EFFECTS OF PRENATAL RISK AND EARLY LIFE CARE ON BEHAVIORAL PROBLEMS, SELF-REGULATION, AND MODULATION OF PHYSIOLOGICAL STRESS RESPONSE IN 6 TO 7 YEAR-OLD CHILDREN OF INTERCOUNTRY ADOPTION (ICA)

By

MAUREEN E. RILEY-BEHRINGER

Submitted in partial fulfillment for the requirements

For the degree of Doctor of Philosophy

Dissertation Advisor: Dr. Victor Groza

Department of Social Welfare

Jack, Joseph, and Morton Mandel School of Applied Social Sciences

CASE WESTERN RESERVE UNIVERSITY

May, 2015

CASE WESTERN RESERVE UNIVERSITY

SCHOOL OF GRADUATE STUDIES

We hereby approve the dissertation of

Maureen Riley-Behringer

candidate for the degree of Doctor of Philosophy

Committee Chair

Victor Groza, Ph.D.

Committee Member

Meeyoung Min, Ph.D.

Committee Member

David Crampton, Ph.D.

Committee Member

Andrew Garner, MD, Ph.D.

*We also certify that written approval has been obtained

for any proprietary material contained therein.

Dedication

To my family, David, Tatiana and Jack

Table of Contents

List of Tables	5
List of Figures	7
List of Appendix	8
Acknowledgements	9
Abstract	10
Chapter 1 Introduction	12
Chapter 2 Extant Literature Review, Research Questions, and Hypotheses .	61
Chapter 3 Methodology	161
Chapter 4 Results	170
Chapter 5 Discussion and Implications	182
Appendix	
References	

List of Tables

Table 1.	Children's Country of Origin	161
Table 2.	Child Demographic Characteristics by Type of Early Care	171
Table 3.	Family Demographic Characteristics by Type of Early Care	172
Table 4	Type of Early Care on Children's Behavior Problems	174
Table 5.	Type of Early Care on Children's Self-Regulation	175
Table 6.	Type of Early Care on Children's Lab Cortisol Baseline	175
Table 7	Type of Early Care on Children's Lab Cortisol Baseline,	
	Controlling for Adoption Age	176
Table 8.	Type of Early Care on Children's Lab Cortisol Stress Task	176
Table 9	Type of Early Care on Children's Home Cortisol Baseline	176
Table 10	Prenatal Risk on Children's Behavior Problems	177
Table 11	Prenatal Risk on Children's Behavior Problems,	
	Controlling Adoption Age and Type of Early Care	177
Table 12	Prenatal Risk on Self-Regulation	178
Table 13	Prenatal Risk on Lab Cortisol Baseline	178
Table 14	Prenatal Risk on Lab Cortisol Stress Task	178
Table 15	Prenatal Risk on Home Cortisol Baseline	179
Table 16	Prenatal Risk on Home Cortisol Baseline,	
	Controlling Adoption Age and Type of Early Care	179
Table 17	Prenatal Risk on Behavior Problems, Testing Moderating Effec	t
	of Type of Early Care while Controlling for Adoption Age	180
Table 18	Prenatal Risk on Self-Regulation, Testing Moderating Effect	
	of Type of Early Care while Controlling for Adoption Age	180

Table 19	Prenatal Risk on Lab Cortisol Baseline, Testing Moderating		
	Effect of Type of Early Care, Controlling for Adoption Age 181		

- Table 20Prenatal Risk on Lab Cortisol Stress Task, Testing ModeratingEffect of Type of Early Care, Controlling for Adoption Age......181
- Table 21Prenatal Risk on Home Cortisol Baseline, Testing ModeratingEffect of Type of Early Care, Controlling for Adoption Age......181

List of Figures

Figure 1. Physiological Effort Required to Enhance Neural Connectivity	
Following Adversity in Very Early Childhood	84
Figure 2. Integrated Model: Teratology, Stress, and Attachment	

List of Appendix

Relationshi	p between Ir	ndependent,]	Dependent a	and Control	Variables205	5
-------------	--------------	---------------	-------------	-------------	--------------	---

Acknowledgements

I want to thank Dr. Meeyoung Min for her statistical expertise, her invaluable guidance as a researcher in the area of substance-exposed children, and her generosity in time. I also appreciate the advice and direction that Dr. Andrew Garner has brought to me and my committee through his expertise in neuroscience, pediatric medicine, and toxic stress. His blend of knowledge/insights of bench science and direct practice with children and families was an incredible resource. I am very grateful to Dr. David Crampton for his guidance in the dissertation process, particularly for his expertise in systems and policy. Over the last 6 years, he has strengthened my teaching and been a wonderful mentor to me.

Finally, I want to thank Dr. Victor Groza. When I began reading the adoption literature 15 years ago as a clinician and ICA parent, he was one of the few researchers writing about these "resilient rascals" with a positive voice—not one that ignored the challenges, but one that helped redefine them through the lens of adaptation and compassion. I am appreciative of his many hours of time, energy, and mentoring. I will be forever grateful for how his voice resonates in my work.

I am very grateful to the many ICA children and families that I have come to know and work with in my practice for the last 15 years. It is through their candor, laugher, tears, and generosity of spirit that many of my insights have been built.

I am especially thankful to my husband, David and my beautiful children, Tatiana and Jack. You mean the world to me. Thank you for being my greatest teachers.

The Effects of Prenatal Risk and Early Care on Behavioral Problems, Self-Regulation,

and Modulation of Physiological Stress Response in 6-7 Year Old Children of

Intercountry Adoption (ICA)

Abstract

By

MAUREEN E. RILEY-BEHRINGER

Guided by teratology, attachment, and stress theories, this cross-sectional secondary dataset analysis examined relationships between prenatal exposure to risk and preadoptive placement on behavior problems, self-regulation, and stress response modulation in 6-7 year old children of ICA. Early care comparisons were made between three groups matched on age at assessment (m = 6.9 years; SD = 0.6) and gender (girls n/group = 30) in children reared in institutional care (IC) (n = 40; m adoption age = 19 months; SD= 6.7 months), foster care (FC) (n = 40; m adoption age = 8.0 months; SD =5.3), or birth family care (BC) (n = 40). Prenatal risk comparisons were made between the IC and FC groups; children were exposed to low (0 or 1) or high (2-3) prenatal risks (global measure of alcohol, malnutrition, and/or prematurity). Adoptive parents provided child/family demographics, historical adoption and known prenatal risk information, completed behavior and temperament scales, and collected home baseline salivary cortisol samples. In the lab, children were tested on inhibitory control, attention regulation, and salivary cortisol sampling. Analysis of Variance (ANOVA), independent samples t-tests, and Analysis of Covariance (ANCOVA) tested the individual effects of prenatal risk and early care on outcomes. Two-way ANCOVAs were used to investigate whether early care moderated prenatal risk on children's outcomes when controlling for

adoption age. For type of early care, results indicated significant differences between groups on behavior problems (IC > BC), self-regulation (IC < BC) and lab cortisol baseline (IC < FC), but only without controlling for adoption age. When comparing high and low prenatal risk on child outcomes, high prenatal risk denoted greater behavior problems and elevated home cortisol baseline results, even when controlling for adoption age and early care type. Early care type did not moderate the prenatal risk effects on the study's developmental outcomes, indicating that, at least in this sample, the effects of prenatal risk were strong. Further implications include the need for further investigation of effects of prenatal risk and institutional care risk on ICA children's developmental outcomes as well as collaborative research between social work, neuroscience, and stress researchers.

CHAPTER 1--INTRODUCTION

Problem Statement

Families formed through intercountry adoption (ICA) often encounter unique challenges linked to the adverse pre-adoptive experiences of the adoptee. A myriad of negative developmental outcomes have been associated with children's poor prenatal experiences as well as the pre-adoptive care they received while in out-of-home placement (i.e., institutional /family foster care). More specifically, two key adverse pre-adoptive experiences impacting almost all ICA children are their exposures to prenatal risk (i.e., alcohol/drug exposure, malnutrition, and/or premature birth) and/or early care risk (i.e., institutional/orphanage or family foster care).

Along with these adverse pre-adoptive experiences, ICA children carry with them their birth families' genetic predispositions to strengths, physical and mental illness, developmental abilities (i.e., IQ), and unique ways that they are biologically susceptible in dealing with the stressors in their environment. Additionally, adoptive family members each carry their own genetic predispositions, history, functioning and processes. Together, most often the new adoptive family system builds on its members' individual experiences, creating a new way of operating that is typically beneficial to both the adoptee and parent(s) (Grotevant, McCroy, Elde, & Fravel, 1994). However, placement in a resource-rich adoptive family environment does not always mitigate the short and/or long-term effects of ICA children's adverse pre-adoptive experiences.

Many ICA children, to varying degrees, continue experiencing challenges after their adoption (i.e., behavioral problems; difficulties with self-regulation or modulating physiological stress). There has been significant heterogeneity in ICA children's

preadoption experiences and developmental outcomes due to a host of many contributing factors (i.e., genetics, epigenetics, prenatal risk exposures, birth family circumstances, sending/receiving country societal contexts, adoptive family circumstances and access to resources) (Grotevant & McDermott, 2014). Despite the many challenges faced, the majority of ICA children and families fare very well, particularly with quality personal and professional support systems after the adoption. Despite this, recent mainstream media has almost exclusively highlighted negative examples of ICA family outcomes, citing children's adverse pre-adoptive experiences, poor parental coping, and a lack of professional supports as the roots to problematic adoption outcomes.

Over the last decade, several highly publicized cases in the media about ICA have fostered a more pathological perspective of children, their families, and the developmental repercussions of adverse pre-adoptive experiences. Extensive focus has been placed on ICA adoptees that exhibit self-injurious/violent behaviors or have suffered from abuse, neglect, and even death at the hands of their adoptive parents. These problematic ICA media cases have had a negative impact on sending and receiving country practices and policies (e.g., *see* Federal Law of the Russian Federation No. 272-FZ) as well as negatively framing the unique challenges that adoptees and their families can face post-placement (Fisher, 2003; Jacobson, 2013; Kline, Chatterjee, Karel, 2009; Waggenspack, 1998; Wegar, 1997).

Unfortunately, these media stories have excessively overgeneralized ICA children as a homogenous population of social orphans unable to recover from early negative prenatal and pre-adoptive experiences (e.g., *see* "From Russia with Love—Dealing with Difficult Adoptions", J. Chang et al., *ABC News* [November 28, 2008]; "When Adoption

Goes Wrong", P. Wingeri, *Newsweek* [December 17, 2007]). They fail to discuss the heterogeneous subsets within this population and how they vary in terms of children's genetic predispositions to mental and physical illness and their biological susceptibility to adverse prenatal and pre-adoptive care environments. Rather than providing a balanced view of ICA that includes a representative reporting on the array of outcomes, these reports instead only over-emphasize those children with severe behavioral, psychological and attachment disturbances, out-of-control aggression, and extreme delays that fail to resolve (Kline, Chatterjee, Karel, 2009; Rozek, 2005).

Recent descriptions of ICA parents have been more polarized. For example, depictions of ICA parents have ranged from them being well-intended/altruistic to abusive/murderous towards their adoptive children. This can be seen in such accounts as the highly publicized cases of 7 year-old, Russian adoptee, Artyom Savelyev (a.k.a. Justin Hansen) and the 21 ICA children that died in the care of their adoptive parents since 1996 (Miller, Chan, Reece, Tirella, & Pertman, 2007).

Savelyev's overwhelmed mother, Torry Ann Hansen, sent her unaccompanied son on a one-way flight back to Russia, only to be met by a stranger that she hired for \$200 over the Internet; the stranger's job was to deliver Saveyev to Moscow's child protection ministry. Pinning a note to his jacket that explained her intent to dissolve the adoption, she relayed, "I no longer wish to parent this child," [due to him being] "…mentally unstable. He is violent and has severe psychopathic issues/behaviors. I was lied to and misled by the Russian Orphanage workers and director regarding his mental stability and other issues" (as reported by Clehane in *Forbes* [May 31, 2012]).

Similar responses related to ICA adoptees' severe behavioral and psychological instabilities were made by a number of the parents who were found responsible for the deaths of their ICA children. Of the 21 ICA child deaths, 17 of these children were Russian, two were Chinese, and two were Guatemalan; approximately two thirds were under the age of 36 months and about half died within the first year of their adoptive placement. These children died from causes related to self-injury/injury as well as parent-inflicted head trauma, suffocation, starvation, hyperthermia, or hypothermia (e.g., *see* Associated Press, 2004, 2006; Bowers, 1997; Joyce, 2004; McClure, 2005; Reilly, 2001; Sector, 2005; Van Sack, 2002; Vargas, 2006).

Although such media coverage often over-emphasizes the extreme and negative end of the spectrum about the struggles that many ICA families face post adoption, it does still increase awareness about the fact that ICA children often do face developmental challenges, validating the need for greater understanding about the effects of prenatal risk and pre-adoptive experiences. Yet, it can also either under or overeducate ICA parents, contributing to unrealistic expectations of their adoptive children. Although some children face extreme developmental challenges, it is more common that others intermittently experience challenges throughout their childhood, adolescence, and/or adulthood. Overall, even with these intermittent challenges, most ICA children and their families thrive post adoption (Tottenham, 2012).

Yet, greater exploration in these areas will support the development of ways to help ICA parents cope and work with their children's unique needs that linger postplacement. Two key areas of pre-adoptive experiences needing further study are the developmental effects of ICA children's harmful prenatal risk exposures and early care

risks related to pre-adoptive placements in institutional or family foster care (Chesney, 2008; Gunnar & Kertes, 2005; Johnson, 2000).

Children's prenatal health and development is best fostered by birth mothers being well-nourished, avoiding exposures to toxins/teratogens during pregnancy (i.e., alcohol/drugs; smoking; environmental poisons), remaining safe from physical or emotional harm, as well as protection from the effects of cumulative stress, receiving good prenatal care, and delivering their baby at full-term gestation. The literature has linked maternal malnutrition with fetal growth restriction and low birth weight (i.e., Georgieff & Rao, 2001); prenatal alcohol and toxic stress exposure (i.e., chronic violence) have also been associated with prematurity, low birth weight, and extensive developmental delays as children mature (i.e., Gunnar & Kertes, 2005). Additionally, prematurity and low birth weight (which often co-occur) relate to a host of poorer child development outcomes (i.e., McCarton, Wallace, Divon, & Vaughan, 1996). To best help children challenge the negative effects of early adversity as they grow, it is also critical that those providing perinatal/post-adoptive caregiving be aware of their prenatal and care risk histories so they can promote early intervention and help adoptive families access appropriate testing and treatment.

Unfortunately, many ICA sending countries (i.e., China; Russia; Ethiopia) provide little information about birth family/prenatal histories upon referral for adoption (Chesney, 2008). For example, Chinese ICAs typically relay little information about prenatal history or birth families, as children are often found abandoned with at most a note stating their date of birth (Miller & Hendrie, 2000). Even when birth family or prenatal history is available, children's medical records are often sparse and filled with

inaccurate information, lack detailed descriptions of the exposure, degree, and timing of prenatal risk(s) (Davies & Bledsoe, 2005), records cannot be adequately translated due to a lack of shared medical nomenclatures between sending and receiving country systems (Ryan & Groza, 2002) or information is extracted and summarized without any universal guidelines of the amount and type of information to record.

For example, in a number of ICAs from Eastern Europe, only cursory information has been provided about children's birth mothers/fathers; information may simply not be available due to birth mothers sometimes secretly surrendering their children (i.e., anonymously dropped off at the local child protection office), because records are poorly kept or fail to accompany children when they move from one placement to another placement. When information has been available, it often included only basic documentation like maternal age, number of pregnancies/births, how children were delivered (i.e., C-section/vaginal), children's APGAR scores, and potentially a brief note regarding prenatal exposure to alcohol or other factors that place them at-risk (Davies & Bledsoe, 2005; Ryan & Groza, 2002).

Additionally, a dearth of documentation about prenatal care may indicate that it simply did not exist, as in many low resource countries/isolated rural areas, women often lack access to general medical care as well as prenatal care. Sometimes, even when available, mothers choose to not receive prenatal care. For example, Johnson (2000) found that very few Eastern European birth parents relinquishing children reported receiving any prenatal care. Of these parents, many had also tested positive for carrying preventable illnesses (i.e., hepatitis B; rubella) due to never, themselves, being

immunized as children. Subsequently, these preventable illnesses can be passed on to children, placing them at even higher prenatal and perinatal risk (Johnson, 2000).

Even when prenatal records omit certain historical information, it is often assumed that children from particular ICA sending countries/world regions are more likely to experience specific prenatal risk factors; this is especially so when it is a widely documented phenomenon in the culture's general population, not just among orphaned and abandoned children. The following examples describe common prenatal risk factors among several of the top sending countries from where U.S. ICA families have adopted from in the last decade. Additionally, rates for these prenatal risk factors are often higher among populations of mothers abandoning children after birth (Johnson, 2000).

Prenatal alcohol exposure has been particularly problematic in some former Communist Bloc countries (i.e., Miller et al., 2005; Miller et al., 2006; Pridemore & Kim, 2006). For example, a survey of 899 pregnant women in St. Petersburg, Russia reported that 60% of them drank during their pregnancy; 35% consumed alcohol within 30 days prior to the survey; and 7.4% of those 35% relayed having \geq 5 drinks in one sitting (Kristjanson, Wilsnack, Zvartau, Tsoy, & Novikov, 2007). Also, general alcohol consumption rates among child-bearing aged women in China and South Korea have also risen by 3% per year since 1995 (Cochrane, Chen, Conigrave, et al., 2003). Additionally, malnutrition and prematurity are common prenatal risks often found in ICA sending countries.

Guatemala has the world's fourth highest chronic malnutrition rates for mothers (> 27% undernourished) and children (> 50% for those age birth-5 years; \leq 80% in indigenous children) (Chomat, 2014). The vast majority (96%) of Ethiopian children less

than 5 years of age are reportedly stunted (47%), wasted (11%), or underweight (38%) (Ethiopian Demographic Health Survey, 2005). Additionally, a 2012 report indicated that China had the second highest premature birth rate in the world, accounting for more than 1,172,300 babies being born at less than 37 weeks of gestation in 2010 (March of Dimes, Partnership for Maternal, Newborn and Child Health [PMNCH], Save the Children, and the World Health Organization [WHO], 2012). Given the relatively significant rates of prenatal risk exposure in sending countries, it is likely that orphaned and abandoned children placed in State care have already entered the world at risk for detriments like disrupted brain architecture, organ damage, birth defects, growth deficiencies, mental retardation and developmental disabilities (Davies & Bledsoe, 2005). Adding insult to injury are the short and long-term effects of institutional and/or poor foster or birth family care.

Nearly 70% of all ICA adoptees have spent some part of their pre-adoptive lives in institutional care (Vandivere, Malm & Radel, 2009). In some countries, 100% of children (i.e., Russia) enter adoptive families after spending some time in group/institutional care. Such early experiences can often result in challenges throughout the adoptive family life cycle including child-specific problems (i.e., physical, emotional, behavioral and learning difficulties, etc.) and parent-child problems (i.e., relationship/attachment difficulties, mismatch of temperament, parental expectations do not match child capabilities, etc.).

As decades of research had supported that factors related to the negative impact of institutionalization (i.e., high child to caregiver ratios and staff turnover; crib confinement with little stimulation) were linked to several poor developmental outcomes, some ICA

sending countries (e.g., Romania; China) began promoting family foster care, as it more resembled life in a typical family (i.e., living in a group of close personal relationships; having a consistent primary caregiver; fewer children receiving care; greater stimulation available). Although foster care has not fully replaced institutional care in most ICA sending countries, it has provided another care option for those children unable to grow up with birth parents, relatives or kin.

Although many developmental outcomes have been noted for children that have been exposed to various prenatal and pre-adoptive care risks (e.g., *see* Zeanah et al., 2003), some mixed results still remain, denoting a need for further study(e.g., *see* van den Dries, Juffer, van IJzendoorn, & Bakermans-Kranenburg, 2010). It is important to acknowledge some potential influences of heterogeneous outcomes in samples of ICA children. Three such areas might be as follows.

The first is the influence of genetics. Each ICA child comes into the world influenced by the genetic programming that has been passed down to them via their birth family. Second, these genetic influences have likely been subject to epigenetics effects; more specifically, the child's genes may have been actively expressed ("switched on") or dormant ("switched off"), based on their individual experiences with their prenatal/postnatal environment (Heijmans et al., 2008). And third, those genetic and epigenetic influences may contribute to how stress-reactive, or biologically sensitive children become to the harshness/nurturing aspects of their prenatal, pre-adoptive caregiving and post-adoptive caregiving environments (Boyce et al., 1995; Boyce & Ellis, 2005). Additionally, there are gaps in the research as to how prenatal risk exposures manifest in

ICA adoptees and whether the type of pre-adoptive care received can moderate the effects of prenatal risk on children's developmental outcomes.

Purpose of the Study

The purpose of this study is to assess the relationships between (IV) prenatal risk and (IV) type of early care experiences on (DV) behavior problems, (DV) self-regulation, and (DV) the body's modulation of physiological stress in 6-7 year-old ICA children that had been placed with their U.S. adoptive families for at least three years. This specifically includes the assessment of three different variations of these relationships: 1) the type of early care experiences on the behavior problems, self-regulation, and body's modulation of physiological stress; 2) prenatal risk on the behavior problems, self-regulation, and body's modulation of physiological stress; and 3) whether the effects of prenatal risk experiences on behavior problems, self-regulation, and the body's modulation of physiological stress were moderated by the type of early pre-adoptive care that children received.

Prenatal risks pertain to children's in utero exposure to alcohol, malnutrition, and/or premature birth. *Early care experiences* pertain to the type of out-of-home care (institutional or family foster care) received by internationally adopted children between the ages of birth and 3 years -and- prior to placement with their U.S. adoptive family. Specific to this study, *self-regulation* describes a child's ability to alter his/her own responses or inner states in a goal-directed manner (*see* Baumeister, Schmeichel & Vohs, 2007; Rawn & Vohs, 2006) by modulating their *inhibitory control* (ability to suppress a behavioral response) and *attentional control* (ability to choose what to focus on and what to ignore) over their feelings and actions. A *physiological stress response* refers to how a child biologically regulates the secretion of the hormone, cortisol. The production of cortisol is dependent upon the child's genetic makeup, epigenetic factors, and a host of experiential variables. Specific to the current study, the measure of cortisol (via saliva sampling) is an index of how the human body physically responds to adversity or stress when faced with the perception of physical or psychological threat.

The study's specific question asks whether there are aggregate or individual effects of early prenatal risk exposures and pre-adoptive caregiving experiences on ICA children's later behavior problems, self-regulation, and physiological stress response modulation. The value of this research lies in the following four areas:

- To provide information to professionals that are first responders to ICA children and families (i.e., *pediatricians; educators; social workers; psychologists)* who provide support to adoptees and adoptive families when medical, behavioral, emotional, and academic challenges arise.
- To contribute to the growing developmental sciences of *social welfare*, *pediatric medicine*, *psychology*, and *education*, broadening the knowledge of how growing up outside of parental care, being exposed to chronic neglect/toxic stress, and experiencing prenatal risk impact children's development.
- To further clarify the literature's mixed outcomes related to the effects of pre-adoptive care risk on children's developmental outcomes.
- To empower ICA children and parents with added information about the unique challenges that they may face related to emotional and stress regulation

The next section of this chapter will include review of the salient adoption literature

Review of Salient Intercountry Adoption Literature

This section reviews the most salient literature related to the current study. Topics include the following six sections. *First*, there will be a description of those children that are growing up outside of parental care worldwide. *Second*, the four sources of adoption open to families in the United States as well as a historical account of the Five Waves of ICA will be described. *Third*, institutionalization and family foster care will be defined as methods of child rearing interventions. *Fourth*, the developmental effects of institutionalization and foster care on ICA children will be reviewed. *Fifth*, there will be a summary of the available literature on the effects of prenatal risk on ICA children's developmental outcomes. And *sixth*, a review of the available literature regarding how institutionalization/foster care and exposure to prenatal risk have impacted developmental outcomes of ICA children will be reviewed.

Children Growing Up Outside Of Parental Care

Globally, over 148,000,000 children are growing up outside of the care of their mothers and/or fathers, often due to factors like parental death or abandonment, removal from birth family due to abuse or neglect, extreme poverty, famine, parent-child separation due to war or natural disaster, and family-limiting social policies (Roby & Shaw, 2008). When children grow up outside of parental care, they may be "taken in" by extended family members/kin, live on the streets, grow up in child-headed households (homes where children have no adult living with them), or be placed in public or State care--the formal and informal public child welfare system in children's birth country (Roby & Shaw, 2008). Public care of orphaned and abandoned children varies within and across countries throughout the world, influenced by such factors as political systems, the availability of financial and other resources, their system's infrastructure, and the social capital value that is placed on children. Two forms of public care most commonly utilized in low resource countries are institutional/orphanage care and/or family foster care. Family foster care is defined as full-time care which is provided to the child while living within the context of a family environment (McCall, 2013).

There are an estimated 2 million (USAID, 2009) to 8 million (Human Rights Watch, 1999) children residing in institutions globally; yet, there is a dearth of information on the number of children living in foster care around the world or specific descriptions of those environments. Most children living in institutional care are deprived of consistent, sensitive caregiving; even under the best of circumstances, these environments cannot fully meet individual children's care and developmental needs.

Growing up in institutional care often, but not always, meets perfunctory care needs (e.g., food; shelter; clothing) and the quality varies tremendously (an exception was the care that children received in Romanian orphanages in the 1980's and 1990's which contributed to homogeneity among Romanian ICA samples; *see* Rutter & the English and Romanian Adoptees [ERA] Study Team, 1998). What is known about institutional care for children is that it is not often conducive to their overall health, development, and well-being (e.g., Dozier, Zeanah, Wallin, & Shauffer, 2012). For example, being reared in an institutional environment has been linked to children's experiencing of developmental delays and/or deficits across multiple domains that reportedly have immediate and long-term ramifications for them throughout their lifespan (e.g., *see*

Albers, Johnson, Hostetter, Iverson, & Miller, 1997; Gronlund, Aring, Hellstrom, Landgren, & Stromland, 2004).

The study of orphaned and abandoned children living in institutional care has often been referred to as a "natural" experiment, where researchers explore outcomes related to children's freely-occurring conditions that would normally be unethical to assign them to under a randomized, controlled study. Adoption, itself, has been described as an *intervention* or protective factor that mitigates children's risks associated with preadoptive pasts (i.e., lack of primary caregiving; prenatal risk exposure; global deprivation) (Johnson, 2000; Van IJzendoorn & Juffer, 2005; 2006).

One older assumption was that adoption singularly ameliorated adverse early experiences in children. Specifically, it was once believed that when orphaned and vulnerable children left their pre-adoptive, developmentally-obstructionist environments and were placed within positive adoptive family environments (i.e., warm, loving, responsive parent[s] who provided good nutrition, quality health care, and cognitive stimulation), their developmental challenges would mostly resolve. Certainly, strong, meta-analytic evidence compiled from hundreds of studies (e.g., Juffer et al., 2011; van IJzendoorn & Juffer, 2006) does support that adoption has been, in fact, an enormously successful intervention fostering significant developmental catch-up (i.e., physical growth, attachment, cognition, academic achievement, and behavioral challenges). Yet, while intercountry adoptees reportedly outperform institutionalized peers left behind in orphanages/foster care, there are still trends of them failing to match neverinstitutionalized peers in domains such as physical growth and attachment with adoptive

parents(i.e., Fox et al, 2011; Nelson et al., 2007; Sroufe, Egeland, Carlson, & Collins, 2005; van IJzendoorn & Juffer, 2006; Zeanah et al., 2003).

Along with placing great therapeutic power in the act of adoption, this older assumption also reportedly fostered a sense of blame towards adoptive parents when children's developmental challenges (i.e., fetal alcohol spectrum disorders [FASD]; attachment problems; behavioral issues) would linger (Grotevant & McRoy, 1990; Wegar, 2000). Often, adoptive parents have noted feeling blamed for children's difficulties, especially by the very family members, friends and professionals that they expected would be supportive to them such as the adoption social worker, pediatrician, mental health professional, educators, or adoption researchers (Wegar, 2000).

For example, a mixed methods study of UK adoptive parents raising children with FASD (N = 66) discussed their perceptions of what others around them believed to be important characteristics required to be a good parent to a child with the disorder; they also reported on their parental stress as measured by the Parenting Stress Index [PSI]), knowledge about FASD, and the type of supports that they experienced since adopting their child (Mukherjee, Wray, Commers, Hollins & Curfs. 2013). Thematic analyses of focus group statements noted that a primary theme surfacing for many parents was feeling misunderstood and blamed (i.e., challenges related to poor parenting) for their child's developmental challenges/behaviors. This was particularly poignant when dealing with uninformed professionals working with them and their children. These two themes were also found to be contributing factors to parental stress/pressure. These results were supported by other mixed methods/qualitative studies of adoptive parents raising children with FASD (Brown, Sigvaldason & Bednar, 2005; Caley, Winkelman & Mariano, 2009).

The theme of blame has also been theoretically linked to the concept that children's lingering challenges relate to the failure of adoptive parents to accept their children's differences from them in personality, intelligence and other physical characteristics through attribution theory (Grotevant & McRoy, 1990). Attribution theory (Heider, 1958) emphasized that adoptive parents often blame problems of the child/family on the adoptee's poor genetics and early traumatic life experiences versus being able to see where their own parental shortcomings contribute to adoptees' challenges (Grotevant & McRoy, 1990). This older assumption, while still prevalent, has evolved into a far more complex view of the adoptive child and family that holistically takes into account influences of such factors as epigenetics, children's biological sensitivity to context, prenatal exposure to teratogens/toxins, and early social-emotional or global deprivation (McCall, 2011).

Much of the current meta-analytic evidence does indicate that previously deprived children experience huge strides in growth catch-up within short time periods postadoption (Colvert et al., 2008; Juffer et al., 2011; Kreppner, Rutter, Beckett, Castle, Colvert, Groothues, et al., 2007; Rutter, Beckett, Castle, Colvert, et al., 2009; Van IJzendoorn & Juffer, 2006). For example, after living in their adoptive families for as little as 1 year, post-adoption assessments of ICA children who left care at 6 months of age or earlier displayed fewer behavioral and other developmental differences than their never-institutionalized, same-age peers (e.g., McCall, 2011). Yet, catch-up in some domains has been more limited or mixed related to growth following adoptees' rapid catch-up spurt from stunting, gross motor, executive functioning, memory, stress response modulation and self-regulation (Bos et al., 2009; Bruce et al., 2002).

An argument could be made that catch-up results may be biased, as it may overestimate children's capacity for adaptation and resilience due to the healthiest children often being the ones typically adopted by advantaged adoptive families; some argue that it is those orphans that have been left behind that were more likely to have experienced greater challenges (Dozier, Zeanah, Wallin, & Shauffer, 2012). Yet, it is likely that this is not uniform across all ICA children's outcomes but more relevant under circumstances where parents in the pre-adoption stage go into care environments without referrals with the intent to "choose" children (personal communication, V. Groza, December 24, 2014).

Specific to differences between individual children, it has been reported that some ICA children just seem to fare better developmentally than others (e.g. Dobrova-Krol, van IJzendoorn, Bakermans-Kranenburg & Juffer, 2010; Groark, McCall, Fish, & The Whole Child International Team, 2011). Three possible explanations for these differences may relate to children's unique genetic influences, their epigenetic influences, as well as their own biological sensitivities to context.

The notion of the biological sensitivity to context validates that individuals not only vary in their degree of vulnerability to the negative impacts of early adversity but also to their level of developmental plasticity (Boyce & Ellis, 2005). ICA children with greater plasticity are likely to have more sensitivity to both the negative (harsher) and positive (more nurturing) environmental caregiving influences -and- those children with lower susceptibility will be less impacted by environmental caregiving influences (Boyce & Ellis, 2005). Despite this individual variability, the themes of negative developmental

outcomes still tend to surface more in reference with ICA children that had a history of institutionalization than those without a history of institutionalization.

Sources of Adoption for US Families

In the U.S., there are four sources of adoption. First, there are step-parent adoptions. Second, there are infant adoptions, handled mostly through attorneys and private agencies. Third, there are adoptions of children from the public child welfare system. And fourth, parents can adopt through ICA. Excluding step-parent adoptions, the 2007 National Survey of Adoptive Parents indicated that there were almost 180,000,000 adopted children in the United States ranging between the ages of birth and 17 years (Bramlett, Foster, & Frasier, Satorious, Skalland, Nysse-Carris, 2010). Approximately 37% of these children were adopted from the public child welfare system, 38% through private domestic adoptions, and 25% through ICA.

Private adoptions, adoption from foster care, and ICA are continuously evolving, often dependent upon varying world circumstances, such as changing domestic and international laws, societal attitudes of sending and receiving countries, and the overall state of nations (i.e., financial; victims of war or natural disaster; availability of children considered to be desirable for adoption) (Bramlett et al., 2010). Which route prospective adoptive parents take to adoption often depends on what motivates them to adopt (i.e., altruism; wanting to increase the size of their family; infertility) as well as the resources they have available (i.e., financial; social class membership).

Adoptive parents often have multiple motivations for adopting such as altruism (i.e. provide a permanent home for a child in need), a wish to have more children, and/or they had a history of primary or secondary infertility (Malm & Welti, 2010; Bramlett et

al., 2010). Using the 2007 National Survey of Adoptive Parents data (2010), Malm and Welti (2010) noted that infertility was most significant for private domestic adopters; their motivation in choosing this type of adoption was significantly related to them wanting a healthy infant. Those adopting domestically from foster care relayed that decreased cost for the process (versus ICA or private adoptions) as well as thinking that they would have a child placed with them sooner motivated their adoption choice. ICA parents reportedly worried about challenges associated with domestic adoption like placements falling through, not being able to adopt an infant, or being able to have a closed adoption (Malm & Welti, 2010). Yet, other motivating factors, like race, gender, social class membership and religious beliefs, have also been noted to catalyze what type of adoption prospective parents pursue (i.e., Gaily, 2010; Joyce, 2013).

Gailey (2010) noted how differences in prospective adoptive parents' race, social class, and gender influenced their paths in adoptive family formation. To discern definitions of kinship and family as well as to understand why some children have been preferred for adoption (i.e., "Blue-Ribbon Babies" or healthy Caucasian babies [p. 104]) over others (i.e., children of color; children with disabilities), Gailey conducted 131 indepth interviews and observations with demographically diverse populations of adoptive parents (i.e., single/two parent; lesbian/heterosexual; African American/Caucasian; private, public, transracial, or ICAs). She found that some adoptive parents were able to build family bonds that challenged blood-line kinship and social class ideologies; yet others expressed worry about whether they and their adopted child could build a typical American family representative of their social class.

