between coders ranged from .65 to .92 with a median of .73 for the TOH session.

Child Reports

Inventory of Parent and Peer attachment. Children's perceptions of the availability and warmth of their parents were measured at Phase 3 by the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987), a 53-item child self-report measure (see Appendix M). This measure was developed with 179 (63% were female) university students with an age range of 16-20 years with a mean age of 18.9 years. Seventy-five percent of the students were Caucasian and they were predominantly middle class. The measure has shown substantial reliability and good potential validity as a measure of perceived quality of close relationships in late adolescence. Further, three-week test-retest reliabilities were .93 for the measure comprised of the Parent Attachment items.

For the purposes of this study only the 30 items pertaining to parent attachment were utilized. However, participants were asked to respond to each of the 30 items for both their mothers and fathers separately. The instrument yields an overall attachment score as well as 3 subscales, Communication, Trust and Alienation. See Appendix L for a list of the items. Only the overall attachment score for mothers was used in this study.

The IPPA was included on the basis of Bowlby's (1951, 1966) claim regarding the importance of attachment between children and their primary caregivers in the development of attention and activity level control. Moreover, in the literature it has been reported that there is a negative correlation between various kinds of parenting that support secure attachments and children's I/O (Cassidy, 1994; Clarke et al., 2002; Erdman, 1998; Sroufe, Fox & Pancake, 1983). It was therefore, hypothesized that

children who perceived their parents as being available to them and providing warmth would have lower rates of I/O.

RESULTS

Preliminary Analyses

Demographic Information

Means and standard deviations and the results of one-way analyses of variance (ANOVAs) comparing demographic characteristics at Phase 4 across the RO, CB and EA groups can be found in Table 1.

There were significant differences among the three groups on age at assessment ($F(2, 71) = 11.10, p < .00$), and gross annual family income ($F(2, 65) = 4.58, p < .05$). Tukey B post hoc comparison tests revealed that the EA children were, on average, slightly younger than the RO and CB children when they were assessed. This is explained by the fact that the EA children were matched to the youngest RO children while the CB group contained matches for all the RO children. Hence these latter two groups included children with a broader range of ages. The RO families had slightly lower gross annual family income than the CB families. The groups did not differ on other demographic characteristics such as parents' education, marital status, and age of parents and generally speaking, despite factors such as time and attrition, the three groups remained comparable at Phase 4.

In order to determine if the demographic variables were associated with I/O correlations were computed between the various measures of I/O and the demographic variables. The only significant correlations found were between parent reported I/O at

Phase 2 and mother's age ($r(33) = -.37, p < .05$) and parent reported I/O at Phase 3 and father's age ($r(32) = -.41, p < .05$) (see Table 2).

Analysis of Phase 4 Attrition

One-way analyses of variance (ANOVA) were run to examine differences in Phase 3 I/O between participants who remained in the study at Phase 4 and those who dropped out after Phase 3. Among the EA children non significant differences on both parent and teacher reports of I/O were found between participants who remained in the study and those who dropped out. Among the RO children, non-significant differences were found on teacher reports of I/O; however, on parent reported I/O participants who did not continue in the study had significantly higher I/O scores ($F(1,34)=6.17, p < .05$) than participants who remained in the study (see Table 3).

Data Reduction

To ensure that suppression and multicollinearity were not issues in subsequent analyses as well as to help with data reduction a composite score consisting of the four parent-child interaction variables measured during the Tower of Hanoi task was computed. A principle components factor analysis with all four parent-child interaction variables was conducted to ensure that each item loaded sufficiently onto the overall component. Item loadings reflect the correlation between a particular measure and the overall component. Loadings of .30 or above are typically considered acceptable (Tabachnick & Fidell, 1983). All four variables had loadings above .30 as shown in Table 4. The four variables were combined by adding the 3 variables that represent positive

parent-child interactions (quality of the relationship, parental warmth and parental encouragement of initiative) and then subtracting the variable that represents a negative aspect of their interaction (parent intrusiveness).

Gender differences in inattention/overactivity

To determine if there were gender differences in I/O, one-way analyses of variance (ANOVA) were run. There were no gender differences on either parent or teacher reported I/O at Phase 2. At Phase 3 there were no gender differences in the parent reports for either the RO or EA group but within the CB group teacher reported that boys had higher I/O scores than girls (see Table 5). At Phase 4, there were no gender differences for the CB or RO groups but a gender difference was found in the EA group with parents reporting that boys had higher I/O scores than girls (see Table 5). Given that there were only 2 gender differences found across all phases and both measures, data for boys and girls were not analyzed separately.

Gender differences in Home Rearing Conditions

One-way analyses of variance (ANOVA) revealed non-significant gender differences for the home rearing condition variables in the RO, EA and CB groups, therefore data for boys and girls were not analyzed separately in any of the remaining analyses (see Table 6).

Group differences in Home Rearing Conditions

One-way ANOVAs revealed non-significant differences among the RO, EA, and CB groups on the home rearing condition variables (see Table 7).

Main Results

Q1: Are rates of I/O higher in the RO than EA and CB groups and higher in the EA than CB group at Phases 2, 3 and 4?

Mean level differences between groups. One-way ANOVAs were calculated to examine differences among the RO, EA, and CB groups on measures of I/O at Phases 2, 3 and 4 (see Table 8). Although group differences in I/O at Phases 2 and 3 were addressed in my master's thesis, here the data were reanalyzed using different statistical methods and including data from Phase 4.

As previously found, at Phase 2 one-way ANOVAs revealed significant differences among groups on I/O as reported by parents ($F(2,89)=18.6, p<.000$). Planned-contrasts using independent samples t-tests revealed that the RO group had a significantly higher mean I/O score than either the EA or the CB groups. The EA and CB groups did not differ significantly from one another. One-way ANOVAs for children's I/O at Phase 2 as reported by teachers also revealed a significant overall effect, $F(2, 65)=3.47, p<.05$. Planned-contrasts using independent samples t-tests revealed that the RO group had a significantly higher mean I/O score than the CB group but did not differ significantly from the EA group. Further, the CB and EA groups did not significantly differ.

At Phase 3, as previously reported, one-way ANOVAs revealed significant I/O differences among groups as reported by parents ($F(2, 99) = 15.8, p< .001$) and teachers ($F(2,89) = 5.3, p< .01$). Planned-contrasts using independent samples t-tests were computed among the three groups and revealed that as a group the RO children were reported by parents to have significantly higher I/O scores than both the EA and the CB

children. The EA and CB groups were not found to differ significantly from one another. For the children's I/O as reported by teachers the RO children were found to have significantly higher I/O scores than the CB children but not the EA children. Once again the EA and CB children were not found to differ significantly from each other.

As hypothesized, at Phase 4, one-way ANOVAs revealed significant differences among groups on I/O as reported by parents ($F(2, 70) = 7.67, p < .001$). Planned-contrasts using independent samples t-tests were computed among the three groups and revealed that the RO and EA groups had significantly higher parent-reported I/O scores than the CB group. However, at this phase, the EA and RO groups were not found to differ significantly from one another.

Clinical range frequencies. As predicted, at each phase there were more children in the RO group scoring within this clinical range than in either other group and there were more children in the EA group scoring within this range than children in the CB group. Specifically, at Phase 2 according to parents 52% of the RO children were in the clinical or borderline range for attentional difficulties, compared to 7% in the CB group and 4% in the EA group. Phase 3 parents reported that 41% of the RO children were in the clinical or borderline range for attentional difficulties, compared to 5% of the CB group and 16% of the EA group. Phase 4 results from the parent form showed that 41% of the RO children scored in the clinical or borderline range for attentional difficulties, compared to 9% of the CB group and 19% of the EA group.

Phase 2 results from the teacher form showed that 29% of the RO children scored in the clinical or borderline range for attentional difficulties, compared to 19% of the CB group and 16% of the EA group. Data from the teacher form of the CBCL attention

problem scale at Phase 3 revealed that 28% of RO children scored in the clinical range compared to 12% in the CB group, and 16 % in the EA group.

Attention Deficit Disorder (ADD)/Attention Deficit with Hyperactivity Disorder (ADHD) diagnosis. An extreme index of I/O is a clinical diagnosis of ADD or ADHD. At Phase 3, parent reports indicated that 34% of the RO children had received a clinical diagnosis of either ADD or ADHD while only 2.5% of the CB and 9% of the EA children had either diagnosis. Similar results were found at Phase 4, with 33.3% of the RO children reported to have received a clinical diagnosis for either ADD or ADHD and only 5.9% of the CB and 18.8% of the EA children. Between Phases 3 and 4 an additional one child was diagnosed with either ADD or ADHD in both the EA and CB groups but no additional children within the RO group received either diagnosis.

Together these results reveal that, although there were slight variations depending on the informant (parent or teacher) and the Phase (2, 3 or 4), on average the RO children did have higher rates of I/O than either the EA or CB groups and that the EA children did have higher rates of I/O than the CB children.

Q2: Does I/O continue to relate to duration of deprivation approximately 14 years post-adoption and has the relationship attenuated over time?

Correlations between duration of deprivation and I/O. Significant correlations were found between I/O and duration of deprivation within the RO group at Phases 2 and 3 although there was some indication that the strength of the association was diminishing over time (Audet, 2003). Here I explore this association further by extending the analyses to include both the RO and EA groups and Phase 4 data. The decision to include the EA

group in this analysis was based on two considerations: (1) Both the RO and EA groups experienced deprivation prior to adoption; and (2) including the EA children in the analyses increased variability in duration of deprivation as well as sample size.

Correlations were computed between duration of deprivation and measures of I/O taken at Phases 2, 3 and 4, within the combined RO and EA groups (see Table 9). These analyses indicated significant positive linear relationships between duration of deprivation and Phase 2 parent reported I/O ($r(52)=.63, p<.001$) and teacher reported I/O ($r(36)=.33, p<.05$). At Phase 3, the correlations were lower (parent reported I/O, ($r(58)=.37, p<.01$); teacher reported I/O, ($r(51)=.21, p=.07$). At Phase 4, the correlation between parent reported I/O and duration of deprivation was similar to that at Phase 3, ($r(37)=.36, p<.05$).

In order to determine if the correlations between duration of deprivation and I/O at Phase 2, 3 and 4 were significantly different the Pearson-Filon Test was used (Steiger, 1980). Differences were non-significant indicating no evidence for attenuation in the association between duration of deprivation and I/O over time.

Longitudinal change within groups.

Planned contrasts using paired samples t-tests were computed between Phase 2 and Phase 3 parent and teacher reported I/O and Phase 3 and Phase 4 parent reported I/O within each of the three groups (see Table 10). Within the RO and CB groups, the parent ratings of I/O were not found to differ significantly between Phases 2 and 3. Within the EA group, however, significant differences were found between Phase 2 and 3 parent ratings of I/O ($t(19) = -2.70, p<.05$) with higher ratings reported at Phase 3 than at Phase 2. Within all three groups, parent ratings of I/O were not found to differ significantly

between Phases 3 and 4. Parent reported I/O was found to differ significantly between Phases 2 and 4 only in the EA group with higher ratings reported at Phase 4 than at Phase 2 ($t(12) = -3.2, p < .01$). Within the RO, CB and EA groups, teacher ratings of I/O were not found to differ significantly between Phases 2 and 3.

Overall, these results indicate that I/O continues to relate to duration of deprivation even 14 years after adoption and that the relationship has not significantly attenuated over time. Interestingly, parents of the EA children actually reported an increased occurrence of I/O across the three Phases.

Q3: Do positive aspects of the home rearing environment correlate inversely with I/O?

One of the main hypotheses of this dissertation was that positive aspects of the adoptive home rearing environments would continue to influence the development of children's attention and activity level control and thus there would be negative correlations between positive aspects of the adoptive home environment and children's I/O.

Correlations between home rearing environment variables and I/O. Correlations were computed between various measures of the adoptive home rearing environment and I/O in the RO, EA and CB groups and several strong associations were found (see Tables, 11, 12 and 13). Given the hypothesis that home environments affect the development of I/O, the predictive correlations between earlier assessed home environment variables and later assessed I/O were of particular interest. In order to rule out the possibility that correlations between the earlier home environment and later I/O were a result of a shared

association with earlier I/O, partial correlations were computed between measures of the home environment at Phase 2 and I/O at Phase 3, controlling for I/O at Phase 2 and measures of the home environment at Phase 3 and I/O at Phase 4, controlling for I/O at Phase 3.

Controlling for parent and teacher reported I/O scores at Phase 2, partial correlations were computed between (1) the HOME (measured at Phase 2) and parent- and teacher reported I/O at Phase 3, and parent reported I/O at Phase 4, (2) parent-child interaction styles (assessed at Phase 2) and parent- and teacher-reported I/O at Phase 3, and parent reported I/O at Phase 4. Controlling for parent reported I/O at Phase 3, partial correlations were computed between (1) parenting practices (measured at Phase 3) and parent reported I/O at Phase 4 and (2) attachment (measured at Phase 3) and parent reported I/O at Phase 4.

Controlling for parent or teacher reported I/O at Phase 2, within the RO group significant partial correlations were found between the HOME (Phase 2) and parent reported I/O at Phase 3 ($r(14) = -.53, p < .05$); and the HOME (Phase 2) and teacher reported I/O at Phase 3 ($r(14) = -.79, p < .001$) (see Table 14). The partial correlation between the HOME (Phase 2) and parent reported I/O at Phase 4, controlling for Phase 2 parent reported I/O, was non significant. Within the CB group the only significant partial correlation, when controlling for parent or teacher reported I/O at Phase 2, was between the HOME and Phase 3 parent reported I/O ($r(20) = -.47, p < .05$). Within the EA group the only significant partial correlation, when controlling or parent or teacher reported I/O at Phase 2, was between the HOME and teacher reported I/O at Phase 3 ($r(10) = -.63, p < .05$) (see Tables 15 and 16).

Controlling for parent or teacher reported I/O at Phase 2, within the RO group the only significant partial correlations found between the composite score for parent-child interaction styles and parent or teacher reported I/O at Phases 3 and 4 was the teacher reported I/O at Phase 3 ($r(14) = -.71, p < .01$) (see Table 14). Within the CB and EA groups none of the partial correlations were found to be significant (see Table 15 and 16).