The researcher noted that public agency adopters were found to be the most ethnically diverse, received the greatest amount of pre-adoptive training when compared to other adopters, and shared more in common in term of social class characteristics with adopted children's birth families. She also linked ICA to social class, noting that due to ICA often costing tens of thousands of dollars, it was a method of family-building broadly out of reach to even many middle class families. She described ICA as the ultimate, "Global Search for 'Blue-Ribbon Babies'" (p. 79).

Joyce (2013) added that despite the great monetary expense, the motivation to pursue an ICA by some prospective parents has been catalyzed via religious beliefs and the financial backing of spiritual communities. She described the Evangelical Protestant Christian adoption movement in *The Child Catchers: Rescue, Trafficking, and the New Gospel of Adoption* as a religious belief system of adoption, viewing family-building via ICA as a spiritual life mission. Rather than being motivated by circumstances like infertility, these prospective adoptive families often already have birth children and typically complete their ICA with the financial assistance of their church (Welsh, Viana, Petrill, & Mathias, 2008). Adoptive parents subscribing to the theologies of the Evangelical Protestant Christian movement reinforce intent to care for and serve the best interest of the child, aligning to the humanitarian roots of ICA.

Historically, there has been a broad spectrum of views related to the topic of ICA, ranging from highly supportive to highly critical. Those who support ICA view the adoption of millions of children throughout the world without parental care as a socially-responsible way of building a family (e.g., *see* Bartholet, 2007). Conversely, those highly critical of ICA view this practice as imperialistic, where the natural resources (i.e., their

children) of vulnerable and lower resource countries (i.e., war; natural disaster; restrictive national family policies; and/or extreme poverty) are robbed by entitled prospective adoptive parents from high resource countries (Bunkers, Groza, & Lauer, 2009). Inequality also underlies the relationship between birth and adoptive parents, as poverty often fuels birth parents' decisions to relinquish child(ren) for ICA. Across many sending cultures, the relinquishment of children by birth parents holds a very different meaning from high resource receiving countries. For example, relinquishment/adoption is often perceived as a temporary care solution where the child's reunification with birth family members remains an option at a later time (Rotabi & Gibbons, 2012). Yet, adoptive parents from high resource, receiving countries often define relinquishment and adoption as the formal and permanent legal transfer of parental rights and responsibilities with the child having no further contact with his/her biological family members (Roby & Ife, 2009).

Other recurring themes in the ICA and human rights literatures discuss ICA as a practice that commodifies children, supports corruption, and bears little distinction from child trafficking (e.g., Dubinsky 2007; Kapstein 2003; Rotabi & Gibbons, 2012; Smolin 2007). Bruening (2013) relayed that credibility for these arguments is strengthened by historically poor regulation of ICA via international policy, as applicable laws such as the Hague Convention on Intercountry Adoption only apply when adoptions take place between sending and receiving countries that have acceded to them.

Foundational in such ICA policies is the notion that decision-making must be carried out in the best interest of the child, a concept that is complex to define in practice (Mezmur, 2009). For example, ICA not only removes children from their birth culture,

but it also separates them from any possible reunification with birth parents/extended kin family. Yet, is removal from their birth culture and the possibility of reunification with birth family a greater detriment to child well-being when the alternative is long-term placement in an institution without a family (Mezmur, 2009)?

ICA has not always been associated as imperialistic and as a commodification of children; it historically began as a movement of humanitarian aid. The origins of the various views about ICA can be traced throughout the following five historical waves of ICA: 1) The humanitarian rescue of war orphans; 2) Latin America and a response to chronic poverty/civil war; 3) former Communist Bloc countries in the aftermath of political chaos and change; 4) China and family policy; and, 5) Africa as unregulated low resource countries

Five Historical Waves of ICA

ICA Wave I — Humanitarian Rescue of War Orphans. The first wave of ICA began in at the end of World War II and extended through 1958. It included displaced children from Poland, Germany, Greece, Italy, Belgium and Japan and was the beginning of a growing acceptance of transracial adoption in U.S. families among mostly white, heterosexual, childless couples (Fehrenbach, 2005). The stationing of American GIs overseas increased awareness about the plight of these children; yet GIs also added to the orphan crisis by fathering children (which they abandoned) with women in Germany, Japan, Korea and Vietnam (Selman, 2009). The post-war baby boom raised affection for large families in the U.S., but also stigmatized childless families—both of which promoted ICA (Carp, 2002).

Harry and Bertha Holt (Holt International) pioneered the ICA movement during the Korean War in an attempt to help place more than 100,000 war orphans left without parental care (Kim, 2007); many were children of American GIs and Korean women. At that time, children of Korean mothers and American GI fathers would reportedly have had a highly stigmatized life in Korean culture due to a stereotypic assumption that they were illegitimately conceived in a state of parental infidelity. Their distinct physical features would have made their parentage and ethno-racial differences from mainstream culture obvious (Kim, 2007).

Between 1955 and 1970, more than 80,250 children were abandoned; 21,890 children were adopted by U.S families from Korea (Kim, 2007). Sex preferences for sons and the restriction on family size fueled the availability of predominantly female Korean children and Korea has remained one of the top sending countries of ICAs, with more than 160,000 adoptions by U.S. families between the years 1958-2007 (Kim, 2007). Korean ICA marked the first period where large numbers of U.S. families and bi-racial orphans became transracial ICA families; between 1966 and 1981, the U.S. continued to adopted bi-racial European children fathered by U.S. African-American servicemen (Simon & Alstein, 1991). Humanitarian rescue missions later took place related to the Vietnam War (1972- 1975), with U.S. families adopting 2,070 Vietnamese children (Gailey, 2000).

Although the pattern of adopting children abandoned by Vietnamese mothers and American GI fathers began as another post-war American humanitarian effort, it was found that U.S.-Vietnamese ICAs later became plagued by exploitative adoption practices. The demand for adoptable children by high resource receiving countries, a

failure by the Vietnamese government to prevent adoption officials from corrupting the pre-adoption process, and allegations of child trafficking led the U.S. State Department in 2003 to halt ICA between the Republic of Vietnam and the U.S. In negotiations to resume ICA between the Republic of Vietnam and the U.S., the U.S. State Department required reform of Vietnamese child welfare system practices paired with the signing of a bi-lateral adoption agreement between the two states. As the Republic of Vietnam was not yet a party to the Hague Convention, the purposes of this were to incorporate similar safeguards for children that were already in place for other countries who were a party to the existing ICA agreement.

The U.S.-Vietnamese Adoption Agreement (UVAA) was signed in 2005 (Agreement Between the United States of America and the Socialist Republic of Vietnam Regarding Cooperation on the Adoption of Children, U.S.-Vietnam, June 21, 2005, Hein's No. KAV 7494). Following this, the adoption of Vietnamese children by Americans resumed, only to be stopped by the very problems responsible for previously halting ICAs. In 2008, reportedly unbeknownst to the U.S. State Department, U.S. adoption agencies and adoptive parents, child trafficking practices and infant kidnapping were found to be involved in a large number of U.S.-Vietnamese ICAs (Graf, 2010). As a result, the U.S. government refused to renew the terms of the UVAA with the Republic of Vietnam and ICA doors closed in 2009 to American applicants (U.S. Department of State, accessed February 22, 2014 at

http://adoption.state.gov/country_information/country_specific_info.php?country-select=vietnam).
ICA Wave II-- Latin America. In the 1970s, three factors influenced Latin American ICAs: extreme poverty, political instability, and a shortage of white babies for domestic adoption in the U.S. (Lovelock, 2000). Latin American sending countries included Guatemala, Colombia, Mexico, Haiti, Brazil, Chile, El Salvador, Peru, Paraguay, Honduras, and Costa Rica. This Wave was initially rooted within a humanitarian base – specifically, ICA was reportedly established to provide an additional child welfare option for Latin children not being placed in country (United Nations Children's Fund International Child Development Centre, 1998).

Historically, Guatemalan children who were living outside of parental care have either been taken in by extended family/kin, grew up in orphanages/institutions typically ran by the Catholic clergy, or were placed in family foster homes. Particularly within Guatemalan indigenous communities (i.e., Mayans), orphaned and abandoned children were more likely to remain in kinship care, whether within their extended biological families or with those in their community who were "like family" (kin). Often, if parents were required to migrate for employment purposes, children were also cared by kin within their indigenous community (Lindstrom, 2003). Other children who lacked parental care have typically been placed in private orphanages/institutions or placed in family foster care.

Prior to 2008, there was little formal research reporting on Guatemalan institutions or the children living in them. In 2008, Perez conducted an assessment of 133 institutional facilities in Guatemala, finding that most were ran/owned by private organizations; as such, these facilities were also exempt from having to maintain any kind of international care standards (Perez, 2008). The most common reasons stated for

children's institutionalization were parental abandonment (25%) or family violence (21%); once placed in care, these children often remained there throughout their childhood/adolescence. Out of the almost 6000 children who were living in institutional care in Guatemala in 2008, Perez estimated that almost one third of them had legally been declared permanent residents of the facility. Most permanent residents (82%) were older children whose ages ranged between 7 and 18 years of age (Perez, 2008).

A third form of living arrangement for children who lacked parental care in Guatemala was family foster care. Bunkers et al (2009) noted that of the several practiced models of foster care, most were "…renegade foster homes created to feed the international adoption market… [where] …carers were not evaluated, trained or monitored [and were] procured by attorneys to care for the infants and toddlers who would leave the country" via ICA (Bunkers et al., 2009, p. 653). Humanitarian motivations were being replaced by a supply-and-demand dynamic for adoptable children on the black market (Selman, 2006).

Black market exchanges grew within Latin America (i.e., women living on "baby farms"), as ICA was still a globally-unregulated practice (Lovelock, 2000, p. 929). For example, in Guatemala there were very few ICAs to the U.S. in 1996 ($N \approx 400$); yet by 2007, ICA rates grew to almost 5,000 children (Roby & Shaw, 2006). As the demand from U.S. adoptive parents increased, there was a rise in the number of Guatemalan children being "supplied" (Roby & Shaw, 2006). ICA supporters argued that Latin-America's less restrictive pre-adoptive screening policies (i.e., no rigorous home studies required) opened a greater potential for the adoption of harder-to-place children with

parents who would have typically been denied approval for domestic U.S. adoption (i.e., older/single parents; gay/lesbian singles and couples) (Lovelock, 2000; Selman, 2006).

Concerns about human rights violations and unethical ICA practices prompted global policies to be drafted for regulation (e.g., Inter-American Convention on Conflicts of Laws Concerning the Adoption of Minors [1984]; the United Nations Convention of the Rights of the Child [1989] and the Inter-American Convention on International Traffic in Minors [1994]). As the U.S. position on ICA remained that the practice rescues orphaned children from adverse environments, the U.N. argued that the practice was not always in the child's best interest. In response, the United Nations Convention on the Rights of the Child (1989) was developed followed by The Hague Convention on the Protection of Children and Co-operation in Respect of Intercountry Adoption (1993) to promote standardization of ICA as well as to further address human/child rights and ethical considerations linked to ICA.

The Hague Convention provided the following guidelines. First, ICA placement must be child-driven, not adoptive family-driven. Second, responsible governmental agencies must determine and document that birth family decisions for placement were freely made, not while under emotional or financial duress, and without any inducement. Third, all legal guidelines for ICA must be enforced and a centralized system established to monitor all adoptions. Fourth, it is preferable to lend financial support for kin placement versus remove children from their homes for ICA. Fifth, children should be placed within their own birth country in family-based care before resorting to ICA. Sixth, adoptive parents and children must be adequately assessed and professionally matched to determine whether placement together is in the best interests of the child. Adoptive

parents cannot choose the adoptee. Seventh, the adopted child has the right to experience their cultural/ family history; as placement in the child's birth culture would make this more easily accessible, domestic adoption is preferable to ICA. Behind many other countries, the Hague Convention was ratified by the U.S. in December, 2007 (U.N., 1993; 2007).

Prior to 2008, the country of Guatemala was extremely vulnerable to the corruption of ICA, influenced by high poverty, high birth rates, political unrest, and child malnutrition rates as well as an ineffectual child protection system --each contributors to a culture of family violence and disintegration, child abuse/neglect and abandonment, and significant school drop-out rates for youth. For example, in Guatemala, almost half of all pregnancies took place out of wedlock, the country had the highest birth rate in all of Latin America, and mothers had on average 4.4 children each (6.1 children/mother in indigenous populations) (Marini & Gragnolati, 2003). The country's infant (24/1000 live births) (CIA Factbook, accessed February 16, 2015 at cia.gov/library/publications/the-world-factbook/fields/2091.html) and maternal mortality (140/100,000 births) (World Bank, accessed February 16, 2015 at

http://data.worldbank.org/indicator/SH.STA.MMRT) rates were extremely high and 49% of all Guatemalan children were chronically malnourished (70% in indigenous populations) (Bunkers et al., 2009). Ziegler (2006) reported that 70% of indigenous and 36 of non-indigenous (Ladinos) Guatemalan children had also experienced the long-term effects of malnutrition resulting in overall developmental growth stunting.

Between 1996 and 2007, the Guatemalan child protection system met such challenges by using ICA as a primary social welfare intervention. Few other support

programs were in place to keep Guatemalan families together, as outlined by part of what The Hague Adoption Convention defined as the "best interest of the child". As such, many Guatemalan parents saw ICA as their only option if they were unable to care for their children (Bunkers et al., 2009).

In 1996, 731 Guatemalan children were adopted via ICA; by 2002, the numbers of children leaving Guatemala through ICA increased four-fold (N = 3289). Additionally, in 2005 it was reported that only 2% of all adoption cases in Guatemala were conducted domestically; ICA accounted for the other 98% (Procuraduría General de la Nación [PGN], (2007). Such ICA trends raised suspicions of corruption, parental coercion, baby buying, kidnapping and child trafficking. In an attempt to quash suspicions, Guatemalan government officials agreed to ratify the Hague Adoption Convention (1993); this was met by the objections of several receiving countries (i.e., Canada; Germany; the Netherlands; Spain; the United Kingdom) due to their concerns of illegal and unethical adoption practices in Guatemala.

Within one year, the Constitutional Court of Guatemala overturned their Hague Adoption Convention ratification and resumed private ICA, but only with the U.S. The U.S. reportedly continued such ICA practices because they had only signed, but not ratified the Hague Adoption Convention—as such, the U.S. would not use alleged violations of the Hague Adoption Convention to halt ICA with Guatemala. Other Hagueratifying countries refused to conduct ICAs with Guatemala. One practice that was put into place in 1998 to counter ICA exploitation was the U.S. Embassy's requirement that DNA testing be done on all ICA infants/children and their relinquishing birth parents. This, of course, was only effective in cases where birth parents could be located and

depended on ethical behaviors of adoption/orphanage professionals involved in children's care.

Suspicions of corruption and child trafficking arose again in 2007 when out of 5,577 Guatemalan children adopted via ICA, 4,726 had been placed in U.S. homes (U.S. Department of State, accessed March 2, 2014 at

<u>http://adoption.state.gov/about_us/statistics.php</u>). Further investigations produced strong evidence of ICA black market baby buying, where traffickers recruited or kidnapped infants and young children, particularly in extremely impoverished and isolated areas of Guatemala (Brandeis University Schuster Institute for Investigative Reporting accessed on March 2, 2014 at <u>http://www.brandeis.edu/investigate/adoption/guatemala.html</u>).

In 2007, the U.S. Embassy in Guatemala required that a second DNA test be conducted to validate that the child being adopted via ICA was then same child tested at relinquishment (Bunkers et al., 2009). In the same year, the Guatemalan government again undertook additional revisions of ICA legislation and practices, intending to meet the Hague Adoption Convention guidelines. This legislation established a new central adoption oversight bureau and additional safeguards to protect children and families from exploitation/unethical practices it also required a ceasing of all ICA with the U.S. in January, 2008, as the receiving country had yet to ratify the Hague Adoption Convention.

Those adoptions that were already in process with U.S. families (N = 2000) were allowed to continue, but were held under much closer scrutiny (i.e., Guatemalan officials required in-person interviews with birth mothers; conducting a round of DNA testing of those children in care to determine whether they matched birth parents who reported their child as kidnapped). In January of 2008, the U.S. announced that it would not further

conduct ICA with Guatemala until there was complete compliance with the Hague guidelines; if/when that occurred, only a few U.S. adoption agencies would be given permission to conduct adoptions in Guatemala. Referrals would be made to those approved agencies directly from Guatemala's central adoption oversight bureau, ending all privately-facilitated ICAs; this would also only be after appropriate attempts had been made to domestically place the child within his/her community, using ICA as a last resort. In April of 2008, the U.S. finally ratified the Hague Adoption Convention, 14 years after the country had originally signed the treaty (U.S. Department of State, accessed March 2, 2014 at http://adoption.state.gov/about_us/statistics.php).

ICA Wave III--Former Communist Bloc Countries. The third wave of ICA to the U.S took place among former Communist Bloc countries that were moving from state economies to market economies following the end of the cold war. Between 1996 and 2009, there were 89,320 children adopted from the former U.S.S.R. by U.S. parents; during that time, the four top sending countries in this region were Russia (N = 48,718), the Ukraine (N = 7,978), Kazakhstan (N = 6,222) and Romania (N = 4695)—all former Communist Bloc countries (Selman, 2012).

Secluded from newer research on child protection and western psychology that reported on the negative effects of institutionalization on young children, such isolation fostered poorly-informed social policies regarding child development and the care of orphaned and abandoned children (Nelson, Fox & Zeanah, 2014). Subscribing to Soviet doctrine that subjugated the individual for the broader good of the state, communal care for orphaned and abandoned children also promoted greater governmental control over weeding out which citizens would be productive versus unproductive (future) workers in society (Popa-Mabe, 2010).

An example of such governmental control over the lives of children and families within a communist Bloc country was witnessed during the 34-year Communist reign of Romanian dictator, Nicolai Ceausescu. In the 1960's, Ceausescu wanted to boost Romanian industrial productivity by increasing the country's work force. Despite the fact that many families were impoverished and had few resources to support more children, Ceausescu banned contraception and abortions to support population growth, imposing a "celibacy tax" on families with less than five children. This resulted in massive numbers of children being abandoned to State institutions (Groza, Ileana & Irwin, 1999).

The institutionalization of children was encouraged by the Romanian government, as the dominant ideology was that the State could do a better job raising these children than would their impoverished parents (Nelson et al., 2014). Following the fall of Ceausescu's regime, international media began exposing how children were being raised among inhumane conditions within Romanian institutions; such media exposure rallied the need for adoptive families for the country's orphaned children. Simultaneously fueling ICA, there had been another decline in the number of preferred, white babies available for adoption in the U.S. paired with an enforcement of tighter domestic adoption restrictions (Pertman, 2000).

After the fall of Ceausescu's 34-year regime, Romania opened its doors globally to ICA in late December 1989 (Nelson et al., 2014). Between 1994 and 2000, more than 12,000 ICA adoptions were completed in Romania; of those, the U.S. had adopted about 4, 695 children (Johnson, 2005; Pertman, 2000). Although Romania had previously

signed and ratified both the CRC (1990) and the Hague Convention (1995), the country's legislations and practices related to ICA were not reflective of the provisions relayed in the two conventions. For example, during the late 1990's, the Romanian ICA system had become very corrupt and was poorly regulated, prompting the emergence of a baby trade. Individuals who were technically held outside of the guidelines of the CRC and Hague Convention were procuring children for international, private adoptions. Cash negotiations were taking place for the private adoption of children between brokers and impoverished birth families which resulted in adoptees technically never having entered the Romanian child welfare system (i.e., Roby & IIfe, 2009). The system violated CRC and Hague guidelines and committed human rights violations by doing the following: prioritizing adoptive parents wishes over the best interest of children; prioritizing ICA over domestic adoption (i.e., in the year 2000, 3035 children were adopted via ICA versus 1,219 domestic adoptions); and by profiting from conducting ICA with children who were technically never adoptable in the first place (Iusmen, 2013).

Such corruption led to a moratorium of ICA in 2001, stimulated by pressure from the European Union (EU) through an anti-ICA policy placed on the country of Romania. More specifically, when Romania applied for membership to the EU in 2001, the governing body who managed the pre-accession process (i.e., the European Commission) made the country's acceptance conditional on whether they reformed their child protection system and ICA human rights violations to be in line with the practices of EU Member States. Between 2001 and 2004, the Romanian government did move towards a family-based care system for orphans, reducing the numbers of children being cared for in institutions by 50% (United Nations, 2004). The new legislation adopted by the

European Commission in 2005 that resulted was considered to be innovative and a potential model for West Europe States; it maintained the ban on ICA, as no other EU Member State expatriates its children (Iusmen, 2013). Other former Communist Bloc countries, like Russia, have shared some similar experiences to Romania.

Much political and economic upheaval followed the breakup of the former Soviet Union (USSR), leaving many families in extreme poverty and thousands of orphaned children left in the care of the State's ill-equipped, institutional system. In 1991, overflowing orphanages prompted Russia/the Russian Federation to open their country's door to ICA. Russian children adopted through ICA to the U.S. peaked in 2004 (N = 5,862). Yet, there has been a significant decline since that time; in 2012, only 749 Russian children were adopted by American families.

Although ICA to the U.S. has declined for most sending countries since 2004, Russian adoptions have also been impacted by several highly charged media cases (e.g., *see "North Carolina Woman Admits Killing Adopted Russian Daughter"* [by T. Vargas, Washington Post, March 2, 2006]; *Mom Gets Prison for Killing Toddler*, [by J. Belnap, Toole Transcript Bulletin, October. 14, 2008]; *World of Grief and Doubt After an Adoptee's Death* [by R. Swarns, New York Times, August 31, 2013]; *Lawmakers Demand Stop to Parents Giving Away Adopted Children on the Internet* Reuters/NBC News, October 29, 2013]; *Adopted Boy. 7. Sent Back. Outraging Russia* [by C. Levy, New York Times, April. 10, 2010]). More than 20 cases related to adoptive parents abusing, neglecting, placing adoptees on a return flight back to their birth country, or them dying while in their family's care have been reported between the years 1990 and 2012. In the majority of the child death cases, parents have been charged with crimes that ranged from child endangering to first-degree murder.

The abuse, neglect, and/or death of Russian adoptees prompted a closer look at ICA practices between the U.S. and Russia. Following the unsupervised return of 7 year old Russian adoptee, Artyom Savelyev (a.k.a. Justin Hansen) to his birth country, negotiations began between the U.S. and Russia to strengthen ICA procedures. In 2011, an agreement was signed by U.S. Secretary of State Hillary Clinton and Russian Foreign Minister Sergei Lavrov that would take effect on November 1, 2012 (Agreement between the United States and the Russian Federation Regarding Cooperation in Adoption of Children, U.S.-Russia, July 13, 2011). Yet, before the agreement could be implemented, another incident of a Russian adoptee's death resulted in a changing policy. On December 28, 2012, Russian President Vladimir Putin signed the Dima Yakovlev law, banning all American parents from adopting Russian children via ICA. This law was named in memory of the Russian-American adoptee (a.k.a. Chase Harrison) that had died in 2008 of hyperthermia—the sleeping boy was forgotten about in a hot car by his adoptive father who absent-mindedly failed to drop him off at daycare before work. The Russian government was reportedly furious when U.S. courts acquitted Miles Harrison, Dima's (a.k.a. Chase) adoptive father, of manslaughter charges (Barnes, 2013).

The Dima Yakovlev law is also known as the Anti-Magnitsky Act, as it was signed 14 days after U.S. President Barack Obama signed the Magnitsky Act. Sergei Magnitsky was a Russian attorney who reportedly died in a Moscow prison after waiting for 11 months to be tried for tax fraud. The day prior to his arrest, Magnitsky exposed Russian officials that had reportedly embezzled more than \$230 million of the State's

money. At the time of his death, the Russian government issued a formal statement that the lawyer's death resulted from health issues that he suffered while in prison. Yet, a 2012 follow-up report by the Kremlin's Human Rights Council concluded that Magnitsky had actually died from injuries sustained during a beating by prison officials' just hours before his death. The Dima Yakovlev law was perceived by Americans as a retaliatory act on the part of Russian leaders for the Magnitsky Act. The Russian Parliament deemed the Magnitsky Act to be an extremely unfriendly gesture towards their country's leaders, as it froze financial assets and banned the approval of U.S. visas for Russian officials who were involved in human rights violations.

Currently, the ban on Russian ICA to the U.S. is still in effect. Some of the adoptions that were in process when the legislation was first signed by the Russian Parliament were able to be completed. As the ICA doors to Russia have closed, many prospective American adoptive parents have pursued adoptions in China or in African countries. *ICA Wave IV—China.* China has historically held the tradition of minimal state involvement and the use of informal extended family/kin networks to care for its orphaned and abandoned children. Prior to 1980, family foster care was more commonly used to tend to orphaned and abandoned infants, particularly in the more rural areas of China. This traditionally included the use of wet nurses as a method of care to promote abandoned children's survival. Chinese culture encouraged wet nurses to see/treat those children in their care as they would their own biological offspring; additionally, children were expected to regard their wet nurses with the same level of respect as they would their birth parents (Shang & Wu, 2003).

In 1980, under a communist system of government, institutionalization of orphaned and abandoned children in China became preferred over family foster care, particularly in more urban areas (Shang & Wu, 2003). Similarly to communist countries of Eastern Europe, the Chinese government reinforced that the State was more capable of providing the kind of care needed by orphaned and abandoned children. As such, foster care policies became extremely controversial child welfare issues; in more rural areas where foster care continued out of necessity due to a lack of institutional care, it had to be strongly defended by those providing family foster care services (Shang & Wu, 2003).

In1992, China opened its doors to ICA as a means to address the overflowing numbers of (mostly female) children who were being reared in more than 41,000 orphanages (Gates, 1999; Johnson, 2004; Miller, 2005). In the 1990's, several human rights organizations published reports that exposed horrific and depriving orphanage conditions that abandoned children were living in within the People's Republic of China. Such exposure called for improved conditions within the country's institutional care

environment; it also sent a broader message to the world about Chinese ICA (Miller, 2005). Thereafter, China rapidly grew into one of the top ICA sending countries, with the U.S. reportedly adopting almost 70% of all Chinese ICA children (Selman, 2009). Between 1999 and 2012, 69, 326 Chinese children were adopted by American families (U.S. Department of State, accessed March 2, 2014 at

http://adoption.state.gov/about_us/statistics.php).

In more recent years, China began shifting to a larger practice of family foster care for abandoned children (Johnson, 2004) and nascent domestic adoption; these programs are considered to still be in their infancy. This shift began around 2004. Often what motivated Chinese citizens to become foster parents was the opportunity to have a second child after living under the country's One Child Policy (Glover, 2006). Yet, Liu and Zhu (2009) noted a disparity in those children who were being assigned to foster care versus traditional institutional care. The children who were being placed in family foster care were mostly those with the most promise for adoption, as they were younger, more physically healthy, and with minimal degrees of developmental disabilities. Conversely, almost 90% of those Chinese children who remained in institutional care had moderate to severe disabilities and were perceived as having little chance of being adopted domestically or via ICA (Liu & Zhu, 2009).

Although adoptions had been taking place by American families since 1988 from the People's Republic of China, it officially opened its doors to ICA in 1992 when 206 children were adopted by U.S. citizens. In 2006, this number grew to 6500 mostly-female children, as many of them became available for ICA due to the government's enforcement of the One Child Policy (Davies, 2011). This legislation was implemented in

an attempt to reduce the country's growing population which was fraught with high rates of poverty and hunger (Poston & Glover, 2006). When the One Child Policy was violated, the Chinese government reportedly sentenced violators to severe consequences like forced abortions, sterilization, infanticide, substantial financial penalties, and/or the confiscation of personal belongings (Johnson, 2004).

The One Child Policy influenced China's domestic adoption policies but also catalyzed ICA. For example, in 1991, China passed its first national legislation that limited domestic adoption to only include legally married heterosexual, childless couples over 35 years of age. Although many childless married couples existed in China, the parameters of this legislation eliminated a large pool of potential adoptive parents. Also limiting the pool was the fact that becoming a first-time parent at the age of 35 years was less socially-acceptable in Chinese culture (Johnson et al., 1998). Arguments have been made that the only purpose of this adoption policy was to do the following (Johnson, 2004, p. 389).

...provide birth-planning officials with additional regulatory weapons to shore up the One Child Policy by eliminating adoption as a potential loophole for those who sought to hide the birth of a child, typically a daughter, in order to try again to have a son over quota.

Concurrently opening the doors to ICA was a way to offset the legal closing of doors to domestic adoption/enforcement of the One Child Policy. American parents were typically older, economically stable and infants has always been in high demand by adoptive families. Legally limiting prospective families that wanted to domestically adopt

abandoned Chinese children was certainly not in line with the best interest of the child as referenced in The Hague Adoption Convention.

The law did promote two things: first, receiving country homes to children who would have likely remained in China's institutional care; and second, financial assistance to orphanages that provided care for abandoned children. For example, as of 2004, it was estimated that each Chinese ICA by American families provided a required orphanage "donation" of \$3000.00 per child; adopters also spent approximately \$2000 in country during their stay (Johnson, 2004). Arguments have been made that the revenue raised through ICA has been fairly insignificant in the context of the broader Chinese economy (Andrew, 2007). Yet, such donations have reportedly made a significant difference to those institutions caring for children/conducting ICA in order to make physical improvements and provide better staffing.

In 1998, efforts were made to increase the rate of domestic Chinese adoptions by revising the parameters of the national adoption act. Parental age parameters were lowered to 30 years and adoptions were permitted by those families who already had children. The policy was loosened for children who were orphaned due to parental death or had special needs (Sheng, Zang & Zhao, 2013).

The overwhelming numbers of abandoned Chinese daughters placed in State care within The People's Republic of China was not only impacted by the One Child Policy, but also the cultural role of Chinese sons. The importance of sons in Chinese culture was rooted in their role of carrying on the family name/bloodline as well as them (and their wives) historically being responsible for the care of their aging parents (Johnson, 2004). Prior to the enforcement of the One Child Policy, it was the norm for one daughter to be

welcomed into Chinese families; but, the second would often be abandoned. Daughters were expected to join their husbands' families, live married life within the home of their husband's parents, and provide needed hands-on care to them in their old age. Yet after the one child law was enforced, even when Chinese parents *wanted* a daughter, they *needed* a son (Johnson, 2004).

In the years to follow, prospective American ICA parents reportedly perceived China's loss as their gain. Five examples of this have been noted in the literature: first, prospective parents saw the act of ICA as a humanitarian effort--they perceived that they were saving the lives of Chinese children by building a family via ICA (Johnson, 2005); second, Chinese ICA opened up more adoption options for prospective parents who were previously denied approval for U.S. domestic adoption because of age and marital status limits (i.e., over 35 years of age; single) (Andrew, 2007); third, prospective parents relayed peace of mind in the fact that adoptions were fully finalized by both Chinese and American governments prior to ICA families leaving China; fourth, prospective adoptive parents saw little risk of having to "deal" with birth parents who might resurface for their daughters/sons, as those children made available for ICA were classified by the Chinese government as permanently "abandoned" (Andrew, 2007); and fifth, unlike Cambodia and Vietnam in the early 2000s, prospective adoptive parents perceived less threat of corruption/black market baby dealings with Chinese ICA.

American adoption agencies perceived greater safeguards to ensure that Chinese children who were deemed available for ICA were in fact abandoned. Reinforced in children's adoption dossiers was the confirmation of where/when children were abandoned and what attempts had been made by the Chinese police and orphanage

officials to find birth parents (Andrew, 2007). Yet, between the years 2002 and 2005, baby buying and infant abduction were reportedly taking place in the Chinese provinces of Hunan and Guangdong (Selman, 2009).

Between 2002 and 2005, the Washington Post, ABC News, and the Xinhua News published reports that more than 1000 infants had been trafficked for ICA in the Hunan and Guangdong Provinces of China (The Schuster Institute for Investigative Journalism, Brandeis University, accessed February 12, 2014 at

http://www.brandeis.edu/investigate/adoption/china.html). According to Xinhua in 2005, corruption/profit in the sale of babies was confirmed among 23 public officials, several staff members from six different orphanages, and a number of baby traffickers (see "23 Officials Punished for Child Trafficking", February 26, 2006, *Xinhua*; "China's Lost Children", by B. Loyd, May 12, 2008, *ABC News*). In 2008, it was also found that several orphanages were offering birth families \$300 for their infant daughters (see: "Burden of Birth: A middle-aged woman runs an underground trafficking network that pays pregnant women for newborns and resells them at high prices", by M. Duong and T. Phuoc, February 20, 2008, *Thanh Nien Daily*). Reportedly, male children were being turned away for fear that they had been abducted from birth parents (see "Stealing Babies for Adoption", P. Goodman, March 12, 2006, *Washington Post*).

In 2004, Chinese ICA peaked when 22,991 children were adopted by American families. Although the numbers of children adopted from China have declined since that time, they remain one of the top ICA sending countries to the U.S. for many years standing (U.S. Department of State, accessed March 3, 2014 at

http://adoption.state.gov/about_us/statistics.php). In 2007, greater limitations were placed

on ICA adopters by the Chinese government. For example, prospective adoptive parents must be between the ages of 30 and 50 years of age; be legally married (single females are permitted to adopt a child with special needs); their Body Mass Index must be below 40; they cannot have AIDS, be blind/deaf, have a facial deformity, have received an organ transplant in the last 10 years, or had any psychiatric conditions that required psychotropic medication for more than two years. As tighter restrictions have led to fewer adoptions between China and the U.S., the numbers of children residing in institutional care continues to climb. As in previous ICA Waves, tighter restrictions, adoption moratoriums, and a decreased flow of ICA children from sending countries often shifts the focus of American adoption agencies and prospective adoptive parents.