Controlling for Parent reported I/O at Phase 3, none of the partial correlations between parenting styles reported at Phase 3 and parent reported I/O at Phase 4 were significant in any of the groups (see Tables 17, 18 and 19).

Controlling for parent reported I/O at Phase 3, none of the partial correlations between attachment assessed at Phase 3 and parent reported I/O at Phase 4 were significant for either the RO or EA groups (see Tables 17 and 19). However, this partial correlation was significant in the CB group ($r(23) = -.56, p < .01$) (see Table 18).

These results reveal mixed evidence for the association between the home rearing environment and the children's I/O. Although there were several significant correlations between various aspects of the home rearing environment and children's I/O across each of the three Phases there was little consistency among the groups (RO, CB and EA) as to which aspects of the environment were correlated with I/O.

Q4: Do duration of deprivation and the adoptive home rearing environment make independent contributions to the prediction of I/O in children with early deprivation experience?

Hierarchical Regression analyses. Hierarchical Regression analyses were conducted to test whether both duration of deprivation and adoptive home rearing environments made independent contributions to the prediction of I/O in combined RO

and EA groups. A separate regression analysis was computed to predict each of the measures of I/O (parent reported I/O at Phases 3 and 4, and teacher reported I/O at Phases 2 and 3). Predictor variables were entered based on chronology, or the order in which they occurred or were assessed. Therefore, duration of deprivation was entered first followed by the home rearing variables at Phase 2 and then at Phase 3. When there was more than one home rearing variable assessed at a given Phase an arbitrary decision was made for the order of their entry. The decision to enter the variables chronologically was made on the basis of the intent to determine if later events accounted for variance in I/O beyond that accounted for by earlier events.

The specific order of entry for the independent variables was as follows; duration of deprivation was entered first, the parent or teacher report of I/O at Phase 2 was entered second depending on whether the dependent variable was a parent or teacher report, nurturance and stimulation in the adoptive home was entered third, a composite score of the parent-child interaction variables was entered fourth, the interaction term for parent-child interaction styles and duration of deprivation was entered fifth, authoritarian parenting at Phase 3 was entered sixth, the interaction term for authoritarian parenting and duration of deprivation was entered seventh, attachment was entered eighth, and the interaction term for attachment and duration of deprivation was entered last. Interaction terms for duration of deprivation and the home-rearing variables were included in the regression models in order to determine if the effect of the home environment on children's I/O varied depending on the amount of time the child spent in an institution. An interaction term for duration of deprivation and the HOME was not included as including this variable resulted in suppressor effects. Furthermore, this interaction had

already been shown not to be a significant predictor of the variation in either the parent or teacher reported I/O at Phase 3 in previous analyses of the same data. Therefore, to guard against the possibility of spurious results, and because it was known not to add significantly to the model, this interaction variable was not included. It was also decided that only the Authoritarian parenting style would be entered into the regression as opposed to all three parenting styles (Authoritative and Permissive). This decision was made because the inclusion of all three variables also resulted in suppressor effects and the authoritarian parenting style seemed to be the most strongly correlated with the various measures of I/O within the EA and RO groups.

The results for the regression analysis with the Phase 3 parent reported I/O as the depended variable are summarized in Table 20. Duration of Deprivation was significantly associated with the parent reported I/O (R^2 change = .107, F change (1,34) = 4.05, $p < .05$). Phase 2 parent reported I/O made a significant contributed to the prediction of Phase 3 parent reported I/O beyond the contribution of duration of deprivation (R^2 change = .273, F change (1,33) = 14.55, $p < .001$). The HOME made a significant contribution to the prediction of children's I/O at Phase 3 beyond the contribution of duration of deprivation and Phase 2 I/O (R^2 change = .122, F change (1, 32) = 7.84, $p < .01$). The composite score for the parent-child interaction styles and the interaction variable between the parent-child interaction styles and duration of deprivation made non-significant contributions to the prediction of children's I/O at Phase 3 beyond that predicted by the previous variables. Authoritarian parenting also made a non-significant contribution to the prediction of children's I/O beyond that predicted by the previous variables. However, the interaction term for Authoritarian parenting and duration of deprivation was

significant (R^2 change = .100, F change (1, 28) = 7.75, $p < .01$). Attachment made a significant contribution to the prediction of children's I/O at Phase 3 beyond the contribution of the previous variables (R^2 change = .085, F change (1,27) = 8.33, $p < .01$). The interaction variable between attachment and duration of deprivation made a significant contribution to the prediction of children's I/O at Phase 3 beyond the contribution from the previous variables (R^2 change = .046, F change (1,26) = 5.25, $p < .05$). Overall the model accounted for 77% of the variance of the outcome (see Table 20).

Following Friedrich's (1982) equation for interpreting interactions, the regression equation was mathematically interpreted to determine the duration of deprivation at which point authoritarian parenting and attachment were found to significantly predict children's I/O at Phase 3. The equation holds the home environment variable (either authoritarian parenting or attachment) in the interaction constant and then probes for the number of months of deprivation required before it becomes a significant predictor of the dependent variable.

Results from this procedure revealed that authoritarian parenting was significantly and positively associated with parent reported I/O at Phase 3 when children experienced less than 4.979 months of deprivation ($\beta = 0.169$, $t(26) = 2.06$, $p < .05$), whereas authoritarian parenting was significantly and negatively associated with parent reported I/O at Phase 3 when children experienced more than 47.696 months of deprivation ($\beta = -0.571$, $t(26) = -2.06$, $p < .05$). This means that when the children experienced between 4.979 to 47.696 months of deprivation, authoritarian parenting did not significantly predict children's I/O at Phase 3. However, when the children experienced less than 4.979 months of deprivation, authoritarian parenting did predict greater rates of I/O,

whereas when children experienced over 47.696 months of deprivation, authoritarian parenting did predict lower rates of I/O.

The same procedure revealed that attachment was significantly and negatively associated with parent reported I/O at Phase 3 when children experienced less than 19.03 months of deprivation ($\beta = -1.359$, $t(26) = -2.06$, $p < .05$). This means that over 19.03 months of deprivation parent attachment did not significantly predict children's parent reported I/O scores at Phase 3. However, under 19.03 months of deprivation secure attachment was predictive of fewer I/O problems.

The results for the regression analysis with teacher reported I/O at Phase 3 as the depended variable are summarized in Table 21. Duration of Deprivation was not significantly associated with teacher reported I/O at Phase 3. I/O at Phase 2 made a significant contribution to the prediction of I/O at Phase 3 beyond the contribution of duration of deprivation (\underline{R}^2 change = .28, \underline{F} change (1,19) = 7.82, $p < .01$). The HOME made a significant contribution to the prediction of children's I/O at Phase 3 beyond the contribution of duration of deprivation and children's I/O at Phase 2 (\underline{R}^2 change = .251, \underline{F} change (1, 18) = 10.53, $p < .01$). The composite score for the parent-child interaction styles and the interaction variable between the parent-child interaction styles and duration of deprivation made non-significant contributions to the prediction of children's I/O at Phase 3 beyond that predicted by the previous variables. Authoritarian parenting also made a non-significant contribution to the prediction of I/O beyond that predicted by the previous variables. The interaction term for Authoritarian parenting and duration of deprivation was however significant (\underline{R}^2 change = .16, \underline{F} change (1, 14) = 14.46, $p < .01$). Attachment and the interaction variable between attachment and duration of deprivation

both made non-significant contributions to the prediction of children's I/O at Phase 3 beyond the contribution from the previous variables. Overall the model accounted for 86% of the variance of the outcome.

The Friedrich (1982) procedure for interpreting interactions revealed that authoritarian parenting was significantly and positively associated with teacher reported I/O at Phase 3 when children experienced less than 9.479 months of deprivation ($\beta = 0.198$, $t(12) = 2.18$, $p < .05$), whereas authoritarian parenting was significantly and negatively associated with children's teacher reported I/O at Phase 3 when children experienced more than 43.925 months of deprivation ($\beta = -0.541$, $t(12) = -2.179$, $p < .05$). This means that when children experience between 9.479 to 43.925 months of deprivation, authoritarian parenting does not significantly predict teacher reported I/O at Phase 3. However, when children experience less than 9.479 months of deprivation, authoritarian parenting is predictive of greater I/O problems, whereas when children experience over 43.925 months of deprivation, authoritarian parenting is predictive of less I/O problems.

The results for the regression analysis with parent reported I/O at Phase 4 as the dependent variable are summarized in Table 22. The only variable that significantly contributed to the variance in the outcome was duration of deprivation (R^2 change = .25, F change (1, 24) = 7.92, $p < .01$). Overall the model accounted for 60% of the variance of the outcome. The fact that only duration of deprivation is a significant predictor for children's I/O at Phase 4, and not any of the variables assessing the home rearing environment as in the regression model for Phase 3, may be attributed to the small sample

size at Phase 4. Therefore, the results of this regression analysis may not reveal a valid model of I/O.

In summary, aspects of the adoptive home-rearing environment were found to make significant contributions to the variance in the outcome beyond that accounted for by duration of deprivation, suggesting that duration of deprivation and the adoptive home environment make independent contributions to the prediction of I/O for the children with early deprivation experience.

DISCUSSION

The main goals of this investigation were to replicate and extend aspects of previous work on inattention/overactivity (I/O) as an institutional deprivation syndrome and, more particularly, to expand that work by examining the potential of the adoptive home environment to mitigate those effects. Consistent with previous research on post-institutionalized children (Kreppner et al., 2001) as a group, the RO children, who experienced the lengthiest deprivation, were found to display significantly greater difficulties in I/O than either the EA or CB children well into adolescence. This difference was observed by a measure completed by both parents and teachers across 3 time points as well as by the percentage of children diagnosed with ADHD.

It was previously reported (Audet, 2003) that children adopted without extensive deprivation, the EA group, did not have elevated rates of I/O and did not differ from Canadian born non adopted children at Phase 2 or Phase 3. However, by Phase 4, when the children were approximately 16 years of age, there were significant differences between the EA and CB groups, with the EA children being reported to have higher rates of I/O than the CB children. Furthermore, although the EA group differed significantly from the RO group in their rates of I/O at both Phases 2 and 3, this was no longer the case at Phase 4. The possible reason for the increase in the rates of I/O in the EA group merits some discussion and will be explored in detail below.

Further indicators of the I/O experienced by children with early deprivation were the numbers of such children in this study who (a) scored in the clinical range for attention problems and (b) who had received a clinical diagnosis of ADD or ADHD. Depending on the informant (parent or teacher) and the age at which the children were assessed (4 ½, 10 ½ or 16 years-of-age), the proportion of children in the RO group scoring in the clinical range for attention problems on the CBCL ranged from just under a third to over half of the group. Although very few of the children in the EA group scored in the clinical range at age 4 ½, by the time they were 10 ½ that number had quadrupled and remained virtually unchanged when they were on average 16 years of age. Furthermore, at both Phase 3 and 4, approximately one-third of the children in the RO group were diagnosed with either ADD or ADHD in comparison to 5% in the general population (Bird, 2002). Even in the EA group, where length of early deprivation was considerably less than in the RO group, the rate of ADD or ADHD at Phase 4 was 18.8%, which is almost quadruple that found in the general population and double their rate of diagnosis from Phase 3 (9%). This striking increase in the rate of children within the EA group scoring in the clinical range and receiving a diagnosis of ADD or ADHD suggests that over time the I/O experienced by the children in the EA group was either becoming more serious or at least becoming more noticeable or troublesome.

It may seem surprising that the rate of children within the EA group scoring in the clinical range increased dramatically between Phases 2 and 3 and remained virtually unchanged between Phases 3 and 4 whereas the rate of the children with a diagnosis of ADHD did not show the same increase until between Phases 3 and 4. However, it is likely that although the children's I/O difficulties merited a diagnosis of either ADD or

ADHD at Phase 3, as signified by their scores in the clinical and borderline range, they did not receive their diagnosis until after the Phase 3 assessments. The likelihood of this possibility is further supported by the finding at Phase 3 that many families in the EA group were not able to receive the services they felt they needed (including psychiatric assessments) because of lengthy waitlists (Le Mare, Audet & Kurytnik, 2007). The longitudinal change exhibited by the EA group, is however an interesting occurrence and is discussed in greater detail below in reference to the longitudinal change in levels of I/O across groups.

At each time point the pattern of group differences, with the children in the RO group demonstrating the greatest difficulty in I/O, the children in the CB group demonstrating the least, and the children in the EA group falling in-between, suggested a trend for I/O to increase with duration of deprivation early in life. Substantial correlations, within the combined RO/EA group, between duration of deprivation and indices of I/O when the children were age 4 ½, 10 ½ and 16 years-of-age, confirmed this association. Kreppner et al. (2001) also found associations between duration of deprivation and I/O in their sample of Romanian adoptees when they were 4 and 6 years-of-age. However, the strength of the relationships they obtained at both ages were considerably less than those found in the current sample at age 4 ½ and the following two assessment phases. For example, using a similar measure to that used in the present study, Kreppner et al. found a non-significant correlation of .13 between duration of deprivation and children's I/O as reported by their parents when the children in their sample were 4-years-old and a correlation of .30 when the children were 6-years-old. This compares to our finding of a significant correlation of .54 for the children in the RO

group when they were 4 ½ years-of-age. The fact that stronger associations were observed in the current study with duration of deprivation among 4-year-olds than Kreppner et al. is difficult to reconcile given the similarity in the samples and measures used in the two studies.

Kreppner et al. (2001) also reported that the effect of duration of deprivation on rates of I/O in their sample did not attenuate over time. Attenuation in the effects of duration of deprivation on I/O was not statistically detectable in the current study either; however, a trend for the relationship between duration of deprivation and I/O to decrease with the amount of time the children spent in their adoptive homes was seen. From the data, it can be concluded that although not statistically significant, there may be some attenuation in the impact of early institutional deprivation on I/O over time. The difference between the conclusion reached here and that of Kreppner et al., likely relates to differences in the length of time between examinations of this association in the two studies. In the Kreppner et al. study there was only a 2-year gap between assessments, which may not have been long enough to observe any attenuation. Here the time between Phases 2 and 3 was 6 years and between Phase 3 and 4 was an additional 6 years.