ICA Wave V-- Africa. Following the closing of the two top sending countries, Guatemala and Russia, paired with China's more restrictive parameters set for adoptive parents, American adoption agencies began to shift their ICA sending country focus to African nations between the years of 2003 and 2010.The HIV/AIDS pandemic, other infectious diseases (i.e., malaria, tuberculosis), famine, and extreme poverty added to an orphan and abandoned children crisis across African, leaving as many as 25% of children without parental care (UNICEF, 2009). Specifically in relation to the AIDS pandemic, it was estimated that 18.4 million children had lost one or both parents (Roby & Shaw, 2008). This factor does not always indicate that children have been placed in institutions, as it has been more commonplace among these African countries for children to live with family members /kin (UNICEF, 2009). For example, 70-80% of children living outside of parental care in Swaziland had been placed within their kinship group (UNICEF, 2009). UNICEF, 2009). The most common factors related to why children have been placed in institutional care relate to parental poverty and/or AIDS-related problems. Many children who are living in institutional care have at least one living parent or extended family member that could care for them if added resources/ supports were made available (UNICEF, 2008). The HIV/AIDS epidemic has moved governments in some African countries (i.e., Ethiopia; South Africa) to consider alternative care options like family foster care and ICA. Additionally, as there are far more African countries conducting ICAs who have not ratified the Hague Adoption Convention Treaty than those who have, there has been much concern that this lack of oversight places already vulnerable children at risk for exploitation.

There are only 13 African countries which have ratified the Hague Adoption Convention (specifically Burkina Faso, Mauritius, Burundi, South Africa, Guinea, Madagascar, Mali, Kenya, Seychelles, Cape Verde, Togo, Senegal, and Rwanda); this accounts for only about 30% of all ICA sending nations in the region (African Child Policy Forum, 2013). From 1996 to 2012, as these African countries ratified The Hague, ICAs in those countries began to drop. Yet, other non-Hague countries have experienced significant increases during this timeframe (i.e., Nigeria; Ethiopia; Cote d'Ivoire; Ghana; and the Democratic Republic of Congo).

The country of Liberia also experienced significant increases in ICA between 2004 and 2006, but later reinforced unilateral measures to quash illegal and unethical adoption practices/trafficking. By 2010, ICA in Liberia had decreased by more than 40% (African Child Policy Forum, 2013). As ratification of the Hague Adoption Convention does not, alone, guarantee that ethical practices, adequate child protection from

trafficking, and the "best interest of the child" will be served (i.e., Guatemala), it does provide an aligning child rights framework in which to balance ICAs; it also serves to support the suspensions and moratoriums of ICAs among ratifying countries when questionable practices occur (African Child Policy Forum, 2013).

Between 2006 and 2011, several African countries have had ICA suspensions and/or moratoriums in order to investigate and/or attempt to resolve questionable practices. For example, in 2006, Madagascar imposed a moratorium just two years after ratifying The Hague which lasted eighteen months. In 2007, Lesotho suspended all ICAs for 18 months, but only in relation to one adoption agency from each of the following four countries: the U.S., Canada, the Netherlands, and Sweden. After adoption agency personnel form Zoe's Ark attempted to move children illegally from Chad to France in 2008, the Republic of Congo and Zambia both suspended all ICAs for 4 months. Also in 2008, the country of Togo suspended all ICAs when evidence that children who were not eligible for adoption were being placed with overseas families due to inadequate background checks. Suspensions were lifted, and the country ratified The Hague in 2010. Although not a Hague country, Liberia issued a moratorium on ICAs in 2009, after longstanding accusations of corruption and illegal adoption practices. The country has since been processing adoptions that were previously initiated before the moratorium, but is still not accepting new applications for ICA. And in 2011, Senegal suspended all ICAs during the month that the Hague ratification was due to go into effect—they did so to implement practices that were in line with the Convention Treaty (African Child Policy Forum, 2013). As Ethiopia has, to date, sent the greatest number of children to the U.S. via ICA, the country's adoption practices have also been scrutinized.

As of 2010, Ethiopia had become the most active ICA sending country in Africa (Bunkers et al., 2009; Rotabi, 2010). Between 2000 and 2012, approximately 13,091 Ethiopian children were adopted by U.S. families. It is likely that the U.S. focused its ICA efforts on this region, as they have yet to sign The Hague Adoption Convention agreement. Because of this, many concerns have been raised about the lack of formal oversight to ensure that children's best interests are being met, particularly in relation to prioritizing domestic over ICA adoption options (Graff, 2010; Rotabi, 2010).

One study conducted in the country's Oromia region found that in 2010, there were a significant number (N = 1,145) of children also being adopted by Ethiopian families (Oromia Bureau of Women, Children, & Youth Affairs, 2012). The study defined these adoptions as formal (63%; n = 724) and informal (37%; n = 421) in nature. They referred to these informal adoptions as guddifachaa (Beckstron, 1972; Bunkers, 2013). Guddiachaa is an Oromia adoption practice where prospective adoptive parents publically pledge their commitment to their adoptive child in front of their community. Parents commit to emotionally wrapping their adoptive children into the larger family as they would any biological child. This ritual typically involves a naming ceremony and has also been incorporated into the Ethiopian court system as synonymous to domestic adoption (Negeri, 2006). Characteristics of the adoptive parents in this study included the following: infertility was their primary motivation for adoption (99%); almost all were non-kin (99%); families were mostly low income-earners; and adopters were typically legally married couples (71%) or single/widowed adults (29%) (Oromia Bureau of Women Children, & Youth Affairs, 2012). Although promising indicators that domestic

adoption was being fostered at least in the Oromia region of Ethiopia, concerns of ICA corruption still existed.

Ethiopia was coordinating its ICAs by providing accreditation to receiving countries' adoption agencies; as a result, the U.S. opened several offices in the region. Rotabi (2010) noted that more than 20 of these U.S. agencies had been suspected of unethical adoption practices. In response, the government of Ethiopia revoked several of the agencies' credentials, yet the action had little effect on the facilitation of ICAs. Due to the rapid increase in the number of ICAs, an overwhelmed Ethiopian government had little resources to enforce these revocations. In response, the Ethiopian government granted far fewer ICAs (U.S. State Department, 2011).

Receiving countries, such as the U.S, argued that this was a contradiction to the very Western definition of the best interest of the child. More specifically, in relation to African nations' kinship care practices, pro-ICA receiving countries have argued that adoption is preferable to long-term kinship/foster care, as only formal, "legal" adoption serves the best interest of the child by providing them true "permanency". This very Western idea assumes that adoption does in fact, in all cases, provide permanency to the adopted child.

The next section will provide a description of institutionalization and family foster care. Although there are a myriad of short and long-term developmental impacts noted in the ICA research literatures associated with early institutional and family foster care (e.g., physical growth delay/stunting; attachment challenges; cognitive, speech/language, socio-emotional delays; risks for early puberty onset; difficulties reading social cues; depression; anxiety) (*for review, see* Juffer et al., 2011; Tottenham,

2012; Van IJzendoorn, Bakermans-Kranenburg, & Juffer, 2007) the following review will be limited to the three salient outcomes related to this study. Those outcomes are as follows: *behavioral problems; self-regulation*; and *children's modulation of their physiological stress responses*.

CHAPTER 2—EXTANT LITERATURE REVIEW

The Effects of Institutionalization and Foster Care on Children

This next section will provide literature reporting common descriptions of institutionalization and family foster care. Following, "age at adoption" will be explored. The age at adoption effect is one of the most robust findings in the ICA research; yet, there have been recent concerns about its common use as a proxy for other ICA constructs potentially leading to spurious conclusions when examining former institutional/foster care children's developmental outcomes (e.g., *see* McCall, 1999). The remainder of Chapter 2 will discuss the developmental impacts of pre-adoptive out-of-home care on children's developmental outcomes specific to this study. It will review the literature related to the effects of institutionalization and foster care on children's developmental outcomes specific to those developmental outcomes. The focus of this review will be on those developmental outcomes most salient to the current study: *behavioral problems, self-regulation*, and *modulation of physiological stress responses*.

Descriptions of ICA Institutional/Foster Care

Pre-adoptive care varies between and within countries (Rosas & McCall, 2010). Gunnar (2001) and van IJzendoorn et al. (2011) classified four levels of institutional care that children have received around the world. Level one depicts a care environment where children are *globally deprived* of basic care needs (i.e., physical well-child care; adequate nutrition; cognitive stimulation; warm and nurturing caregiving). At level two, children are *social-emotionally deprived* where they may receive adequate health and nutritional care, but lack much-needed cognitive stimulation and responsive primary caregiving. At level three, children may only be *deprived of a long-term, consistent* *relationship with one primary caregiver* (Gunnar, 2001). IJzendoorn et al. (2011) introduced a fourth level where children receive health, nutrition, cognitive stimulation and warm, long-term caregiving relationships, yet are *deprived of the experience of living in a permanent or "forever"* family to provide them the context of growing up in a typical social environment. Along with this classification of institutional care, Rosas and McCall (2010) helped to paint a comprehensive portrait of orphanage life through their synthesis of the pediatric institutional literature in low resource countries.

Rosas and McCall (2010) provided a composite view of commonly reported upon orphanage care experiences that children were exposed to from around the world. Institutions within their literature review did vary between and within countries as well as within countries over time; yet their descriptions provided ranges of commonly reported characteristics. Rosas and McCall (2010) reported it to be typical for there to be between nine and 16 children on each ward; rarely were there fewer than nine, but the numbers of children rose as high as 70 per ward in some countries and in some institutions. Children were mostly grouped by age and/or level of developmental disability. If they entered care within their first year of life, they were likely to have "graduated" from wards at least two to three times before turning 3 years of age, transitioning due to age or accomplishment of developmental milestones.

Caregivers were predominantly female, with children having little exposure to adult males. The child-to-caregiver ratio ranged between 8:1 and 31:1. Staff turnover was reportedly high, with care providers working long shifts (i.e., 24 hours). They often did not return for several days at a time, took extended time off (i.e., 2 months), and rotated wards (Rosas & McCall, 2010). The St. Petersburg-USA Orphanage Research Team

(2008) estimated that children would have 60 to 100 different caregivers within their first 19 months of life if they entered institutional care shortly after birth in Russia.

Institutional caregivers typically receive very little education beyond how to meet children's basic healthcare needs. They lack emphasis on the importance of primary caregiving responsiveness and sensitivity that is needed for children to healthily develop across several developmental domains; hence, care provider-child interactions are often emotionally sterile and perfunctory (i.e., feeding; diapering; cooking), with little spontaneous interaction (Rosas & McCall, 2010; St. Petersburg-USA Orphanage Research Team, 2005). Even if providing adequate physical care, caregivers may have an emotionally-protective detachment in order to avoid building attachment relationships with children who will eventually reunify with birth families, graduate from one institution to another, or get adopted (The St. Petersburg-USA Orphanage Research Team, 2005, 2008). Some interesting findings have been noted in studies and intervention evaluations examining the impacts of institutional caregiver sensitivity (i.e., increasing caregiver sensitivity).

For example, Vorria et al. (2003) found that Greek infant residential care facility caregivers spent more *actual* time with the children in their care than did parent controls. Yet, the caliber of how sensitive the care was differed; for example, when the quality and appropriateness of caregiver sensitivity was measured during interactions with 13-14 month old infants in their care providers, institutional caregivers scored significantly lower than parent controls on the Parent/Caregiver Involvement Scale (Farran, Kasari, Comfort, & Jay, 1986). Other research indicates that the quality and appropriateness of caregiver sensitivity is a skill that can be taught through training institutional care staffs,

particularly when these skills are supported by the orphanage environment (St. Petersburg-USA Orphanage Team, 2005, 2008)

The St. Petersburg-USA Orphanage Team (2005) found very encouraging results through cross-sectional and longitudinal evaluations of the use of an institutional caregiving intervention that included structural changes in the care environment. Pre and post intervention comparisons were made between three infant orphanages in St. Petersburg, Russia that cared for children ages birth to 4 years. The first orphanage received the institutional caregiving (i.e., engaging children, especially through warm, contingently-responsive verbal and non-verbal interactions) as well as having structural changes in the facility environment to make the care more family-like (i.e., reduced child-caregiver ratio; assigned specific primary caregivers to each small group of children who would be present during most of the children's waking hours) (Training + Structural Changes group). The second orphanage received the institutional caregiver training intervention, but no structural changes (Training Only group). Orphanage three received no intervention/structural changes and served as a control comparison (No Intervention).

These researchers found that between pre and post intervention assessments, the Training + Structural Changes group illustrated significant improvements over the Training Only and No Intervention groups in the following areas: positive caregiving behaviors towards children; behavioral and mental development (assessed via the Battelle Developmental Inventory) where children's developmental quotients (DQ) increased on an average of 35points; and the group was more likely to have established secure attachment relationships with their favorite caregiver and was less likely to be classified

as having a disorganized attachment when assessed by a modified Strange Situation Procedure between 11.5-18 months of age. Children in the Training + Structural Changes and Training Only group (versus No Intervention) denoted significantly greater physical growth changes (height, weight, head circumference), positive quality of play, mental alertness, and self-regulation.

The outcomes from institutionalization are in contrast to what is known about the pre-adoption history of foster care, where evidence is more mixed. Some studies note that long-term foster care has produced more positive developmental outcomes when compared to institutionalization. For example, The Bucharest Early Intervention Project (BEIP) studied the effects of continued orphanage care versus Romanian children's randomized placement into quality foster care on outcomes across several developmental domains (Zeanah et al., 2003).

Results indicated that those children that were placed in quality foster care showed higher performances on almost every developmental measure when compared to their continued institutionalized peers. This supported the robust effects of a responsive family environment (i.e., quality foster care; adoptive care) on post-institutionalized children's developmental catch-up (e.g., Marshall et al, 2008; Nelson et al., 2007; Zeanah, Smyke, & Dumitrescu, 2002). Yet, the degree to which children are impacted by family foster care and/or institutionalization can greatly vary, dependent upon such factors as individual differences between care facilities/foster homes as well as the type of public child welfare system options that are available in children's birth countries, age of placement, length of exposure to environment and their genetic predispositions. Yet, other studies report conflicting developmental findings between children reared in institutional versus foster family environments. For example, van den Dries, Juffer, van IJzendoorn, and Bakermans-Kranenburg (2010) found mixed results when comparing the physical (growth; physiological stress regulation), cognitive, and motor developmental catch-up of Chinese girls adopted between 11 and 16 months of age from family foster (n = 42) or institutional (n = 50) care. Results indicated that institutional care appeared to be most detrimental to children's cognitive and motor skill development, yet had little impact on physical growth and physiological stress modulation. Specifically, the researchers reported significantly higher cognition and motor skill scores for former foster care children on the Bayley Scales of Infant Development (second edition) at 2 and 6-month visits when compared to their post-institutionalized peers. There were no significant differences between pre-adoptive care groups related to physiological stress regulation of cortisol or physical growth at 2 and 6 month visits.

"Age at Adoption" Effect

In the ICA literature, age at adoption has historically been considered a proxy for two key factors: length of time in institutional care home and level of deprivation. It is also one of the only measures to describe the institutional experience (Julian, 2013). When it is being used to describe developmental outcomes (i.e., as an indicator of children's exposure to the depriving or damaging environment), it often defines institutionalization as a causal factor (Julian, 2013).

Yet, concerns have been noted that, despite age of adoption effects being one of the most robust findings in ICA research, using it as a proxy for other constructs may lead to spurious conclusions (Groza, 1999; Gunnar, Van Dulmen, & The International

Adoption Project Team, 2007; Hawk & McCall, 2011; Hawk, McCall, Groark, Muhamedrahimov, Polmov, Nikiforova, 2012). This section reviews patterns in the literature related to age at adoption, discusses concerns of its use as an imperfect proxy specifically for length of time in institutional care and possible confounds that it may reflect besides actual time spent in institutional care, and discusses children's preadoptive experiences and characteristics as predictors of age at adoption.

As opposed to ICA children adopted at younger ages, one pattern that the literature reports related to age at adoption is that those who were adopted beyond certain ages (i.e., anywhere between 6 months and 24 months) have been found to have poorer developmental outcomes in several areas. For example, children in older age ranges denoted more problematic behavior (Gunnar et al., 2007; Hawk & McCall, 2011; Stevens et al., 2008) cognition, executive functioning, inhibitory control (Beckett et al., 2006; Bruce, Tarullo, & Gunnar, 2009; Merz & McCall, 2011) and social skills (Julian, 2010).

Another pattern that formed related to age at adoption was a step-like effect. For example, post-institutionalized, Russian ICA children adopted at < 18 months mostly resembled biological, family-reared controls that had never experienced early deprivation when measuring behavior problems, executive functioning, and social skills. Those who were adopted at \geq 18 months denoted higher risks in these developmental areas; yet, these risks did not increase significantly beyond 18 months of age (Hawk & McCall, 2011; Julian, 2010; Merz & McCall, 2011). If this 18-month, step-like association aligned with attachment theory premises which proposed that infants needed to be part of an primary caregiver-child dyad between 8 and 18 months, Hawk and associates (2012) noted that it would be likely that it would be likely that these children would struggle with psychosocial challenges later in development (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1982). This step-like trend also existed for post-institutionalized Romanian ICA children in the 1990's, yet their step-point was much earlier (adopted < 6 months of age had far few problems) (Beckett et al., 2006; Rutter et al., 2010; Stevens et al., 2008). The Romanian results suggest that tremendous damage can be done very early in the developmental process long before children typically display attachment to a primary caregiver.

Age of adoption has also been used as a proxy for length of time spent in institutional care. With exception to samples (e.g., *see* Rutter et al, 2010) where researchers could confirm that children were placed almost immediately after birth, it was much more likely that there was greater heterogeneity about arrival at the institution. Hence, under such circumstances, age at adoption would not accurately reflect actual time spent in the orphanage nor serve as an appropriate proxy. Additionally, this would not consider circumstances where children experienced temporary placements that alternated between different birth family members or where adoptions may have dissolved and they returned back to the same institution where they resided previously.

McCall (1999) noted at least three confounding factors that age at adoption may reflect besides actual time spent in institutional care: Inaccurate institutional records/adoptive parent errors; characteristics of prematurity and low birth weight delaying adoptions; and children living with their birth families prior to institutionalization are placed in orphanages later and adopted at older ages. First, almost all ICA studies with age of adoption effects are dependent upon institutional records (which are often poorly kept/inaccurate), facts that adoptive parents were told, and/or

adoptive parents' memories—each of which have historically been wrought with inconsistencies (Hawk et al, 2012).

Second, other studies found that premature and/or low birth weight babies have been adopted later than those who were born full term and at higher birth weights (Beverly, McGuinness, & Blanton, 2008; Miller, Chan, Tirella, & Perrin, 2009). And third, children that were adopted at older ages were placed in institutions much later due to first living with birth family members and then being removed from them due to adverse family situations (i.e., parental alcohol abuse; abuse) (Hawk et al., 2012).

Additionally, early abuse and neglect were found in some ICA and domestic adoption studies to be more highly associated with long-term developmental outcomes than was age of adoption (Rosenthal, 1993; Van der Vegt, van der Ende, Ferdinand, Verhulst, & Tiemeier, 2009). Yet, attachment theory would suggest that children having experienced some time within a family, even when in the context of an insecure attachment relationship common with neglect or parental alcohol abuse, would still produce better outcomes than being reared in institutional care where attachment behaviors would be extremely uncommon. Hawk and associates (2012) further explored what pre-adoption variables might serve as predictors for age at adoption.

In 169 ICA children (birth to 4 years) from two orphanages in St. Petersburg, Russian Federation, Hawk and associates (2012) examined relationships between several pre-adoption variables (i.e., length of time in the orphanage; pre-baby home location) to determine the best predictor of age at adoption. The data was collected as part of a larger study associated with The St. Petersburg-USA Orphanage Research Team (2008) which was testing an intervention designed to increase primary caregiver sensitivity. Results

indicated that the best predictor of age at adoption was time in the orphanage, which (explained 41% of the variance); the two were related with an almost 1:1 ratio. Yet, family experience was also an important predictor. They noted that children that were adopted at later points were more likely to have begun life within their birth family home, not having been placed in the orphanage setting until older ages versus at birth; they were also more likely to have been exposed to abuse/neglect than earlier adoptees.

Even though the brain retains some plasticity over the life cycle where experiences maintain an ability to shape neural phenotypes, infancy is still the developmental period with the greatest neural plasticity (Lupien, McEwen, Gunnar, & Heim, 2009). The longer that children remain in the institutional setting, the more likely they have moved through sensitive periods where they are more vulnerable to environmental pressures and the less neural plasticity they retain (Pascual-Leone, Amedi, Fregi, & Merabet, 2005).

The remainder of this section will focus on the effects of institutionalization and foster care on children's developmental outcomes. The developmental outcomes most salient to the current study are *behavioral problems, self-regulation*, and *modulation of physiological stress responses*.

Behavioral Problems

Children being reared in institutional care encounter many hazards that place them at risk for problematic behaviors like exposure to prenatal risks (i.e., alcohol/drugs, malnutrition, no/poor prenatal care, prematurity), limited access to medical care, lack of a consistent primary caregiver, poor cognitive stimulation, inadequate diet, and neglect (Johnson, 2000; van IJzendoorn & Juffer, 2006). Although adoption is undoubtedly a

highly effective intervention for many of the health and developmental challenges that ICA children face related to prenatal risk and out-of-home care (Juffer & van IJzendoorn, 2005), the literature does note that some adopted children, particularly those reared for longer periods of time in institutions, continue to have behavior problems after being placed in their adoptive families (van IJzendoorn & Juffer, 2006); some can persist into adult years as well (van der Vegt, van der Ende, Ferdinand, Verhulst, & Tiemeier,2009).

In a cross-sectional analysis, Verhulst et al (1990) compared the CBCL Total Problem Score of 2,148 post-institutionalized Dutch ICA children from various sending countries (e.g., India, Indonesia, Colombia, Korea, Bangladesh, Austria) to 933 nonadopted Dutch control children between the ages of 10-15 years of age to determine who was most at risk of developing internalizing problems. Across adoption groups, there were significant differences for gender; specifically boys had more emotional problems than girls; girls that were significantly older at the time of adoption were at greater risk for risk of exhibiting symptoms of depression.

Yet, Verhulst et al (1990) also cautioned that a limitation of the study included problematic outliers in the adoption group which, when removed, significant differences for gender and group did not remain, placing the majority of both adopted and nonadopted groups within the non-clinical ranges for behavior problems. More specifically, with outliers removed, 77% of adoptive boys in the sample were in the non-clinical sample for behavior problems, validating other studies that indicated that the majority of ICA children are behaviorally and emotionally well-adjusted post-adoption (Jenista, 1997).

Verhulst, Althus, and Versluis-den Bieman (1992) used the same sample of ICA children that they studied in 1990 (N = 2,148) to examine the influence of early adverse experiences on later overall adjustment. They found that experiences of early neglect, abuse, and the number of changes that ICA children were exposed to in their early caretaking environment increased their risk for later maladjustment. They also noted that the older the age at placement, the greater the probability that ICA children had been exposed to such pre-adoptive adversities. Children's older ages also reflect less neural and epigenetic plasticity.

Versluis-den Bieman and Verhulst (1995) re-evaluated the same sample between the ages of 13-18 years of age (N = 1,538). Results indicated that those ICA children that were in the clinical range for behavioral problems in 1990 had more severe behavioral problems in 1995. Among those ICA children in the non-clinical range for behavioral problems, scores in 1995 remained consistent with those in 1990; specifically, no greater numbers of ICA children moved into the clinical range for behavior problems. Yet, among those children in the non-adopted control group, there was a significant decrease in behavioral problems when comparing 1995 scores to 1990.

A meta-analysis by Juffer and van IJzendoorn (2005) validated that ICA children that were adopted from institutions (N = 15, 790) reportedly displayed significantly greater numbers of behavior problems when compared to non-adopted Dutch controls. They also found that it was those ICA adoptees with the most severe adversity histories that reportedly had the greatest externalizing behavior problems (Juffer & van IJzendoorn, 2005). There were two limitations of this meta-analysis: first, several different tools were used to evaluate behavior problems across the studies versus one
consistent measure; and second, studies that included children with a mixed care background (i.e., institutional care + foster care) were only coded as "institutional care" which did not take into account the influence of foster care on child outcomes.

Hawk and McCall (2011) conducted a meta-analysis of 18 studies that examined ICA children's behavior problems via the internalizing and externalizing subscales of the Child Behavior Checklist (CBCL) (Achenbach, 1991) for comparison. They concluded that behavior problems were affected by more than type of pre-adoptive care. They noted key influences as the type of early pre-adoptive care (i.e., institutional; mixed [institutional + foster] pre-adoptive care), age at adoption, and whether families were in the early or later stages of adoptive family formation. Results indicated that when children were primarily reared in institutional care, were adopted at older ages and were in the "early" stages of adoptive family formation, they exhibited significantly greater internalizing behaviors than did their non-adoptive, same age peers, yet had no significant differences from mixed/foster family placement only, same-aged peers. For those postinstitutionalized children that were older and their families were in the later stages of adoptive family formation, they denoted significantly greater internalizing and externalizing behavioral problems than did non-adopted and their mixed care peers.

Using the CBCL, Sonuga-Barke, Schlotz, and Kreppner (2010) (Rutter & the English and Romanian Adoptees [ERA] Study Team) also found a greater preponderance of externalizing behavior problems when testing post-institutionalized Romanian children. Yet, they did not see increasing problem scores on subscales when re-testing children at age 6, 11, and 15 years in their longitudinal study.

Fisher, Ames, Chisholm, and Savoie (1997) conducted a longitudinal study among Canadian adoptive families that measured the effects of institutional care on Romanian ICA children's internalizing and externalizing behaviors using the CBCL (Achenbach, 1991). Children were divided into three groups: ICA children adopted before being placed in institutional care (≤ 4 months of age) (n = 34; mean adoption age = 2 months; mean months in adoptive family at baseline CBCL = 23 months); ICA children that were adopted at ≥ 8 months from institutional care (n = 46; mean age = 15 months; mean months in adoptive family at baseline CBCL = 11 months); and nonadopted, same-aged Canadian peers (n = 46). All children were tested at baseline (mean age = 25 months), age 3 years, and 8 years. Baseline results indicated that those children that had spent the longest period of time in institutional care (≥ 8 months) denoted significantly greater internalizing problems, but not externalizing problems than ICA adoptees adopted before they entered institutional care (≤ 4 months) and non-adopted Canadian controls. Yet, conduct problems emerged in the longitudinal results; there were significantly greater levels of conduct problems when testing the sample at 3 and 8 years after adoption (MacLean, 2003). By contrast, Juffer and van IJzendoorn (2005) reported a link between adverse preadoption histories in international adoptees (mainly Romanian and Russian orphanage experiences) and externalizing, but not internalizing, problems (Juffer & van IJzendoorn, 2005).

Examining ICA children between 4 and 18 years of age from Russia, China, Guatemala, Columbia, India and Korea (N = 1948), Gunnar, Van Dulmen, & the International Adoption Project Team (2007) further explored (via the CBCL) social emotional and behavioral problems. The researchers divided children into two groups: adoptees that had spent ≤ 4 months in institutional care and those that spent > 4 months in institutional care. Even though more institutionalized (> 4 months) (65%) than control (\leq 4 months) (51%) group children denoted behavior problems in the clinical range, it is important to note that half of the ICA children in the sample were found to be problem-free. Yet, 11% of institutionalized (> 4 months) versus 5% of control (\leq 4 months) group children denoted scores in the clinical range on \geq 5 CBCL subscales.

These data support the literature indicating that many ICA children fare quite well post-adoption with fewer exhibiting on-going difficulties throughout development. Gunnar's work also brought to light the overrepresentation of former USSR children, particularly among those that were adopted after 24 months of age. Results indicated that those adoptees experiencing the poorest behavioral outcomes were male children from countries of the former Soviet Union adopted at ≥ 24 months of age.

In summary, the research mostly supports that ICA children reared in institutions versus foster care are more likely to experience greater challenges with behavioral problems believed to result from the absence of a consistent primary caregiver in early life. They are reportedly also more likely to experience greater behavior problems post-adoption, especially if they are adopted at a later age and have been exposed to a more depriving care environment for a longer period of time. The literature is mixed as to the timing of the manifestation of ICA children's externalizing or internalizing behavioral issues. Some note that mixed care (previously institutionalized-fostered) and institutionalized ICA children resemble one another behaviorally when they are young, but tend to diverge as they age. Yet, as mixed care (institutional + foster care) children age (i.e., approach adolescence), their internalizing and externalizing scores on the CBCL

tended to mirror never-institutionalized, same aged peers. The literature also notes consideration of variables when assessing behavioral problems like age at adoption (i.e., Hawk & McCall, 2010; Gunnar, van Dulmen & the International Adoption Project Team, 2007), age at assessment (Hawk & McCall, 2010; Bsonuga-Bark, Schlotz, & Kreppnar, 2010; Verhulst et al., 1990; Verhulst et al., 1995), and gender (Verhulst et al., 1990).

Self-Regulation

In the current study, self-regulation is specifically defined as the child's ability to alter his/her own responses or inner states in a goal-directed manner (*see* Baumeister, Schmeichel & Vohs, 2007; Rawn & Vohs, 2006). This is done so by modulating *inhibitory control* and *attentional control* over feelings and actions. Clinically-documented self-regulation problems effect between 3-10% of all U.S. school children (Faraone, Sergeant, Gillberg, & Biederman, 2003). Symptoms often surface before the age of 12 years, will consistently persist for at least 6 months, and take place across multiple environments (i.e., home; school) (American Psychological Association [APA], 2013). The inattentive child appears distracted, has poor follow-through on school work, makes careless mistakes, and is disorganized (APA, 2013). Those with inhibitory control challenges are fidgety, appear constantly on the go, are chatty, have trouble sustaining quiet activities, are verbally interrupting, blurt out answers in class before being called on, and are impatient in turn-taking (APA, 2013).

ICA children with previous institutional care or foster care experiences often struggle with self-regulation long even after placement in a supportive family with stable caregiving. The literature often explores self-regulation in one of two ways: first, as the topic of emotion control comprised of two key components, inhibitory and attentional

control; and second within the framework of attention-deficit hyperactivity disorder (ADHD) or executive functioning (EF). Inhibitory control and attention control are often described in the literature as EF abilities. Therefore, some of the ICA studies reviewed will reference these areas, but will in no way serve as an exhaustive review of their individual literatures, as that would be move outside of the scope of the current study.

Stemming from the prefrontal cortex and adjacent areas of the brain, EF is a set of neural functions that serve to protect the temporal order of thought processes and the behaviors that follow. EF has been viewed as a single entity (i.e., IQ) (Duncan, Emslie, Williams, Johnson, & Freer, 1996) and a collection of relatively independent, but relating sub-functions that involve the mental tasks of shifting, updating and inhibiting. The tasks of shifting, updating and inhibiting are the underlying functions that are responsible for goal-directed behaviors, work collaboratively, yet denote distinct roles as well (Chambers et al.2009).

For example, *shifting* is responsible for the function of moving back and forth between mental tasks that require skills of engagement and disengagement with former and subsequent tasks (Lehto, Juujarvi, Kooistra & Pulkkinen, 2003). *Updating* is the mental function that controls and stores working memory representations (Miyake et al., 2000). And *inhibition* involves a person's ability to deliberately inhibit dominant and/or autonomic responses that help human beings follow what is deemed acceptable within a given social environment (Miyake *et al.,* 2000). These are also closely related to the function of attention regulation (Hughs, 2011). The following studies will be a review of the literature in relation to institutional/foster care as a form of child rearing with ICA populations.

A number of longitudinal studies conducted by Sir Michael Rutter and the English and Romanian Adoptees (ERA) Study Team (1998) examined the effects of institutionalization on children's self-regulation through the lens of ADHD or inattention/over-activity. These studies have two major strengths: first, they are longitudinal; and second, Romanian ICA children in the study are compared to domestically adopted children in the UK.

Early in the work of the ERA Team (1998), they reported seeing a trend of similar symptoms to ADHD in post-institutionalized Romanian adoptees, yet they also saw subtle differences and questioned whether its uniqueness related to etiology—that it was specific of a depriving institutional environment. They postulated that early adversity was somehow affecting young children's biological programming/neural wiring in early life and wondered what effect length of time in the orphanage, and developmental catch-up in the adoptive family environment played in developmental outcomes.

In a randomly selected sample of 165 Romanian children that were adopted before 42 months of age by UK families (institutionally-reared= 144; foster care = 21), the ERA Study Team performed developmental evaluations at 4, 6 and 11 years of age and made comparisons with a sample of 52 never-institutionalized children in the UK domestically-adopted prior to 6 months of age. Comparisons made between ages 4 and 6 years noted that most children demonstrated significant catch-up in physical and intellectual domains by the time they started kindergarten, although that traces of deficits in a minority of children that were present at 4 years of age were present at 6 years of age as well (O'Connor & Rutter, 2000). Yet, it was still common for most children in the sample to struggle with psychological issues. Child impairments were positively

associated with length of time in depriving institutions and were clustered within in four key domains: cognitive impairments, disinhibited attachment, quasi-autism and (the domain most salient to the current study) inattentiveness/over-activity (I/O).

Specifically in reference to I/O, there was a significantly higher prevalence found in ICA Romanian adoptees versus the UK adoptees; I/O scores were also positively related to length of time in institutional care (Kreppnar et al 2001). At age 11 years, the Romanian ICA children with a history of institutional care also indicated significantly greater I/O scores when compared with the UK adoptees, particularly among those postinstitutionalized children left in the orphanage beyond 6 months of age. There was no significant difference between those children that were adopted before 6 months of age and the never-institutionalized controls (Stevens et al., 2008).

Based on the developmental patterns originally described by Rutter and the ERA (1998) in ICA Romanian children, Kumsta et al.(2010) further described from longitudinal work four deprivation-specific psychological (DSP) patterns found in children that had been institutionalized in Romania for > 6 months that included quasi-autism, disinhibited attachment, cognitive impairment, and inattention/over-activity (I/O). For those Romanian ICA children institutionalized > 6 months, the following information was indicated: the increase in DSPs were not only related to sub-nutrition; children's head circumference continued growing until age 15 but remained significantly smaller than same-aged norms; there was an immediate growth catch-up in weight and height, but early post-puberty plateaus resulting smaller stature particularly in females; there was an association between conduct problems and I/O which peaked between ages 11 and 15. It is possible that these group differences related to the second round of pruning that is

typical in adolescence (Huttenlocher, 1979; Woo, Pucak, Kye, Matus, & Lewis, 1997) and emotion problems which peaked between first grade and ninth grade. These outcomes validate that children remaining in institutional care for > 6 months has been shown to predict poorer behavioral and I/O outcomes when compared to peers institutionalized < 6 months or to those that have never spent time in institutional care

Building further on Rutter's/ERA Study Team's concepts of the effects of early deprivation/institutionalization on the developing early brain, Pollak et al (2010) compared the effects of early ICA care (institutional care group [IC]; foster care group [FC]; birth family control group [BC]) on 8 to 9 year-old children's attention control, inhibitory control, and executive processing (N = 132). Those in the IC group joined their adoptive homes \geq 3 years prior and were adopted \geq 12 months of age, having spent \geq 75% of their pre-adoptive life in an orphanage in Asia, Latin America, Russia/Eastern Europe and Africa. Those in FC were adopted at \leq 8 months of age from Asia and Latin America spending little to no time in institutional care. Results indicated greater neuropsychological deficits in the IC group when compared to the FC and BC groups on tests of attention control, inhibitory control, and visually mediated learning. Yet, there were no differences between the three groups when testing abilities that required children's use of auditory processing or executive processes (i.e., rule acquisition and planning).

Pollak et al (2010) proposed that these findings may indicate that parts of the brain (i.e., prefrontal cortex) may be more sensitive to the effects of early adversity than others and that results were indicative of delayed maturation of parts of the prefrontal cortex, an area long associated with cognitive developmental challenges in post-

institutionalized children. Additionally, the lack of differences between the groups regarding the abilities that require auditory processing may possibly relate to the following: the fact that, although visual and auditory processing are experiencedependent functions, auditory processing begins functioning during the third trimester of pregnancy and visual functioning not until birth; at the point where visual processing begins developing, the brain is at a different point of development (Birnholz & Benaceraff, 1983). Some literature also supports that children tend to exhibit auditory dominance as well (Saffran, Werker, & Werner, 2006; Sloutsky & Napolitano, 2003)

Chugani, Behen, Muzik. Juhasz, Nagy, and Chugani (2001) traced patterns of brain glucose metabolism in 10 previously-institutionalized Romanian ICA children (6 males; mean age = 8.8 years, range = 7-11) in order to decipher what areas of the brain were involved in the long-term deficits resulting from early global deprivation. They did so by comparing their positron emission tomography (PET) scans to those scans obtained from two control groups: 17 adults (9 males, 8 females, mean age 27.6 years) and 7 typical children (5 males and 2 females, mean age 10.7 years). In reference to the group of ICA children, their lengths of stay in the orphanage varied (16- 90 months) as did their time in the adoptive family (15-113 months).

The children's neuropsychological assessments indicated mild neurocognitive impairment, impulsivity, inattention and social deficits. Their normalized glucose metabolic rates, when compared to the child and adult control groups, indicated significantly decreased metabolism in the following areas of the brain: orbital frontal gyrus; the infra-limbic prefrontal cortex; the medial temporal structures (amygdala/hippocampus); the lateral temporal cortex; and the brain stem. Important to

note about these particular brain regions is that they are deeply interconnected, are involved in the management of the neuropsychological abilities that the ICA children in this study had displayed impairment, and these are regions which are well known to be vulnerable to long-term developmental impacts to chronic stress exposure during early development (Sanchez, Ladd, & Plotsky, 2001).

The Bucharest Early Intervention Project (BEIP), via its randomized control trial design, provided an opportunity to evaluate foster care as an alternative to institutional care for orphaned and abandoned children (*see* Zeanah et al, 2003). As part of the BEIP study, Bos et al., (2009) examined for the effects of early care on EF and memory when children were 8 years of age (institutional group n = 49; foster care group n = 54; community family-reared control group n = 47). Results of the Cambridge Neuropsychological Test and Automated Battery (CANTAB) indicated that children with a history of early institutional care (versus never institutionalized controls) performed significantly worse on measures of memory and EF. When comparing the children that were randomly assigned to the foster care intervention group to their peers who remained in the care as usual institution group, the two groups did not significantly differ on EF and memory. Yet, after controlling for birth weight, head circumference, and time spent in early institutional care, the foster family care intervention significantly predicted EF scores.

McDermott, Troller-Renfree, Vanderwert, Nelson, Zeanah, and Fox (2013) tested the effects of early deprivation, placement type, and the relationship outcomes between EF (i.e., inhibitory control and response monitoring) and 8 year-old children's internalizing and externalizing in the BEIP study (institutional group n = 49; foster care

group n = 54; community family-reared control group n = 47) (Zeanah et al., 2003). Results indicated that children's exposure to early psychosocial deprivation was associated with impaired inhibitory control; specifically, children in the foster care group performed better on response monitoring and denoted lower levels of socio-emotional behavior problems than did their peers who remained in the orphanage.

Mertz, McCall & Groza (2013) explored for EF differences in 6-18 year old children of ICA that had either experienced psychosocially depriving (n = 471) or globally depriving care (n = 111). Psychologically depriving institutions (i.e., Russian orphanages) provided adequate physical resources, but lacked in consistent/responsive primary caregiving; globally depriving institutions (i.e., Romanian orphanages) severely deprived children of both basic physical and psychosocial care. Parents completed the Behavior Rating Inventory of Executive Function (BRIEF) and children's EF abilities were followed over a two year period. Results indicated the following: adoptees that had experienced pre-adoptive care in a globally depriving institution had significantly greater deficits in EF than did their psychosocially-deprived peers; deficits in each group were greatest among children who were adopted after 18 months of age; and, EF deficits remained moderately to strongly continuous over the two-year time frame of the study.

Merz, McCall, Wright, and Luna (2013) compared the inhibitory control and working memory abilities of previously-institutionalized Russian adoptees (N = 75; mage = 12.97; SD = 3.03) to never-institutionalized, family-reared children (n = 133; m =12.26; SD = 2.75) by using stop-signal and spatial span tasks. Results indicated that those adoptees that left institutional care after the age of 14 months had poorer inhibitory control and working memory scores when compared to those who left before 9 months of



Figure 1 describes how much physiological effort is needed in order for a child to recover from experience-dependent early detriments (used with permission from the Center on the Developing Child, 2009; Graph: "The Ability to Change Brains and Behavior Decreases over Time." Data source: P. Levitt, 2009; In *Core Concepts in the Science of the Early Childhood Development*. Retrieved from <u>http://developingchild.harvard.edu</u>).

age. Additionally, there was a positive relationship between children's scores and ratings (by parents) of hyperactive-impulsive behavior in daily life. These outcomes suggest that prolonged exposure to institutionalization may have long-term, negative implications on children's skills of inhibitory control and working memory even years after adoption, validating earlier studies studying inattention, impulsivity and hyperactivity (e.g., Gunnar & van Dulmen 2007; Kreppner et al., 2001; Rutter et al., 2001; Stevens et al., 2008). One possible influence on outcomes that Merz et al (2013) did not discuss was the role between children's length of time in institutional care (sometimes measured as the variable "age at adoption") and their decreasing epigenetic and neural plasticity with age (Huttenlocher, 1979; Woo, Pucak, Kye, Matus, & Lewis, 1997).

With age comes a brain increasingly hard wired for specialization in certain skills, but with less ability to reorganize or alter its functioning. *Figure 1* describes how it is best for brain development and the cultivation of future learning that children have what they need up front ("Pay for it now") in terms of healthy conditions in which to thrive and develop in early life like a loving family, a consistent and responsive caregiver, healthy nutrition, and cognitive stimulation. It takes more physiological effort to remediate the damage/what children missed when challenged by negative or unhealthy life conditions (i.e., "Pay for it later") in order to enhance neural connections in later development.

In summary, children are most likely to develop strong self-regulation/EF abilities when they live in a family environment with a primary caregiver that meets their care needs and participates with the child in "serve-and-return" interactions; these interactions form the foundation for the brain architecture for which all other levels of development will be built (Center for the Developing Child accessed on October 23, 2014 at http://developingchild.harvard.edu/). Therefore, it is not surprising that the literature reported that never-institutionalized children typically did perform better on measures of self-regulation, inhibitory and attentional control, and EF than did children with institutional or foster care histories. The only exception to this was when ICA children were only in care for a very short period of time (< 6 months) (Rutter & the ERA Team, 1998).

Additional factors appeared to influence children's developmental outcomes. These factors were as follows: duration of time in care/when they left care; type of institutional care; and, degree of deprivation. Whether in institutional or foster care, children's length of time within care appeared to be the best predictor of self-regulation in each adoptive care group. Children in institutional care performed more poorly on attention control, inhibitory control and EF than did FC and community reared/early adopted UK controls *unless* they were adopted from care at a very early age (< 6 months); when adopted at an early age, they likely displayed little/no differences whatsoever from never institutionalized children in terms of inattentiveness/over-activity (Rutter & the ERA Study Team, 1998). And lastly, globally depriving orphanage environments had greater negative, long-term impacts on children's EF abilities, especially the longer that children remained in care past 18 months (Mertz et al, 2013).

The next section will discuss the literature related ICA children's modulation of their physiological stress responses (cortisol). Prior to reviewing this literature, there will be an introduction explaining some basic concepts of neuroscience related to the most salient topics in the current study. This introduction will specifically describe brain structure and the neurobiology of childhood stress.

Physiological Stress Modulation

Research is mixed about how early institutional or family care rearing impacts ICA children's abilities to regulate their physiological response to stress when faced with real or perceived threat (e.g., *see* Bender & Yarnell, 1941; Gunnar, & van Dulmen, 2007; Kreppner et al., 2001; O'Connor, & Rutter, 2000; O'Connor et al., 2000; Rutter, 1999). Prior to reviewing the available literature on ICA children, a basic primer of typical children's brain structure/function and children's physiological responses to stress will be provided.

Typical Brain and Stress Response System Development. The human brain is an organ that is made up of interconnected cells called *neurons*. Neurons consist of the cell body (materials that manage its metabolism), *dendrites* (hundreds of branching appendages), and an *axon* (a single appendage). Neurons connect together by their axons and dendrites, forming linkages to one another (Solms & Turnbull, 2002) and the average brain reportedly has over one hundred billion neurons (Siegel, 1999). Synaptogenesis is the process through which *neural systems*, or circuits that serve similar functions, are built; this is where the axon of one neuron connects to the dendrite of another. Where the two join, a slight gap forms; this gap is referred to as a *synapse*. It is over this synapse that *neurotransmitters* (chemical molecules like serotonin, dopamine, and norepinephrine) are transferred or *fired* between neurons (Pally & Olds, 2000). The communicative nature that exists between neurons is one reason that the brain is unique from other organs in the body. A second reason is that the organization of the brain depends on the interaction between genetics and environmental experiences (Siegel, 1999).

At birth, barring differences in prenatal risk exposures, infants' brains are quite similar. Yet, as they acquire new experiences, their interconnecting neurons begin to take shape with increased activation of synapses in neural networks, creating new synaptic connections (*synaptogenesis*). Children's experiences in early life have lasting influences on the developing brain. Although genes may serve as a human blueprint, it is the child's experiences that shape whether the brain is strong or weakly prepared to support longterm health, learning, and behavior. As neural networks fire together, they typically join into the same synaptic connections (Hebb, 1949). As infants are born with an

overabundance of neurons, the most frequently used networks survive. They forge connections with other neurons and eventually millions become the basic foundation of brain architecture. For those rarely used, they remain solitary, weak, and typically die or get *pruned*. Well-used circuits create lightning-fast pathways for neural signals to travel across the brain; simple circuits lay the foundation for more complex ones which support behavior, self-regulation, motor skills, language, and logic. While circuits will originate in certain areas of the brain, they become interconnected, much in the same way as human skills are intertwined (i.e., using logic and language skills together) (Pally & Olds, 2000).

The brain is hierarchically structured from lower order (most primitive) to higher order functioning (most advanced); its positioning in the skull also reflects this. For example, the lower structures are at the *brain stem* (an extension of the spinal cord) and are responsible for regulating functions like heart rate, body temperature, and other basic body functions. Above the brainstem is the *thalamus*; the thalamus processes incoming sensory information and serves as the central terminal for several other important areas of the brain (Pally & Olds, 2000).

Higher structures of the brain reside in the cerebral cortex which is located on the outer layer of the brain. This area is responsible for higher order thinking like mental representations of the self and formulating new ideas. It is formed after birth via children's interactions with the social (i.e., caregiver/family) and physical environment. The cerebral cortex consists of four distinct lobes: the *occipital lobe* (processes visual stimuli); the *temporal lobe* (mediates auditory, language and memory function); the *parietal lobe* (links sensory and motor functions and provides a sense of spatial location);

and, the *frontal lobe* (the executive center which mediates motor behavior, language, abstract reasoning, and directed attention) (Cozolino, 2002). The corpus collosum connects the two hemispheres.

Between the brainstem and the cerebral cortex lies the *limbic system*; the regions in the limbic system are the *amygdala, anterior cingulate*, and the *orbitofrontal cortex*. These regions are responsible for processing and regulating mental and emotional processes that include attachment formation between children and their parents. The orbitofrontal cortex plays a particularly important role in self-regulation, processing affective responses to events, and storing information about those events in unconscious memory. Also in the limbic system is the hippocampus which relates to the access of conscious forms of memory (Siegel, 1999).

Children's brains begin to develop before birth (in *gestation*) where neurons are proliferating, migrating and forging connections with other neurons. Nutrition and growth help to regulate fetal brain development while it works at protecting itself from insults like maternal stress and environmental toxins (i.e., alcohol or poisons). During this time period, the brain is extremely vulnerable. Between gestational weeks 12 through 20, neuronal migration peaks and is almost complete by week 29 of the pregnancy. Once migration is completed, neurons extend axons and dendrites to bring them together. The brain's developing cortex begins to thicken in the third trimester as synaptogenesis increases its speed, peaking during the 34th week; 40,000 new synapses are forming at approximately every second (Tau & Peterson, 2010). Starting in week 24, auditory and visual cortices begin to develop as well as areas underlying receptive language and higher and higher neurocognitive functions (Monk, Webb, & Nelson, 2001). Fetal brain areas

become particularly vulnerable to prenatal risk exposures (i.e., maternal distress; poor nutrition).

At birth, the neural circuitry of the brain is incomplete and its organization mostly depends on relational experiences (Post, Weiss, Smith, Li, & Mc Cann, 1997). Schore and Schore (2008) noted that primary caregiving is the most significant contributor to the process of synaptogenesis. This is particularly important given that the post-natal brain is developing at a much faster rate than previously believed. Early caregiving experiences will impact synaptogenesis in three distinct ways:

- Important interconnections between brain systems are being made during periods of infancy and toddlerhood based on the experiences (positive or negative) of their early caregiving
- Between ages birth and 3 years, the total number of brain cells will not change dramatically based on a child's early experience but the number of neural connections will depend upon the caregiving experiences, It reaches its peak between ages 2-3 years and falls to about half by the time the child reaches 14-15 years (Zuckerman, 1997);
- Because the developing brain uses a neural "use it or lose it" philosophy, important connections that are not activated through sensitive caregiving are likely to be lost.

The *hypothalamic pituitary adrenal (HPA) axis* is the biological system that regulates the secretion of cortisol. The typical *diurnal*, or daily pattern curve, shows a rapid increase of cortisol to its peak within the first 30 minutes of waking (*Cortisol Awakening Response [CAR]*) (Fries, Dettenborn, & Kirschbaum, 2009). A steady decline takes place throughout the rest of the day (Hostinar & Gunnar, 2013). Outside of this diurnal pattern, corresponding peaks in cortisol will be seen throughout the day when stress is encountered to prepare the body for fight or flight and to mobilize energy (Hostinar & Gunnar, 2013). Abnormal cortisol patterns can be associated with certain physical and mental illness (Buitelaar, 2013; Miller, Chen & Zhou, 2013), behavior problems and children's early experiences of stress like that found related to ICA children that have dealt with parental separation and extreme deprivation (*see* Miller et al., 2007).

Providing a window into how regulation of the stress response system takes place between infancy and toddlerhood, Gunnar et al. (1996) examined the evolution of infants' cortisol responses and behavior distress regulation through the influence of their primary caregivers' responsiveness. Longitudinally examining 78 infants during routine vaccinations at 2, 4, 6, 15, and 18 months of age, they found that those children with responsive primary caregivers exhibited the expected decrease of stress reactivity typical of secure attachments. Conversely, coping systems for those with unresponsive primary caregivers and disorganized attachments maintained the same cortisol level and pattern in toddlerhood as they had displayed in infancy—easily distressed and elevated cortisol responses. Results indicated that children's abilities to develop long-term physiological coping is dependent on primary caregivers' responsiveness. They also noted that primary caregivers' responsiveness decreases the probability of infants developing disorganized attachments and predicted whether primary caregivers will later moderate the child's cortisol response (Gunnar et al., 1996). When children encounter stress, their bodies experience important physiological changes that serve as important signals to mobilize adaptive coping responses. In the brain, these changes occur in the amygdala (where the fight or flight response is initiated), hippocampus, hypothalamus, pituitary gland, and adrenal cortex. Measureable indexes of stress include the release of adrenalin, stimulation of the immune system, changes in glucose and blood pressure, and altered daily and/or stress induced salivary/urinal cortisol.

These changes include short-term stress responses like increased breathing, higher heart rate, perspiration, and release of more sugar into the blood stream to ready the body for a burst of energy exertion and associated with the fight or flight response—otherwise known as the sympatho-medullo-adrenal (SAM) system. During a stressful situation, the body signals the *autonomic nervous system* (responsible for the control of the bodily functions not consciously directed like the heart beating and digestive processes) to help bring the body to full alert (sympathetic) and then back to a state of homeostasis (parasympathetic). During stress, activation of the hypothalamic pituitary adrenal (HPA) axis system takes place when the hypothalamus is stimulated to release *corticotrophin releasing factor* (*CRF*) (a peptide hormone or neurotransmitter) which activates the pituitary gland to release *adrenocorticotrophic hormone* (*ACTH*) (a polypeptide tropic hormone produced/secreted by the anterior pituitary gland). ACTH signals the adrenal gland and stimulates the adrenal cortex to release the stress hormone, *cortisol*.

At the same time, sympathetic neurons signal the medulla to release adrenaline noradrenaline, pushing the body into a hyper alert state. In an attempt to balance the body, a negative feedback system moves into play where high levels of cortisol trigger

the hypothalamus to reduce its output of CRH, lowering the levels of ACTH and cortisol to protect the body from damage. Although the HPA axis supports acute flight-or-flight responses, it's responses to stressors also *suppress* the impact of fight-or-flight reactions (Gunnar & Quevedo, 2007).

When a child experiences short/acute bursts of cortisol secretion via stress system activation, this fosters healthy adaptation to stress and threat. Yet, when they have prolonged periods of cortisol secretion/stress system activation and suppression, this produces a wear and tear on the body (*allostatic load [AL]*) which has been linked to detrimental impacts on physical and mental health such as heart disease or diabetes and increased risk for depression (Lupien, McEwen, Gunnar, & Heim, 2009).

When children's body's experience a toxic stress response, it has short and long term implications on development across multiple domains. Experiencing moderate levels of stress is an important part of development, as it serves as an opportunity to help them learn how to cope with stress (Gunnar & Quevedo, 2007). When the child perceives a situation as stressful or threatening, the stress response system activates (brain and body sense the surge in adrenalin, heart rate and stress hormones levels increase and they move into survival mode [fight-or-flight]). When their stress is relieved after a short period of time (i.e., because the threatening situation ceases or their responsive primary caregiver buffers them from their stress), the stress response system begins to deactivate and the body's system returns to its normal, un-stressed state.

Yet, if a child remains in an environment of severe or chronic stress (i.e., abuse/neglect) where there is a lack of responsive primary caregiving to buffer them from threat, the stress response system remains activated for an extended period of time

(Gunnar & Quevedo, 2007). When the stress response system remains chronically activated, children experience an overload effect, remaining in a physical state of high alert. This negatively impacts other developing systems, fostering long-term consequences to health and well-being (i.e., chronic illness; learning deficits). For example, in infancy and toddlerhood, neural connections in areas of the brain that are foundational for learning and reasoning are weaker and fewer in numbers; it is during early childhood that rapid growth of new neural connections take place. Yet, prolonged activation of stress hormones (i.e., cortisol) in early childhood have been found to inhibit the rapid growth in neural connections, negatively influencing cognitive developmental outcomes (Gunnar & Quevedo, 2007).

ICA Children's Stress Response Modulation. Carlson and Earls (1997) conducted one of the earliest studies comparing the effects of institutional and foster care rearing on HPA axis stress response regulation. They wanted to determine whether children that were exposed to extreme deprivation in early life (i.e., institutionalized children in Romanian in the1990's) had similar daily cortisol patterns/HPA axis functioning as those family-reared infants and toddlers that were being studied in recent burgeoning stress research in the US (*see* Hertsgaard, Gunnar, Farrell, Erikson, & Nachmias, 1995; Spangler & Grossman, 1993). Carlson and Earls began working with children who were part of a foster care intervention study in Romania headed by psychologist, Joseph Sparling. The children in Sparling's study were randomly assigned (at 2-9 months of age) to receive "institutional care only" (n = 28) or "mixed foster/institutional care" (n = 30). The child- to-caregiver ratio in the foster care environment was 4:1; caregivers were instructed on the importance of touch/handling in

the care they were providing and the effect that it had on child growth and cognitive development. The institutional care group remained in their orphanage and the child-to-caregiver ratio was 20:1.

Carlson and Earls (1997) received funding 13 months later to study how the care differences were impacting children's HPA axis stress responses and other developmental outcomes. The children were approximately 2 years of age and Starling's funding had been discontinued, despite evidence of the foster care children's psychological and physical gains over those that had remained in institutional care; the foster care children returned to institutional care after receiving 7 months of family foster because the foster program could not be sustained without funding. Carlson and Earls (1997) followed both groups of children and found that within 6 months of returning to the institution, those children from the foster care condition no longer differed from the control group on measures of physical growth (both groups averaged 3-10th percentile by North American and Western European norms) or on mental/motor scores (both performed at 50-70 percent of age expectation on the Bayley Scales of Infant Development).

In terms of children's HPA axis diurnal salivary cortisol response patterns, Carlson and Earls (1997) measured basal cortisol levels at three points during the day: at waking; noon, and late afternoon or evening. They found that those children that the institutional care group had only slightly higher (non-significant) basal cortisol concentration levels than those children that had spent 7 months in foster care. In terms of the pattern of cortisol throughout the day, values were the highest among the foster care group at waking and declined throughout the day; for the institutional care group, peak cortisol patterns were often noted at midday and there was little decline between the early

morning and evening sample. They also noted a positive correlation between noon cortisol levels and cognitive developmental domain delays. In summary, Carlson and Earls' (1997) results suggests that institutional rearing does not support significantly higher concentrations of cortisol production but it appears to interrupt the typical daily rhythmic pattern of highest levels in the early morning and a gradual decline throughout the day with the lowest point in the evening. Institutionalization appeared to be associated with blunted daily cortisol patterns.

Kroupina et al. (2012) conducted a longitudinal study of ICA children adopted from institutional care in Eastern Europe (N= 76) (mean age = 17 months, SD = 5 months) to determine whether placement in the adoptive family would help alter their blunted daily cortisol patterns to a more typical and healthy pattern similar to same aged peers without a history of adversity. Additionally, they were also curious as to whether children that continued to have a blunted cortisol pattern also had greater cognitive, emotional or behavioral impairments at follow-up. Children were tested on all measures at 1 and 6 months post adoption; two days of saliva sampling were taken at waking and bedtime at 1 and 6 month post-adoption for HPA axis salivary cortisol pattern. Results indicated that overall, morning cortisol values did significantly increase at six months when compared to baseline; yet those children who continued to have a dysregulated HPA axis system (cortisol levels that remained blunted at 6 months) also had significantly greater emotional and behavioral problems.

In typical, non-neglectful caregiving situations, a responsive parent helps their infant regulate the immature stress response that they were born with and develop a much more sophisticated biological and emotional way to regulate their stress and arousal over

time (Feldman, Greenbaum, Yirmiya, 1999). Building on this premise, Wismer Fries, Shirtcliff, & Pollak (2008) explored whether previously institutionalized children that failed to receive this type of regulation scaffolding in early life might experience more long term impacts on their physiological coping with stress. They questioned whether HPA axis dysregulation was specific to interactions with the primary caregiver by also having a control condition that involved a similar interaction between the child and unfamiliar female adult.

Also tested were diurnal salivary cortisol rhythms by measuring morning, noon, and late afternoon samples on four non-study days that did not include novel events to ascertain a stable baseline for each child. Parents also completed questionnaires about the children's history, orphanage conditions, etc. In the institutional care group (n = 18), 4 year old children that came from Russian (n = 12) and Romanian (n = 6) orphanages had been in care for 7-24 months (m = 16.6 months) and had lived with adoptive families for approximately 3 years (m = 35 months, SD = 11 months). They were compared to same aged, never-institutionalized peers (n = 21).

Results indicated that HPA dysregulation was specific to institutionally-reared children's interactions with their mothers (prolonged and elevated cortisol levels) versus the female stranger. The greatest severity of neglect/orphanage conditions was positively associated with the highest basal cortisol levels and the most impaired cortisol regulation following the mother interaction. Results indicated that early social deprivation may keep children from acquiring the needed early scaffolding in order to learn how to modulate physiological stress and may contribute to long-term regulatory problems of the stress-responsive system. How this lack of long-term regulatory problems may manifest is

within the context of ongoing, close interpersonal relationships. Another view as to why children may have had higher basal cortisol levels in the presence of the adoptive mother versus the stranger is the context with which interpersonal caregiving relationships once held for them when living in their birth family or institutional care setting. Children may have once needed to be self-protective in the presence of their caregivers due to abuse or neglect; under such circumstances, children need protecting from the very relationship that should be their safe haven.

Dobrova-Krol et al (2008) studied the effect that institutionalization had on Ukrainian children's growth and HPA axis stress regulation. Growth trajectories (height, weight, head circumference from archival medical records and day of the study) and stress regulation (diurnal salivary cortisol sampled six times during one day) were examined in institutionally-reared (n = 16) children (ages 3-6 years) and 18 native familyreared children that were matched on age and gender. Archival growth data indicated significant delays in the first year of life; there was greater improvement among postinstitutionalized children by 24 months, with temporarily stunted institutionally reared children making significantly greater gains in weight and partial catch-up in height. Yet, by 48 months, there were still 31% of institutionally-reared children that continued to be growth stunted.

The institutionally-reared and family-reared children showed similar patterns of diurnal cortisol production with normal decreases over the day. However, those children that had been temporarily stunted had a significantly higher concentration of total daily cortisol production than did the chronically stunted institutionally-reared children and family-reared control groups. These data confirm previous findings regarding physical

growth delays and stress dysregulation being associated with institutional care, but also point to differences in cortisol production between stunted and non-stunted institutionally-reared children.

Consistent with the hypothesis that orphanage-reared children have been exposed to long periods of stress, Gunnar, Morison, Chisholm, and Schuder (2001) studied 6- to 12-year-old ICA children reared in Romanian orphanages to determine how their early experiences impacted their daily cortisol patterns. Children's salivary cortisol samples were collected at waking, noon, and early evening on three consecutive days; parents completed questionnaires regarding children's historical information and health and participants were excluded if taking a psychotropic or corticosteroid, as both can affect salivary cortisol results. Results indicated that those children that remained in the institution for ≥ 8 months (n = 18; boys n = 10) had higher daytime cortisol levels than did those that were adopted before age 4 months (n = 15; boys n = 7) as well as those children in the Canadian born control group (n = 27; boys n = 11). There was also a positive association between time in the orphanage and cortisol levels for children adopted at ≥ 8 months; yet, early adopted children indistinguishable from the familyreared children on all measures. This may indicate that this study's salivary cortisol results were less likely to be associated with prenatal risk. Limitations of this study include small sample size, only studying Romanian ICA children, and not examining cortisol patterns when children were mildly stressed.

Among ICA toddlers that were adopted from Chinese institutions (n = 50) and foster care (n = 42), Van den Dries et al (2010) compared physical, cognitive, motor, and physiological stress development. Children were between ages 11 and 16 months upon arrival. Their growth, (height, weight, and head circumference), diurnal salivary cortisol, cognitive, and motor development were assessed at 2 and 6 months post-adoption. Surprisingly, there were no significant differences between groups or at time points related to daytime cortisol rhythms; this lack of stress response system dysregulation may relate to greater responsive care in the institution than anticipated. Results also indicated that there were slightly more elevated afternoon cortisol levels when comparing former foster youth to never institutionalized controls. The investigators questioned whether this slight elevation may relate to severed attachments and grief after leaving their foster families behind.

Catch-up over time was found for weight and head circumstance. There was a significant interaction between time and age at arrival with those children adopted earlier having a more rapid growth catch-up. Former institutionalized children performed more poorly than former foster children on cognitive and motor skills at both time points. These results indicate that cognitive and motor development appear to be influenced by the effects of deprivation (institutionalization > foster care) more so than stress regulation and physical growth and that these two systems may be more robust in the face of adversity.

In summary, stress response dysregulation has been associated with institutional care. For example, one study noted that children in institutional care had distinctively unique diurnal rhythms that peaked midday versus in the early morning (like those from foster care) and denoted a blunted pattern that gradually declined over the day (Carlson & Earls, 1997). Impacting basal cortisol rhythms was the severity of neglect; an increase in

severity of neglect in previously institutionalized children yielded increased basal cortisol levels (Wismer Fries et al, 2008).

Also associated with institutionalization and stress dysregulation is physical growth delay, as cortisol distinctions have been made between stunted and non-stunted institutionally-reared children (Dobrova-Krol et al., 2008). The adoptive family has been found to be a successful intervention for post-institutionalized ICA children's dysregulated basal cortisol patterns (i.e., increased previously blunted morning cortisol from baseline) (Kroupina et al., 2012). The length of time that children resided in institutional care was positively associated with cortisol concentrations (i.e., \geq 8 months in care yields higher concentrations of cortisol than < 4 months in care; early adopted children indistinguishable from family-reared controls) (Gunnar et al., 2001).

Given the relatively significant rates of prenatal risk exposure to the general populations of sending countries, it is likely that orphaned and abandoned children placed in State care have already entered the world at risk for detriments like disrupted brain architecture, organ damage, birth defects, growth deficiencies, mental retardation and developmental disabilities (Davies & Bledsoe, 2005). The previous sections traced the impacts of institutionalization and foster care on children's behavior problems, selfregulation, and physiological stress response. The next section will review the topic of the effects of prenatal risk, specifically in utero alcohol exposure, malnutrition and premature birth, on ICA children's developmental outcomes that are most relevant to the current study.

Prenatal Risk Exposure and Intercountry Adoption

The previous section's literature discussed long-term behavioral and selfregulatory implications that children face following early adverse care through institutional or foster care environments. Yet, most populations of ICA children that enter their country's public child welfare system do so having already been exposed to early adversity via prenatal risk. Johnson (2000) relayed that many of the children in institutional care in Eastern Europe were likely to have been exposed to a constellation of prenatal risk factors (i.e., prenatal alcohol/drugs; malnutrition; poverty; prematurity; domestic violence); for example, he noted that "over 50% of institutionalized children in Eastern Europe are low birth weight infants, many were born prematurely, and some have been exposed to alcohol in utero [and] are children with major medical problems or physical handicaps that may be placed in orphanages by their [biological] parents due to limited access to corrective treatment and rehabilitation services" (p. 6).

The majority of these prenatal risks are also considered in the reproductive literature as proxies for maternal stress, as each risk deleteriously places stress on both the mother's/child's health (e.g., *see* Di Pietro, 2012; Reeb, 1987; Wadhwa et al., 1993); in contrast, maternal stress (including psychological stressors during pregnancy) has been defined as a developmental teratogen (Di Pietro, 2012). The burgeoning field of epigenetics would also argue that linked to these early adverse experiences was fetal programming and changes in brain plasticity where the child's course to physical health or disease would be mediated by their abilities or inabilities to modulate stressful events in their environment (Wellberg & Seckl, 2001). Key prenatal risks examined in this study are in utero alcohol exposure, malnutrition, and/or premature birth.

In the ICA literature, there is a dearth of research exploring the effects of prenatal risk as a more global variable (i.e., summation of several types of prenatal risk exposures; categorizing as high/low risk exposure) of cumulative stress versus examining only one specific prenatal risk variable (i.e., prenatal alcohol exposure). For example, one common prenatal risk that has been explored in ICA populations has been in utero exposure to alcohol—yet, in non-ICA literatures (general obstetric and pediatrics), the risk of prenatal alcohol has been found associated with other prenatal risks (i.e., low birth weight; premature birth; maternal malnutrition; fetal malnutrition) (e.g., *see* Di Pietro, 2012; Reeb, 1987; Wadhwa et al., 1993).

Certainly, a valid argument can be made that by not isolating each prenatal risk for individual study would provide results fraught with confounds. Yet, given the lack of available information about many children placed for ICA (i.e., birth family; prenatal; delivery), there remains only a modest literature (outside of children's growth delays and in utero alcohol exposures) on children's individual prenatal histories. This has made it virtually impossible for researchers to clearly examine with any certainty the impacts of prenatal risk influences on ICA children's developmental outcomes.

This study, much like most studies of ICA children, relies on the information provided by adoptive parents regarding their children's prenatal histories. It views children's experiences with prenatal alcohol, malnutrition, and premature birth as a conglomerate of teratogen/behavioral teratogen exposures. While theories of teratology/behavioral teratology will be discussed in greater detail later in the chapter, some key terms will be described here for greater understanding of the current section.

Teratology describes the biological processes by which birth defects are caused and behavioral teratology describes the effects of prenatal exposure to toxic substances/experiences on the central nervous system and concomitant behavior functioning (Vorhees, 1986).Prenatal alcohol and malnutrition are both teratogens and behavioral teratogens. They are known to cause global defects in the physiological and neurological functioning of exposed children and disrupt the typical development of the embryo and fetus (Ouellette, Rosett, Rosman, & Weiner, 1977).

Behavioral teratology specifically relates to abnormal development in children's behavior outcomes as a result of their exposure to toxic substances or experiences that cause short and long-term problems in functioning (Vorhees, 1986). Teratologic exposures throughout pregnancy (i.e., like alcohol and malnutrition--which often result in premature birth) impact the development of the central nervous system on a cellular level which gets expressed through behavioral dysfunction. Central nervous system damage related to the teratologic exposure is often irreversible (Vorhees, 1986), manifests behaviorally in a highly individualistic way based on the child's genetic vulnerabilities, and the degree of damage is linked to increased exposure to the toxic substances/experiences.