Looking at within group difference over time, in the RO group, I/O was relatively stable over the 12 years between phases with non-significant differences in mean levels of I/O between Phases 2, 3 and 4. Measures of I/O were also stable from Phase 2 to Phase 4 in the CB group. However, in the EA group change was observed with rates of I/O being significantly higher at Phase 3 than at Phase 2. Consistent with this change, and as noted above, at Phase 2 the EA and CB groups did not differ significantly on parent or teacher reported levels of I/O but at Phase 4 they did, with greater difficulties

being seen in the EA group. Similarly, at Phases 2 and 3 the EA group differed significantly from the RO group whereas by Phase 4 there was no longer a significant difference between them. This change in the EA group is interesting and may reflect the children's difficulties in dealing with the demands of the school environment as opposed to those of the home. At Phase 2, when the children were on average only 4 ½ years-of-age, they were not in formal school settings but, of course, at both Phase 3 and 4, when they were 10 ½ and 16 years-of-age respectively, they were.

Why we would see a shift like this in the EA group and not the RO or CB groups merits some discussion. The following somewhat speculative explanation is offered. All of the RO children experienced lengthy institutional deprivation prior to adoption, which may have compromised the development of their attention and activity level control to the extent that problems were apparent early on in the adoption, even in the relatively unstructured and undemanding environment of the home. When these children entered school, their I/O was known and accommodated for; hence a significant increase in such problems was not noted. Although the EA children, who were adopted before the age of 4 months, did not experience lengthy early institutional deprivation, their very early lives were characterized, at best, by extreme poverty and in other cases, by institutional neglect in hospitals and orphanages for a relatively short time. The lesser deprivation experienced by the EA children may not have been enough to interfere with the development of their attention and activity level control to the extent that problems were apparent when they were very young. Indeed, in the relatively unstructured and undemanding environment of the home the EA children appeared to not have any I/O difficulties and it was not until they encountered the increased demands of the structured

school environment that problems became evident. The CB children, on the other hand, suffered no common experience that might have affected their abilities in attention and activity level control in either the home or school environment, hence the low level of difficulty that was stable over time in that group.

Because the children in the EA group did not have significantly higher rates of I/O than either the general population or the children in the CB group at Phases 2 and 3, previous research (Audet, 2003) reported that the children who were adopted early in life, and thus did not experience lengthy durations of deprivation, did not exhibit an increased rate of I/O similar to those of children experiencing a longer duration of deprivation. Similar findings were also reported by Kreppner et al. (2001) and Rutter et al. (2001) who reported that the children in their study who were adopted from institutions prior to 6 months of age were within the normal range of functioning for attention and activity level control.

Here, however, it appears the effects of deprivation on children's I/O may actually occur very early in infancy (within the first 4 months of life) but because the effects are not as extreme as with children with extensive deprivation their difficulties are not recognized until later in life when they are faced with tasks that are more demanding of attention and activity level control. Thus post-institutionalized children, even with as little as 4 months of deprivation, have significantly higher rates of I/O than that found within the typical population. The theoretical arguments of Bowlby (1951, 1966), Kopp (1982, 1989) and Tronick (1989) that parenting plays an important role in the development of children's attention and activity level control beginning in early infancy are therefore supported.

Although the theoretical positions of Bowlby, Kopp and Tronick are supported inasmuch as rearing environments do appear to affect the development of attention and activity level control early in infancy, parenting and the home environment later in childhood appear to also have an effect on the development of these skills. Based on the literature it was hypothesized that positive features of the home rearing environments in both infancy (length of time spent in an institution) and early and later childhood (when the children were 4 ½ and 10 ½ years-of-age) would relate inversely with children's rates of I/O at both Phases 3 and 4 in each of the three groups but it was unknown whether or not their contributions would be independent of each other. As previously discussed, length of time in an institution was significantly related to rates of I/O. Interestingly, several measures of the home rearing environment when the children were 4 ½ and 10 ½ years-of-age were also significantly correlated with I/O at both Phases 2 and 3 for the RO and EA groups but to a lesser extent at Phase 4.

However, single order correlations between aspects of the home environment and rates of I/O do not allow us to be certain of the direction of the effect. It is unclear whether the children's I/O affected the home environment or if the home environment affected the children's I/O. In order to tease out these two competing possibilities partial correlations were computed between the children's I/O at Phases 3 and 4 and various measures of the adoptive home environments while controlling for children's concurrently reported I/O. Interestingly, for the children in the RO group many of the correlations remained significant, indicating that the home environment has a significant impact on children's I/O over and above that predicted by their previously reported rates of I/O. In other words, it appears that although there is no doubt that children affect their

home environments, the home environments do appear to be having an impact on the children's I/O as well. These findings provide further support that later parenting practices continue to affect the development of attention and activity level control and that this impact is not limited to infancy and early childhood. In other words, if children's early home environments do not support the development of attention and activity level control it is possible, with a positive change in their environments, that children's later home environments can support the development of these skills.

It is interesting that the correlations between measures of the adoptive home environment and children's I/O, although in the right direction, at Phase 4 did not reach significance as they had in the previous phases. This could be explained by the length of time between the home rearing assessments and the Phase 4 assessment which ranged from, between 6 and 12 years depending on whether or not the home environment measures were from Phases 2 or 3. However, there were obviously many other factors that could have affected the children's I/O during this period of time. Potentially more likely, is the unfortunate decline of participation between Phases 3 and 4. With every longitudinal study there is the possibility of participants dropping out before the end of the study. As discussed in the methods section a number of participants chose not to continue their participation in Phase 4 for various reasons. Because of these factors, the sample size was depleted making it more difficult to uncover significant findings. Therefore, it is possible that the relationship between children's I/O and aspects of the adoptive home environment was still present at Phase 4 but there was simply not enough statistical power to detect these relationships.

Interestingly, a somewhat different pattern of findings was revealed by the single order and partial correlations between the home environments and I/O within the EA and CB groups. Although within both the CB and EA groups I/O was significantly related to some aspects of the home environment at Phases 2, 3, and even 4, once concurrent I/O was controlled for only one or two correlations for each group continued to be significant. These findings may be explained by two important differences between the children in the RO group and those in either the EA or CB groups: (1) the higher rates of I/O experienced by the RO group early in childhood and (2) the extensive deprivation the RO group experienced. Because of the RO children's compromised development at time of adoption and their early rearing experiences, what might be considered normal variations in home rearing conditions were important and made a difference to their development. The CB children, and perhaps even the EA children, were likely at developmental levels beyond the threshold where such normal variations would make much difference and of course had not experienced extensive deprived rearing conditions, hence the weaker relationship between I/O and the home rearing environment in these groups. Further, because the CB children did not experience any early life situations that would have potentially affected the development of their I/O we would expect these behaviours to also remain relatively stable over time therefore contributing to the stability in the correlations between the home rearing environment and these abilities.

However, given that the EA children by Phase 4 do show elevated rates of I/O, to nearly the same extent as that displayed by the RO children, it is surprising that the adoptive home rearing environment did not appear to be positively affecting their attention and activity level control to the same extent as that shown for the RO children.

It is possible that because the EA children's I/O went unnoticed when they were younger, their adoptive parents did not make the same adaptations and/or specific efforts that the RO parents did to help their children with their difficulties that later proved beneficial for the children in the RO group.

Looking again at the single order correlations, it is also interesting to note that among the various measures of the home rearing environment slightly different patterns of findings were revealed among the groups. Within the RO group, significant single order correlations were found between children's rates of I/O and nurturance and stimulation in the home environment, parent-child interaction styles and attachment but not for any of the parenting styles. For the EA children, on the other hand, all of the significant correlations with children's I/O were with parenting styles. For the CB children significant correlations were revealed between I/O and all aspects of the home rearing environment.

The reason that warmth and stimulation in the home environment, interaction styles and attachment seemed to have a stronger impact on the development of the RO children's I/O than parenting practices is a puzzling question. Obviously, each of these constructs assesses different aspects of the home rearing environment. It could also be argued that the development of I/O is simply affected more by certain aspects of the home rearing environment than others. Why this would be the case for the RO group and not the other two groups is a perplexing question.

Another possibility is that unlike the other aspects of the home environment the effect of parenting styles on children's I/O depends on the children's length of institutionalization. In other words, children experiencing lengthier institutionalization

may benefit from a different type of parenting than children with less lengthy institutionalization. This possibility was directly addressed in the regression analyses by entering an interaction variable between authoritarian parenting and duration of deprivation into the model. Interaction variables for the other home rearing constructs were also investigated and are discussed below.

Hierarchical regression analyses also allow for the examination of whether the relationship between children's I/O and their adoptive home environments is independent of the contribution of duration of deprivation, and their previously reported rates of I/O. In order to address this question hierarchical regression analyses were computed with duration of deprivation, children's I/O at Phase 2 and the home rearing variables entered as predictor variables for children's I/O at Phases 3 and 4. The regressions reveal that even after the contribution of duration of deprivation and reported rates of children's I/O at Phase 2 were accounted for, several aspects of the home rearing environment were significantly related to both parent and teacher reports of children's I/O at Phase 3. Specifically, in the regression model for children's I/O as reported by parents at Phase 3, the HOME, the interaction variable between authoritarian parenting and duration of deprivation, attachment and the interaction between attachment and duration of deprivation significantly contributed to the variance of the outcome over and above the variables that were entered previously.

Although the regression model for children's I/O as reported by teachers at Phase 3 revealed less significant contributions to the variance of the outcome, both the HOME and the interaction between authoritarian parenting and duration of deprivation made significant contributions over and above previously entered variables. These two

regressions tell us that aspects of the home rearing environment do have an impact on post-institutionalized children's I/O over and above that accounted for by their duration of deprivation and their previously reported rates of I/O and thus although the rearing environment experienced early in infancy affects the development of children's attention and activity level control, parenting and the home environment in later children can also have an impact on the development of these skills.

The significant prediction of the interaction variables in the regression analyses is interesting and merits further discussion. Although the single order correlations did not reveal a significant relationship between rates of children's I/O and authoritarian parenting within the RO group, here we see that parenting practices do have a significant impact on children's I/O but the direction depends on how much time the child was institutionalized for and thus this relationship could not be revealed in a simple correlation. These results tell us that although we typically think of authoritarian parenting as being less desirable, and even associated with higher levels of I/O, for children experiencing more than approximately 46 months of deprivation authoritarian parenting is actually associated with less I/O. These findings may be explained by the severe difficulties with I/O children experience with more than 46 months of deprivation. Specifically, it may be that these children, because of the extent of their existing difficulties, needed and thrived in an environment that was more controlling and strict (which are characteristics of an authoritarian parenting style). Because all the children in the EA group experienced well under 46 months of deprivation the single order correlations were able to reveal the positive relationship between children's rates of I/O and authoritarian parenting.

Interestingly, the interaction variable between attachment and duration of deprivation was also found to be a significant predictor of parent reported I/O at Phase 3. More specifically, attachment was only found to be predictive of lower rates of I/O in children who had experienced less than 19 months of deprivation. From the single order correlations, it was concluded that attachment was negatively related to children's reported rates of I/O; however, it appears that after children have experienced more than 19 months of deprivation their attachment style to their adoptive parents can no longer mitigate the effects of early deprivation on the development of their attention and activity level control. However, these results must be interpreted with some caution and do not, by any means, suggest that if parents adopt a child after 19 months-of-age they should not focus on developing a secure relationship with their child. Although attachment was not found to significantly predict children's rates of I/O if they had experienced more than 19 months of deprivation it might have a small statistically undetectable difference, that practically speaking may be "significant". Moreover, a secure attachment to their adoptive parents is likely to be a protective factor and significantly related to many other aspects of the child's overall health and development.

Given that children's I/O, as reported by parents, remained relatively consistent between Phase 3 and Phase 4, we would expect to see similar findings in the regressions for these two outcome variables. However, this was not the case. Unlike the regression model for Phase 3 parent reported I/O, the Phase 4 regression model revealed only one significant predictor variable, duration of deprivation. Unfortunately, the small sample size remaining in Phase 4 is likely to have contributed to these findings because of the decrease in power and thus the findings may not be interpretable.

Overall, the findings from the various hierarchical regression analyses suggest that the home environment does have an independent effect on children's I/O beyond the effects of duration of deprivation and earlier reported rates of I/O. It is encouraging to know that parents can make a difference in their children's attention and activity level control even when they have experienced extreme deprivation early in life. Thus, it is important that regardless of their children's pre-adoptive history, adoptive parents should be encouraged to provide an appropriately nurturing and stimulating home environment for their adoptive children and utilize appropriate parenting practices, interaction styles and work towards developing a secure relationship with their children.

There are a few main limitations of this study that should to be noted. First, because the early deprivation experienced by the RO children was so pervasive, it was not possible to tease apart what specific aspect of deprivation accounted for the effects on the children's I/O. In other words, although there is a correlation between the duration of deprivation and children's I/O we do not know whether this is from some specific aspect of the deprivation (e.g., inability to form attachments to caregivers due to the poor staff-child ratios), or deprivation as a whole including, for example, nutritional deprivation, lack of cognitive stimulation and confinement to a crib. Second, our information on children's I/O is largely based on standardized questionnaires completed by parents and teachers rather than on more detailed clinical assessments that include direct observations of the children's behaviour. Because the teacher and parent measures correlate significantly with one another we can be relatively confident in the accuracy of the reports. Nonetheless, independent clinical assessment would be preferable. Lastly, the reduction in sample size due to attrition across the phases makes the Phase 4 analyses

difficult to interpret because of the decrease in power to find significant relationships as well as a potential selection bias. The participants from the RO group who remained in the study were largely the ones that were (1) doing well enough to still be living with their adoptive families, (2) able to complete the questionnaires on their own and (3) had parents that were not so overwhelmed with their child's difficulties to opt out of the research.