As structural teratogens that damage the development of the fetus at the cellular level, prenatal alcohol and malnutrition exposure affects all areas of the brain that are responsible for behavior; some examples include the hippocampus (memory; emotion), the cerebellum (i.e., memory; behavior), and the corpus callosum (facilitates communication between the left and right hemispheres of the brain) (Mattson, Shoenfeld, & Riley, 2001; Streissguth, 1997). In particular, damage to the corpus

callosum has been linked to executive function disorders, learning challenges, and attention difficulties (Mattson et al., 2001).

The following section will begin with a discussion of the one prenatal risk factor that appears to have the most literature available related to ICA children--prenatal alcohol exposure. What information is available has mostly been gathered via adoption specialty clinic file mining, adoptive parent report from pre-adoption information, or facial FAS/FASD measurements completed as children have aged.

The prenatal alcohol section will begin by providing a general history of the research of prenatal alcohol exposure. Second, there will be a review of the prevalence of prenatal alcohol exposure in ICA sending countries. And third, there will be a review of the available research on ICA children with a history of prenatal alcohol exposure.

Prenatal Alcohol Exposure

Streissguth (1997) provided a historical account of many of the "natural studies" that examined the effects of prenatal alcohol exposure on developing children, documenting them as early as the turn of the twentieth century. For example, a study of pregnancy outcomes among alcoholic mothers found that they had a greater preponderance of infant deaths and still births (Sullivan, 1899); these results were later found in alcoholic mothers to be at twice the risk for infant death/still birth when compared to those mothers that did not drink alcohol during their pregnancy. Yet, other schools of thought during that time period argued that the developmental disabilities that children of alcoholic mothers suffered were more linked to heredity and poverty than maternal alcohol use during pregnancy (Streissguth (1997).

From the 1950's through the early 1970's, researchers began to see short and long-term developmental patterns in children of alcoholic mothers, particularly poor behavioral problems, failure to thrive, poor growth and other developmental challenges (Lemoine, Harousseau, Borteyru, & Menuet, 1968; Rouquette, 1957; Ulleland et al, 1970). Lemoine et al (1968) were the first to document facial abnormalities and shared behavioral characteristics among children of alcoholic mothers. When Ulleland et al (1970) were studying a group of children with a diagnosis of failure to thrive, they began to see patterns forming among the infants of alcoholic mothers (n = 11) in comparison to the infants of their non-alcoholic mothers (n = 1,582); they noted that maternal alcoholism was a major risk factor associated with poor developmental outcomes, particularly failure to thrive.

In 1973, Jones and Smith put a name to the pattern of physical features and neurological system dysfunction found among the children born to alcoholic mothers—

fetal alcohol syndrome (FAS); recognizing that alcohol exposure played a major role in children's neurological system dysfunction was guided by and pivotal in the theoretical work of behavioral teratology (Vorhees, 1986). Jones and Smith (1973) established the following criteria for diagnosis of FAS:

- 1. Maternal use of alcohol during pregnancy was documented
- 2. Pre or postnatal growth deficiency (height and/or weight)
- 3. Facial dysmorphology (small eye slits; flattened midface; short nose; flat philtrum; and thin upper lip; and
- 4. Central nervous system damage (Small head circumference; motor problems; seizures; hyperactivity; attention problems; learning problems; and cognitive delays with or without clinical mental retardation.

Initially, the calling for a strict adherence to meeting all four criteria resulted in an under-diagnosis of FAS when physicians were describing birth defects (Stratton, Howe, & Battaglia, 1996). For FAS, prevalence in the US has been estimated to be 1 to 3 per 1,000 births, but results vary dependent on population (Stratton et al., 1996). More specifically, prevalence rates for FAS have been reported to be higher among Plains Indian populations in Washington State (9 per 1000 births; May & Gossage, 2001) and foster care populations in Washington State (10 – 15 per 1,000 births; Astley, Stachowiak, Clarren, & Clausen, 2002).

Over the last 30 years, great controversy has ensued as to what the appropriate diagnosis and coding processes which are to be used with children who may meet some but not all criteria of FAS. Throughout this time period, there has grown a greater understanding that children's behavior and cognitive abilities can still be impacted by

their prenatal alcohol exposure even if they do not meet all four criteria for FAS. This has been particularly important in the ICA child population where adoptees may lack prenatal history. In 2004, the Centers for Disease Control and Prevention defined the term *fetal alcohol spectrum disorders (FASD)* which describes a broader array of physical and behavioral affects related to prenatal alcohol exposure. Although not a medical diagnosis, it does bring a common nomenclature to the table for discussion about the effects of prenatal alcohol exposure on child developmental outcomes.

Approximately 50% of all children diagnosed with FAS suffer from mental retardation (i.e., I.Q. score below 70). Nearly all struggle with challenges related to attention and behavior [Streissguth et al. 1991]). Most often, they have been exposed to heavy alcohol use in utero (> than 14 alcoholic drinks per week). Davies and Bledsoe (2005) noted that the ways and degree in which a child is impacted by their prenatal exposure to alcohol is dependent on his/her individual genetic vulnerabilities paired with such factors as the point in pregnancy which the exposure takes place, the frequency of the mother's alcohol usage, how much she drinks in one sitting, when she drinks, and the dosage of what she drinks.

When comparing populations of children that had been exposed to more "moderate" versus "heavy" alcohol use that most often resulted in the outcome of children's full blown FAS they share many of the same symptoms, but at less severe levels. For example, J. L. Jacobson and S.W. Jacobson (1994) found that those children whose mothers exposed them to approximately 7-14 alcoholic drinks per week (defined as "moderate drinking") versus children that had been exposed to "heavy" alcohol use (>14 drinks/week), the moderately exposed children fell within
normal limits for IQ scores (mean = 100) but still denoted many challenges with information processing, executive functioning/self-regulation, and behavior problems—these difficulties were simply rated with slightly less severity than were those in the "heavy" exposure group.

Another examined the possible neurobiological effects of prenatal alcohol exposure on the limbic-HPA axis, a key component of the stress response system in humans. Abnormal development of the limbic-HPA has been a marker for later cognitive deficits (Lupien et al., 1994), emotional disturbances (Granger et al., 1994), and psychopathology (Holsboer et al., 1995).

Haley, Handmaker and Lowe (2006) hypothesized that children that had been exposed to prenatal alcohol would experience greater infant stress when testing 5 to 7 month old (N = 50) children whose mothers were enrolled in an alcohol intervention study. They measured maternal alcohol consumption during and after delivery (Timeline Followback interviewing method) and further examined relationships between prenatal alcohol consumption and infant developmental outcomes. They divided mothers into high and low frequency alcohol drinkers (mean percent of prenatal drinking days [PDD]) to make between group comparisons when measuring infant physiological stress.

Researchers used a modified still-face procedure to examine parent-child interactions and to induce moderate stress in the infant. This procedure explores parentchild interactive styles and infants' interactive and regulatory abilities. There are three phases in the sequence—initial play (child-mother interacts), still-face (child tries to interact with mother and mother remains still-faced, causing stress [proved to be reliable in the 3-6 month old] (Cohn & Tronick, 1983), followed by a reunion (normal child-

mother interaction). Baseline saliva samples were taken five minutes prior to the start of the experiment and a second set 30 minutes after the still-faced interaction task was completed.

Results indicated that although mothers had significantly decreased their alcohol intake after learning they were pregnant, their mean percent of prenatal drinking days [PDD]) from conception to pregnancy recognition was still positively related to children's cortisol reactivity, elevated heart rates, and negative affect. Additionally, as mothers' frequency of drinking increased (high frequency), infants displayed significantly elevated cortisol responses during the stress task when compared to those infants in the low frequency group.

Gender differences were also present related to stress response. Boys with high drinking frequency mothers denoted elevated cortisol and little/no evidence of recovery (regulation) from their elevation at significantly higher rates than boys of mothers in the low frequency drinkers' group. In contrast, girls whose mothers were in the high frequency drinking group did not differ from female infants with mothers in the low frequency group in terms of elevated reactivity patterns.

Important to note is that these patterns remained consistent even when controlling for other environmental factors associated with infants' elevated cortisol patterns (i.e., maternal depression; annual income). Limitations of this study are the absence of nonalcohol exposed control infant control groups of similar demographic backgrounds and the correlational limitations of the analyses. The next section will explore the prevalence of prenatal alcohol use in ICA sending countries. *Prevalence of Prenatal Alcohol Exposure in ICA Sending Countries*. While studies do exist related to international populations that indicate high maternal alcohol use during pregnancy (i.e., South Africa [*see* May et al, 2014]; Italy [*see* Ceccanti et al., 2014), there are few studies in the literature related to prenatal alcohol exposure in children that reside in institutions within sending countries of ICA. Due to the fact that many children that resided in institutional care often have little/no birth family, prenatal history, or medical history information available at the time of referral or placement, adoption specialists, prospective adoptive parents, and adoption researchers often extrapolate from the norms surrounding alcohol use and abuse in children's sending countries to determine the degree of risk that alcohol exposure during pregnancy has taken place.

Such an extrapolation might be in relation to China and Korea, two sending countries that the US has had long-standing relationships with in regards to ICA. Alcohol consumption by women in China and South Korea have become much more common than in generations past. For example, rates among child-bearing aged women in China and South Korea has risen by 3% per year since 1995 (Cochrane, Chen, Conigrave, et al., 2003; Hao, Chen, & Su, 2005; Park, 2001).

Another example would be alcohol-related risk behaviors in Russia. In 1994 when ICA was at its peak, alcohol-related mortality was as high as 50 deaths/100,000 people (Pridemore & Kim, 2006) (maternal mortality rate in 1992 was 52 deaths/100,000 people) (Kingkade & Vasin, 1997). Nemtsov (2002) estimated alcohol was responsible for one-third of deaths in Russia. Although this does not indicate statistics about drinking

behaviors of women of child bearing ages, alcohol use during pregnancy, or FASD outcomes in children, it does describe the effect that alcohol use has in Russian society.

For example, in a cross-section survey of 648 pregnant and non-pregnant Russian women of child-bearing age in seven women's clinics in St. Petersburg and the Nizhny Novgorod region, Balachova, et al (2014) conducted face-to-face structured interviews to assess demographic characteristics, pregnancy status, alcohol consumption, level of trust in and receptivity to FASD prevention messages during pregnancy, the importance of educating professionals and community about FASD, and the credibility of various sources in messaging them about FASD prevention. Results indicated that 60% of women in the sample drank during their pregnancy; 35% consumed alcohol within 30 days prior to the survey; and 7.4% of those 35% relayed having ≥ 5 drinks in one sitting. Similar outcomes about alcohol during pregnancy were found in an earlier survey by Kristjanson et al, 2007.

In ICA populations, several negative physical problems have resulted from prenatal alcohol exposure (Davies & Bledsoe, 2005; Miller et al., 2009; Robert et al., 2009). For example, among children prenatally exposed to alcohol, there are high rates of microcephaly at birth (small head circumference; failure of brain growth) and subsequent damage to other brain centers that are responsible for important roles like threat perception and response, attention-related abilities, self-regulation, stress modulation (i.e., amygdala; medial prefrontal cortex) (Davies & Bledsoe, 2005). The next section will discuss the research that is available on ICA children that has been conducted after children were adopted from institutions or foster care.

ICA Children with a History of Prenatal Alcohol Exposure. Children that have been exposed to prenatal alcohol exposure have been shown to be at increased risk for greater internalizing and externalizing behaviors when studied after ICA (Streissguth, 1997). For example, using the CBCL and factoring in other child variables (i.e., time in care; birth weight; risk and protective factors) McGuinness and Pallansch (2007) longitudinally studied behavioral issues in Russian ICA children. Excluded from the sample were children with major health or neurological diagnoses, including FAS. At Time 1, children were between 6 and 9 years of age (n = 105); at Time 2, they were 10 to 13 years of age (n = 57).

Children's problem behavior scores decreased slightly from Time 1 to Time 2. Results indicated a wide range of behavior scores, which over time remained fairly consistent. This pattern is a repeated finding in the ICA literature and a finding that differentiates this population from the typical performance bell curve of their nonadopted peers. Of the various risk factors evaluated in this study, low birth weight was found to be a predictor of behavior problems. Both low birth weight and behavior problems are linked to prenatal exposure to alcohol (Streissguth, 1997) and McGuinness et al. (2000) and McGuinness et al.(2007) noted that 41% of the children at Time 1 and 38% of children at Time 2 were reported to have been born to alcoholic mothers.

Miller et al (2005) explored differences in growth, cognition, and prenatal alcohol exposure between previously institutionalized and foster-reared children through a retrospective chart review of Guatemalan adoptees (N = 100). Children were evaluated by a U.S. adoption specialty clinic shortly after their adoptive placement (mean = 2 months). The study sample was representative of Guatemala's system of care which included care

in family foster care, orphanage care, or mixed care (foster family + orphanage). Children were divided by their system of care (foster care n = 25; orphanage care n = 25; mixed foster care and institutional care) and matched by age at arrival (mean age = 16 ± 19 months), time between arrival and clinic assessment, and gender. Developmental evaluations were conducted using the University of Michigan Early Intervention Development Profile (Schafer & Moersch, 1981) and Mullen Scales of Early Learning (Mullen, 1985).

Prior to matching, the foster-only group had significantly stronger physical growth scores when compared to the institution-only group. In the matched samples, the foster-care only group also had significantly greater weight, height and head circumference scores than previously institutionalized children; in those adopted at < 2 years of age, children's post-adoption growth measures were negatively correlated with age at arrival. In the total sample, 14% of children exhibited global developmental delays and 28% expressed phenotypic facial features suggestive of utero alcohol exposure. When comparisons were made among sub-samples, there were no differences between those children in the foster and institutional-only groups.

Overall, these studies suggest that those children exposed to alcohol while in utero are at greater risk for significant health and developmental problems. For example, they are at greater risk for low birth weight, poor post-natal growth, premature birth, small head circumference, attention-related problems, internalizing and externalizing behavioral problems. The next section will discuss the only study that could be found that specifically discussed the effects of prematurity as a prenatal risk on ICA children's developmental outcomes. Plenty of publications discuss prematurity as a problematic

prenatal risk in several sending countries from which US families adopt. For example, a 2012 report indicated that China denoted the second highest premature birth rate in the world, accounting for more than 1,172,300 babies being born at < 37 weeks of gestation in 2010 (Lawn, Davidge, & Paul, 2012). Yet, only one study specifically addresses prematurity as an outcome related to ICA children.

Prenatal History of Malnutrition

Johnson (2000) noted that many ICA children suffer from prenatal malnutrition. For example, Guatemala has the world's fourth highest chronic malnutrition rates for mothers (> 27% undernourished) and children (> 50% for those ages birth-5 years; \leq 80% in indigenous areas) (Zello, 2012); 96% of Ethiopian children < 5 years of age are reportedly stunted (47%), wasted (11%), or underweight (38%)(Ethiopian Demographic Health Survey, 2006). Yet, few studies of children eligible for international adoption who are residing in institutional and/or foster care environments in ICA sending countries are specifically being conducted. Additional issues that have been problematic remain to be poor access to children's medical and family history records as challenges in teasing out other prenatal risk factors that share symptomology with malnutrition (i.e., prenatal alcohol exposure).

Additionally, the challenge of examining some of the general malnutrition literature outside of ICA literature to more broadly understand the short and long term impacts on children's developmental behavior problems, self-regulation, and physiological stress response is that it will likely not rule out other important confounds. For example, in low resource countries where all types of malnutrition are common (prenatal, postnatal, maternal, child, adult, elder), disease often comes hand in hand.

Where there are developmental challenges, it would be difficult to discern the contributing factors.

A body of literature to consult might be one that specifically examines the longterm developmental effects of prenatal malnutrition without the combined effects of postnatal malnutrition and disease. Such studies might include epidemiological research that focused on a birth cohort of children that were in utero during some point of the Dutch Famine, otherwise known as the Dutch Hunger Winter of 1944. This body of studies also profoundly contributed to an understanding of how even a transient prenatal environment can cause consistent changes in epigenetic information in children (Heijmans et al., 2008).

Cohort from the Dutch Hunger Winter of 1944. The Dutch Hunger Winter of 1944 lasted from November of 1944 through May of 1945 during the height of World War II. During this time, the urban cities in the western part of The Netherlands were struck by a 7 month period of severe food scarcity. The famine was caused by an embargo on the food transports imposed by the Nazi-occupying forces as retaliation for the striking-Dutch railways that set out to hamper the transport of German troops through the north.

Prior to October of 1944, nutrition in the Netherlands had been quite adequate, with most citizens eating approximately 2000 to 2500 calories per day. During the Famine, official rations for adults fell abruptly below 1000 calories per day at the end of November 1944; from December 1944 until April 1945, the official daily rations varied between 400 and 800 calories. Pregnant women were entitled to an extra amount of food, but at the peak of the famine (December through April) these extra supplies could no

longer be provided. After the liberation in early May of 1945, the food situation quickly improved. One month later, the rations were again above 2000 calories (Burger, Sandstead, & Drummond, 1948).

The famine had a profound effect on the general health of the western Dutch population. In Amsterdam, the mortality rate in 1945 had more than doubled compared to 1939, and it was very likely that most of this increase in mortality was attributable to under-nutrition (de Rooij, Wouters, Yonker, Painter, & Roseboom, 2010). It reportedly impacted fertility, [lack of] women and fetal weight gain during pregnancy, central nervous system development, and infant size at birth (i.e., decline in mean birth weight to 300 grams among those children that were in the third trimester of pregnancy) (de Rooij et al., 2010). The famine was a humanitarian disaster, yet much like institutionalized/postinstitutionalized children, it left the opportunity to study the effects of deprivation in later life.

Because the Dutch population was well fed prior to and after the Dutch Hunger Winter of 1944, it served as a "natural experiment" (much like ICA) to study the developmental effects of fetal malnutrition, as deprivation took place for a circumscribed period of time. Susser, Hoek, and Brown (1998) proposed that a long-term developmental outcome associated with the blockade included a two–fold increased risk for neurocognitive disorders. They explained two possible interpretations regarding the causal mechanisms of these effects. First, among the Dutch Hunger Winter Cohort, there was an association between the prenatal deficiency of many micro– and macronutrients being linked to neurodevelopmental schizophrenia or other related personality disorders; and second, they proposed that maternal distress (i.e., from fear of Nazi occupation;

poverty; death), secondary to the famine, each having neurotoxic effects on the developing brain.

In a landmark epidemiological cohort study on the effects of the Dutch famine on cognitive functioning of this birth cohort at age 19 years, Stein, Susser, Saenger, and Marolla (1972) examined the medical records of 125,000 (98% male) individuals from selected famine and control cities between January 1944 and December 1946 that were inducted into the military. Given their date and place of birth, Stein et al (1972) denoted that 20,000 of the men had been carried in utero at the time of the famine and were exposed to it via maternal starvation at that time. When performing cognitive testing on them at age 19 years, Stein et al (1972) found no significant differences between those that had/had not experienced prenatal malnutrition when scoring cognitive abilities of abstract reasoning or measuring for rates of mental retardation. They indicated that their results supported theories of adaptation and resiliency in the face of nutritional deprivation and that children's post-natal experiences have the great potential to override devastating prenatal insults. A major weakness of this study was that is only included male participants, not being able to rule out any effects of gender. The men in the study were also in the military; a requirement of them entering military service may have included some sort of screening process of cognitive skill, potentially excluding those that had greater cognitive deficits.

Utilizing a broader sample that included both men and women, the cognitive abilities of this cohort were later tested when participants were between the ages of 56 and 59 years. In this sample (N = 797; 53% female), de Rooij et al (2010) found that 40% (n = 297; 52% female) were found to have had prenatal malnutrition when they consulted

participants' birth hospital medical records. At age 59, de Rooij et al (2010) tested cohort participants to determine whether there were any effects of prenatal malnutrition on cognitive functioning in later life. They performed a general intelligence test, a paragraph recall memory task, a perceptual motor-learning task (mirror drawing), and a selective attention task (a Stroop-like color-word in-congruency task). They found some intriguing results.

Regardless of the criteria for famine exposure used, the data suggested that those exposed to malnutrition during the first trimester of pregnancy were most vulnerable to its effects on selective attention performance. They noted that this was likely due to the fact that the central nervous system is structurally formed in the beginning of gestation (de Rooij et al., 2010). This result also validated Stein et al (1975) earlier associations between famine exposure during early gestation and the increased prevalence of congenital abnormalities. The participants exposed to famine in early gestation were also significantly more likely to have full term births (longer gestation periods) than were those exposed in the second or third trimesters. Additionally, de Rooij et al (2010) noted that those exposed to famine in mid or late gestation were lighter in weight and smaller in head circumference at birth than were those unexposed to famine during gestation.

When comparing growth and cognitive abilities of this cohort (those exposed to famine at any point in pregnancy) to those not exposed to famine, the children that had been exposed to famine (age 59 years) had significantly smaller adult head circumferences and performed worse on Stroop-like tasks when compared to the unexposed adults (ages 56-58 years). There were no differences between the groups on tasks of memory or the perceptual motor learning task (de Rooij et al., 2010). Results

likely indicate that fetal malnutrition may negatively impact aspects of cognitive development that may not be clearly present until later in life as suggested by men and women's Stroop-like Task performance that were exposed to famine in utero (Stroop, 1935).

Much like the Go/No-Go Task of inhibitory control and the Attention Regulation Task used in the current study, the Stroop-like Task requires selective attention in order for the participant to inhibit their automatic reaction to the advantage of the nonautomatic one. This function is situated in the prefrontal cortex which typically declines with age (Healey, Campbell, Hasher, 2008). It has been suggested by de Rooij et al (2010) that poorer selective attention performance by those exposed prenatally to famine is actually caused by early aging; yet it is also possible that this deficit has always been present but that earlier measures used by Stein et al were not sensitive enough to detect it. The only way to validate this hypothesis would be to perform further longitudinal testing with the same sample and measures.

When comparing famine-exposed to non-famine exposed participants, those exposed to famine (age 59 years) had significantly smaller adult head circumferences and performed worse on Stroop-like tasks, but were similar on memory tasks. This may indicate that fetal malnutrition may negatively impact certain aspects of cognitive development that require selective attention, a function associated with the prefrontal cortex which typically declines with age (Healey, Campbell, Hasher, 2008). Prenatal exposure to famine may contribute to the onset of early aging; yet it is always possible that this deficit has always been present but the earlier measure used was not sensitive

enough to detect it. The only way to determine this finding would be to perform longitudinal testing with the same measures.

Heijmans and associates (2008) specifically examined epigenetic differences associated with varying points of famine exposure during gestation among the Dutch Hunger Winter Cohort population. The researchers compared cohort members that were exposed to famine early in pregnancy (point in prenatal development that is most critical for epigenetic programming) versus later in pregnancy; additionally, each of which were also compared to a same-sex sibling.

As earlier studies had suggested associations between adult disease and early exposure to adverse environments, Heijmans et al (2008) hypothesized that the roots of disease surfacing later in life had actually stemmed from problems in early epigenetic regulation (the "turning on" and "turning off" of genes related to disease). Therefore, they examined the maternally imprinted, epigenetically-regulated insulin-like growth factor II (*IGF2*) which is important in human growth. It is also maintained through the *IGF2* differentially-methylated region (DMR2) and remains genetically-determined up until about middle age, which at the time of the study, was the age of the Dutch Hunger Winter Cohort. The purpose of their study became to understand whether preconception exposure to famine was associated with *IGF2* methylation DMR in middle adulthood.

Results indicated that the timing of exposure to malnutrition did impact *IGF2* DMR—specifically, 60 years later, those individuals exposed very early in pregnancy denoted significantly lower methylation of *IGF2* DMR when compared to their same sex, unexposed siblings. In contrast, late-pregnancy famine exposure was not associated with *IGF2* DMR methylation. These outcomes indicated that the exposure to temporary

environmental conditions (of risk) taking place very early in pregnancy result in a persistent, epigenetic mark formation, as periconception (versus late pregnancy exposure) serves as a heightened period of sensitivity.

In summary, the studies that followed the cohort from the Dutch Hunger Winter of 1944 provide us with a wealth of valuable findings from a natural experiment about prenatal malnutrition and epigenetics that can be used to help provide a better understanding of the in utero impacts on later development of ICA children. The timing of prenatal malnutrition is important. For example, the first trimester of pregnancy is the most vulnerable in terms of children's cognitive abilities which also relate to behavior and self-regulation abilities. It was suspected that this relates to the central nervous system being structurally formed in the beginning of gestation. Some protective mechanism may be at play with children that had early gestation exposures to malnutrition, as they were more likely to have full-term deliveries, longer gestation periods, heavier in weight and larger head circumference than were those exposed in later gestation periods. Timing of exposure to malnutrition during pregnancy was also key in relation to susceptibility to disease in midlife—specifically, individuals from the cohort exposed to malnutrition at the very early stages of pregnancy (versus late pregnancy) indicated significantly lower *IGF2* methylation DMR. The literature associated IGF2 methylation DMR with increased cancer risks during middle life.

Prematurity.

Measuring Global Rates of Prematurity. No data have been published as to the global incidence of premature birth (Beck et al., 2010). Information that has been available is mainly from high resource countries like the UK, the US, and Scandinavia

(Beck et al., 2010). This research denotes a rise in premature birth rates over the last two decades, citing contributing factors such as adults becoming parents at older ages, an increase in multiple births related to assisted reproduction methods, and greater use of Cesarean sections for delivery (Callaghan, MacDorman, Rasmussen, Qin, & Lackritz, 2004).

In medium and low resource countries, there is a lack of accurate population data available paired with a host of other factors like varying definitions of the viability of preterm infants, access to prenatal/perinatal/postnatal care, lack of consensus as to the methods used to measure gestation age, and cultural differences in religious and burial practices that may conflict with registering infants on birth registries (Graafmans et al., 2001). Factors like these make the measurement of premature birth rates between and within low, medium and high resource countries quite varying (Beck et al., 2010).

Beck et al (2010) conducted a systematic analysis of the literature on preterm birth rates worldwide to determine its incidence as a public health problem and to decipher regional effects throughout the world. They examined published and unpublished materials on preterm birth rates worldwide that were reported between 1997 and 2007. Region-specific multiple regression models were used to estimate the preterm birth rates for countries with no formally-published data. Findings indicated that in 2005, 12.9 million births (9.6% of all births globally) were considered to be preterm with the majority of those births (11 million [85%]) being concentrated in Africa and Asia; approximately 0.5 million occurred in each of Europe and North America (excluding Mexico) and 0.9 million in Latin America and the Caribbean. The

highest rates of preterm birth were in Africa and North America (11.9% and 10.6% of all births, respectively), and the lowest were in Europe (6.2%). In terms of absolute numbers within low resource countries, the burdens of preterm birth are most profoundly experienced in Africa and southern Asia.

Outcomes Associated with Very Early/ Extremely Early Premature Birth. In countries that have access to adequate medical supports for very preterm infants (25 to 30 weeks of age), survival rates have increased in the last two decades. Yet, survival is not the last and only challenge faced by these children and their families.

Preterm children are at risk of developmental problems for a number of reasons. First, they may have experienced a premature birth because of other health problems that surfaced when they were a neonate. Second, being born prematurely may have resulted in damage to the lungs and brain. Third, treatments required during the neonatal period may have caused additional health problems for the child. Fourth, stress that the child experienced from fetal distress, an early delivery, and the fight for subsequent survival before his/her bodily systems were ready to enter the world may have contributed to further damage. Fifth, long stays in a highly stimulating hospital environment and the barriers to the child-primary caregiver attachment process may also add to the risk. Therefore, an important point to consider when trying to discern just how developmentally affected an individual child has been by their premature birth, at 25 and 40 weeks gestation the infant brain is still immature and rapidly developing—it is also at this time that the brain is very vulnerable to insults (Hüppi et al., 1998).

The literature related to the developmental outcomes of preterm infants is mostly organized by perinatal interventions and divided into cohort and follow-up studies. Outcome measures focus on disabilities or examinations concerning a specific neurodevelopmental domain (i.e., WHO criteria in impairments, disabilities, or handicaps [World Health Organization, 1989]), cerebral palsy (CP), mental retardation, and blindness or deafness or a combination (Aylward, Pfeiffer, Wright, & Verhulst, 1988; McCormick, 1997; Vohr & Msall, 1997). More than with those born at full gestation, associations have been made between problems at school and children born very early preterm or extremely early preterm (i.e., neuromotor problems; developmental delay, speech/language delay, or behavioral problems) (Horwood, Mogridge, & Darlow, 1998; Hansen, Dinesen, Hoff, & Greisen, 2002).

Previous research of non-ICA populations has demonstrated the presence of emotional and behavioral disturbances in older (i.e., school-aged; early adolescent) children that were born very preterm (born <34 weeks gestational age) and extremely preterm (born <28 weeks gestational age) (Botting et al., 1997; Klebanov et al., 1994; Sykes et al., 1997). Additionally, based on experimental and observational measures, several other studies have indicated that attention regulation is also problematic for these children (Caravale, Tozzi, Albino, & Vicari, 2005; Rose, Feldman, Wallace, & McCarton, 1989; Vicari, Caravale, Carlesimo, Casadei, & Allemand, 2004).

For example, Landry et al (Landry & Chapieski, 1988; Landry et al., 1996) found that 6 month old children born very preterm and with a high degree of perinatal risk had much difficulty when shifting attention effectively from one toy to another when playing alone or with their parents. Studies that have examined executive abilities in older

children born preterm have also produced conflicting results regarding the specific areas of attention that may be disrupted, with some suggesting that sustained attention and inhibitory control may be the areas that are the focus of their difficulty (Bohm, Smedler, & Forssberg, 2004). There is some possibility that different attentional impairments may become more apparent at different developmental stages, thereby explaining some of the variation in findings.

Clark, Woodward, Horward, and Moor (2008) studied the development of emotional and behavioral regulation in a cohort of extremely preterm (<28 weeks gestational age, n = 39), very preterm (<34 weeks gestational age, n = 56), and full term (n = 103) born children between the ages of 2 and 4 years of age. They found that children in the three groups differed in how persistent and attentive they were during problem solving activities.

At age 2 years of age, those children that were extremely preterm (youngest in gestation) illustrated poorer emotional and behavioral regulation during cognitive testing and denoted less persistence and attentiveness in completing problem-solving tasks than did those who were full term. When children were tested again at age 4 years of age, similar patterns emerged among those that were born extremely preterm when compared to those in the full term group. Parents confirmed that their children were regularly struggling with self-regulation challenges; they also noted that their own parental expectations had increased related to their children's behaviors since testing at age 2 years. These outcomes were consistent with earlier studies of children born preterm in suggesting that difficulties in the regulation of attention, emotion, and behavior are

apparent at an early age (Lowe, Woodward, & Papile, 2005; Ohgi, Takahashi, Nugent, Arisawa, & Akiyama, 2003).

In addition to these biological factors related to regulation, Clark et al (2008) noted that parental responsiveness also plays an important role in predicting regulatory competence among children born very or extremely preterm. Their findings indicated that parents had difficulty scaffolding interactions around the cues that children delivered to them; as a result, they did not always provide children with well-timed support.

During tests involving parent-child interactions, parents often appeared intrusive during their 2 year old children's problem-solving attempts. Yet, Clark et al (2008) viewed this intrusiveness as part of a bidirectional interaction. For instance, children with more difficulties regulating their arousal and affect may require a more soothing and facilitation by parents. Additionally, cues that these children express may also be more mixed. For instance, Eckerman, Hsu, Molitor, Leung, and Goldstein (1999) found that children who were born very preterm were found to show more ambiguous cues with parents. Therefore, those parents that appeared more intrusive may have done so in order to illicit a response from their child which may in turn be overstimulating to the child, setting up aversive social interactions for both parties. This can have ongoing effects on the development of the mutually rewarding relationship between parent and child.

Difficulties in the regulation of affect and attention have a number of implications for ongoing development. Subtle difficulties in regulation and emotional control may well become more apparent with the growing complexity of the demands in the classroom not to mention impacting learning, self-esteem, and social development. Thus, early regulatory support may be an important target for intervention. One example of

such a support is The Newborn Individualized Developmental Care and Assessment Program (NIDCAP), an intervention aimed at regulating arousal and improving signal recognition (i.e., sensitivity) of parents of compromised preterm babies.

NIDCAP has shown discriminate effects on later child behavior, quality of mother – child interaction, improved neurobehavioral functioning, and more mature frontal brain structure development (Kleberg, Westrup, & Stjernqvist, 2000). Kleberg, Westrup, and Stjernqvist (2000) investigated what effect that the family-centered, developmentally supportive intervention had on the development and behavior of Swedish children and the mother–child interactions at 3 years of age. Two groups of very-low-birth-weight (VLBW) infants (\leq 1500 g) were studied. A control group (n = 21) was tested which had been born two years prior to the implementation of NIDCAP. The intervention group (n = 21) participated in the formal NIDCAP observation once every 10 days and had their development assessed using the Griffiths' Developmental Scale II paired with a neurological examination. Children's behavior was assessed via parental interview and Parent–Child Early Relational Assessment Scale (ERA) was used to score mother–child interaction.

The findings indicated that at 3 years of age, the group of preterm children that received the NIDCAP intervention (NIDCAP group) performed significantly better than the preterm children that had not received any intervention (No NIDCAP) on three measures. The NIDCAP group performed greater than the No NIDCAP group on the three following outcomes in the study: the hearing and speech measure (p = .02); the total score with respect to the Behavior Symptom Interview (p = 0.03); and the mother–child interaction score (the child cluster 'communication') (p = 0.03). There were no significant

differences between the groups on the following two measures: motor development and total developmental quotient (DQ) (Griffiths' Developmental Scale). In conclusion, care of VLBW infants according to NIDCAP appears to have certain positive long-term effects on the child's behavior and mother–child interaction.

ICA Children with a History of Prematurity and Low Birth Weight. Kreppner et al (2007) conducted a longitudinal study of ICA children that were adopted from Romania by UK families. They examine the differences in developmental functioning (normal versus impaired) across seven different domains when testing at age 6 and 11 years. Developmental domain comparisons were made between ICA children that had been institutionalized up to 42 months in profoundly depriving institutions and non-deprived domestic adoptees placed before the age of 6 months in UK families.

Two predictors tested in their model were the influences of prematurity and low birth weight (<2500 kgs in weight) on domain outcomes Findings indicated the following: First, normality/impairment patterns were established by age 6 years, meaning that if children scored within the normal range on domains at age 6 years, they remained in the normal range at age 11 years as well; children typically had the same trends with impairments. Second, post-institutionalized children that had remained in the orphanage for \geq 6 months displayed significantly greater pervasive impairment when compared to UK adoptee controls; only a minority of this group showed little/no impairment. Third and most relevant to the study of prenatal risk, neither "obstetrics" (premature birth) nor "low birth weight" (below 2500 kg) predicted normality or impairment at age 6 years or 11 years as predictors in the model. These findings indicated that deprived care and institutional care duration (\geq 6 months) were predictive of overall normality and impairment, suggesting a possible sensitive period for development.