In conclusion, unfortunately, given the stability of these findings, there is the potential for these children to continue to experience I/O as well as related problems. Difficulties in I/O have been studied extensively in relation to their association to a large range of difficulties and comorbid diagnoses (e.g., August & Garkinkel, 1990; Jensen, Martin, & Cantwell, 2000). These correlated difficulties can be classified into seven main groups: school performance and ability, social difficulties, externalizing problems, self-concept and self-esteem, internalizing problems, attachment with parents and substance abuse. These studies indicate that each of these areas is highly related to and predicted by early I/O. Furthermore, the stability of I/O has been found to be astonishingly strong. In a review of the literature, Klein and Mannuzza (1991) state that the overall pattern for hyperactive children in adolescence is a continuation of their childhood symptoms and the development of antisocial behaviour.

It is therefore absolutely essential that prevention and intervention measures commence and include involving the child's family, addressing his/her environment and providing support in other areas that may be associated with his/her I/O. Given the presence of individual variability among the Romanian orphans, it is important that

interventions are designed with the children's individual needs in mind. Moreover, each family is also likely to require different levels of support and possibly intervention.

Continued longitudinal assessment of these children and their families will allow us to determine if the adoptive rearing environments continues to have an impact on the children's I/O and whether the effect of duration of deprivation on I/O continues to attenuate with time. Furthermore, and potentially more interestingly given the current age of the children, is the continued assessment of these children to discover how they are able to negotiate adult life with the potential continuation of their I/O. For example, at Phase 4, the majority of the children in the study were at an age in which they should be graduating from high school within the next year or two. It would be fascinating to see how the children are able to negotiate the demands of post-secondary education, full time employment and/or long-term relationships. For many of these children, starting their own families may also be in the not too distant future.

REFERENCE LIST

- Achenbach, T. M. (1991). *Manual for the Child Behavior Checklist/4-18 and 1991 Profile*. Burlington, VT: University of Vermont, Department of Psychiatry.
- Achenbach, T.M. (1991). Manual for the Teacher's Report form and 1991 profile. Burlington, VT: University of Vermont, Department of Psychiatry.
- Achenbach, T.M. (1999). Child Behavior Checklist. In A. E. Kazdin (Ed.), *Encyclopedia of psychology*. New York: Oxford University Press.
- Achenbach, T.M. & Edelbrock, C., (1981). Behavioral problems and competencies reported by parents of normal and disturbed children aged 4 through 16. *Monographs of the Society for Research in Child Development*, 46, Serial No. 188.
- Achenbach, T.M., Phares, V., Howell, C.T., Rauh, V.A., & Nurcombe, B. (1990). Seven-year outcome of the Vermont intervention program for low birthweight infants. *Child Development*, 61, 1672-1681.
- Adoption Council of Canada (2004). Adoption statistics by country. Retrieved March 7, 2006 from: <http://www.adoption.ca>
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (revised 4th ed.) Washington, DC: Author.
- Ames, E.W. (1990) Spitz revisited: A trip to Romanian orphanages. *Canadian Psychological Association Developmental Psychology Newsletter*, 9 (2). 8-11
- Armsden, G.C., & Greenberg, M. T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence*, 16 (5), 427-454.
- Arnold, L., E., & DiSivestro, R.A. (2005). Zinc in attention-deficit/hyperactivity disorder. *Journal of Child and Adolescent Psychopharmacology* 15(4), 619-627.
- Audet, K. (2003). Attentional and Self-regulatory Difficulties of Romanian Orphans Ten Years after Being Adopted to Canada: A Longitudinal Study. (Masters Thesis, Simon Fraser University, 2003).

- August, G.J., & Garkinkel, B.D. (1990). Comorbidity of ADHD and reading disability among clinic referred children. *Journal of Abnormal Child Psychology* 18, 29-45.
- Barkley, R.A. (1988). The effects of methylphenidate on the interactions of preschool ADHD children and their mothers. *Journal of the American Academy of Child and Adolescent Psychiatry*, 27 (3), 336-341.
- Biederman, J., Faraone, S.V., Keenan, K., Knee, D., & Tsuag, M., (1990). Family-genetic and psychosocial risk factors in girls with DSM-III attention-deficit disorder. *Journal of the American Academy of Child Adolescent Psychiatry*, 29, 526-533.
- Bradley, R.H. (1989). HOME measurement of maternal responsiveness. *New Directions for Child Development*, 43, 63-74.
- Brodzinsky, D.M., Schechter, D.E., Braff, A.M., & Singer, L.M., (1984). Psychological and academic adjustment in adopted children. *Journal of Consulting and Clinical Psychology*, 52 (4) 582-590.
- Brodzinsky, D., M., Radice, C., Huffman, L., & Merkler, K., (1987). Prevalence of clinically significant symptomatology in a nonclinical sample of adopted and nonadopted children. *Journal of Clinical Child Psychology*, 16 (4) 350-356
- Botting, N., Powls, A., Cooke, R.W.I., & Marlow, N., (1997). Attention deficit hyperactivity disorders and other psychiatric outcomes in very low birth weight children at 12 years. *Journal of Child Psychology and Psychiatry* 38(8) 931-941.
- Bowlby, J. (1951). *Maternal care and mental health*. Geneva: World Health Organization.
- Bowlby, J. (1966). *Maternal care and mental health: A Report Prepared on behalf of the World Health Organization as a contribution to the United Nations programme for the welfare of homeless children*. New York: Schocken Books.
- Bowlby, J. (1969). *Attachment and Loss Volume 1: Attachment*. New York, Basic Books.
- Bowlby, J. (1988). *A secure base*. London, England: Routledge.
- Bruner, J. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry* 17 (2), 89-100.
- Cadwell, B.M., & Bradley, R.H. (1984). *Home Observation for Measurement of the Environment*. Unpublished manuscript, University of Arkansas at Little Rock.
- Carlson, E., Jacobvitz, D., & Sroufe, A. (1995). A developmental investigation of

- inattentiveness and hyperactivity. *Child Development* 66, 37-54.
- Cassidy, J. (1994). Emotional regulation: Influences of attachment relationships. In N. Fox (Ed.), *The development of emotion regulation: Biological and behavioral considerations. Monographs of the Society for Research in Child Development*, 59 (Serial 240, 2-3), 228-249.
- Chisholm, K. (1998). A three year follow-up of attachment and indiscriminate friendliness in children adopted from Romanian orphanages. *Child Development*, 69, 1092-1106.
- Clarke, L., Ungerer, J., Chahoud, K., Johnson, S., & Stiefe, I. (2002). Attention deficit hyperactivity disorder is associated with attachment. *Clinical Child Psychology and Psychiatry*, 7 (2). 179-198.
- Colquhoun, I.D. (1994). Attention deficit/hyperactivity disorder: A dietary/nutritional approach. *Therapeutic care and Education*, 3(2) 159-172.
- Deutsch, C.K., Swanson, J.M., Bruell, J.H., Catwell, D.P., Weinberg, F., Baren, M., (1982). Overrepresentation of adoptees in children with the attention deficit disorder. *Behavior Genetics*, 12, 2, 231-238.
- Egeland, B., & Hiester, M. (1993). *Teaching task rating scales*. Unpublished manuscript, University of Minnesota, Institute of Child Development, Minneapolis.
- Erdman, P. (1998). Conceptualizing AD/HD as a contextual response to parental attachment. *The American Journal of Family Therapy*, 26, 177-185.
- Faraone, S.V., Biederman, J., Mich, E., Williamson, S., Wilens, T., Spencer, T., Weber, W., Jetton, J., Kraus, H., Pert, J., & Zallen, B., (2000). Family study of girls with attention deficit hyperactivity disorder. *American Journal of Psychiatry*, 157, 1077-1083.
- Faraone, S.V., & Doyle, A.E., (2001). The nature and heritability of attention-deficit/hyperactivity disorder. *Child and Adolescent Psychiatric Clinics of North America*, 10(2) 299-316.
- Fisher, L., Ames, E., Chisholm, K., and Savoie, L. (1997). Problems reported by parents of Romanian orphans adopted to British Columbia. *International Journal of Behavioral Development*, 20(1), 67-81.
- Frank, D. A., Klass, P.E., Earls, F., Eisenberg, L. (1996). Infants and young children in orphanages: One View from Pediatrics and Child Psychiatry. *Pediatrics*, 97, (4), 569-578.

- Feldman, R., & Klein, P. (2003). Toddlers' self-regulated compliance to mothers, caregivers, and fathers: Implications for theories of socialization. *Developmental Psychology*, 39 (4), 680-692.
- Frick, P.J., & Lahey, B.B. (1991). The nature and characteristics of attention-deficit hyperactivity disorder. *School Psychology Review*, 20. 163-173.
- Goldfarb, W. (1943). Infant rearing and problem behaviour. *American Journal of Orthopsychiatry*, X111 (12), 249-265.
- Goldfarb, W. (1943/44). The effects of early institutional care on adolescent personality. *Journal of Experimental Education*, 12. 106-129.
- Goldfarb, W. (1945). Psychological privation in infancy and subsequent asjusement. *American Journal of Orthopsychiaty*, 13. 247-255.
- Goodman, R., & Stevenson, J., (1989). A twin study of hyperactivity: II. The etiological role of genes, family relationships and perinatal adversity. *Journal of Child Psychology in Psychiatry*, 30, 691-709.
- Groza, V., & Ryan, S.D., (2002). Pre-adoption stress and its association with child behavior in domestic special needs and international adoptions. *Psychoneuroendocrinology*, 27, (1-2), 181-196.
- Groze, V., (1997) International Adoption. In R.L. Edwards (Ed.in-chief). *Encyclopedia of Social Work*, 19th Edition, 1997 Supplement (pp. 1-14). Washington, D.C: NASW press.
- Groze, V., Ileana, D. (1996). A follow-up study of adopted children from Romania. *Child Adolescent Social Work Journal*, 13(6). 541-565.
- Hartsough, C.S., & Lambert, N.M. (1985). Medical factors in hyperactive and normal children: prenatal, developmental, and health history findings. *American Journal of Orthopsychiatry*, 55(2), 190-201.
- Hinshaw, S. P., (2002). Preadolescent girls with attention-deficit/hyperactivity disorder: I. Background characteristics, comorbidity, cognitive and social functioning, and parenting practices. *Journal of Consulting and Clinical Psychology*, 70 (5), 1086-1098.
- Hinshaw, S. (1994). *Attention deficits and hyperactivity in children*. Thousand Oaks, California: SAGE publications, Inc.
- Hodges, J., & Tizard, B. (1989). IQ and behavioural adjustment of ex-institutional adolescents. *Journal of Child Psychology and Psychiatry* 30. 53-75.

- Jensen, P.S., Martin, D., & Cantwell, D.P. (2000). Comorbidity in ADHD: implications for research, practice and DSM-V. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36, 1065-1079.
- Johnston, C., & Mash, E.J. (2001). Families of children with attention-deficit/hyperactivity disorder: Review and recommendations for future research. *Clinical and Child Family Psychology Review*, 4 (3), 183-207.
- Johnston, C., Murray, C., Hinshaw, S., Pelham, W., & Hoza, B. (2002). Responsiveness in Interactions of mothers and sons with ADHD: Relations to maternal and child characteristics. *Journal of Abnormal Child Psychology*, 30 (1), 77-88.
- John-Steiner, V., & Mahn, H. (1996). Sociocultural approaches to learning and development: A Vygotskian Framework. *Educational Psychologist*, 31, 191-206.
- Kazdin, A. E., & Kagan, J. (1994). Models of dysfunction in developmental psychopathology. *Clinical Psychology: Science and Practice*, 1(1), 35-52.
- Keller, H. (2002). Culture and development: Developmental pathways to individualism and interrelatedness. In W. J. Lonner, D. L. Dinnel, S. A. Hayes, & D. N. Sattler (Eds.), *Online Readings in Psychology and Culture* (Unit 11, Chapter 1), (<http://www.wvu.edu/~culture>), Center for Cross-Cultural Research, Western Washington University, Bellingham, Washington USA.
- Klein, R., & Mannuzza, S. (1991). Long-term outcomes of hyperactive children: a review. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30, 383-387.
- Kopp, C. (1982). Antecedents of self-regulation: A development perspective. *Developmental Psychology*, 18 (2), 199-214.
- Kopp, C. (1989). Regulation of distress and negative emotions: A developmental view. *Developmental Psychology*, 25(3), 343-354.
- Kreppner, J., O'Connor, T., Rutter, M., Beckett, C., Castle, J., Croft, C. (2001). Can inattention/overactivity be an institutional deprivation syndrome? *Journal of Abnormal Child Psychology* 29 (6). 531-528.
- Landry, S., Miller-Loncar, C., Smith, K., & Swank, P. (2002). The role of early parenting in children's development of executive processes. *Developmental Neuropsychology*, 21 (1), 15-41.
- Le Mare, L., Audet, K., & Kurytnik, K. (2007). A Longitudinal study of service use in families of children adopted from Romanian orphanages. *International Journal of Behavioral Development*, 31(3), 242-251.

- MacLean, K. (2003). The impact of institutionalization on child development. *Development and Psychopathology, Vol 15*(4). Special issue: Experiments of nature: Contributions to developmental theory. 853-884.
- McLaughlin, D.P., & Harrison, C.A. (2006) *Parenting Practices of Mothers of Children with ADHD: The Role of Maternal and Child Factors*. *Child and Adolescent Mental Health* 11 (2), 82–88.
- Marfo, K. (1994). *Multi-pass: A computer-controlled interactive video coding scheme for analyzing parent-child interaction*. Unpublished manuscript, University of South Florida, Department of Special Education, Tampa.
- Minde, Webb & Sykes (1968). Studies on the hyperactive child. VI. Prenatal and paranatal factors associated with hyperactivity. *Developmental Medicine and Child Neurology, 10*(3) 355-363.
- Morison, S. (1997). *Predictors of the cognitive development of children adopted from Romanian orphanages*. (Doctoral Dissertation, Simon Fraser University, 1997).
- O'Connor, T.G., Bredenkamp, D., & Rutter M. (1999). Attachment disturbances and disorders in children exposed to early severe deprivation. *Infant Mental Health Journal, 20*(1)10-29.
- Ornoy, Segal, Bar-Hamburger, Greenbaum, (2001). Developmental outcome of school-age children born to mothers with heroin dependency: Importance of environmental factors. *Developmental Medicine Child Neurology 43*(10) 668-675.
- Olson, S.L., Bates, J.E., Sandy, J.M., Schilling, E.M. (2002). Early developmental precursors of impulsive and inattentive behaviour: from infancy to middle childhood. *Journal of Child Psychology and Psychiatry, 43*(4), 435-447.
- Pollard, S. Ward, E.M., & Barkley, R.A., (1983). The effects of parent training and Ritalin on the parent-child interactions of hyperactive boys. *Child and Family Behavior Therapy, 5*(4), 51-69.
- Provence, & Lipton, (1962). *Infants in institutions*. New York: International Universities Press.
- Robinson, C. C., Mandleco, B., Olsen, S. F. (1995) Authoritative, authoritarian, and permissive parenting practices: Development of a new measure. *Psychological Reports, 77*(3, Pt 1), pp. 819-830.
- Robson, A., & Cline, B., (1998). Developmental consequences of intrauterine growth retardation. *Infant Behavior & Development, 21* (2). 331-344.

- Roy, P., Rutter, M., & Pickles, A. (2000). Institutional care: Risk from family background or pattern of rearing? *Child Psychology and Psychiatry*, 41(2), 139-149.
- Rutter, M., Kreppner, J., O'Connor, T. & Thomas, G. (2001). Specificity and heterogeneity in children's responses to profound institutional privation. *British Journal of Psychiatry*, 179, 97-103.
- Rutter, M. & Sroufe, L.A. (2000). Developmental Psychopathology: Concepts and challenges. *Development and Psychopathology*, 12(3), 265-296.
- Samudra, K., & Cantwell, D.P. (1999). *Risk factors for attention-deficit/hyperactivity disorder*. In H.C. Quay, & A.E., Hogan, (Ed's). Handbook of disruptive behavior disorders (199-220). New York, Kluwer Academic/Plenum Publishers.
- Simmel, C., Brooks, D., Barth R.P., & Hinshaw, S.P., (2001). Externalizing symptomatology among adoptive youth: Prevalence and preadoption risk factors. *Journal of Abnormal Child Psychology*, 29 (1), 57-69.
- Simon, H. (1975). The functional equivalence of problem solving skills. *Cognitive Psychology*, 7(2), 268-289.
- Sroufe, L.A., Fox, N.E., & Pancake, V.R. (1983). Attachment and dependency in developmental perspective. *Child Development*, 54, 1615-1627.
- Steiger, J.H. (1980). Tests for comparing elements of a correlation matrix. *Psychological Bulletin*, 87, 245-251.
- Szatmari, P., Saigal, S., Rosenbaum, P., & Campbell, D., (1993). Psychopathology and adaptive functioning among extremely low birthweight children at eight years of age. *Development and Psychopathology* 5(3), 345-357.
- Tabachnick, B.G., & Fidell, L.S. (1983). *Using multivariate statistics*. New York: Harper and Row.
- Tannock, R. (1998). Attention hyperactivity disorder: Advances in cognitive, neurobiological, and genetic research. *Journal of Child Psychology and Psychiatry*, 39(1), 65-99.
- Thapar, A., (2003). Attention Deficit Hyperactivity Disorder: New genetic findings new directions. In R. Plomin, J.C. Defries, I.W. Craig, & P. McGuffin, (Ed's). Behavioral Genetics in the Postgenomic Era. Washington, D.C., American Psychological Association.
- Thapar, A., Holmes, J., Poulton, K., Harrington, R., (1999). Genetic basis of attention

- deficit and hyperactivity. *British Journal of Psychiatry*, 174, 105-111.
- Tharp, R.G., & Gallimore, R. (1988). *Rousing minds to life: Teaching, learning, and schooling in social context*. New York: Cambridge University Press.
- The Scottish Low Birthweight Study Group. (1992). The Scottish low birthweight study: II. Language attainment, cognitive status, and behavioral problems. *Archives of Disease in Childhood*, 67, 682-686.
- Tizard, B. (1991). Intercountry adoption: A review of the evidence. *Child Psychology and Psychiatry* 32 (5). 743-756.
- Tizard, B., Hodges, J. (1978). The effects of early institutional rearing on the development of eight year old children. *Journal of Child Psychology and Psychiatry* 19. 99-118.
- Tizard, B., Rees, J. (1975). The effects of early institutional rearing on the behaviour problems and affectional relationships of four-year-old child. *Journal of Child Psychology and Psychiatry* 16. 61-73.
- Tronick, E. (1989). Emotions and emotional communication in infants. *American Psychologist*, 44(2), 112-114.
- Vygotsky, L. (1978). *Mind in Society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Vygotsky, L. (1987). The collected works of L.S. Vygotsky. Edited by R. W. Rieber & A. S. Carton. New York : Plenum Press
- Wells, K.C., Epstein, J.N., Hinshaw, S.P., Conners, C.K., Klaric, J., Abikoff, H.B., Abramowitz, A., Arnold, L.E., Elliott, G., Greenhill, L. L., Hechtman, L., Hoza, B., Jensen, P.S., Marsh, J.S., Pelham, W., Pfiffner, L., Severe, J., Swanson, J.M., Vitiello, B., & Wigal, T. (2000). Parenting and family stress treatment outcomes in Attention Deficit Hyperactivity Disorder (ADHD): An empirical analysis in the MTA study. *Journal of Abnormal Child Psychology*, 28, 543-553.
- Wertsch, J.V. (1991). *Voices of the mind: A sociocultural approach to mediated action*. Cambridge, MA: Harvard University Press.
- Whitaker, A.H., Van Rossem, R., Feldman, J.F., Schonfeld, I.S., Pinto-Martin, J.A., Torre, C., Shaffer, D., & Paneth, N., (1997). Psychiatric outcomes in low-birth-weight children at 6 years: Relation to neonatal cranial ultrasound abnormalities. *Arch Gen Psychiatry*, 54, 847-856.

APPENDICES



OFFICE OF
RESEARCH ETHICS

Appendix A: Ethics Approval

February 20, 2008

STREET ADDRESS
SIMON FRASER UNIVERSITY
Multi-Tenant Facility
Room 230, 8900 Nelson Way
Burnaby, B.C. Canada
V5A 4W9

Ms. Karyn Audet
Graduate Student
Faculty of Education
Simon Fraser University

Dear Ms. Audet:

MAILING ADDRESS
8888 UNIVERSITY DRIVE
MULTI-TENANT FACILITY
BURNABY, B.C. CANADA
V4A 1S6

**Re: Mitigating effects of the home environment on
inattention and overactivity in children adopted from
Romanian orphanages: A longitudinal study - Appl. #38451**
SSHRC Doctoral Fellowship

*Grant title: Attention and self regulation in post institutionalized
children*

Title Change

In response to your request dated February 11, 2008, I am pleased to approve, on behalf of the Research Ethics Board, the amendment to change your title from, "A longitudinal study assessing the potential of home rearing environments to mitigate the effects of early deprivation on children's attention and self-regulation", in the research protocol of the above referenced Request for Ethical Approval of Research originally approved on October 2, 2008.

If there is an adverse event, the principal investigator must notify the Office of Research Ethics within five (5) days. An Adverse Events form is available electronically by contacting dore@sfu.ca.

Please note that all correspondence with regards to this application will be sent to your SFU email address.

Best wishes for continued success in this research.

Sincerely,

Dr. Hal Weinberg, Director
Office of Research Ethics

c: ✓ Dr. Lucy Le Mare, Supervisor

Appendix B: Introductory Letter to Parents

Dear Participant,

Thank you so much for your participation in our study. Enclosed you will find questionnaires for yourself and your child as follows:

Parent questionnaires include: Demographic Questionnaire, Education Questionnaire, Child Behaviour Checklist, Parenting Stress Index, Strengths and Challenges, Relationships, Sex-Role Orientation, and the Health Questionnaire.

Child questionnaires include: Adoption Questionnaire, Romantic Relationships, Puberty, Child and Youth Resilience Measure, Relationships, Youth Resiliency, sex-role orientation, Inventory of Parent and Peer Attachment, and the RPLQ.

These questionnaires do not need to be completed all at one time. We do ask you do your best to complete them all within 3 weeks and mail them back to us in the enclosed self-addressed stamped envelope. Please respect the confidentiality of your child's answers. We have enclosed a smaller envelope for your child to place their completed questionnaires, which should be sealed and placed inside the larger envelope to mail.

Please also make sure that you and your child sign and return the consent forms included in your package.

We will continue updating our website with information about the findings from the study. Our website is <http://lucy.viper.ca/>

Should you have any questions please do not hesitate to contact Karyn Audet at 604-291-5687 or via email at knaudet@sfu.ca.

Thank you again for your participation in this important research.

Sincerely,

Lucy Le Mare
Faculty of Education
Simon Fraser University

Appendix C: Consent form for Parents

Simon Fraser University

Informed Consent for Participation by Parents of Children in the Romanian Adoption Project: Phase 4

The University and those conducting this research study subscribe to the ethical conduct of research and the protection at all times of the interests, comfort, and safety of participants. This research is being conducted under the permission of the Simon Fraser University Research Ethics Board. The chief concern of the Board is for the health, safety and psychological well-being of research participants. This form and the information it contains are given to you so that you have a full understanding of the procedures involved in this project. Your signatures on this form will signify that you have read the description of the procedures of the study below, that you have had adequate opportunity to consider the information in that description, and that you voluntarily agree to participate.

Any information that is obtained during this study will be kept confidential to the full extent permitted by law. All materials will be maintained in a secure location.

Procedure

A package of questionnaires will be sent via mail to both parent and child participants. Child participants aged 10 – 12 years will be asked to complete questionnaires about themselves assessing the following areas: self-esteem; peer relationships; relationships with parents; sex-role orientation; views on adoption (for adopted participants only); and physical growth (puberty). Participants aged 13 and older will complete the same questionnaires and additional questionnaires on resilience and romantic relationships. We estimate that it will take children a total of approximately 2 hours to complete these questionnaires. They can be completed over as many sittings as required. Once the child questionnaires are complete they are to be returned to the researchers in the provided self-addressed stamped envelope.

Parents are asked to respect the confidentiality of their children's responses by allowing them to complete their questionnaires in private if this is what they desire.

Parent participants will be asked to complete questionnaires about their child assessing the following areas: physical and emotional health; peer relationships; education; sex-role orientation; problem behaviour, and strengths and challenges. Parents will also complete questionnaires about themselves that assess parenting stress and their relationship with their child. We estimate that it will take parents approximately 2 hours in total to complete these questionnaires. They can be completed over as many sittings as required. Once the parent questionnaires are complete they are to be returned to the researchers in the provided self-addressed stamped envelope.

The purpose of this research is to investigate the developmental outcomes of children who spent part of their early lives in an orphanage and to compare the outcomes for those children to adopted children without orphanage experience and non-adopted children. The knowledge that we gain from this study will be disseminated in both scientific and applied outlets, including scientific journals, professional newsletters, conferences, and workshops, and will be of benefit to a variety of audiences that include those concerned with the care of abandoned and orphaned children in their countries of origin, adoption facilitators, adoptive parents, and students of child development.

Contingent on continuing funding for this research, the researchers may contact families again to request participation in a similar study in the future.

Having been asked by Dr. Lucy Le Mare of the Faculty of Education, Simon Fraser University to participate in a research project, I have read the procedures above.

I understand the procedures to be used in this study and that I may withdraw my participation at any time.

As parent of _____ (your child's name), I consent to my child engaging in the procedure described above.

I certify that I have discussed the procedures of the study with my child and informed my child that he/she has the right to withdraw from the study at any time.

I understand that all information collected in this study is completely confidential and will only be used for research purposes.

I understand that Dr. Le Mare will provide me with the results of this study upon its completion.

I understand that if I have any concerns or complaints about this study I may register them with Dr. Phil Winne, Director of Research, Faculty of Education, Simon Fraser University.

Name: _____

Signature: _____

Date: _____

Appendix D: Consent form for Children

Simon Fraser University

Informed Consent for Participation by Children and Adolescents in the Romanian Adoption Project: Phase 4

The University and those conducting this research study subscribe to the ethical conduct of research and the protection at all times of the interests, comfort, and safety of participants. This research is being conducted under the permission of the Simon Fraser University Research Ethics Board. The chief concern of the Board is for the health, safety and psychological well-being of research participants. This form and the information it contains are given to you so that you have a full understanding of the procedures involved in this project. Your signatures on this form will signify that you have read the description of the procedures of the study below, that you have had adequate opportunity to consider the information in that description, and that you voluntarily agree to participate.

Any information that is obtained during this study will be kept confidential to the full extent permitted by law. All materials will be maintained in a secure location.

Procedure

A package of questionnaires will be sent via mail to both parent and child participants. Child participants aged 10 – 12 years will be asked to complete questionnaires about themselves assessing the following areas: self-esteem; peer relationships; relationships with parents; sex-role orientation; views on adoption (for adopted participants only); and physical growth (puberty). Participants aged 13 and older will complete the same questionnaires and additional questionnaires on resilience and romantic relationships. We estimate that it will take children a total of approximately 2 hours to complete these questionnaires. They can be completed over as many sittings as required. Once the child questionnaires are complete they are to be returned to the researchers in the provided self-addressed stamped envelope.

Parents are asked to respect the confidentiality of their children's responses by allowing them to complete their questionnaires in private if this is what they desire.

Parent participants will be asked to complete questionnaires about their child assessing the following areas: physical and emotional health; peer relationships; education; sex-role orientation; problem behaviour, and strengths and challenges. Parents will also complete questionnaires about themselves that assess parenting stress and their relationship with their child. We estimate that it will take parents approximately 2 hours in total to complete these questionnaires. They can be completed over as many sittings as required. Once the parent questionnaires are complete they are to be returned to the researchers in the provided self-addressed stamped envelope.

The purpose of this research is to investigate the developmental outcomes of children who spent part of their early lives in an orphanage and to compare the outcomes for those children to adopted children without orphanage experience and non-adopted children. The knowledge that we gain from this study will be disseminated in both scientific and applied outlets, including scientific journals, professional newsletters, conferences, and workshops, and will be of benefit to a variety of audiences that include those concerned with the care of abandoned and orphaned children in their countries of origin, adoption facilitators, adoptive parents, and students of child development.