The following study relates to factors associated with language delays in ICA infants and toddlers (N = 130), specifically prematurity and low birth weight. Glennen and Masters (2002) surveyed previously-institutionalized Eastern European children; the majority of the sample was from Russian (n = 118). Children's ages ranged between 8 months and 30 months; they were assessed by researchers with a number of language-based standardized measures and parents completed a pre and post-adoption developmental history form. Researchers assessed children every 3-6 months or until children reached the ages of 36-40 months of age.

Results indicated that the percentage of the sample that was documented as having a premature birth was 30.77%. At the time of adoption, approximately 80% of the participating children evidenced risk factors associated with language development. The percentage of children in the sample with height and weight below the 10th percentile on WHO Growth Standards was 59.23%. At study baseline, 38.46% noted gross motor delays and 44.62% had developmental delays. With respect to language outcomes gathered at follow-up, a multivariate factor analysis found no significant correlation between preadoption developmental risk factors and eventual language development outcomes, therefore indicating that prematurity and low birth weight showed no significant lasting effect on language outcomes. As with many other developmental domains, those children that were adopted at younger ages resembled same aged English language norms and children adopted at older ages still displaying mild delays at 36-40 months of age.

The next section of the paper will describe the theoretical models used to inform the current study. Those models are as follows: attachment theory; stress, coping and adaptation theories; and theories of behavioral teratology.

Theoretical Foundations of the Current Study

Understanding how early adversity can later impact life-span outcomes has been influenced mostly by the work of Bowlby and colleagues using attachment theory. The decade of brain science (1990 -1999) cultivated a broader theoretical scope of the role of the brain in attachment; this led to an increased emphasis on the influence of the quality of early primary caregiving and its effects on the development of children's physical and neurological brain architecture. This scope of work was influenced by researchers like McEwen, Lazarus, and Folkman who utilized varying theories of stress, coping and adaptation. This theoretical approach fostered an understanding about how children develop the skills to physiologically, psychologically and behaviorally modulate threat and what the cascading nature of developmental effects are when children experience social/global privation in early life.

As early adversity and stress often begin in utero for children of ICA, studies guided by Vorhees and Wilson's theories of teratology have also added a stronger understanding of how children's exposures to toxic, prenatal conditions (i.e., malnutrition; alcohol/drugs; prematurity) have placed them at greater risk for serious long-term health and developmental issues (i.e., emotional-behavioral dysregulation; diminished cognitive abilities; fetal alcohol syndrome). This section will describe the three theoretical foundations on which this dissertation has been built: 1) attachment theory; 2) the stress, coping and adaptation theory; and 3) the theory of behavioral teratology.

Attachment Theory

Early researchers (e.g., Bowlby, 1951; Chapin, 1911, 1917) studying the effects of pediatric institutionalization indicated that having a primary caregiver played a profound role in how children would further interact with caretakers, themselves, peers, and their environments. Bowlby began formulating attachment theory by studying young children's responses to early separation from their primary caregivers (i.e., via hospitalization). He noted in his seminal trilogy (1973; 1980; 1982) on attachment and loss (*Attachment and Loss I: Attachment; Attachment and Loss II: Separation Anxiety and Anger; Attachment and Loss III: Sadness and Depression*) that the child-primary caregiver attachment is an instinctually-based, reciprocal, bio-behavioral system that promotes child survival. Bowlby reported that sensitive periods for attachment occur between birth and two years of age where the child first forms a primary (child-first parent) then a few secondary relationships (i.e., child-second parent) (1973).

In the 1960's and 1970's, Ainsworth (1963; 1967) expanded Bowlby's work through observational, in-home studies of patterns of attachment with a focus on primary caregiver sensitivity and responsiveness. She found that maternal sensitivity and responsiveness played a significant role in whether the communication between the primary caregiver-child became synchronous and helped to modulate children's emotional-behavioral regulation. Through the primary caregiver's repetitious responsiveness, the child associates them as their safe haven and secure base. A safe haven promotes children's feelings of security to explore his/her environment while providing them a secure base to intermittingly check-in while safely learning about the world around them (Ainsworth et al., 1978; Bowlby, 1973; 1988).

The dyad's synchronized communication begins with the child's use of instinctual proximity-seeking or *attachment behaviors* (i.e., smiling, crying) which prompts interaction with the primary caregiver. These are triggered by a stressor or a sense of threat that the primary caregiver may not be physically and/or emotionally available to them. In response, the primary caregiver chooses to be/not to be responsive to the child's behaviors (Ainsworth et al., 1978; Bowlby, 1988). The primary caregiver's degree of responsiveness relays the child's worthiness to be protected, while providing scaffolding in which to build cognitive components for *internal working models*, or mental representations based on predictability of the primary caregiver, themselves, and their world (Bowlby, 1982). It is through internal working models that emotional, cognitive, and behavioral responses within relationships are shaped (Bowlby, 1982).

In the 1970's, attachment theory focused on attachment patterns and abnormalities. Using the Strange Situation Procedure, Ainsworth et al. (1978) defined organized attachment typologies as secure, insecure-avoidant (detachment), and insecureresistant (ambivalence). Main and Solomon (1986) added the insecure-disorganized typology, a pattern often associated with child maltreatment where the primary caregiver serves as both a safe haven *and* source of fear for the child. It is important to note that secure, avoidant and ambivalent are all organized patterns of attachment with secure being the most optimal outcome. The disorganized pattern means that the child does not have a specific pattern of attachment.

Tizard and Rees' (1977) observations of four-year-olds in an English residential nursery informed the first diagnostic criteria for attachment disorders (*Reactive Attachment Disorder [RAD]* with subtypes, *inhibited* and *disinhibited*) outlined in the

American Psychological Association's (APA) *Diagnostic and Statistical Manual of Mental Disorders* (1980; 1987); the "mixed" subtype was added in *DSM IV Edition* (APA, 1994). From 1980-1994, there was little published in the developmental research to inform the APA as to how to more comprehensively define RAD, prompting Zeanah and his colleagues (i.e., Zeanah, Mammen & Lieberman, 1993; Zeanah, Danis, & Hirshberg,1995) to further study and clarify alternative criteria/typologies.

For example, Zeanah et al (1993) found that the criteria for a RAD diagnosis failed to take into account those children with observable, but disturbed attachment relationships with a primary caregiver; additionally, the criteria/typologies at that time only identified a small minority of children from maltreating environments (Zeanah et al., 1995). To further encompass such populations, Smyke and Zeanah (1999) developed the Disturbances of Attachment Interview, an instrument that more comprehensively assessed the broader clinical disturbances of attachment in children (Smyke & Zeanah, 1999). For example, this measure differentiated between attachment characteristics of institutionalized and never-institutionalized Romanian children (Smyke et al., 2002; Zeanah, Smyke, & Dumitrescu, 2002); it reliably detected signs of RAD in young children with early maltreatment (Smyke et al., 2002; Zeanah et al., 2002; Zeanah et al., 2004); and the instrument reliably compared to similar measures used in other studies that identified signs of RAD (e.g., Crittenden's Preschool Assessment of Attachment [1992]; O'Connor & Rutter's model outlining behavioral characteristics of disinhibited/inhibited RAD [2000]).

This work later informed Zeanah & Boris's (2000) proposal for three, additional alternative attachment criteria/typologies that included a broader spectrum of attachment

disturbances: *disorders of non-attachment*; *secure base disorders*; and a *disrupted attachment disorder*. *Disorders of non-attachment* propose that the existing attachment pathology is within-child, or child-based; the *secure base* and *disrupted attachment disorders* propose that the attachment pathology is rooted between the child-primary caregiver relationship (Zeanah & Smyke, 2008). Clarification of these alternative attachment criteria/typologies is provided to further illustrate the wide range of symptomology associated with disturbed attachment.

Children who have *disorders of non-attachment* lack a preference for any one attachment figure and do not exhibit proximity-seeking behaviors. Zeanah and Boris (2000) defined that in order for children to meet criteria for this disorder of attachment, they must have a mental age of at least 10 months and cannot vacillate between having/not having attachment behaviors in other contexts. Additionally, children may or may not have a documented history of pathogenic care (Zeanah & Boris, 2000). There are two sub-types of *disorders of non-attachment: emotionally withdrawn/inhibited* and *indiscriminate/disinhibited*.

Children who display characteristics of the sub-type, *emotionally withdrawn/inhibited* attachment disorder, have often experienced histories of severe neglect, institutional rearing (Hinshaw-Fuselier, Boris, Zeanah, 1999; Tizard & Rees, 1974), or have lived in foster care settings with multiple placement changes (O'Connor, 2002). They do not display comfort-seeking behaviors towards a preferred attachment figure nor are children soothed by their caregiver(s) (Boris, Zeanah, Larrieu, Scheeringa, Heller. 1998; Boris, Hinshaw-Fuselier, Smyke, Scheeringa, Heller, & Zeanah, 2004; Smyke, Dumitrescu, & Zeanah, 2002). Children with an *emotionally withdrawn/inhibited* attachment disorder subtype often withhold affection, struggle with cooperative peer play, have difficulty understanding the serve-and-volley nature of social interactions, and are challenged with regulating emotions (Greenberg, 1999). Additionally, they often have a differential diagnosis of early childhood depression, anxiety (Zeanah & Boris, 2000), and/or hyper-arousal that has been catalyzed by early trauma experiences (i.e., severe abuse) (; O'Connor, 2002).

Children who can be described by the second typology of non-attachment disorders, *indiscriminate/disinhibited disorder* sub-type, often have a history of institutional or foster care rearing where they were looked after by multiple caregivers (Tizard & Rees, 1974; Hodges & Tizard, 1989). Behaviorally, children share both similarities and differences to those described in the *emotionally withdrawn/inhibited* subtype. They both lack being able to be soothed by a primary caregiver. Yet, children exhibiting behaviors of the *indiscriminate/disinhibited disorder* subtype *will* assert comfort-seeking behaviors, but within superficial relationships with unfamiliar adults; as such, they lack the natural reticence to wandering off with strangers and away from parent(s) (Boris & Zeanah, 2005).

The underlying components of non-attachment disorder typologies relate to children's lack of caregiver preference and their inability to healthily use primary caregiver attachments for comfort-seeking/soothing. The second (*secure based*) and third (*disrupted*) alternatives for attachment disorder criteria denote a relationship-specific pathology; behaviors reportedly emanate from within the dyad between the primary caregiver *and* the child (Boris & Zeanah, 2005).

Boris and Zeanah (2005) defined that those children with a *secure-base distortion* fall among four distinct sub-types: *Self-endangerment; clinging/inhibited exploration; vigilance/hyper-compliance;* and *role reversal*. Those characterized by the *self-endangering subtype* fail to activate typical attachment behaviors (i.e., proximity-seeking; checking in with the primary caregiver), tend to be high risk-takers (i.e., running into traffic), and can act-out aggressively towards themselves and/or their caregiver(s). It has been hypothesized that motivating factors for children's behaviors stem from early experiences of home violence; to promote protection, children were likely conditioned to exhibit more extreme attachment behaviors in order to invoke engagement with normally passive or physically/emotionally unavailable primary caregivers (Lieberman & Pawl, 1990; Lieberman & Zeanah, 1995).

Conversely, children who exhibited *clinging/inhibited exploration* subtypes showed a *hyper-activation* of proximity-seeking/checking-in behaviors with their primary caregiver (Boris & Zeanah, 2000). Boris and Zeanah (2000) noted that this was at the cost of developmentally-appropriate exploration which children need in order for them to learn about their environment; instead, they remain fearfully tied to their primary caregiver. In the third sub-type of secure base disorders, *vigilant/hyper-compliance*, children show an unwillingness to challenge authority and display a limited range of emotion (Steele, 1983). They display a strong need for control, mostly manifesting in behaviors of extreme self-constraint. Zeanah & Boris (2000) hypothesized that a motivating factor for children's over-compliance is a fear of displeasing their primary caregiver. Children characterized by the fourth sub-type of secure base disorders, *role reversal*, also exercise a strong need for control, but manifest behaviors externally towards their parent(s) versus internally towards themselves. Children display behaviors of over-protectiveness and preoccupation with their caregiver's physical and emotional needs. Motivating factors for children's behaviors may be rooted in their parent's inability to care for themselves/their child's needs (i.e., due to alcohol or substance abuse). In cases like adoption where primary caregivers change, the child may continue this attachment pattern with adoptive parents, having the perception that all adult caregivers are incapable of adequately caring for themselves as well as their child's needs (Solomon, George, & De Jong, 1995).

Children whose behaviors manifest within the third alternative attachment criteria, the *disrupted attachment disorder*, have often experienced a long separation (i.e., due to illness) from parent(s) or have encountered the sudden loss (i.e., due to death) of their primary attachment figure (Lieberman & Zeanah, 1995). Robertson and Robertson (1989) described a specific sequence of behaviors in children with a disrupted attachment disorder: Protest; sorrow/despair; and withdrawal/detachment from the world/others around them.

The expansion of RAD criteria/typologies by Zeanah and colleagues helped to illustrate the complex and varying nature of disordered attachments, providing greater insight into the many ways that children behaviorally manifested responses to early adverse experiences (i.e., unresponsive primary caregiving). As many previously-used instruments of attachment (i.e., Strange Situation Procedure) were found unreliable in assessing relational behaviors in children who had never formulated a discriminating,

preferred attachment (i.e., institutionalized children reared by frequently-changing caregivers) (Zeanah, Smyke, Koga, Carlson, & The BEIP Core Group, 2005), the broadening of attachment disorder classification became particularly poignant in promoting more inclusive measures for RAD and a greater understanding of those children reared in out-of-home care (i.e. institutions; foster care). During the same time period, Rutter, O'Connor, and colleagues were further refining the constructs of *disinhibited* and *inhibited* attachment disturbances (disorders of non-attachment).

Rutter and his colleagues found three essential behavioral components present in adopted children with a *disinhibited* attachment type. First, children did not differentiate a preferred attachment between their adult caregivers. Second, they were non-reticent about wandering off with complete strangers and away from their primary caregivers. And third, while exploring their environment, children did not display checking-in behaviors with their caregivers (O'Connor, Bredenkamp, Rutter,& English and Romanian Adoptees [ERA] Study Team, 1999; O'Connor et al., 2000; Rutter, & ERA Study Team, 1998; Rutter & O'Connor,1999). In terms of children who were classified as *inhibited* attachment disturbances, they expressed little to no emotional responsiveness in the midst of stressful experiences nor would they seek out comfort for their distress from primary caregivers.

The further refining of *disinhibited* and *inhibited* attachment types emphasized the role of primary caregivers in children's development of self-regulation abilities (O'Connor, Brcdcnkamp, Rutter, & English and Romanian Adoptees [ERA] Study Team, 1999; O'Connor et al., 2000; Rutter, & ERA Study Team, 1998; Rutter & O'Connor,

1999). This paralleled the self-regulation foci of eco-developmental transactional model of attachment (i.e., Sameroff & Chandler, 1975; Rothbart & Bates, 1998).

Eco-developmental transactional models emphasized the bi-directional relationship between child behaviors and parent responses on the development of self-regulation and attachment. Much of the early research related to this model included dyads with temperamental infants (Sameroff & Chandler, 1975; Rothbart & Bates, 1998). In this model, child temperament was defined as a relational versus trait-based construct; it considered how parents' behavioral responses to their distressed child paired with the feedback returned to them by their child (i.e., parents' responses soothed/did not sooth) influenced one another in the dyad's attachment development. Further, they explored the bi-directional relationship between the dyad's attachment dynamics and children's abilities to emotionally-behaviorally regulate (Sameroff & McKenzie, 2003).

For example, physiological and emotional-behavioral regulation involves the use of relational feedback between the child-primary caregiver dyad to help restore children's physiological, emotional and behavioral systems to a homeostatic or stable set-point. This set-point returns the previously stressed child to a state of being awake and attentive, yet not overly-aroused or distressed. When the child is inattentive, sensitive parents work to engage them; when over-aroused, caregivers' initiate strategies that aim to soothe the child (Sameroff & McKenzie, 2003). Under such circumstances, a bi-directional relationship is formed through the relational feedback exchanged between the child and parent over time. When the parent is able to calm the child, the transactional feedback loop closes for them both, strengthening their attachment and the child's regulation skill building. Yet, when the caregiver is unable to soothe the child, the transactional feedback

loop does not close for either the parent or the child and can, in turn, serve as a barrier to healthy attachment formation within the dyad and the child building regulation skills to cope with stress (Sameroff & McKenzie, 2003).

Crockenberg (1981) further explored this by examining whether social support moderated the mother-child attachment relationship in the presence of varying degrees of parental responsiveness and infant irritability. In a longitudinal study assessing 46 mother-child dyads at both 3 and 12 months after birth, results indicated that at 12 months of age, social support was the best predictor of secure attachment. A significant interaction effect indicated that social support was more important for those mothers who had the most irritable babies. In the presence of less social support, maternal unresponsiveness increased and was found to be linked to infant resistance during the reunion phase of the Strange Situation Procedure. This was indicative of the presence of bi-directional pathways—less emotionally-behaviorally regulated infants were more likely to develop insecure attachments related to less responsive caregiving in an environment of limited social support.

Although the eco-developmental transactional model did further the understanding of the bi-directional nature of primary caregiver responsiveness and children's emotional regulation, it did not specifically establish its link to children's biological/physiological stress response regulation early in the attachment relationship. Through the modern attachment theory, Schore and Schore (2008) furthered this understanding by outlining how primary caregiver responsiveness and exposure to global neglect conceptually linked children's learning of how to modulate physiological stress responses, emotions and behaviors. This concept also theorizes how exposure to chronic

stress (i.e., neglect; abuse; domestic violence) in the presence/absence of a responsive primary caregiver impacts the very young child's developing right brain architecture (Schore & Schore, 2008; Mikulincer, Shaver, & Pereg, 2003).

The introduction of modern attachment theory (Schore & Schore, 2008) marked a return to Bowlby's (1982) biological basis of attachment, defining attachment theory as a developmental and regulatory theory that highlighted components of physiological, emotional, and behavioral modulation. The modern attachment theory reinforced that healthy, early childhood brain maturation evolved to develop within the context of relationships. More specifically, on-going parental responsiveness to his/her child's attachment-seeking behaviors was integral in the development of the right brain's neurobiological systems (Mikulincer, Shaver, & Pereg, 2003). The goals of the childprimary caregiver attachment system were defined as trifold: for purposes of safety, survival, and the shaping of the child's right brain organization. The organization of the child's right brain was found to be essential, as it is the part of the human neurobiological system involved in the physiological modulation of stress, cognitive and emotional processing, and regulation of emotional and behavioral expression. It also serves as the functional origins that underlie attachment and developmental change (Schore & Schore, 2008).

In summary, attachment theory articulates the importance of primary caregiving on children's development. Very young children must receive primary caregiving, as they are completely dependent in early life and need it in order to survive. It is most optimal when primary caregiving is consistent, as frequent changes have often been accompanied by disturbed attachment patterns and diminished developmental outcomes across multiple

domains. Yet, more than the *presence* of a primary caregiver is needed for healthy child development. Child outcomes are most successful when there are optimal caregiving dynamics—specifically, where a primary caregiver is *present, consistent, sensitive, responsive, and engaged with their child.* This engagement fosters children's sense of safety so they feel comfortable in exploring their environment, build trusting and predictable relationships with caregiver(s) themselves, and the world, and to forge a healthy parent-child attachment where a synchronous, verbal/non-verbal communication pattern is established for the dyad to relay thoughts, feelings, needs and wants.

Building on these key premises of primary caregiver-child relations in attachment theory, it is important to note that the current study's population of ICA children adopted from institutional care likely differs from those raised in foster families in terms of their exposure to pre-adoptive care risk; if so, they would also be likely to experience more severe adverse developmental effects in the domains of self-regulation, stress response modulation, and social cognition given their right brain origins (Zeanah et al, 2005). Theoretically, institutionalized children would be at greater pre-adoptive care risk due to the three following reasons: first, they lack the *presence* of a consistent, primary caregiver; second, they experience a deficit in *sensitive and responsive* primary caregiving; and third, they likely encounter more pervasive and damaging forms of institutional neglect while in the absence of the protective buffer of a consistent, responsive primary caregiver with whom they were healthily attached (Zeanah et al, 2005).

Yet, ICA adoptees reared in family foster care would likely still experience some adverse effects across developmental domains, as lacking in *responsive* primary
caregiving alone is still an important deficit (Zeanah et al., 2005). It is likely the *combination* of a lack of protective factors (i.e., *presence of primary caregiving and responsive primary caregiving*) paired with the experiences of significant risk factors that increase with degree and number of stressors (i.e., *lacking primary caregiving; lacking responsive primary caregiving; and experiencing institutional global neglect; prenatal exposure to teratogens*) that heightens the detrimental impacts on development across domains in children from institutions.

What attachment theory fails to integrate is any depth as to how other preadoptive risk factors commonly found in ICA children reared in institutional and/or foster care settings may impact developmental outcomes. Examples of such factors are how children process the early stress experiences of perinatal global neglect –and- the influences of prenatal exposure to teratogens and/or toxins (i.e., alcohol/drugs; malnutrition; premature birth). Informing the consideration of these factors are the conceptual frameworks of stress, coping, and adaptation and teratogen theories.

Stress, Coping and Adaptation Theories

The general tenets of stress theory emphasize the physiological and psychological responses to relationships between *external demands* (stressors) and the *processing of those demands* (stress) (i.e., Cannon, 1939; Selye, 1956). Specific to describing the body's autonomic responses to stress, Selye (1950) defined the *general adaptation syndrome (GAS)* model. The GAS had three stages: *alarm* activates the body's physiological stress response system resulting in a gradual release of the stress hormone cortisol in order to re-route energy stores for survival behaviors (safety/survival); *resistance* steadies the body's physiological responses, lessening uncomfortable

symptoms; and, *exhaustion* occurs when threat is unremitting, causing a depletion of physiological defenses and a re-emergence of stress symptoms (Selye, 1950; 1956).

Lazarus (1966) and Lazarus and Folkman (1984) expanded Selye's work by exploring how cognitive psychological appraisals of stressful events impacted the human stress response. They defined *stress* as a person-and-environment transaction where an individual's adaptation depends upon whether he/she cognitively perceives an event as threatening (*a primary appraisal*). Benign appraisals would be ignored, at least psychologically. If threatening, the primary appraisal would enforce a *secondary appraisal* assessing the adequateness of the individual and/or environmental resources available for coping. In a person's attempt to restore a sense of control, these appraisals lead to coping behaviors which are either problem-focused or emotion-focused. *Problemfocused coping* is defined as the management of a problem that is causing feelings of distress (i.e., making an action plan and following it). *Emotion-focused coping* is defined as the management of feelings or distress associated with the problem (i.e., trying to forget about the problem; seeing "the silver lining" to minimize feelings of distress).

The goal of problem-focused coping is to either make the stressful situation less threatening by changing the environment or how an individual copes with that environment. This includes actions directed at removing barriers or increasing resources within their environment (Lazarus & Folkman, 1984). Emotion-focused coping goals are to either alleviate or exacerbate emotional distress. Examples of strategies that alleviate distress are avoidance, minimization, distancing, selective attention, and positive comparisons; behavioral strategies that exacerbate distress are approaches like self-blame and self-punishment. Also considered an emotion-focused coping strategy would be the

implementing of cognitive reappraisals with a goal to change those meanings associated with situations versus concretely altering the circumstances. These problem-focused and emotion-focused coping strategies transition into behavioral, psychological, and biological responses that children use in order to increase their chances for safety and survival (Lazarus & Folkman, 1984).

One example of a young child's *behavioral* response to threat would be their natural expression of attachment behaviors (i.e., crying) in an attempt to access their primary caregiver as a moderating, stress-management resource. A child's typical *psychological* response to stress might include feelings of fear when hearing adults angrily argue; the child may problem-solve for their own safety by hiding from adults until the conflict diminishes. And an example of a young child's *biological* response to stress would be the body's physiological threat response system of "fight-or-flight".

The fight-or-flight system is a human stress response system that is controlled by the body's autonomic (unconscious) system (i.e., heart rate; digestion; pupillary response). It is composed of the physiological activation of certain neurobiological systems that help the body to increase its strength and speed so when faced with threat, it can either stand its ground or run (McEwen & Seeman, 1999). The role of the fight-orflight response is mediated by two different components, the sympathetic and parasympathetic nervous system. The sympathetic nervous system triggers the physiological changes that take place during the fight or flight response (i.e., release of epinephrine through adrenal gland). The parasympathetic nervous system works in conjunction with the sympathetic nervous system, as it is activated after the fight-or-

flight response to tell the system (through the release of acetylcholine) to return the physiological stress response system to a state of homeostasis.

Human physiological stress responses are impacted by two distinct systems: the sympathetic-adrenomedullary (SAM) and hypothalamic pituitary adrenocortical (HPA axis) systems (Stratekis & Chrousos, 1995). The fight-or-flight response is triggered when increases in epinephrine are detected (Cannon, 1929); epinephrine takes very little time to reach optimal levels for fight-or-flight and the effects within the body are typically short-term (Bohus, de Kloet, & Veldhuis, 1982) and only adaptive in nature.

The functions of the HPA axis are targeted on the brain; this system produces the steroid hormone, cortisol. Cortisol takes approximately 25 minutes to reach an optimal level, and has a longer duration within the body than epinephrine (Bohus et al., 1982). The HPA axis system's role in the body's stress response system is more complex than the SAM, as the SAM can simply be described synonymously as the fight-or-flight response (Sapolsky, Romero, & Munck, 2000). The HPA axis supports acute flight-orflight responses, yet it's responses to stressors also *suppress* the impact of fight-or-flight reactions (Gunnar & Quevedo, 20007). When a child experiences short/acute bursts of cortisol secretion via stress system activation, this fosters healthy adaptation to stress and threat. Yet, when children have prolonged periods of cortisol secretion or stress system activation and suppression, this produces a wear and tear effect on the body which has been linked to detrimental impacts on physical and mental illness (i.e., heart disease; diabetes; increased risk for depression) (Lupien, McEwen, Gunnar, & Heim, 2009). The differences associated with acute versus chronic stress activation relays the tender balance between "healthy" or adaptive stress and deleterious stress.

It is therefore important to clarify three key concepts when examining the theoretical underpinnings of children's stress, coping and adaptation: First, experiences of stress and threat are neither all good nor all bad—each situation being relative to the time course and situational context; second, they are basic components of general life experiences for everyone; and third, children will individually differ in terms of the degree, intensity, and duration of stress encountered in life as well as their level of vulnerability and resilience to it (Akil & Morano, 1995; Ellis et al., 2011; Gunnar & Quevedo, 2007). In an attempt to further clarify the nuances of these components, the Center for the Developing Child accessed October 23, 2014 at http://developingchild.harvard.edu/ designed the following conceptual taxonomy to describe stress response in young children. They defined these as *positive, tolerable; and toxic* stress responses.

This classification was based on the degree of disruptive physiological effects, intensity, and duration experienced by the child related to their stress responses (Shonkoff, 2010). A *positive physiological stress response* is moderate in degree and short-term in duration. When presented with mild and short-term stress (i.e., being immunized), children's access to their responsive primary caregiver typically buffers them from the negative effects of the presenting stressor (Center for the Developing Child, <u>http://developingchild.harvard.edu/</u>). When the primary caregiver is sensitive to their child's needs, it also serves as a facilitator to help the child return their biological and emotional stress response to a healthy physiological set point. The circumstances of a positive stressor provide a learning opportunity for the child to develop coping skills which in turn help them adapt to short-term distress (Shonkoff & Garner, 2012).

The second level of stress response in young children is *tolerable;* this stress response relates to children's encounters with uncommon life stressors that are typically accompanied by greater adversity and threat (i.e., death of a parent; natural disaster). Integral in making this type of stressor "tolerable" is the child experiencing it within the protective presence of a responsive adult; a responsive adult would guide the child's adaptation while supporting them in carving out a greater sense of control over their life. Under such circumstances, children are reportedly less likely to develop a chronically-activated physiological stress response found associated with long-term negative health and developmental outcomes (Center for the Developing Child accessed October 23, 2014 at http://developingchild.harvard.edu/).

Toxic stress in children results from chronic exposure to severe stress (i.e., child abuse/neglect; parental substance abuse) in the absence of a protective, sensitive, and responsive caregiving to help them cope. This type of stress is associated with prolonged activation of the body's physiological stress response which has been found to disrupt young children's developing brain architecture. Particularly when toxic stress exposure takes place during sensitive early developmental periods, chronic dysregulation of the physiological stress system acts as a precursor to later stress-related physical and mental illnesses, impaired learning and behavior, and the unhealthy progression to a biological process referred to as allostatic load (McEwen & Stellar, 1993; Center for the Developing Child accessed October 23, 2014 at http://developingchild.harvard.edu/). McEwen and Stellar (1993) found that children's exposure to recurrent, toxic stress triggered the destructive effects of allostatic load which negatively impacted children across multiple developmental domains.

In the 1990's, more focus was placed on understanding the short and long-term impacts of stress on overall health. Common in the discussions of how stress impacted physical and psychological health were the terms, *allostasis* and *allostatic load*. McEwen and Stellar (1993) later used both of these terms to help explain the relationship between stress and disease. *Allostasis* is defined as the body's physical attempt to restore itself to a physiological set point or homeostatic state when faced with acute stress. When physiological stress responses function normally, the return to a homeostatic set point comfortably keeps a person alert and attentive, but not distressed. Encountering psychological or physical threat triggers a network of allostatic mediators in the form of two different stress hormones, dehydroepiandrosterone (DHEA) and cortisol. These two hormones conjunctively regulate one another in order to help the body and mind to return to a calm and alert state (McEwen, 2006; Sterling & Eyer 1988).

Allostatic load refers to the price paid by the body for being forced to chronically adapt to adverse psychosocial or physical situations; this takes place when there is either too much stress or the inefficient operation of the stress hormone response system (McEwen, 2006; Sterling & Eyer 1988; Seeman et al., 2010). With overuse, the physiological function of allostasis that was once used to restore balance and protect the body from damage fails to shut on and off appropriately, metamorphosing from its original protective purpose to a pathological function (i.e., increased risk for heart disease; damages the brain's ability to process affective, cognitive or social information for self-regulation) (Juster, McEwen, & Lupien, 2010; Lupien, McEwen, Gunnar, & Heim, 2009; McEwen & Gianaros, 2010; Seeman, Singer, Rowe, Horwitz, & McEwen, 1997). Ganzel, Morris, and Wethington (2010) relayed that the neural focus of allostatic

load lies in the same right brain regions (hippocampus, amygdala, and prefrontal cortex) necessary for processing cognitive or emotional information for children's self-regulation and attachment formation.

Children's susceptibility to early adverse experiences reportedly varies (Boyce, 2007; Luthar, 2006; Sameroff, 2006). Those children that have been behaviorally, emotionally and biologically reactive to stressful experiences following early adversity reportedly have higher rates of chronic health issues than their low stress reactive peers in the context of environmental risk (Belsky, Hsieh, & Crnic, 1998; Cummings, El-Sheikh, Kouros, & Keller, 2007). Boyce and Ellis (2005) redefined stress reactivity from a perspective of a biological sensitivity to context. They predicted that children who were biologically sensitive to context would be more vulnerable to aversive environmental factors; yet, they would also have a greater capability to benefit from positive environmental influences. This work underlines the importance of understanding more fully the biological processes that interact with environmental influences to shape children's adaptation, as indexed by competence and psychopathology (Curtis & Cicchetti, 2003; Masten & Obradovi, 2006).

Healthy right brain development and organization is reportedly dependent upon more than caregiver responsiveness and regulation of postnatal stress response systems; it is also affected by children's prenatal environment (i.e., being exposed in utero to alcohol/drugs, malnutrition, and premature birth). These types of early exposures are particularly toxic to the development of the fetal, embryonic, and childhood brain architecture; children's brains have extreme plasticity (ability to be molded and shaped) in these early life stages of development which heightens sensitivity to chemicals.

Examples of these chemicals would include toxins like alcohol and drugs as well as fetal exposure to chronically elevated stress hormones (Center for the Developing Child accessed October 23, 2014 at http://developingchild.harvard.edu/).Overwhelming evidence suggests that children who experience these types of early toxic exposures are at substantial risk of disrupting the development of early brain architecture which will significantly challenge later right brain functioning (e.g., Cottrell & Seckl, 2009; Darnaudéry & Maccari, 2008; Oberlander, Weinberg, Papsdorf, Grunau, Misri, & Devlin, 2008; Sameroff & Chandler, 1975). As a population, ICA adoptees have often experienced disruptions in the development of their early brain architecture related to their exposure to high prenatal risk (i.e., prenatal alcohol/drug exposure; malnutrition; premature birth). It is therefore important to consider how children's exposure to high prenatal risk (i.e., in utero exposure to alcohol, malnutrition, and/or premature birth) influences outcomes across ICA children's developmental domains; this will be examined within the theoretical frameworks of teratology and behavioral teratology.

Teratology and Behavioral Teratology

Teratology is the study of how prenatal conditions (i.e., malnutrition) and toxins (alcohol) interrupt healthy embryonic/fetal development (Wilson, 1977). An interest in studying the effects of being exposed to prenatal adversities was partially catalyzed by the recognition of the cause and effect relationship between mothers' use of thalidomide during pregnancy and children's severe birth defects (Vorhees, 1986).

In 1977, Wilson defined the following principals of teratology, describing the effects of teratogen exposure on animal development: outcomes resulting from prenatal teratogen exposure are the interaction of embryonic/fetal genetics and the type of

environmental exposures experienced; fetal cell damage from a teratogen is influenced by the system or site that is developing during the time of exposure; children's outcomes from teratogen exposure include developmental disorders, growth malformations or retardation, and/or death; there is a positive relationship between the amount of teratogen exposure and the amount of damage experienced; and teratogens capable of crossing the placenta produce the greatest damage to the embryo/fetus (i.e., alcohol).