Contingent on continuing funding for this research, the researchers may contact families again to request participation in a similar study in the future.

Having been asked by Dr. Lucy Le Mare of the Faculty of Education, Simon Fraser University to participate in a research project, I have read the procedures above.

I understand the procedures to be used in this study and that I may withdraw my participation at any time.

I understand that all information collected in this study is completely confidential and will only be used for research purposes.

I understand that Dr. Le Mare will provide me with the results of this study upon its completion.

I understand that if I have any concerns or complaints about this study I may register them with Dr. Phil Winne, Director of Research, Faculty of Education, Simon Fraser University.

Name: _____

Signature: _____

Date: _____

Appendix E: Table of Measures Used

Construct Assessed	Informant	Phase of data collection	Measure
Family Demographics	Parents	Phase 3	Demographics Questionnaire
Rearing Environment	Parents	Phase 1	Interview: total time in institution
Rearing Environment	Parents	Phase 3	Parenting Practices Questionnaire
Rearing Environment	Researcher	Phase 2	Teaching Task Rating Scales
Rearing Environment	Researcher	Phase 2	Parent-child Interaction Scales
Rearing Environment	Researcher	Phase 2	Home Observation for the Measurement of the Environment
Rearing Environment	Child participant	Phase 3	Inventory of Parent and Peer Attachment
Inattention/Overactivity	Parent	Phases 2, 3, and 4	Child Behaviour Checklist
Inattention/Overactivity	Parent	Phases 3 and 4	Clinical diagnosis of ADHD
Inattention/Overactivity	Teacher	Phase 2 and 3	Child Behaviour Checklist

Appendix F: Demographic Questionnaire

5. Age of Mother at time of Adoption _____

6. Age of Father at time of Adoption _____

9. Mother's highest level of education

- _____ elementary school
- _____ some high school
- _____ high school completion
- _____ vocational or some college/university
- _____ college or university graduate
- _____ graduate or professional school

13. Father's highest level of education

- _____ elementary school
- _____ some high school
- _____ high school completion
- _____ vocational or some college/university
- _____ college or university graduate
- _____ graduate or professional school

17. Please estimate your gross annual family income

- | | | |
|--------------------------|-----------------|---------------------|
| _____ Less than \$20,000 | _____ 50-60,000 | _____ 90-100,000 |
| _____ 20-30,000 | _____ 60-70,000 | _____ Above 100,000 |
| _____ 30-40,000 | _____ 70-80,000 | |
| | _____ 40-50,000 | _____ 80-90,000 |

Appendix G: Child Behaviour Checklist Attention problems scale (parent and teacher forms)

1) Acts too young for his/her age

0 = Not True (as far as you know)

1 = Somewhat or sometimes True

2 = Very True or Often True

8) Can't concentrate, can't pay attention for long

10) Can't sit still, restless, or hyperactive

13) Confused or seems to be in a fog

17) Day-dreams or gets lost in his/her thoughts

41) Impulsive or acts without thinking

45) Nervous, highstrung, or tense

46) Nervous movements or twitching (describe)

61) Poor school work

62) Poorly coordinated or clumsy

80) Stares blankly

Appendix H: Parenting Practices Questionnaire

Today's date: _____

Phase 3: ID _____

PARENTING PRACTICES QUESTIONNAIRE- Mother's Form

Please make two ratings for each item: (1) rate *how often your spouse/partner* exhibits this behaviour with your child and (2) *how often you* exhibit this behaviour with your child.

1 = Never

2 = Once in awhile

3 = About half of the time

4 = Very often

5 = Always

<u>Spouse</u>	<u>Self</u>	
_____	_____	1. Encourages our child to talk about his/her troubles.
_____	_____	2. Guides our child by punishment more than reason.
_____	_____	3. Knows the names of our child's friends.
_____	_____	4. Finds it difficult to discipline our child.
_____	_____	5. Gives praise when our child is good.
_____	_____	6. Spanks our child when he/she is disobedient.
_____	_____	7. Jokes and plays with our child.
_____	_____	8. Withholds scolding or criticism even when our child acts contrary to our wishes
_____	_____	9. Shows sympathy when our child is hurt or frustrated.
_____	_____	10. Punishes by taking privileges away from our child with little if any explanation.
_____	_____	11. Spoils our child.
_____	_____	12. Gives comfort and understanding when our child is upset.
_____	_____	13. Yells or shouts when our child misbehaves.
_____	_____	14. Is easy going and relaxed with our child.
_____	_____	15. Allows our child to annoy someone else.
_____	_____	16. Tells our child our expectations regarding behaviour before the child engages in an activity.
_____	_____	17. Scolds and criticizes to make our child improve.
_____	_____	18. Shows patience with our child.
_____	_____	19. Grabs our child when he/she is disobedient.
_____	_____	20. States punishments to our child and does not actually do them.
_____	_____	21. Is responsive to our child's feelings or needs.
_____	_____	22. Allows our child to give input into family rules.
_____	_____	23. Argues with our child.
_____	_____	24. Appears confident about parenting abilities.

- _____ 25. Gives our child reasons why rules should be obeyed.
- _____ 26. Appears to be more concerned with own feelings than our child's feelings.
- _____ 27. Tells our child that we appreciate what the child tries or accomplishes.
- _____ 28. Punishes by putting our child off somewhere along with little, if any, explanation.
- _____ 29. Helps our child to understand the impact of behaviour by encouraging our child to talk about the consequences of his/her actions.
- _____ 30. Is afraid that disciplining our child for misbehaviour will cause our child to not like his/her parents.
- _____ 31. Takes our child's desires into account before asking the child to do something.
- _____ 32. Explodes in anger towards our child.
- _____ 33. Is aware of problems or concerns about our child in school.
- _____ 34. Threatens our child with punishment more often than giving it.
- _____ 35. Expresses affection by hugging, kissing, and holding our child.
- _____ 36. Ignores our child's misbehaviour.
- _____ 37. Uses physical punishment as a way of disciplining our child.
- _____ 38. Carries our discipline after our child misbehaves.
- _____ 39. Apologizes to our child when making a mistake in parenting.
- _____ 40. Tells our child what to do.
- _____ 41. Gives in to our child when the child causes a commotion.
- _____ 42. Talks it over and reasons with our child when our child misbehaves.
- _____ 43. Slaps our child when our child misbehaves.
- _____ 44. Disagrees with our child.
- _____ 45. Allows our child to interrupt others.
- _____ 46. Has warm and intimate times together with our child.
- _____ 47. When 2 children are fighting, disciplines the child first and asks questions later.
- _____ 48. Encourages our child to freely express him/herself even when disagreeing with parents.
- _____ 49. Bribes our child with rewards to bring about compliance.
- _____ 50. Scolds or criticizes when our child doesn't meet our expectations.
- _____ 51. Shows respect for our child's opinions by encouraging our child to express them.
- _____ 52. Sets strict well-established rules for our child.
- _____ 53. Explains to our child how we feel about our child's good and bad behaviour.
- _____ 54. Uses threats and punishment with little or no justification.
- _____ 55. Takes into account our child's preferences when making plans for the family.

- | | | |
|-------|-------|---|
| _____ | _____ | 56. When our child asks why he/she has to conform, states
“because I said so” or “I am your parent and I want you to”. |
| _____ | _____ | 57. Appears unsure of how to solve our child’s misbehaviour. |
| _____ | _____ | 58. Explains the consequences of the child’s behaviour. |
| _____ | _____ | 59. Demands that our child does things. |
| _____ | _____ | 60. Tries to channel our child’s misbehaviour into more acceptable
activity. |
| _____ | _____ | 61. Shoves our child when the child is disobedient. |
| _____ | _____ | 62. Emphasizes the reasons for rules. |

Appendix I: Brief description of the Subscales of the Preschool Version of the Home Observation for Measurement of the Environment (HOME)

1. Toys and learning materials: This subscale contains 11 items which assess whether the home contains stimulation materials such as puzzles, record player, art materials, books, toys, and games which teach colors, sizes, and numbers. It also assesses whether the family buys and reads the newspaper and subscribes to magazines, and whether books are available.
2. Language stimulation: This subscale contains 7 items, which assess whether the child is encouraged to learn the alphabet and simple manners, and whether the parent uses correct grammar and encourages the child to relate experiences.
3. Physical environment: This subscale contains 7 items, which assess whether the child's environment is safe, clean and conducive to development. It also evaluates whether the building is safe, the play area is safe and free of hazards, whether the interior of the dwelling is not dark or perceptually monotonous, and whether there is adequate space for the number of persons living there.
4. Pride and affection: This subscale contains 7 items which assess whether the parent responds to the child's queries, converses with the child, holds the child close for some time during the day, spontaneously praises the child's qualities or behaviour, and caresses, kisses or cuddles the child.
5. Stimulation of academic behaviour: This subscale contains 5 items, which assess whether the child is encouraged to learn colors, patterned speech, spatial relationships, numbers, and how to read a few words.
6. Encouragement of maturity (modeling): This subscale contains 5 items, which assess whether some delay of food gratification is demanded of the child, whether the television is used judiciously, whether the child can express negative feelings or hit the parent without harsh reprisal.
7. Variety of stimulation: This subscale contains 9 items, which assess whether the child has been taken on biweekly outing, on longer trips, and to museums. It also evaluates whether the child is encouraged to help with clean up, whether the child's art work is displayed, whether some meals are eaten with the whole family, and whether the child has some say in what foods are purchased.
8. Acceptance (use of punishment): This subscale contains 4 items which assess whether the parent scolds or derogates the child, uses physical restraint, spansks the child, or has had to use physical punishment more than once in the past week.

Appendix J: Brief description of the Subscales of the Elementary School Version of the Home Observation for Measurement of the Environment (HOME)

- 1) Emotional and verbal responsibility: This subscale contains 10 items which assess whether the child has a fairly regular and predictable daily schedule, whether the parent sometimes yields to the child's fears, whether the parent encourages the child to read on his/her own and to contribute to conversation, whether the parent responds to the child's questions, uses complete sentence structure, and initiates verbal interchange with the visitor/examiner.
- 2) Encouragement of maturity: This subscale contains 7 items which assess whether the child is required to carry out certain self care routines, to keep living and play are reasonably clean, whether the parent sets limits for the child and generally enforces them, and whether the parent violates rules of common courtesy.
- 3) Emotional climate: This subscale contains 8 items which assess whether the parent loses his/her temper with the child, uses physical punishment more than once in past month, whether the child can express negative feelings toward the parent without harsh reprisal, whether the child has seen the parent cry or visibly upset more than once in past week, whether the child has a special place to keep possessions, whether the parent uses terms of endearment or a nickname for the child, and does not express overt annoyance with the child.
- 4) Growth fostering materials and experiences: This subscale contains 8 items which assess whether the child has access to a radio or other music machine, to a musical instrument, to appropriate books, to a desk for reading or studying, whether the parent buys and reads the newspaper, whether the child has visited a friend on his/her own in the past week, and whether the family has a dictionary the child is encouraged to use it.
- 5) Provision of active stimulation: This subscale contains 8 items which assess whether television is used judiciously, whether the child is encouraged to develop hobbies and is included in the family's recreational hobby, whether the child's talents are encouraged through membership to classes or lessons, whether the child has ready access to playground equipment, to the library, and has been taken to a museum and on longer trips on planes, trains, or buses.
- 6) Family participation in developmentally stimulating experiences: This subscale contains 6 items which assess whether the family visits or receives visits from relatives or friends at least biweekly, whether the child has been taken on a family business venture 3-4 times in the past year, whether the child has been taken to live theatre or a musical, and on a trip of more than 50 miles from home, whether the parent discusses television

programs with the child and helps the child to achieve motor skills, such as riding a bicycle or skating.

- 7) Paternal involvement: This subscale contains 4 items which assess whether the father or father substitute regularly engages in outdoor activities with the child, whether the child sees and spends times with the father at least 4 times a week, whether the child eats at least one meal a day on most days with both parents, and whether the child has remained with his/her primary family all his/her life.
- 8) Aspects of the physical environment: This subscale contains 8 items which assess whether the child's room has decorations appealing to children, whether the interior of the dwelling is not dark or perceptually monotonous, whether there is adequate space for the number of persons living in the home, whether the home is reasonably clean and minimally cluttered, and whether the building and the outside play environment is safe.

Appendix K: Egeland's Teaching Task Rating Scales

The *Parental Intrusiveness* scale captures the degree to which the parent intruded on the child's play or performance during the teaching task. This could be seen when the parent redirected the child in a poorly timed fashion or intervened before the child needed help. At the high end of this scale was a parent whose own agenda took precedence over the child's wishes and who failed to understand or to recognize his/her precedence over the child's wishes and failed to understand or to recognize his/her child's efforts to gain autonomy. At the low end of the scale there was no sign of intrusiveness.

The *Quality of the Relationship* scale focused on the affective and reciprocity aspects of the parent-child relationship. A high score gives evidence to a relationship in which there was a strong sense of relatedness and of mutual engagement between the parent and child. A low score on this scale reflects a parent-child dyad where the core sense of emotional relatedness was absent and where they did not interact responsively to each other.

Appendix L: Marfo's Parent-child Interaction Scales

The *Parental Warmth* scale focuses on the affection the parent shows the child during the interaction. A high score reflects a parent who displays a great deal of affection toward the child throughout the interaction, touching, kissing, and praising the child. A low score on the scale reflects a parent who interacts with the child in a cold manner, showing little affection toward the child.

The *Parental Encouragement of Initiative* scale measures the extent to which the parent encourages the child to tackle the task(s) on his/her own, while at the same time giving help and guidance when appropriate. A high score reflects a parent who encourages the child to initiate as much as possible the problem-solving, while providing guidance in a noncontrolling way when appropriate. A low score on the scale represents a controlling parent who directs every step of the task, without letting the child initiate any moves on his/her own. A parent scoring at the midpoint of the scale uses either some controlling and some encouraging behaviour, or is neither controlling of the situation nor encouraging the child to do the task on their own.

Appendix M: Inventory of Parent Attachment

Some of the following statements ask about your feelings about your mother or the person who has acted as your mother. If you have more than one person acting as your mother (e.g., a natural mother and a step-mother) answer the questions for the one you feel has most influenced you.

Please read each statement and circle the ONE word that tells how true the statement is for you now.

1. My mother tells me that it is okay to feel the way that I do about things.

NO no sometimes yes YES

2. My mother is okay with the way I feel about things.

NO no sometimes yes YES

3. My mother tells me that I should not feel the way I do about some things.

NO no sometimes yes YES

4. I think my mother is a good parent.

NO no sometimes yes YES

5. My mother is doing a good job raising me.

NO no sometimes yes YES

6. I wish I had a different mother.

NO no sometimes yes YES

7. My mother likes me just the way I am.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

8. My mother wishes I was different in some ways.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

9. If I have a problem, I can tell my mother about it.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

10. If I have a problem, my mother is a good help.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

11. I like to tell my mother about the things that I am worried about.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

12. There's no point in telling my mother how I feel about things.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

13. My mother can tell when something is upsetting me.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

14. Talking about my problems with my mother makes me feel stupid or silly.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

15. My mother expect too much from me.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

16. I get upset easily at home.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

17. My mother often doesn't know when I'm upset.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

18. My mother listens to me when I talk to them.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

19. My mother trusts me.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

20. I trust my mother to be there for me when I need her.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

21. My mother helps me when I need her.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

22. I tell my mother about my problems and troubles.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

23. I don't bother my mother with my problems.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

24. My mother makes me mad.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

25. I feel angry with my mother.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

26. My mother pays enough attention to me.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

27. My mother wants me to talk to her about my problems.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

28. My mother understands me.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

29. When I get angry, my mother tries to understand why.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

30. I trust my mother.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

FATHER

1. My father tells me that it is okay to feel the way that I do about things.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

2. My father is okay with the way I feel about things.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

3. My father tells me that I should not feel the way I do about some things.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

4. I think my father is a good parent.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

5. My father is doing a good job raising me.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

6. I wish I had a different father.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

7. My father likes me just the way I am.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

8. My father wishes I was different in some ways.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

9. If I have a problem, I can tell my father about it.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

10. If I have a problem, my father is a good help.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

11. I like to tell my father about the things that I am worried about.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

12. There's no point in telling my father how I feel about things.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

13. My father can tell when something is upsetting me.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

14. Talking about my problems with my father makes me feel stupid or silly.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

15. My father expect too much from me.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

16. I get upset easily at home.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

17. My father often doesn't know when I'm upset.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

18. My father listens to me when I talk to them.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

19. My father trusts me.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

20. I trust my father to be there for me when I need her.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

21. My father helps me when I need her.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

22. I tell my father about my problems and troubles.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

23. I don't bother my father with my problems.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

24. My father makes me mad.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

25. I feel angry with my father.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

26. My father pays enough attention to me.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

27. My father wants me to talk to her about my problems.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

28. My father understands me.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

29. When I get angry, my father tries to understand why.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

30. I trust my father.

NO	no	sometimes	yes	YES
----	----	-----------	-----	-----

Tables

Table 1: Means and Standard Deviations for Demographic Characteristics of All Groups, Phase 4

	RO ^a			CB ^b			EA ^c		
	M	SD	N	M	SD	N	M	SD	N
Duration of deprivation	22.08 ^c	12.33	24	-	-	-	2.42	1.44	24
Age at Adoption	25.30	16.05	23	-	-	-	1.91	1.04	16
Age at Assessment	17.58	1.25	24	16.94	1.41	32	15.75 ^{ab}	.45	16
Mother's educ	4.26	1.01	23	4.54	.88	28	4.63	1.09	16
Father's educ	4.48	1.03	21	4.54	1.20	28	4.69	1.08	16
Mother's age	52.81	5.59	22	50.76	4.84	33	52.13	5.44	16
Father's age	53.79	4.67	19	51.78	4.83	32	55.13	7.55	15
Income	6.59 ^b	2.79	19	8.53	1.73	28	7.19	2.53	16

Note. Duration of deprivation = time children spent in institutions in months; Age at adoption = age in months; Age at assessment = child's age in months; Mother's educ = mother's education level with 1 = elementary school, 2 = some high school, 3 = high school completion, 4 = vocational or some college/university, 5 = college or university graduate, 6 = graduate or professional school. Father's educ = father's education level with 1 = elementary school, 2 = some high school, 3 = high school completion, 4 = vocational or some college/university, 5 = college or university graduate, 6 = graduate or professional school. Mother's age = Mother's age in years at time target child was assessed; Father's age = Father's age in years at time target child was assessed. Income = gross annual income with 1 = less than \$20,000, 2 = \$21-30,000, 3 = \$31-40,000, 4 =

41,000-50,000, 5 = 51-60,000, 6 = 61,000-70,000, 7 = \$71,000-80,000, 8 = 81,000-90,000, 9 = 91,000, 10 = above \$100,000.

^{a, b, c,} indicate means that differ significantly ($p < .05$) from one another.

Table 2: Correlations Between Demographic Characteristics and I/O Measures

RO Group ($n = 19-36$)					
	Mom age	Mom educ	Dad age	Dad educ	Income
Phase 2					
I/O parent	-.37*	-.12	-.22	.04	.02
I/O teacher	-.09	.12	-.19	.14	-.14
Phase 3					
I/O parent	-.31	.10	-.41*	-.06	-.13
I/O teacher	-.03	.10	-.06	.01	-.11
Phase 4					
I/O parent	.04	.20	-.17	.15	-.33

Note. I/O parent= Child Behaviour Checklist parent report form attention scale; I/O

teacher =Child Behaviour Checklist teacher report form attention scale; Momage =

Mother's age in years at time target child was assessed; Momed = mother's education

level with 1 = elementary school, 2 = some high school, 3 = high school completion, 4 =

vocational or some college/university, 5 = college or university graduate, 6 = graduate or

professional school; Dadage = Father's age in years at time target child was assessed;

Daded = father's education level with 1 = elementary school, 2 = some high school, 3 =

high school completion, 4 = vocational or some college/university, 5 = college or

university graduate, 6 = graduate or professional school; Income = gross annual income

with 1 = less than \$20,000, 2 = \$21-30,000, 3 = \$31-40,000, 4 = 41,000-50,000, 5 = 51-

60,000, 6 = 61,000-70,000, 7 = \$71,000-80,000, 8 = 81,000-90,000, 9 = 91,000, 10 =

above \$100,000.

* $p < .05$ ** $p < .10$.

Table 3: Comparison of Participants who participated in Phase 4 with those who declined in Phase 4

		Participated in Phase 4 ^a			Declined in Phase 4 ^b		
		n	M	SD	n	M	SD
RO Group							
	Parent reported I/O	23	6.22 ^b	4.54	12	10.67	5.89
	Teacher reported I/O	20	5.9	4.39	9	6.56	4.93
EA Group							
	Parent reported I/O	18	4.06	4.36	6	4.17	7.86
	Teacher reported I/O	17	4.76	5.07	6	3.50	3.99

Note. ^{a, b}, indicates that the groups differ significantly from each other.

Table 4: Results of Factor Analysis of Parent-Child Interaction Variables at Phase 2

Parent-Child Interaction Style	Loading
Parent Intrusiveness	.41
Parent Warmth	.35
Parent Encouragement of Initiative	.48
Quality of the Relationship	.71

Table 5: Gender Differences on all Measures of I/O

RO group					CB group			EA group		
Measures										
Phase 2		n	M	SD	n	M	SD	n	M	SD
I/O parent										
	Males	16	6.06	5.14	15	1.60	1.55	10	2.3	3.16
	Females	17	6.88	5.40	22	2.05	1.70	10	1.1	.99
I/O teacher										
	Males	14	6.00	5.92	15	2.87	2.85	6	6.00	6.36
	Females	10	5.00	5.92	17	2.11	3.94	6	1.33	1.75
Phase 3										
I/O parent										
	Males	17	7.59	5.43	18	2.11	2.78	11	5.82	4.55
	Females	18	7.89	5.52	22	1.82	2.78	13	2.62	5.52
I/O teacher										
	Males	12	7.00	4.53	16	4.88***	4.69	11	6.36	5.16
	Females	17	5.47	4.47	21	1	1.27	12	2.67	2.73
Phase 4										
I/O parent										
	Males	12	6.25	5.2	14	2.36	3.2	9	6.33***	2.65
	Females	10	5.9	5.8	18	1.56	2.8	7	.86	1.46

Note. I/O parent= Child Behaviour Checklist parent form; I/O teacher = Child Behaviour

Checklist teacher report form

*** = $p < .001$

Table 6: Gender Differences on all Measures of the Home Rearing Environments

RO group			CB group			EA group				
Measures										
Phase 2		n			n			n		
			M	SD		M	SD		M	SD
HOME										
	Males	17			19			10		
			-.27	.72		.25	.97		-.11	.88
	Females	16			20			12		
			-.08	1.1		.32	.60		.29	.79
Parent-Child Interaction styles										
	Males	16			17			10		
			9.08	2.61		9.13	2.61		9.7	3.0
	Females	16			20			11		
			8.79	2.0		10.35	2.26		9.7	2.5
Phase 3										
IPA										
	Males	15	105.5	6.7	19	107.5	4.4	9	101.2	8.2
	Females	17	104.6	8.4	23	105.3	5.2	14	106.6	4.9
Authoritarian										
	Males	14	37.86	9.0	15	39	8.3	8	39.38	6.1
	Females	15	40.0	7.2	19	35.7	8.5	13	33.7	8.13
Authoritative										
	Males	15	108.1	13.7	17	112.1	12.7	10	106.6	9.4
	Females	15	110.1	8.6	20	113.6	12.5	11	110.5	13.8
Permissive										
	Males	16	33.4	4.8	17	35.3	5.1	10	33.4	2.0
	Females	14	33.8	3.7	18	33.2	4.5	13	32.5	2.6

Note. HOME= Home Observation for the Measurement of the Environment, Phase 2;

IPA= Inventory of Parent Attachment;

Table 7: Differences in Home Rearing Environments among Groups

	RO ^a		CB ^b		EA ^c	
	M	SD	M	SD	M	SD
HOME	-.18	.91	.29	.79	.14	.83
Authoritarian	38.97	8.04	37.15	8.45	35.90	7.77
Authoritative	109.13	11.29	112.89	12.44	108.62	11.77
Permissive	33.57	4.30	34.20	4.90	32.91	2.45
Parent-child interaction styles	-.174	.703	.127	.691	.061	.788
IPA	-.050	.792	.068	.831	-.054	.830

Note. HOME= Home Observation for the Measurement of the Environment total score at

Phase 2. Authoritative= Mother's score on the Authoritative Parenting scale on the

Parenting Practices Questionnaire; Permissive= Mother's Score on the Permissive

Parenting scale on the Parenting Styles Questionnaire at Phase 3; Authoritarian=

Mother's score on the Authoritarian Parenting scale of the Parenting Practices

Questionnaire; Parent-child interaction styles= Composite score on the parent-child

interaction styles from Phase 2; IPA=Total score on the Inventory of Parent Attachment

at Phase 3.

Table 8: Phase 2, 3, and 4 I/O Scores Across

	RO ^a		CB ^b		EA ^c	
	M	SD	M	SD	M	SD
Phase 2						
I/O parent	6.27 ^{bc}	5.20	1.86	1.63	1.7	2.36
I/O teacher	5.26 ^{bc}	5.58	2.41	2.47	4.0	3.67
Phase 3						
I/O parent	7.74 ^{bc}	5.4	1.95	2.75	4.08	5.24
I/O teacher	6.10 ^{bc}	4.48	2.68	3.720	4.43	4.756
Phase 4						
I/O parent	6.1 ^b	5.34	1.8	2.92	3.9 ^b	3.53

Note. I/O parent= Child Behaviour Checklist parent report form attention problems

scale; I/O teacher=Child Behaviour Checklist teacher report form attention problems

scale

a,b,c,d indicate means that differ significantly ($p < .05$) from one another

Table 9: Correlations between Duration of Deprivation and Measures of I/O from Phases 2, 3 and 4 Within the RO/EA Combined Group

	Duration of deprivation
Phase 2 I/O parent report	.63***
Phase 2 I/O teacher report	.33*
Phase 3 I/O parent report	.37**
Phase 3 I/O teacher report	.21+
Phase 4 I/O parent report	.34*

Note. I/O= Child Behaviour Checklist parent report or teacher form attention problems

scale; Duration of deprivation= amount of time children spent in an institution prior to adoption

+ $p=.07$ * $p<.05$ ** $p<.01$

Table 10: Phase by Group means for I/O measures

	Phase 2 ^a	Phase 3 ^b	Phase 4 ^c
RO Group			
Parent report (n= 20)	5.45	6.25	5.50
Teacher report (n=19)	5.26	6.21	-
CB Group			
Parent report (n=30)	2.0	2.27	1.97
Teacher report (n=29)	2.41	2.90	-
EA Group			
Parent report (n=13)	2.15 ^{b,c}	4.92	4.54
Teacher report (n=11)	4.0	5.73	-

Note. I/O= parent or teacher reported attention problems on the Child Behaviour

Checklist.

a,b,c,d indicate means that differ significantly ($p < .05$) from one another

Table 11: Correlations among all measures in the RO GROUP

	I/O p2	I/O t2	I/O p3	I/O t3	I/O p4	Deprivation	HOME	Interaction	IPA	Authoritative	Authoritarian	Permissive
I/O p2	-	.59*	.68**	.87**	.52*	.35	-.29	-.04	-.22	-.24	.25	-.20
I/O t2		-	.49*	.60**	.62**	.34	-.33	-.30	-.12	-.15	-.10	-.19
I/O p3			-	.66**	.37	.20	-.43*	-.18	-	.01	.27	.18
I/O t3				-	.73**	.30	-.37*	-.55**	-.18	-.10	.17	.03
I/O p4					-	.51**	-.14	-.26	-.19	-.16	.15	-.13
Deprivation						-	-.12	-.34	-.13	-.30	-.15	-.12
HOME							-	.35*	-.06	.22	.07	.33
Interaction								-	.16	.09	-.24	-.12
IPA									-	-.50**	-.10	-.17
Authoritative										-	-.55*	.03
Authoritarian											-	.29
Permissive												-

Note. I/O p2= Parent report on the Child Behaviour Checklist Phase 2; I/O t2= Teacher report on the Child Behaviour Checklist Phase 2; I/O p3= Parent report on the Child Behaviour Checklist Phase 3; I/O t3= Teacher report on the Child Behaviour Checklist Phase 3; I/O p4= Parent report on the Child Behaviour Checklist Phase 4; Deprivation= Time spent in an institution prior to adoption;

HOME=Home observation for the measurement of the environment inventory at Phase 2; Interaction = Composite score on the parent-child interaction variables at Phase 2; IPA= total score on the inventory of parent attachment at Phase 3; Authoritative= score

on the Authoritative parenting style scale at Phase 3; Authoritarian = score on the Authoritarian parenting styles scale at Phase 3;

Permissive= score on the Permissive parenting styles scale at Phase 3.