Building on Wilson's (1977) principals, Vorhees (1986) further defined behavioral teratology—a framework used to explain how prenatal teratogen exposure (i.e., to alcohol/drugs) can result in abnormal behavior patterns and processing problems in children. He maintained Wilson's principals, additionally expanding in the following areas: each child's outcomes to teratogen exposure will vary based on their genetics, timing of exposure (i.e., critical periods), type, and level of exposure; embryonic/fetal exposures to prenatal teratogens causes physiological damage at the cellular level to the central nervous system (CNS) (i.e., brain tissue), manifesting through abnormal behavior patterns in children (i.e., prenatal alcohol exposure damages brain cells and contributes to neurologically-based behavioral and cognition problems); as the CNS is developing throughout the prenatal period, the brain is vulnerable to the negative effects of teratogen exposures from conception to birth; teratogen damage can be global, crossing multiple developmental domains (i.e., behavioral, cognitive; social-emotional sensory) that manifests in a spectrum (mild to severe) of behavioral challenges; prenatal teratogens like alcohol have negative impacts from conception to birth and is particularly damaging as it can cross the placenta and into the embryo/fetus who is incapable of metabolically processing it as a toxin.

To date, the theoretical frameworks guiding this body of research relate to physiological and psychological stress (e.g., Cicchetti & Rogosch, 2001), attachment (e.g., Dozier et al., 2006), or an integration of both theories. For example, DeBellis et al (2002) used a framework of developmental traumatology which relied heavily on models of stress and attachment. Gunnar, Fisher, and The Early Experience, Stress, & Prevention Network (2006) included components of stress and attachment theories in a model of the neurobiology of stress and threat responses in post-institutionalized children. The model included cognitive appraisals as well as the moderating role of attachment as children's stress buffers. Cicchetti et al. (2001) used concepts of stress theory, incorporating attachment in physiological stress responses.

Conceptual Model of the Current Study

Key concepts of attachment theory, stress, coping and adaptation theory, and the theory of teratology/behavioral teratology are used to guide the current study's understanding of how prenatal risk and early type of care affects children's developmental outcomes of behavior problems, self-regulation, and physiological stress modulation. The model begins with concepts of teratology/behavioral teratology when children are exposed to conditions of malnutrition, premature birth (teratogens) or alcohol (toxins) in utero that disrupts the typical development of the embryo or fetus (Wilson, 1977).

The current study builds on conceptual frameworks based on the direct causal links between events and outcomes (teratology; stress, coping and adaptation) and theories where there are implications of indirect causal links (attachment). There has been generous study of the natural experiment of outcomes related to children's

institutionalization, but less with foster care. Little research examines the simultaneous effects of prenatal risk and institutionalization/foster care on children's behavior, emotion and stress regulation.

Theory of teratology is foundational, as the prenatal exposure to the study's toxins/teratogens have strong causal links with attention and behavior problems, self-regulation challenges, stress modulation issues and children's hypersensitivity to environmental stimuli. Being exposed to prenatal alcohol, malnutrition, and/or prematurity has also been linked to immature brain formation (i.e., prefrontal cortex) and children sending ambiguous cues to their primary caregivers about needs. The literature notes this can be a contributor to a strained parent-child interaction which negatively impacts the attachment dyad from forming. In turn, parents have also added to children's sense of environmental overstimulation by contributing greater frustration and intrusiveness with their high prenatal risk children. Therefore, children's teratologic exposures can provide fertile ground for challenging ICA childparent attachment relationships. It would also likely hinder them getting that extra positive interaction with care providers in the institution if they appear fussy or send mixed signals to their nurses' attention/affection.

Attachment theory is foundational in the role of formation of the positive relationship between child and responsive primary caregiver. When the primary caregiver is consistent and responsive, they engage in the "serve-and-return" interaction with the child which helps form foundational neural connections for longterm emotional, behavioral, relational, and academic learning. When children have inconsistent caregiving (like in socially-depriving institutional care), neural

connections that form are often not strong and in turn, neither is their regulation abilities. This inconsistency fosters a lack of trust with the child and the primary caregiver then lacks the ability to soothe the child when stressed. In turn, children's stress response systems remain dysregulated (often chronically) and they do not learn cues from a responsive caregiver as to how to modulate their behaviors and emotions. The cycle within institutional care begins to reinforce itself (see Figure 2).

Figure 2.

Integrated Model: Teratology, Attachment, and Stress Theories



Research Questions and Hypotheses

Research Question 1: How does children's type of early life care (Institutional [IC], foster [FC], birth family [BC] care) relate to behavior problems, self-regulation, and physiological stress responses in 6-7 year-old children of ICA?

Hypothesis 1: ICA children who were reared in IC will have significantly greater numbers of behavioral problems than those reared in FC or BC.

Hypothesis 2: ICA children reared in IC will display significantly less self-regulation than those reared in FC or BC.

Hypothesis 3-5: ICA children reared in IC will display significantly more blunted physiological stress response modulation in lab baseline cortisol, stress task cortisol, and home baseline cortisol samples than those reared in FC and BC.

Research Question 2: How do children of ICA that were exposed to high prenatal risk differ from those who experienced no/low prenatal risk in terms of behavior problems, self-regulation, and physiological stress response modulation?

Hypothesis 6: ICA children who were exposed to high prenatal risk will display greater behavior problems when compared to those with no/low prenatal risk. Hypothesis 7: ICA children who were exposed to high prenatal risk will display less self-regulation than those with no/low prenatal risk.

Hypothesis 8-10: ICA children who were exposed to high prenatal risk will display significantly higher cortisol levels in Lab Baseline, Lab Stress Task, and Home Baseline Cortisol Samples when compared to those with no/low prenatal risk.

Research Question 3: Among ICA children who were exposed to varying degrees of prenatal risk (no/low; high), does the type of pre-adoptive care received moderate behavior problems, self-regulation, and physiological stress response modulation? Hypothesis 11: Among ICA children, foster care rearing will moderate the effects of high prenatal risk on behavior problems.

Hypothesis 12: Among ICA children, foster care rearing will moderate the effects of high prenatal risk on self-regulation.

Hypothesis 13-15: Among ICA children, foster care rearing will moderate the effects of high prenatal risk on lab baseline cortisol, lab stress task cortisol, and home baseline cortisol sample results.

CHAPTER 3--METHODOLOGY

Participant Recruitment

Both adoption groups of children were recruited from the Minnesota International Adoption Project Registry (MnIAP), consisting of over 2000 internationally-adopted children whose families returned a postcard expressing their interest in participating in ICA research. All of the non-adopted children were recruited from a departmentmaintained participant list comprised of children whose parents expressed interest in participating in research. A description of the study was provided; if families were interested, they were scheduled by the research staff for a laboratory session which lasted approximately 2.5 hours.

Table 1

Institutional Care		Foster Family Care		Birth Family Care	
Country	N (%)	Country	N (%)	Country	N (%)
China	17 (42.5)	Korea	32 (80.0)	USA	40 (100.0)
Russia	6 (15.0)	Guatemala	5 (12.5)		
Romania	5 (12.5)	China	2 (5.0)		
Bulgaria	3 (7.5)	Chile	1 (2.5)		
India	3 (7.5)				
Ukraine	3 (7.5)				
Korea	1 (2.5)				
Peru	1 (2.5)				
Poland	1 (2.5)				
Total	40 (100.0)	Total	40 (100.0)	Total	40 (100.0)

Country of Origin by Children's Type of Pre-Adoptive Care Received

The study used a convenience sample for children who were adopted from China, Russia, Romania, Ukraine, Bulgaria, India, and Peru (see *Table 1*). This study is a quasiexperimental, cross-sectional research design of a secondary dataset (sub-sample of the MnIAP), specifically the Social and Emotional Development of Children dataset. The principal investigator is Megan R. Gunnar, Ph.D., Professor in the Department of Child Development & Center for Neurobehavioral Development at the University of Minnesota. Data were collected between November, 2002 and March, 2003 and funded by the National Institute of Mental Health (Grant numbers MH59848 and MH018264).

Samples differed in relation to children's birth countries (Fisher's Exact Test = 73.9, p < .001), with more children in the FC group being likely to have come from Korea. Children in the IC group were adopted from the following countries: China (n = 15), Russia (n = 6), Romania (n = 5), Ukraine (n = 3), Bulgaria (n = 3), India (n = 3), and Peru (n = 1). Those in the FC group were adopted from Korea (n = 22), Guatemala (n = 3), and Chile (n = 1) (*see* Table 1). Reasons for these differences relate to the type of existing care available for abandoned children in birth countries' public child welfare system (i.e., family-based or institutional systems) as well as birth countries' policies regarding age requirements for when children can become eligible for ICA.

Measures

Individual scale and multi-method/multi-agent composite scores (Patterson & Bank, 1986) were used in the current set of analyses. Criteria for such indicators to be utilized in the study were as follows: First, there needed to be acceptable internal consistency (Cronbach α coefficient \geq .60; item-total correlations \geq .20); and second, a convergence with other indicators designed to assess the same scale/composite (factor

loadings for a one factor solution \geq .30) was required. Indicators that met these specified criteria were then used to create scale or composite scores.

Life History

Adoptive parents completed a questionnaire related to their children's early care history. This included the following items: children's country of origin; age at adoption; type of pre-adoptive care; and, length of time in institutional or foster care which was used as a measure of general deprivation.

Prenatal Risk Factors

The prenatal risk index was created by summing the number of prenatal risk factors that parents knew or suspected their child to have experienced. Adoptive parents reported on the following suspected prenatal risk factors: (1) prenatal exposure to alcohol or drugs; (2) prenatal malnourishment; and (3) premature birth (range = 0-3). Scores were transformed into two categories for the analysis (low prenatal risk exposure [0 and 1] and high prenatal risk exposure [3 and 4]).

Total Behavior Problems

The total behavior problems index was created by summing the number of specific behavior problems (i.e., Child steals; child lies) that parents answered "yes" to their children exhibiting ("no" = 0; "yes" = 1). Parents were questioned about ten possible behavior problems (i.e., stealing; lying) commonly cited in the ICA literature (range 0-10).

Self-Regulation

Self-regulation was calculated using two computerized tasks commonly utilized in neuroimaging studies due to their activation of the orbital prefrontal and anterior cingulate cortex (Casey et al., 1997) (the Go-No Go Task; Attentional Control Task; Children's Behavior Questionnaire (CBQ) [assesses inhibitory and attentional control]) (Rothbart, Ahadi, Hershey, & Fisher, 2001).

Go/No Go Task. The go/no go task measures children's abilities to suppress a prepotent behavioral response by responding to target stimuli while inhibiting equally salient non-target stimuli. More specifically, letters were displayed individually on the screen for 500 milliseconds, separated by an inter-stimulus interval of 1,500 milliseconds. As quickly as possible, each child was asked to respond to all letters (target) except for X (non-targets); they were tested under two conditions: a control condition (42 trials - 100% targets); and an inhibition condition (42 trials - 50% targets and 50% non-targets).

Attentional Control Task. This measure was used to assess children's abilities to process multiple stimulus attributes and inhibit attention to irrelevant attributes. In this task, three stimuli were presented simultaneously and varied in either shape or color. The child was asked to indicate which of the three stimuli differed from the other two. The stimuli were presented until a response was made. This task also contained two conditions: a control condition of 60 trials involving automatic processing and an inhibition condition of 60 trials involving controlled attentional processing. In the control condition, the attribute that was used to determine uniqueness was the same. In the inhibition condition, the attribute that was used to determine uniqueness changed from trial to trial. Percent correct during the inhibition condition was recorded separately for the two tasks.

Children's Behavior Questionnaire (CBQ). The CBQ (Rothbart, Ahadi, Hershey, & Fisher, 2001), a parent-report measure of temperament, was used to assess the

children's inhibitory control abilities in daily situations. This 195-item questionnaire provides scores for 15 scales and three higher order dimensions. Two scales from the effortful control dimension, attention focusing (i.e., tendency to maintain attentional focus upon tasks) and inhibitory control (i.e., capacity to suppress inappropriate responses), were selected as most relevant to the construct of interest. These scales demonstrated acceptable internal consistency ($\alpha = .84$ and .88, item-total correlations.35 and .41, and factor loadings .45 and .48, respectively). In addition, these scales were correlated, r (117) = .66, $p \le .001$, and thus were standardized and averaged to create a parent report of inhibitory control.

Composite Measure of Self-Regulation: The scores from the go/no go task, attentional control task, and CBQ met established criteria ($\alpha = .64$, item-total correlations and factor loadings .47) and were then standardized and averaged to create a composite measure of emotional regulation, a strategy described by Patterson and Bank (1986).

Physiological Stress Response

Salivary Cortisol (Lab). At the laboratory assessment, a number of saliva samples were drawn in relation to tasks that were part of a larger study. Only two sets of saliva samples drawn in the laboratory will be examined in relation to this dissertation: one set at arrival (baseline saliva sample) and a second set following the completion of the self-regulation tasks (in duplicate). (*Home*). Parents were trained to collect saliva samples from their children using the same lab protocol; they were provided with collection kits and were instructed to use them on two typical school days only when children were not ill and had not ingested dairy or caffeinated products prior to collection. Three sets of samples were collected each for two days: first, within 30 minutes of waking (morning *M*

= 7:58 A.M., SD = 57 minutes); second, between 4 and 5 P.M. (afternoon M = 4:22 P.M., SD = 69 minutes); and third within 30 minutes before prior to bedtime (evening M = 8:40 P.M., SD = 25 minutes). There were no significant differences for sampling times across the three groups of children in the sample.

Prior to extracting samples, children chewed a piece of Trident Original sugarless gum to stimulate salivation; the literature indicates that this method has little to no effect on cortisol levels (Schwartz, Granger, Susman, Gunnar, & Laird, 1998). Saliva was drawn using a small straw from the kit and the sample was placed into a pre-labeled vial. Following, while waiting for study staff to pick up vials, parents placed their children's samples in their home refrigerator. Vials were then stored at -20° C in the primary investigator's laboratory and mailed to the Biochemical Laboratory at the University of Trier for analysis.

The saliva samples were assayed for cortisol using a time-resolved fluorescence immunoassay (DELFIA). All of the samples from each child were included in the same assay batch, and the assay batches were balanced by group and sex. The samples were assayed in duplicate and were averaged. Those duplicates which varied by more than 15% were re-assayed and the inter-assay and intra-assay coefficients of variance were 5.4% and 8.1%, respectively. Cortisol levels were normally distributed and thus were not transformed prior to analysis. Only one home baseline cortisol time sample made available for use in this dissertation was the one drawn in the mid-afternoon (between 4-5 P.M.).

Statistical Analyses and Data Distribution

All data analyses completed for this study were conducted using the statistical software IBM SPSS Statistics 22. The distributions for all independent and dependent variables were checked for normality and outliers prior to completing further analyses. Independent variables included the following: types of early care; child related variables (country of origin; total number of prenatal risk factors; child's gender; child's age at adoption; child's age at the time of the study; child's number of months in institutional care; child's number of months in family care; child's number of months in the US); and adoptive family-related variables (parental ages; marital status; parental race(s); number of children in the home; parental education level(s); parental employment; annual family household income). The dependent variables included the total number of behavioral problems; self-regulation composite score (attention regulation accuracy + CBQ Regulation /2); and physiological stress response (lab cortisol baseline, stress test cortisol; home cortisol) These variables were normally distributed based on measures of skewness, kurtosis and distribution of scores, for the entire sample, by type of early care groups, and prenatal risk groups.

Data Analysis

The samples were compared based on the children's three types of early life experiences -- institutionalization, foster care rearing, and birth family rearing—using ANOVA. Second, ANCOVAs were conducted that only included the two adoption groups examining the effects of independent variables and dependent variables, controlling for covariates. ANCOVAs were run for IC and FC groups, excluding BC groups; age at adoption and prenatal risk were not relevant to the BC group. To answer Research Questions 1-3, hypotheses 1-15, the following analyses were conducted. In the analysis of Research Question 1, a one-way between groups' ANOVA was implemented to examine whether early life care impacted children's later behavioral problems, self-regulation, and physiological stress response modulation. Preliminary checks were conducted to test whether there were any violations of the assumptions of normality, linearity, homogeneity of variances, and homogeneity of regression slopes. When the assumption of homogeneity was violated, the Welch's adjusted F ratio was calculated and the Games-Howell post hoc was conducted. When the assumption of homogeneity was not violated, a Tukey's post hoc was conducted.

In research question 1, when ANOVA outcomes indicate significant post hoc results between the two adoption groups, an analysis of covariance (ANCOVA) will be completed. As "age at adoption" is strongly correlated with the dependent variables of behavior problems and self-regulation, an ANCOVA will be conducted using "age at adoption" as a covariate. A violation of the homogeneity of regression slopes was tested using an interaction term of predictor variables by the covariates. In Research Question 1, an interaction was assessed for "type of pre-adoptive care" by "age at adoption". With insignificant interaction effects, the assumption of the homogeneity of regression slopes was not violated and an ANCOVA model will be implemented without the interaction term.

For Research Question 2, an independent sample's t test was performed for outcome variables comparing the differences between adopted children's high versus low prenatal risk experiences testing "prenatal risk" by "age at adoption" and "prenatal risk by "type of early care". With insignificant interaction effects, the ANCOVA model will be implemented, controlling for both age and type of care.

To test Research Question 3, a two-way ANCOVA will be implemented to test whether type of care will moderate the effects of prenatal risk (high/low) on behavior problems, self-regulation, and stress regulation when controlling for age at adoption. A significant interaction effect would indicate that the type of early pre-adoptive care that children received had some type of effect on the impacts of prenatal risk experienced. The magnitude or size of the effect (effect size d) will be interpreted under the following parameters (Cohen, 1988): .20 = small; .50 = moderate; and .80 = large.

A power analysis was performed using a matched pair, two dependent means t test; this parameter was chosen because the two adoption groups were matched on age and sex. Using a significance level of 0.05 and a 2-tailed test, the study's sample has 81% power to detect a medium effect size (Cohen's d = .46).

CHAPTER 4--RESULTS

Sample Characteristics

Participants

Three years post-adoption, participants (N = 120) included six- and seven-yearold children who were equally distributed between three groups: the institutional care (IC) group (n = 40); the foster care (FC) group (n = 40); and, the birth children (BC) group (n = 40). The age range for the sample was 6.02 and 7.98 years with *mean* age of 6.85 years (SD = 0.56 years). All children in the IC and FC groups were internationally adopted by parents living in the mid-western USA.

Children in the IC group spent at least 75% of their lives prior to adoption in institutional care, had resided in family-based care for less than 6 months, and were between 12 and 36 months of age when adopted. Those in the FC group spent at least 75% of their pre-adoption lives in a family-based care setting (e.g., foster family care or relative care), had lived in institutional care for no more than 2 months, and were less than 36 months of age when adopted. Children in the BC group were born in the Midwestern United States of America (USA) and had always been reared by their biological parents. There were no children from the IC or FC groups excluded due to having a medical condition that may have influences HPA axis activity/cortisol.

The FC and BC groups served as comparison groups for the IC children (see Table 2). At the time of the study, they were matched on age and sex; there were no age differences between the groups. For the IC group, the mean age was 6.85 (SD = .56; range = 6.02 and 7.88 years). For the foster care group, the mean age was 6.86 (SD = .60;

range= 6.02 and 7.98 years). For the BC group, the mean age was 6.86 years (SD = .55; ranged between 6.05 and 7.88 years). Each group contained 30 girls and 10 boys.

Table 2.

<i>Child Demographic</i>	Characteristics l	by Type o	of Early Care	(N = 120)
		· / / · · ·	J	

	Type of Early Care						
	Instit	Institutional Care		ter Care	Birth Care		
	(<i>n</i> = 40)	(1	n = 40)	(<i>n</i> = 40)		
Characteristic	М	Median	М	Median	М	Median	
	(SD)	(Range)	(SD)	(Range)	(SD)	(Range)	
Age at study (years)	6.9	6.6	6.9	6.8	6.9	6.7	
	(0.6)	(6.0-7.9)	(.6)	(6.0-8.0)	(.6)	(6.1-7.9)	
Adoption Age (months) 1**	18.6	16.5	8.0	6.0	-	-	
	(6.7)	(12-36)	(5.2)	(2-25)			
Years in US at time of study 2**	5.3	5.3	6.2	6.1	-	-	
	(0.8)	(3.1-6.7)	(0.8)	(3.9-7.6)			
Time in institution (months) ³ **	17.7	15.0	0.4	0.0	-	-	
	(7.1)	(1.0 - 36.0)	(0.6)	(0.0-2.0)			
Months in foster care ⁴ **	0.1	0.0	7.0	6.0	-	-	
	(0.3)	(0-1)	(4.2)	(2-22)			
Number of prenatal risk factors	.30	0	.10	0.0	-	-	
(High = 1) 5*	(.46)	(0-1)	(.31)	(0-1)			

**Significant p < .01; * p < .05; 1 t (78) = 7.85; 2 t (78) = 25.3; 3 t (80) = 15.4; 4 t (45) = -8.31; 5 t (68) = 2.24

The two adoption group samples differed from one another in the following ways (see *Table 2*): children in the IC group (M = 18.6 months; SD = 6.76) were significantly older at adoption t (78) = 7.85, p < .001 than those in the FC group (M = 8 months; SD = 5.19); this value also corresponded with children's length of time in the U.S. [t (78) = - 5.03, p < .001, as IC (M = 5.30 years/SD = 0.81 years)] as those in the FC group (M = 6.19 years/SD = 0.76) lived in-country longer than did those in the IC group.

Characteristic	Institutional Care	Foster Care	Birth Family Care
	(<i>n</i> = 40)	(<i>n</i> = 40)	(<i>n</i> = 40)
Respondent (% mothers)	85.0	87.5	92.5
Age M (SD)			
Respondent ¹	45.4 (4.5)	45.5 (4.2)	39.2 (5.1)
Other Parent ²	46.8 (5.0)	45.9 (5.1)	40.5 (5.1)
Race (% Caucasian)			
Respondent	100	97.5	97.5
Other Parent	100	94.9	92.1
Marital Status (% married/live with partner) ³	92.5	97.5	95.0
Number of Children in Home M (SD)	2.1 (1.1)	2.1 (0.9)	2.5 (0.9)
Education (% 4-year college degree or >)			
Respondent	72.5	80.0	70.0
Other Parent	72.7	76.9	71.1
Employment (% Full-time)			
Respondent	40.0	37.5	27.5
Other Parent	81.8	87.2	89.5
Annual Family Income (% > \$75,000)	53.8	65.8	59.0

Table 3.

Family Demographic Characteristics by Type of Early Care (N = 120)

¹⁻² Tukey post hoc indicated that parents in BC group younger than both adopted groups; Bonferroni post hoc indicated that parents from IC group < likely to be married/living with partner than were FC or BC group.

The families of the children in the IC and FC groups were quite similar demographically (see *Table 3*), differing only on marital status t (78) = 2.28, p = .02. Specifically, parents in the IC group (M = 1.18; SD = .38) were slightly more likely to be unmarried than were those in the FC group (M = 1.03; SD = .16). This may relate to differing sending country public child welfare policies related to single parent adoption. For example, many countries utilizing foster care versus institutional care for children who are wards of the state often require that children be adopted by two-parent, heterosexually-married couples. There were no significant parent differences between the three parent groups related to who completed the survey, race, age of parents at adoption (comparison relevant to IC and FC groups only) and time of the study, household income, education attainment, and total number of children in the family home

Research Question #1: Hypotheses 1-5 (Tables 4 - 9)

RQ1. How does children's type of early life care (Institutional [IC], foster [FC], birth family [BC] care) relate to behavior problems, self-regulation, and physiological stress responses in 6-7 year-old children of ICA.

To test whether (H1) IC children had significantly greater behavior problems than FC and BC groups, a Welch's F (2, 59.94) = 9.62, p < .001 with a Games-Howell post hoc indicated that IC children had significantly greater behavioral problems than did those from the BC group (eta ² = .09). This analysis is presented in *Table 4*. The estimated omega squared (est. $\omega^2 = 2 (9.62-1)/[2 (9.62-1) + 120] = .13)$ indicated that 13% of the total variation in average number of reported behavioral problems is attributable to the differences between children's early care environments.

Table 4.

Effect of Type of Early Care on Children's Behavior Problems (N = 120).

	Types of Early Life Care			df	F	р
	IC FC BC					
	(<i>n</i> = 40)	(<i>n</i> = 40)	(<i>n</i> = 40)			
Behavioral Problems M (SD) ¹	.98 (1.23)	.70 (1.38)	.18 (.39)	2, 60	9.62	.001

¹Welch's adjusted F ratio with Games-Howell post hoc indicates IC >BC;

To test whether (H2) children from the IC group had significantly less selfregulation abilities than the FC and BC groups, a one-way between groups ANOVA compared the effect of the type of early care on children's abilities to regulate their emotions. These results are presented in *Table 5*. With equal variances assumed, results indicated a significant difference between type of early care groups on self-regulation (F [118] = 4.19, p = .02; eta ² = .07). Post hoc analysis using Tukey HSD indicated that the BC group had significantly stronger self-regulation abilities than did the IC group F (118)

= 4.19, p < .05.

Table 5.Effect of Type of Early	df	F	р			
	IC (n = 39)	FC (n = 40)	BC (n = 40)	_		
Self-Regulation M (SD) ¹	31 (1.21)	03 (.85)	.31 (.74)	2, 118	4.19	.02

Tukey's post hoc indicated BC>IC

A one-way between groups ANOVA compared what effect children's types of early care had on their cortisol stress responses. Hypotheses 3 (lab cortisol baseline), hypothesis 4 (lab cortisol stress task) and hypothesis 5 (home cortisol baseline) predicted that children from the IC group would have significantly more blunted physiological responses to stress than would the FC and BC groups. Results indicated that the Welch's adjusted F ratio with a Games-Howell post hoc validated significantly blunted cortisol in the IC group versus the FC group Welch's F (2, 73.9) = 3.18, p = .047(eta 2 = .04). Results are presented in *Table 6*. However, when controlling for age at adoption, the differences between the IC and FC were no longer significant for the lab cortisol baseline (Table 7).

Table 6.

Effect of Type of Early Care on Lab Cortisol Baseline ($N = 119$).									
	Types of Early Life Care			df	F	р			
_	IC	FC	BC	-					
	(n = 40)	(n = 39)	(n = 40)						
Cortisol Baseline Sample ¹	.13 (.06)	.17 (.10)	.15 (.07)	2, 73.9	3.18	.047			

¹Games-Howell post hoc indicated FC >IC

Table 7.

	Sum of Squares	df	M Square	F	р
Type of Early Care (IC = 1)	.007	1	.007	1.07	.304
Age at Adoption (in months)	.005	1	.005	.862	.356
Error	.483	76	.006		
Total	2.20	79			

FC = reference group

Tables 8-9 denote a lack of significant differences between the type of early care groups

on the lab cortisol stress task sample or the home cortisol baseline sample

Table	8 .
Effect	of Tr

Effect of Type of Early Care on Lab Cortisol Stress Task ($N = 118$).							
i	Types of Early Life Care			df	F	р	
	IC	FC	BC				
	(n = 40)	(n = 38)	(n = 40)				
Lab Cortisol Stress Task M (SD)	.09 (.04)	.12 (.07)	.10 (.04)	2, 73.3	1.18	.16	

Table 9.

Effect of Type of Early Care on Home Cortisol Baseline ($N = 113$).							
	Types of Early Life Care			df	F	р	
	IC	FC	BC				
	(n = 38)	(n = 39)	(n = 36)				
Mean Home PM Cortisol M (SD)	.15 (.08)	.14 (.05)	.14 (.05)	2, 110	0.45	.64	

Research Question #2, Hypotheses 6-10 (Tables 10-16)

RQ#2: How do children of ICA that were exposed to high prenatal risk differ from those who experienced no/low prenatal risk in terms of behavior problems, self-regulation, and physiological stress response modulation?

When equal variances were assumed, results from an independent-samples ttest supported that (hypothesis 6) children of ICA that had been exposed to high versus low prenatal risk exhibited significantly more behavior problems than those with low prenatal risk (t [77]) = -2.52, p = .01). The magnitude of the differences

Table 10

Effect of Prenatal Risk on the Behavior Problems $(N = 79)$ Level of Prenatal Risk df t p							
	Low (n = 63)	High (n = 16)					
Behavioral Problems M (SD) ¹	.67 (1.27)	1.56 (1.26)	77	-2.52	.01		
$r^2 = 08$							

in the means was moderate (see *Table 10*). Even when adjusting for age at adoption and type of early care, prenatal risk results remained significant (F [79] = 4.53, p < .05) (see *Table 11*).

Table 11

Effect of Prenatal Risk on Behavior Problems, Controlling Adoption Age (N = 78).

	Sum of Squares	df	M Square	F	р	
High Prenatal Risk ¹	7.43	1	7.43	4.53	.037	•
Type of Early Care	.112	1	.112	.068	.795	
Age at Adoption (in months)	.810	1	.810	.494	.484	
Error	122.9	75	1.64			
Total	191.0	79				

¹ High prenatal risk > low prenatal risk; $r^2 = .08/adjusted r^2 = .047$

Results from an independent-samples t-test indicated that (hypothesis 7) there

were no significant differences in self-regulation abilities between those adoptees

that experienced high versus low prenatal risk (t [76]) = 1.31, p = .21) (see *Table 12*)

on measures of self-regulation.

Table 12						
Effects of Prenatal F	Risk on Self-l	Regulation (N :	= 78).			
	Level of P	renatal Risk	df	t	р	-
	Low (n = 63)	High (n = 15)				-
Self-Regulation M (SD)	04 (.89)	54 (1.40)	76	1.31	.21	

Independent samples t-test results indicated that (hypothesis 8) there were no significant differences between adoptees that experienced high (m = .15; SD = .08) versus low (m = .15; SD = .10) prenatal risk (t [76]) = 1.31, p = .21) on measures of lab cortisol baseline samples (see *Table 13*)

Table 13.

Effects of Prenatal Risk on Lab Cortisol Baseline (N = 78).

	Level of Prenatal Risk		df	t	р
	Low (n = 62)	High (n = 16)			
Lab Cortisol Baseline	.15 (.08)	.15 (.10)	76	-0.04	.97

Results from an independent samples t-test indicated that (hypotheses 9) there

was no significant differences between adoptees that experienced high and low prenatal risk on measures of the lab cortisol stress task t [75]) = -.085, p = .40, two tailed (see *Table 14*).

Table 14

Effects of Prenatal Risk	on Lab Cort	isol Stress Ta	sk(N =	77).	
	Level of P	renatal Risk	df	t	р
	Low (n = 61)	High (n = 16)			
Lab Cortisol Stress Task M (SD)	.11 (.06)	.09 (.04)	75	-0.85	.40

Results from an independent samples t-test indicated that (**hypothesis 10**) there were significant differences between those adoptees that experienced high versus low prenatal risk t [76]) = -.2.78, p = .01 (see *Table 15*). When controlling for age at adoption and type of early care, prenatal risk remained significant F (76) = 13.7, p < .0001 (r² = .182) (see *Table 16*).

Table 15

rtisol Baselin	e(N = 76).			
Level of Prenatal Risk		df	t	р
Low	High			
(n = 61)	(n = 15)			
.13 (.05)	.20 (.09)	76	-2.78	.01
	rtisol Baseline Level of Pr Low (n = 61) .13 (.05)	rtisol Baseline (N = 76).Level of Prenatal RiskLowHigh $(n = 61)$ $(n = 15)$.13 (.05).20 (.09)	rtisol Baseline (N = 76).Level of Prenatal RiskdfLowHigh $(n = 61)$ $(n = 15)$.13 (.05).20 (.09)76	rtisol Baseline (N = 76). Level of Prenatal Risk df t Low High (n = 61) (n = 15) .13 (.05) .20 (.09) 76 -2.78

$r^2 = .33$

Table 16.

Prenatal Risk on Home Cortisol Baseline, Controlling for Age at Adoption and Type of Early Care (N = 76)

	Sum of Squares	df	M Square	F	р
High Prenatal Risk ¹	.049	1	.049	13.7	.000
Age at Adoption (in months)	.000	1	.000	.056	.813
Institutional Care	.000	1	.000	.137	.712
Error	.258	72	.004		
Total	1.86	76			

Partial eta squared = .16

Research Question #3, Hypotheses 11-15 (Tables 17 - 21)

RQ#3: Among ICA children who were exposed to varying degrees of prenatal risk (no/low; high), does the type of pre-adoptive care received moderate behavior problems, self-regulation, and physiological stress response modulation?

A two-way ANCOVA found that the type of early care did not moderate the effects of prenatal risk on children's behavioral problems (hypothesis 11; see *Table* 17), self-regulation (hypothesis 12; see *Table 19*), lab baseline cortisol (hypothesis 13; see *Table 19*), and lab cortisol stress task (hypothesis 14; see *Table 20*) when controlling for age at adoption (see *Table 21*).

Table 17

Prenatal Risk on Total Number of Behavior Problems, Testing Moderating Effect of Early Care (N = 79)

	Sum of Squares	df	M Square	F	р
High Prenatal Risk ¹	4.15	1	4.15	2.53	.116
Institutional Care	.187	1	.187	.114	.737
Age at Adoption	.748	1	.748	.456	.502
Prenatal Risk * Early Care	1.52	1	1.52	.925	.339
Error	121.5	74	1.64		
Total	191.0	79			

Table 18

The Effect of Prenatal Risk on Self-Regulation, Testing the Moderating Effect of Type of Early Care (N = 78), Controlling for Age at Adoption

	Sum of Squares	df	M Square	F	р
High Prenatal Risk	.475	1	.475	.479	.491
Institutional Care	2.62	1	2.62	2.64	.108
Age at Adoption	.001	1	.001	.001	.974
Prenatal Risk * Early Care	2.59	1	2.59	2.62	.110
Error	72.3	73	.991		
Total	80.8	78			
Table 19

Prenatal Risk on Lab Cortisol Baseline, Testing the Moderating Effect of Type of Early Care, Controlling for Age at Adoption (N = 78).

Sum of Squares	df	M Square	F	р
.006	1	.006	.969	.328
.007	1	.007	1.01	.318
.009	1	.009	1.36	.247
.002	1	.002	.296	.587
.475	73	.007		
2.17	78			
	Sum of Squares .006 .007 .009 .002 .475 2.17	Sum of Squares df .006 1 .007 1 .009 1 .002 1 .475 73 2.17 78	Sum of Squares df M Square .006 1 .006 .007 1 .007 .009 1 .009 .002 1 .002 .475 73 .007 2.17 78	Sum of Squares df M Square F .006 1 .006 .969 .007 1 .007 1.01 .009 1 .009 1.36 .002 1 .002 .296 .475 73 .007 2.17 78

Table 20

Prenatal Risk on Lab Cortisol Stress Task, Testing the Moderating Effect of Type of Early Care, Controlling for Age at Adoption (N = 77).