*p <.05 **p < .10.

Table 12: Correlations among all measures in the EA Group

	I/O p2	I/O t2	I/O p3	I/O t3	I/O p4	Deprivation	HOME	Interaction	IPA	Authoritative	Authoritarian	Permissive
I/O p2	-	.73*	.42	.74**	.66*	-.32	-.15	.03	-.17	-.63*	.50	.44
I/O t2		-	.66*	.75**	.81**	.11	-.47	-.20	-.35	-.55	.54	.40
I/O p3			-	.65**	.53*	-.19	-.36	.05	-.45	-.37	.70**	.23
I/O t3				-	.70**	-.29	-.32	.08	-.02	-.76**	.78**	.06
I/O p4					-	.06	-.09	-.01	-.30	-.31	.57	.30
Deprivation						-	-.14	-.19	.11	.34	-.19	-.10
HOME							-	.24	.43	.27	-.47	.08
Interaction								-	.07	.38	-.09	-.16
IPA									-	.29	-.29	.01
Authoritative										-	-.72**	-.05
Authoritarian											-	.22
Permissive												-

Note. I/O p2= Parent report on the Child Behaviour Checklist Phase 2; I/O t2= Teacher report on the Child Behaviour Checklist Phase 2; I/O p3= Parent report on the Child Behaviour Checklist Phase 3; I/O t3= Teacher report on the Child Behaviour Checklist Phase 3; I/O p4= Parent report on the Child Behaviour Checklist Phase 4; Deprivation= Time spent in an institution prior to adoption;

HOME=Home observation for the measurement of the environment inventory at Phase 2; Interaction = Composite score on the parent-child interaction variables at Phase 2; IPA= total score on the inventory of parent attachment at Phase 3; Authoritative= score

on the Authoritative parenting style scale at Phase 3; Authoritarian = score on the Authoritarian parenting styles scale at Phase 3;

Permissive= score on the Permissive parenting styles scale at Phase 3.

* $p < .05$ ** $p < .10$.

Table 13: Correlations among all measures in the CB Group

	I/O p2	I/O t2	I/O p3	I/O t3	I/O p4	HOME	Interaction	IPA	Authoritative	Authoritarian	Permissive
I/O p2	-	.07	.50**	.74**	.60**	-.50**	-.04	-.19	-.53**	.44**	.50**
I/O t2		-	.19	-.00	.13	-.44*	-.30	-.25	-.01	.07	.08
I/O p3			-	.25	-.14	-.26	-.18	-.38*	-.47**	.55**	.66**
I/O t3				-	.54**	-.42**	-.55**	-.04	.03	.04	.21
I/O p4					-	-.24	-.23	-.30	-.51**	.39*	.64**
HOME						-	.33	-.10	.43*	-.40*	-.38*
Interaction							-	.05	.19	-.15	.02
IPA								-	.05	-.19	-.28
Authoritative									-	-.43*	-.30
Authoritarian										-	.62**
Permissive											-

Note. I/O p2= Parent report on the Child Behaviour Checklist Phase 2; I/O t2= Teacher report on the Child Behaviour Checklist Phase 2; I/O p3= Parent report on the Child Behaviour Checklist Phase 3; I/O t3= Teacher report on the Child Behaviour Checklist Phase 3;

2; I/O p4= Parent report on the Child Behaviour Checklist Phase 4; HOME=Home observation for the measurement of the environment

inventory at Phase 2; Interaction = Composite score on the parent-child interaction variables at Phase 2; IPA= total score on the

inventory of parent attachment at Phase 3; Authoritative= score on the Authoritative parenting style scale at Phase 3; Authoritarian =

score on the Authoritarian parenting styles scale at Phase 3; Permissive= score on the Permissive parenting styles scale at Phase 3.

*p < .05 **p < .10.

Table 14: Partial correlations between Phase 2 Home variables and Phase 3 and 4 measures of I/O controlling for Phase 2 I/O within the RO Group

Home Variables	Ph 3 Parent I/O	Ph 3 Teacher I/O	Ph 4 Parent I/O
HOME	-.53*	-.78**	-.43
Interaction Styles	-.40	-.71**	-.21

Note. HOME= Home Observation for the Measurement of the Environment at Phase 2;

Interaction Styles = Composite score on the parent-child interaction styles at Phase 2; I/O =

Phase 2 or 3 parent or teacher reported Child Behaviour Checklist attention problems scale

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

Table 15: Partial correlations between Phase 2 Home variables and Phase 3 and 4 measures of I/O controlling for Phase 2 I/O within the CB Group

Home Variables	Ph 3 Parent I/O	Ph 3 Teacher I/O	Ph 4 Parent I/O
HOME	-.47*	-.35	-.25
Interaction Styles	.16	.02	-.03

Note. HOME= Home Observation for the Measurement of the Environment at Phase 2;

Interaction Styles = Composite score on the parent-child interaction styles at Phase 2; I/O = Phase 2 or 3 parent or teacher reported Child Behaviour Checklist attention problems scale.

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

Table 16: Partial correlations between Phase 2 Home variables and Phase 3 and 4 measures of I/O controlling for Phase 2 I/O within the EA Group

Home Variables	Ph 3 Parent I/O	Ph 3 Teacher I/O	Ph 4 Parent I/O
HOME	-.44	-.63*	-.17
Interaction Styles	.01	-.08	-.44

Note. HOME= Home Observation for the Measurement of the Environment at Phase 2;

Interaction Styles = Composite score on the parent-child interaction styles at Phase 2; I/O =

Phase 2 or 3 parent or teacher reported Child Behaviour Checklist attention problems scale

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

Table 17: Partial correlations between Phase 3 Home variables and Phase 4 measures of I/O controlling for Phase 3 I/O within the RO Group

Home Variables	Phase 4 Parent Reported I/O
Authoritative Parenting Style	-.22
Authoritarian Parenting Style	.07
Permissive Parenting Style	-.25
IPA	-.29

Note. Authoritative Parenting Style= Mother's score on the Authoritative Parenting Scale at Phase 3; Authoritarian Parenting Style= score on the Authoritarian Parenting Scale at Phase 3; Permissive Parenting Style= score on the Authoritarian Parenting Scale at Phase 3; IPA= Child reported Inventory of Parent Attachment at Phase 3; Phase 4 Parent Reported I/O= Phase 4 Parent reported Child Behaviour Checklist Attention Problems scale; Phase 3 I/O= Phase 3 Parent reported Child Behaviour Checklist Attention Problems scale.

Table 18: Partial correlations between Phase 3 Home variables and Phase 4 measures of I/O controlling for Phase 3 I/O within the CB Group

Home Variables	Phase 4 Parent reported I/O
Authoritative Parenting Style	-.34
Authoritarian Parenting Style	-.12
Permissive Parenting Style	.27
IPA	-.56**

Note. HOME= Home Observation for the Measurement of the Environment total score at Phase 2. Authoritative= Mother's score on the Authoritative Parenting scale on the Parenting Practices Questionnaire; Permissive= Mother's Score on the Permissive Parenting scale on the Parenting Styles Questionnaire at Phase 3; Authoritarian= Mother's score on the Authoritarian Parenting scale of the Parenting Practices Questionnaire; Parent-child interaction styles= Composite score on the parent-child interaction styles from Phase 2; IPA=Total score on the Inventory of Parent Attachment at Phase 3.

Table 19: Partial correlations between Phase 3 Home variables and Phase 4 measures of I/O controlling for Phase 3 I/O within the EA Group

Home Variables	Phase 4 Parent reported I/O
Authoritative Parenting Style	-.42
Authoritarian Parenting Style	.09
Permissive Parenting Style	.37
IPA	-.32

Note. HOME= Home Observation for the Measurement of the Environment total score at Phase 2. Authoritative= Mother's score on the Authoritative Parenting scale on the Parenting Practices Questionnaire; Permissive= Mother's Score on the Permissive Parenting scale on the Parenting Styles Questionnaire at Phase 3; Authoritarian= Mother's score on the Authoritarian Parenting scale of the Parenting Practices Questionnaire; Parent-child interaction styles= Composite score on the parent-child interaction styles from Phase 2; IPA=Total score on the Inventory of Parent Attachment at Phase 3.

**Table 20: Summary of Hierarchical Regression Analysis for Phase 3
Parent Reported I/O**

Variable	B	SE B	β	R ² change
Block 1				
Duration of deprivation	.102	.051	.326	.107
Block 2				
Parent reported I/O ph2	.697	.183	.652	.273
Block 3				
HOME	-1.821	.650	-.354	.122
Block 4				
Interaction styles	-.112	.918	-.018	.000
Block 5				
Interaction styles * duration of deprivation	.021	.055	.067	.002
Block 6				
Authoritarian	.124	.082	.210	.036
Block 7				
Authoritarian * duration of deprivation	-.022	.008	-.342	.100
Block 8				
IPA	-.191	.662	-.353	.085
Block 9				
IPA * duration of deprivation	.086	.037	.328	.046

Note. Duration of Deprivation= Amount of time children spent in an institution prior to adoption; Parent reported I/O ph2 = Parent reported scores on the attention problems scale of the Child Behaviour Checklist at Phase 2; HOME= Phase 2 Home Observation of the Measurement of the Environment; Interaction Styles= Composite score on the parent-child interaction scales at Phase 2; Interaction styles * duration of deprivation = interaction variable between the composite score on the parent-child interaction variables and amount of time children spent in an institution prior to adoption; Authoritarian= Mother's score on the Authoritarian scale of the Parenting Styles Questionnaire at Phase 3; Authoritarian * duration of deprivation = The interaction variable between the composite score on the Authoritarian scale and amount of time spent in an institution prior to adoption; IPA= Child reported total score on the Inventory of Parent Attachment at Phase 3; IPA * duration of deprivation =

Interaction variable between the total score on the Inventory of Parent Attachment and the amount of time children spent in an institution prior to adoption.

**Table 21: Summary of Hierarchical Regression Analysis for Phase 3
Teacher Reported I/O**

Variable	B	SE B	β	R ² change
Block 1				
Duration of deprivation	.050	.056	.196	.038
Block 2				
CBCL ph2	.545	.195	.566	.280
Block 3				
HOME	-.294	.907	-.618	.251
Block 4				
Interaction styles	.119	1.45	.019	.000
Block 5				
Interaction styles * duration of deprivation	.102	.062	.375	.061
Block 6				
Authoritarian	.136	.085	.265	.054
Block 7				
Authoritarian * duration of deprivation	-.024	.006	-.433	.160
Block 8				
IPA	-.561	.730	-.119	.007
Block 9				
IPA * duration of deprivation	.024	.045	.115	.003

Note. Duration of Deprivation= Amount of time children spent in an institution prior to

adoption; Parent reported I/O ph2 = Parent reported scores on the attention problems scale of the Child Behaviour Checklist at Phase 2; HOME= Phase 2 Home Observation of the Measurement of the Environment; Interaction Styles= Composite score on the parent-child interaction scales at Phase 2; Interaction styles * duration of deprivation = interaction variable between the composite score on the parent-child interaction variables and amount of time children spent in an institution prior to adoption; Authoritarian= Mother's score on the Authoritarian scale of the Parenting Styles Questionnaire at Phase 3; Authoritarian * duration of deprivation = The interaction variable between the composite score on the Authoritarian scale and amount of time spent in an institution prior to adoption; IPA= Child reported total score on the Inventory of Parent Attachment at Phase 3; IPA * duration of deprivation =

Interaction variable between the total score on the Inventory of Parent Attachment and the amount of time children spent in an institution prior to adoption.

**Table 22: Summary of Hierarchical Regression Analysis for Phase 4
Parent Reported I/O**

Variable	B	SE B	β	R ² change
Block 1				
Duration of deprivation	.198	.070	.498	.248
Block 2				
CBCL ph2	.473	.235	.470	.113
Block 3				
HOME	-1.28	.827	-.253	.063
Block 4				
Interaction styles	1.10	1.62	.137	.012
Block 5				
Interaction styles * duration of deprivation	-.125	.117	-.195	.030
Block 6				
Authoritarian	.130	.114	.221	.034
Block 7				
Authoritarian * duration of deprivation	-.020	.011	-.309	.076
Block 8				
IPA	-.384	1.04	-.072	.003
Block 9				
IPA * duration of deprivation	-.082	.097	-.197	.018

Note. Duration of Deprivation= Amount of time children spent in an institution prior to

adoption; Parent reported I/O ph2 = Parent reported scores on the attention problems scale of

the Child Behaviour Checklist at Phase 2; HOME= Phase 2 Home Observation of the

Measurement of the Environment; Interaction Styles= Composite score on the parent-child

interaction scales at Phase 2; Interaction styles * duration of deprivation = interaction

variable between the composite score on the parent-child interaction variables and amount of

time children spent in an institution prior to adoption; Authoritarian= Mother's score on the

Authoritarian scale of the Parenting Styles Questionnaire at Phase 3; Authoritarian * duration

of deprivation = The interaction variable between the composite score on the Authoritarian

scale and amount of time spent in an institution prior to adoption; IPA= Child reported total

score on the Inventory of Parent Attachment at Phase 3; IPA * duration of deprivation =

Interaction variable between the total score on the Inventory of Parent Attachment and the amount of time children spent in an institution prior to adoption.