J	0 0	1	()		
	Sum of Squares	df	M Square	F	р
High Prenatal Risk ¹	2.99E-5	1	2.99E-5	.010	.921
Institutional Care	.000	1	.000	.059	.809
Age at Adoption	.006	1	.006	1.86	.176
Prenatal Risk * Early Care	3.39E-6	1	3.39E-6	0.01	973
Error	.218	72			
Total	1.06	77			

Table 21

Prenatal Risk on Mean Home Afternoon Cortisol, Testing Moderating Effect of Early Care (N = 76)

	Sum of Squares	df	M Square	F	р	
High Prenatal Risk ¹	.032	1	.032	9.11	.004	
Institutional Care	.001	1	.001	.270	.605	
Age at Adoption	.000	1	.000	.117	.733	
Prenatal Risk * Early Care	.006	1	.006	1.59	.211	
Error	.253	71	.004			
Total	1.86	76				

CHAPTER 5--DISCUSSION AND IMPLICATIONS

Study Purpose

The purpose of the current study was to examine the relationship between prenatal exposure to risk and preadoption placement on the developmental outcomes related to behavior problems, self-regulation, and stress response modulation in 6-7 year old children of intercountry adoption (ICA). Comparisons were made between three groups of children: those that received early rearing in overseas institutional care (IC, n = 40), those that were raised in international foster care (FC, n = 40), or non-adopted American children that were always reared in birth families (BC, n = 40).

Opportunities Provided by the Sample

This sample provided two unique opportunities. First, it compared early care experiences that had varying degrees of social deprivation. The BC group included those children raised in birth families with no apparent social or physical deprivation. The FC group included children reared in foster care and did not lack physical deprivation, was suspected to have had more opportunity to establish responsive primary caregiving relationships that likely encouraged "serve-and-return" interactions and built strong brain architecture to support future learning and regulation, yet still experienced deprivation as they were lacking a permanent parent connection. The IC group included children raised in socially-depriving institutional care that at lacked cognitive stimulation and responsive primary caregiver-child interactions.

The second unique opportunity that this sample has provided was the opportunity to examine the effects of prenatal risks; this was done from a cumulative, global risk perspective versus examining single or specific prenatal risk exposures (i.e., only prenatal alcohol exposure). This approach to only focusing on cumulative risk was made because sending countries' record keeping is often poor, there is a lack of contact with birth family members to quantify/confirm prenatal risk exposure information, adoptive parents receive spotty prenatal information about their children, there are likely some memory errors in information that parents report, and the literature notes that many of the children that end up in IC/FC come from high risk backgrounds and typically experience greater numbers of prenatal detriment (Johnson, 2000).

Issues that the Study Examined

In particular, this study examined three major questions. *First*, it explored whether being raised in institutional care (IC) placed children at greater risk for behavioral problems, emotion dysregulation, and stress response dysregulation than those children reared in foster (FC) or birth families (BC). Additional comparisons were made between the IC and FC groups while controlling for age at adoption. *Second*, it examined whether those ICA children that had been exposed to high prenatal risk were displaying greater behavioral problems, challenges with self-regulation, and difficulties modulating physiological stress, while controlling for age at adoption and type of early care. *Third*, it studied whether placement in family foster care moderated the prenatal risk effects on behavior problems, self-regulation and physiological stress modulation, while controlling for age at adoption.

What Results Suggest

IC children differed significantly from BC children on behavior problems (IC > BC) and self-regulation (IC < BC), but less so on stress response modulation. IC children only had significantly more blunted lab cortisol baseline results than the FC group

controls (IC > blunted FC). However, when controlling for age at adoption, results for the lab cortisol baseline no longer remained significant. There were no differences between the FC and BC groups. No significant differences existed between the three groups for the lab cortisol stress task or home cortisol baseline sample.

Children that had high prenatal risk exposures had significantly greater behavioral problems and elevated home cortisol baseline levels than did those children with low prenatal risk exposures, even when controlling for age at adoption and type of early care experienced. There were no significant differences between high and low prenatal risk for self-regulation, lab cortisol baseline, and lab cortisol stress task. Placement in foster care did not moderate the effects of high prenatal risk on children's behavior problems, selfregulation or stress response modulation (lab cortisol baseline; lab cortisol stress task; home cortisol baseline).

The results partially support the findings of Rutter and the ERA Team (1998) who noted that children in the BC group had fewer behavioral problems and stronger selfregulation skills than IC children. These findings are consistent with attachment theories (i.e., Ainsworth, 1963; 1967; Bowlby, 1951; Schore & Schore, 2008) as well as stress, coping and adaptation theories (Lazarus, 1966; Lazarus & Folkman, 1984; McEwen, 2006; McEwen & Seeman, 1999; Selye, 1956; Sterling & Eyer, 1988). Children are most likely to develop strong emotional and behavior regulation abilities when they live in a family environment with a primary caregiver that consistently meets their needs and participates in "serve-and-return" interactions with the child. Over time, the sensitive caregiver reinforces the child's trust by comforting their distress; their consistent feedback and support helps the child learn how to regulate biological stress, cope with

discomfort, manage emotions, and control behaviors. It is through these interactions that the foundation for brain architecture is formed, providing the neural scaffolding in which all other levels of higher learning and development are built. It is also likely that the FC group did not significantly differ from either the IC or BC group because they had elements of *both* in terms of attachment and social deprivation. While they had more consistent primary caregiving within their foster family than did IC children, they likely lacked the depth of attachment, commitment, and sense of stability from the foster parent that a child would have with a permanent, legal parent.

This finding is consistent with the research of Dozier and Lindheim (2006) who found that foster parents' level of commitment towards children varied, influencing the parent-child relationship and placement security. They found that foster parents indicated greater *commitment* (extent to which caregiver is motivated to have an enduring relationship with a particular child) if they had fostered fewer children (50% of participants had fostered 5 or > children) and if children were placed with them at younger ages; additionally, foster parent commitment predicted placement stability.

The Rutter and the ERA Team (1998) indicated that the only exception to their earlier finding regarding increased behavior and self-regulation difficulties among IC and FC children when compared to BC children was when IC and FC children only remained in institutional or foster care for a very short period of time. This specifically related to children who had remained in institutional care for less than 6 months prior to their ICA placement. The results of the current study support these findings as well. For example, the FC group had been in care for a median of 6 months prior to placement in their

adoptive families as opposed to the IC group who had been in care for a median of 15 months before adoption.

Given how young the children are in the current study (all three groups were a mean age of 6.9 years), behavioral problems and challenges with self-regulation for the IC group may also distinguish themselves from the FC group as children begin to approach adolescence. Verhulst and colleagues (1990) noted that in early childhood, institutionally-reared and foster care reared ICA children resembled one another more in terms of internalizing behaviors. But, it was not until they began to reach adolescence that those children formerly in foster care began to distinguish themselves from post-institutionalized adoptees to resemble their same-aged, birth family reared peers. During adolescence, those that previously resided in institutional care had greater internalizing and externalizing behavioral problems than both control groups (foster and birth). It is also possible that the later changes between the institutional care group and the two control groups (FC and BC) were more related to the natural second round of synaptogenesis and pruning that is associated with adolescence (Woo et al, 1997).

Children in the IC and FC groups differed in another potentially influential way. Those in the FC group had lived significantly longer in their adoptive families (6.2 years) than did those children in the IC group (5.3 years). McCall and Hawk (2011) found that time in the adoptive family was an influential factor in later internalizing and externalizing behaviors for post-institutionalized and fostered intercountry adoptees. They noted that children that had been institutionalized (versus fostered), adopted at older ages, and in the later stages of adoptive family formation showed significantly greater internalizing and externalizing behaviors than did their same aged peers from foster care

who had resembled them more at earlier ages. This raises the important issue of the robust age of adoption effects found in the current study.

Another potential factor impacting the results of this study relates to children's countries-of-origin by care group differences. There were significantly more children from Eastern European countries (n = 18; 45%) and China (n = 17; 42.5%) in the IC group than the FC group (Eastern European n = 0; China n = 2; 5%). There were also significantly greater numbers of children from Korea in the FC group (n = 32; 80%) than the IC group (n = 1; 2.5%). This is important because these countries vary greatly in terms of children's preadoption experiences (i.e., adequate nutrition, cognitive stimulation, and level of responsive caregiving) (Gunnar, Bruce & Grotevant, 2000). More specifically, Kim (1995) noted that ICA children adopted from South Korea experience few short or long-term cognitive or social-emotional delays because children of this country receive excellent medical care, strong nutrition, and are typically reared by stable, responsive, and well-trained foster families. Yet, institutional care still plays a strong role in caring for abandoned children in many Eastern European countries and China. These environments notoriously lack adequate cognitive stimulation and responsive, individualized care, both of which are needed to foster the development of children's brains (Johnson, 2000; Muhamedrahimov, Palmov, Nikiforova, Groark, & McCall, 2004). They also may lack access to appropriate medical care and good nutritional supplements. Lacking that early cognitive/social stimulation, IC children often miss out on the opportunity to build strong early brain architecture to scaffold later learning and regulation capacities. As a result, many ICA children from countries that

still use institutional care demonstrate behavioral problems and emotion dysregulation (Juffer & van IJzendoorn, 2005).

These cognitive and social-emotional delays seem to diverge from other delays (i.e., growth; stress response) with regard to etiology and recovery; specifically, they appear to be associated with a lack of individualized care from a consistent caregiver rather than a lack of adequate nutrition or general health issues (Hodges & Tizard, 1989; Vorria et al., 1998). They have also been reported to persist post-adoption (Johnson, 2000; Kreppner, O'Connor, Rutter, & the ERA Study Team, 2001; Morison & Ellwood, 2000). Although focusing on different populations, these outcomes are further validated by Walker and associates (2011) who found in their longitudinal study of growth-retarded Jamaican children that received nutritional milk supplementation. Walker, Chang, Vera-Hernandez, and Grantham-Mac Gregor (2011) assessed several developmental outcomes once participants reached the age of 22 years and found no significant benefits from only nutritional supplementation.

The IC group having more blunted cortisol responses than FC is supported by physiological stress models (i.e., stress, coping and adaption theory; theory of allostatic load). Yet, when determining whether the IC group did have a significantly more blunted lab cortisol baseline sample than the FC group, age at adoption had a more powerful effect in the statistical model, as it overrode the significant stress response effect between the two groups of adoptees.

Theoretically, children that were reared in the socially-depriving environment of institutional care would likely lack a responsive primary caregiver in which to securely attach, participate in ""serve-and-return"" interactions to build neural connections,

reinforce social cues, calm them when distressed, and teach them how to regulate stress. Without these things, babies would never learn how to leave the highly stressed state that they were born in to and those children that live in toxically stressful environments (i.e., neglect) remain on high alert, causing damage to the body and brain. Because the body/brain adapt by resetting the stress threshold to a more blunted level, it requires a much higher level of threat/stress to catapult children's bodies into fight-or-flight responses. Children in the FC group have also experienced early trauma (i.e., prenatal risk exposure + abandonment by birth mother), likely impacting their stress response systems. As they were placed in a foster family environment, it is likely that the primary caregiver had some positive effect on modulating physiological stress. Foster caregivers' assistance in helping children modulate their distress may have been just enough to keep them from continually remaining in a state of high alert; if they had remained in such a state, stress/allostatic load theories would indicate that an adaptive/protective process of resetting the stress threshold would have taken place. Yet, IC and FC children had both been placed with their adoptive families for several years at the time of the study, so why would IC children's cortisol responses appear blunted? The answer to this may be that comparisons were made between the groups (IC compared to FC compared to BC) not in relation to a set of standard results (normative ranges for cortisol levels for all 6-7 year old children in the US). Additionally, Kroupina et al. (2012) described the adoptive family as a successful intervention for ICA children's dysregulated basal cortisol patterns, as they were found to increase previously blunted morning cortisol levels at baseline. If the adoptive family therapeutically increased previously blunted cortisol levels, then it may also help explain why the FC group had significantly higher levels of

lab cortisol baseline samples compared to the IC group—the FC group had spent, on average, one year longer with their adoptive family which provided additional time to help children modulate their dysregulated cortisol stress responses when compared to the IC group.

These findings were also supported by stress response research among Romanian and Russian adoptees. Results of this research have shown that time in the adoptive family typically predicts stress response system patterns. For example, Kroupina and colleagues (2012) found that children adopted from Russian and Romanian orphanages often have a mix of hypo (blunted) and hypercortisolism (high) patterns post-adoption; for those children that come from socially depriving environments of institutions that are > 6 months of age at the time of adoption, they typically indicate blunted diurnal cortisol patterns at the time of placement (tested within 1 month of placement) when compared to previously reported normative data of same age children (Watamura, Donzella, Alwin, & Gunnar, 2003). At 6 months post adoption, children were tested again. Results indicated that those children that initially had blunted cortisol patterns emerged to a more hypercortisol response pattern. Bruce, Kroupina, Parker, and Gunnar (2000) also found hypocortisolism in post-institutionalized children of ICA at 2 months post-placement, with more than 30% having cortisol levels at least one standard deviation below the mean of non-institutionalized, non-maltreated children.

The presence of hypercortisolism appears to remain for several years post adoption in some Russian and Romanian adoptees reared in orphanages. For example, Wismer and colleagues (2005) found continued hypercortisolism in Russian and Romanian adoptees at 3 or more years post adoption, where the greater the severity of

neglect, the higher the cortisol levels. Gunnar and colleagues (2001) also found hypercortisolism in Russian adoptees with a mean of 6 years post-placement. There was a positive correlation between cortisol levels and the number of months over 8 that children remained institutionalized.

These physiological stress responses among Russian and Romanian intercountry adoptees, similarly with other outcomes (i.e., challenges with behavior; self-regulation) likely indicate that these two populations (or possibly populations of Eastern European children in institutional care) should be treated as their own subset among ICA populations. Although the level of deprivation experienced in Russian institutions (1990s-current; "socially deprived") and Romanian institutions (1980s-1990s; "globally deprived") has differed in some ways, there are still many similarities that may contribute to why these two groups of children may appear to be their own subset in the overall ICA population. For example, the modulation of the stress response is cultivated through the child-primary caregiver attachment relationship early in life. In the institutional setting commonly used in Romania in the 1990s or currently used in Russia, such relationships typically do not exist due to high child to caregiver ratios, inconsistent staffing/frequent staff turnover, or little training on the importance of social-cognitive interaction with children to enhance their development.

In this set of results, the effects of prenatal risk were strong, so much so that significance was maintained even when controlling for age at adoption and type of early care. Treating prenatal risk as a global variable versus individually examining the three types of risk did accurately describe the ICA child and family-building experience. When the current sample of children were being adopted (1997-1998), they were

typically coming adopted with little/no information about their prenatal history or their birth families. Additionally, when their prospective adoptive families were receiving referrals about their potential sons or daughters, they were often not getting much more information than what data was available since their child entered their most recent orphanage or foster home.

The prenatal risks that were examined in the current study are prenatal alcohol exposure, malnutrition, and prematurity. Children exposed to any one of the three risks can often share a crossover in symptomology, making it difficult to discern which type of exposure(s) children may have experienced. For example, prenatal alcohol (i.e., Davies & Bledsoe, 2005; Jones & smith, 1973; McGuinness & Pallansch, 2007; Miller et al., 2007), malnutrition (i.e., de Rooij et al., 2010; Stusser et al., 1972) and prematurity (Glennan & Masters, 2005; Kreppner et al., 2008) have all been linked to low birth weight, poor height, weight, and small head circumference scores. Central nervous system damage, cognitive problems, behavior problems, self-regulation challenges, immature prefrontal cortex development and stress response system dysregulation appear to be mostly linked to prenatal alcohol exposure (e.g., Davies & Bledsoe, 2005; Haley, Handmaker, & Lowe, 2006; Jones & Smith, 1973; McGuiness & Pallansch, 2007; Miller et al., 2007) and prenatal malnutrition (de Rooij et al., 2010; Stusser et al., 1972). Small head circumference, a pattern among all three prenatal risks, has also been associated with subsequent damage to other brain centers (prefrontal cortex; amygdala) responsible for important roles like threat perception and stress response, attention-related abilities, and self-regulation.

The results of the current study indicated that those children in the high prenatal risk exposure group had significantly more elevated cortisol (stress response hormone) during the home cortisol baseline sample than did those children that had experienced low prenatal risk, even when controlling for age at adoption and type of early care received. These results are consistent with the studies of Wismer Fries, Shirtcliff, and Pollack (2008) and Haley, Handmaker and Lowe (2006).

The greatest severity of neglect/orphanage conditions was positively associated with the highest basal cortisol levels and the most impaired cortisol regulation following the child's interaction with their adoptive mother. Results indicated that early social deprivation may keep children from acquiring the needed early scaffolding in order to learn how to modulate physiological stress and may contribute to long-term regulatory problems of the stress-responsive system. How this lack of long-term regulatory problems may manifest is within the context of ongoing, close interpersonal relationships. Yet, the results of the current study would argue that maybe it has less to do with the severity of neglect and orphanage condition and more to do with the degree of prenatal risk. Given that in this analysis, age at adoption and type of early pre-adoptive care were controlled for, it lends credibility that (at least in this sample), such outcomes might rest more on prenatal risk. Haley, Handmaker, and Lowe (2006) study also argued that degree of prenatal risk experienced can impact stress response outcomes, especially when the prenatal environment is so caustic that the child's physiological stress response system has to adapt in utero and does not recover when in the presence of the primary caregiver. Differentiating between high and low exposure to prenatal risk (behavioral teratology),

Being placed in family foster care did not moderate the effects of prenatal risk on children's behavior problems, self-regulation or stress response. At least in the current study, the effects of prenatal risk appeared to be stronger than the effects of type of early care. Therefore, the type of care that children received between prenatal exposure and adoption did not appear to moderate the impacts of prenatal risk they experienced. Given the varying degree of care received, it is always possible that those children that received care in institutions and foster care had actually received far more comparable care than was expected.

Limitations

There were a number of significant limitations in the study. For example, the BC group participants were part of a convenience sample and the sample size was small (N = 120). Additionally, the sample size further decreased (n = 80) when analyses only included variables that related to the adoption groups (prenatal risk; age at adoption). In terms of the prenatal risk variable, data was only collected for the two adoption groups. Lacking this information for the BC group did not allow for any comparisons to be made on prenatal risk research questions. Additionally, there was a lack of access to raw data versus summative data for the prenatal risk variable (i.e., did not specify which types of prenatal risks were experienced; instead provided the sum total number of risk factors experienced).

An overall methodological weakness of the study related to recall bias of parents. Pre-adoption experience data was based on adoptive parent report which Bruce, Tarullo, and Gunnar (2009) denoted can sometimes be problematic. For example, adoptive parents often do not have direct knowledge about ICA children's pre-adoptive levels of

deprivation; their retrospective reports are often estimates based on their children's levels of functioning at the time of the study.

Strengths

There are five major strengths of the current study. First, the three care groups in the sample were matched on age and gender, both of which are variables of influence on outcomes in the study. Second, it was a strength to examine ICA children's outcomes across multiple developmental domains to provide a unique lens using behavioral, emotional, and biological markers in which to understand the child. Third, it was a strength to examine ICA children's outcomes from the theoretical perspectives of multiple scientific disciplines-social work, psychobiology, and neuroscience. Fourth, the study's sample included ICA children from multiple sending countries. Some may view this as a weakness but it has also served as a strength, as one of the purposes of this research was to form a more global "portrait of ICA adoptees" versus postinstitutionalized children adopted from Eastern Europe or Korean children adopted from foster care. Fifth, as trends can begin to form among children from different regions/child welfare systems throughout the world, we as social workers must also be cognizant of prospective adoptive children becoming labeled as "unadoptable". This is one of many reasons why it is important for social work researchers to be examining this information.

Generalizability

The generalizability of results should be done so conservatively, as the sample size was small (N = 120) and outcomes relate specifically to ICA children reared in institutional care and foster care from a variety of sending countries. There always remains an argument in ICA research as to who is an adequate comparison group for

post-institutionalized children. This sample utilized two control groups: birth children and foster reared ICA children, covering two common control groups in this literature. **Implications**

This study provides findings that bring multi-disciplinary ICA researchers and clinicians a step closer to understanding the associations between children's prenatal exposures, type of early care, and whether their placement in foster care versus institutional care would moderate the impact that prenatal effects had on developmental outcomes of behavior, self-regulation, and physiological stress when controlling for age at adoption. The topics discussed uniquely connect important worlds related to ICA: it provides a link between ICA researchers and clinicians, it bridges the professional fields of social work, neuropsychology, pediatric medicine, neuroscience, and stress research, and, most importantly, it links all of the aforementioned professionals to ICA families. Much like first glance at the ICA family photograph, the mishmash of its members looks a bit like a plethora of people who do not necessarily "fit" with one another—yet, peering more closely at the details of their story, you realize they do belong together. Working as a comprehensive team, we can help ICA families understand their children better and assist them in healthily moving forward in family life together.

Strong, multi-disciplinary training programs are needed to support more specialization in adversity-competent and adoption-competent clinical practices. For example, there are some adoption-competent training practices taking place in graduate schools of social work (i.e., several semester-long courses in adoption or trauma-related topics; 9 month field rotations in adoption-based agencies; medical school semester-long elective courses in adoption medicine). Other less intensive trainings are taking place via

continuing education courses, maintenance of certification (MOC) curriculum, or daylong institution-wide programs. These programs need to be expanded and a team of professionals need to be trained together. It is also important that ICA specialists receive on-going, cutting edge multi-disciplinary training about the developmental impacts of early adversity on child development and its role in physical/mental health across the lifespan. This type of training should include extensive review of the science of traumatology, adoptive family dynamics, as well as other contemporary topics related to ICA (i.e., transracial adoption; gay/lesbian couple adoption). It should also include instructors from several different disciplines like social work, neuroscience, pediatric medicine, neuropsychology, endocrinology, stress research, adoptive parents, adult adoptive children...etc. There should be a broader understanding of additional conceptual models like the Fetal Origins of Coronary Heart Disease (Barker's Theory; Barker, 1993), and Biological Sensitivity to Context (Boyce & Ellis, 2005) link to such theories more commonly utilized in social work.

As complex as the ICA child is, another implication of the current study is that it is increasingly important for social workers to integrate neuroscience into their training, research and practices. In the last 20 years, burgeoning discoveries have been made in the broader field of neuroscience, not just in relation to how early adversity impacts children's brain. Yet, graduate schools of social work have been reluctant to integrate cutting-edge neuroscience curricula into coursework (Applegate & Shapiro, 2005; Farmer, 2009; Lefmann & Combs-Orme, 2013). It is likely that these findings would have had strong implications for the field of social work, as they would have promoted a greater understanding of human development and behavior. Additionally, if graduate

social work students were taught to appropriately integrate findings of the physical sciences into their work while in formal training, they may have less apprehension to embrace it into their research and practices throughout their careers. Having more fluency in the physical sciences will help provide a common nomenclature within interdisciplinary collaborations not to mention strengthen social workers' clinical skills by having a stronger understanding of the brain, physiology, and physical development.

Social workers need to increase their fluency within the physical sciences because ICA families need a translator to decipher research findings from neuroscience, genetics, epigenetics, endocrinology, and stress research outcomes that continue to emerge into a language and way of presenting that they can understand. It is extremely important that family members translate/get this information translated accurately, yet there is also a fine line between the information being either under and over simplified. As the two interdisciplinary medical team members most frequently on the front lines with ICA parents and their children are the pediatrician and the social worker, it is likely that if questions arise, it will be to these professionals who translate information to adoptive families. Therefore, it is important that social workers remain abreast of the research but keeps an open dialogue with the pediatrician about the family's questions so they can continue the conversation during the family's next office visit.

It is likely that the neuroscience and epigenetic findings will be informing the ICA literature in the future. This is exciting but challenging to figure out how this information will better inform prospective or existing ICA families. It is likely that this will vary. From one prospective, knowledge is power. From another, it may be utterly overwhelming and anxiety-provoking for prospective parents, given all the other

information they are gathering and have to process. Greater potential for heterogeneous developmental outcomes due to differences in prenatal risk exposures, differences in biological susceptibility to context and other factors may be promising to one parent or perceived by another as simply an increased opportunity for more things to go wrong. The translation of bench science to the real world situations will still leave gaps and it is important for social workers to provide families with the most accurate scientific information available in a language parents understand.

In terms of prospective parents, pre-adoptive families need to be well prepared. Currently, foster families are better prepared for the developmental challenges that the children in their care face. We need to help potential adoptive families be positive and realistic about what to expect with their child(ren)—help them think through the joys and challenges in order to develop some strategies about what they will do, how they will do it, and who they will call when the challenges surface so the crises do not completely overwhelm them. One way to do so is to invest more resources in adoptive family mentoring programs. It is common for prospective adoptive parents to attend preadoptive training courses as part of the home study process to help them learn about whether adoption is the right practice for them in building a family, become educated about the many types of needs that children may have in the family, to meet other prospective adoptive parents, and to learn from other adoptive families' experiences.

Social work practitioners must help adoptive parents understand the complexities of their son or daughter. There are also a number of concrete, practical ways in assisting parents in understanding the complexities of their children. First, parents need multiple resources in which to gather information like reading materials, reputable websites, and

adoptive family support groups. Second, when working as a social worker with families, it is also important to provide parents with reading materials between sessions. Even if meeting weekly with a family, seven days can be a very long and frustrating period for them. By having written materials to refer to during appointment gaps, it helps them reframe frustration and stay on track with the new approaches to their parenting.

Third, adoptive parents must be encouraged to see their children's behaviors as their language. For example, children from ICA populations/prenatal risk populations often struggle with sending their parents ambiguous cues or withholding information about what they need from parents. This often results in parents becoming frustrated, loud and physically intrusive in their child's space, prompting equal frustration and irritation in their child. When this situation is taking place between a child and parent, ask the parent to pull back and get very quiet. Ask them to very quickly, without hesitation, to write down on a slip of paper what they believe is going on with their child. Then, ask them to take a step back, get very quiet, and see their behavior as their language. With everything they have shared with you about their child's history and functioning, what does their behavior "as their language" tell them they are saying? Have the parent share with the child *that* piece of information (*this typically goes a long way in relationshipbuilding between the dyad*). When the practitioner is alone with the parent, talk more about what is on the piece of paper. Give the parent(s) a homework assignment-- ask them (each) to write down one more example that took place during the week where they completed the same exercise.

From a global policy perspective, greater emphasis needs to be placed within sending countries to promote health and poverty reduction strategies for women. It is

especially important to empower pregnant women with choices to strengthen their abilities to care for the family such as fiscal opportunities/cash transfer programs for independence/poverty prevention. From a health perspective, pregnancy can be an extremely vulnerable time for women, as it interacts with other serious health and mental health disorders. Many pregnant women in low resource countries suffer from complications during pregnancy/delivery (Filippi et al., 2006) or they choose to not access prenatal care or use health services for fear that it will push the family further into poverty. Living in an environment where women can remain independent, in good health and fiscally capable of supporting their family may play a role in decreasing maternal stress, diminish her needs for using self-medicating coping mechanisms like alcohol/drug use in pregnancy, and support a mother's goals in protecting her children. Additionally, by having such resources in place, they may also be in less of a position where they feel like they need to place their children in an institution because they are unable to care for them.

Another policy implication should also include the development of universal standards about what types of data should be available to ICA children and adoptive parents. ICA children often leave their countries-of-origin knowing very little about their birth families' medical histories, details of their own birth, or histories while in the pre-adoptive placement. Even under circumstances where children have been abandoned, more often than not, they have at least one living parent. More efforts must be made within sending countries to gain access to birth family history/prenatal history.

What is ultimately known is that children should not be in institutions and more must be done to help low resource countries move to a family-based system of care.

Romania, the Communist Bloc country that gained international attention in the late 1980's for the horribly depriving institutional care of its children, has made huge strides towards deinstitutionalization, the use of higher quality foster care, and training child care providers to understand the link the care that they deliver and children's developmental outcomes (Nedelcu & Groza, 2012). In 2006, Russian President Vladimir Putin allegedly attempted to begin the deinstitutionalization of orphanage system in favor a foster care system. The Russian Duma (Parliament) supposedly undermined his plan. The old adage of the closed society being walled off from Western scientific findings being unaware of the poor developmental outcomes of institutionalized children can no longer be the poor excuse given. Unfortunately, it is unlikely that lessons learned will be taken from its Eastern European brethren or anyone else when it comes to deinstitutionalizing their children.

Future research should explore whether other measures/proxies exist that describe "deprivation" experiences (prenatal and preadoptive) besides what is currently being used in ICA studies (i.e., age at adoption, type of pre-adoptive care, and/or sending country). To do so, a longitudinal, mixed methods study might be conducted within ICA sending countries with a small number of children in State care (i.e., prenatal, birth, baby hospital, time with birth family, institutional/foster care, and adoptive family placement [if any]) to better define experiences of "deprivation". Methods used might include exploratory file mining for each institution, baby/maternity hospital or foster care environment of record for the child to help compile a stronger composite report about the child. As most children that are living in institutional care are social orphans and have at least one living parent (Johnson, 2000), another method might include qualitative interviewing with birth family/kin or others who knew the child/family in order to help piece together birth family, prenatal, and post birth information (i.e., family medical/genetic). Qualitative themes along with quantitative measures across several developmental domains would be used to compare with traditional proxies for deprivation like age at adoption.

Future research also needs to be conducted at different points in ICA children's development to determine whether the effects of prenatal risk on behavior problems, self-regulation, and/or physiological stress responses can be moderated by placement in a family foster care environment as opposed to being reared in institutional care. In the current study, the children were still quite young; some of the benefits of early family care may not have been fully recognized across developmental domains.

Summary

In summary, the findings of the current study indicated that type of early care had little influence on behavior problems, self-regulation, and physiological stress responses. Where differences did exist, they were either weak or no longer existed after controlling for age at adoption. Yet, children having experienced high exposure to prenatal risk versus low prenatal risk denoted greater behavior problems and more elevated home cortisol baseline results, even when controlling for adoption age and early care type. Early care type did not moderate the prenatal risk effects on the study's developmental outcomes, indicating that, at least in this sample, the effects of prenatal risk were strong. Further implications include the need for further investigation of effects of prenatal risk and institutional care risk on ICA children's developmental outcomes as well as collaborative research between social work, neuroscience, and stress researchers. Greater investigation also needs to be done to better understand the role of epigenetics in

ICA children in relation to prenatal risk exposure and early preadoptive care environments and how that knowledge might better prepare adoptive families to meet their ICA children's needs post-adoption and throughout the life cycle.

	1	2	3	4	5	6	7	8	9	10	11	12
1.Group (IC; FC)	1	-	-	-	246*	664**	.495**	106	.137	103	.246*	.216
2.Group IC (else = 0) (N = 120)		1	500**	500	.246*	.761**	495**	.225*	218*	.079	203*	153
3 Group FC (else =0) (N = 120)			1	500	246*	067	.495**	.052	014	077	.168	.174
4 Group BC (else = 0) (N = 120)				1	-	-	-	277**	.231*	.036	019	001
5 Prenatal Risk (low; high) (N = 79)					1	.330**	158	.276*	193	.425**	.004	097
6 Adoption Age (months) ($N = 80$)						1	773**	.295**	280**	.099	176	145
7 Years in the USA (N = 80)							1	013	.185	184	.284*	.263*
8 Behavior Problems ($N = 120$)								1	313**	.242**	.140	.198*
9 Emotion Control ($N = 119$)									1	326**	003	039
10 Home Baseline Cortisol (N = 113)										1	.141	.171
11 Lab Baseline Cortisol (N = 119)											1	.660**
12 Stress Task Cortisol (N = 118)												1

Appendix: Relationships between Covariate, Independent, and Dependent Variables

*Significant *p* < .05; ** *p* < .01

References

- Achenbach, T. (1991). Child behavior checklist 4-18. *Burlington: University of Vermont,* 5
- Aguiar, A., Eubig, P. A., & Schantz, S. L. (2010). Attention deficit/hyperactivity disorder: A focused overview for children's environmental health researchers. *Environmental Health Perspectives*, 118(2), 1646-1653.
- Ainsworth, M. D. (1963). The development of infant-mother interaction among the Uganda. Determinants of infant behaviour II. In B. M. Foss (Ed.), (pp. 67-112).London: Methuen; New York: Wiley.
- Ainsworth, M. D. S. (1967). *Infancy in Uganda: Infant care and the growth of love.* . Baltimore: Johns Hopkins University Press.
- Ainsworth, M. D. S. (1969). Object relations, dependency, and attachment: A theoretical review of the infant-mother relationship. *Child Development*, 969-1025.
- Akil, H., & Morano, M. (1995). Psychopharmacology: The fourth generation of progress,ed. Bloom, FE & Kupfer, DJ.
- Albers, L., Johnson, D., Hostetter, M., Iverson, S., & Miller, L. (1997). Health of children adopted from the former Soviet Union and Eastern Europe: Comparison with preadoptive medical records. *JAMA*, 278(11), 922-924. doi: 03550110060037
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders, (DSM-5®)* American Psychiatric Pub.

- Andrew, A. (2007). China's abandoned children and transnational adoption: Issues and problems for U.S.-china relations, adoption agencies, and adoptive parents. *Journal of Women's History*, *19*(1), 123-131.
- Ashford, L. (n.d.). Hidden Suffering: Disabilities from pregnancy and childbirth in less developed countries. http://www.prb.org/pdf/ HiddenSufferingEng.pdf (accessed March 16, 2015).
- Astley, S. J., Stachowiak, J., Clarren, S. K., & Clausen, C. (2002). Application of the fetal alcohol syndrome facial photographic screening tool in a foster care population. *The Journal of Pediatrics*, 141(5), 712-717.
- Astley, S. J., Stachowiak, J., Clarren, S. K., & Clausen, C. (2002). Application of the fetal alcohol syndrome facial photographic screening tool in a foster care population. *The Journal of Pediatrics*, 141(5), 712-717.
- Aylward, G. P., Pfeiffer, S. I., Wright, A., & Verhulst, S. J. (1989). Outcome studies of low birth weight infants published in the last decade: A meta-analysis. *The Journal* of *Pediatrics*, 115(4), 515-520.
- Bakermans-Kranenburg, M. J., Steele, H., Zeanah, C. H., Muhamedrahimov, R. J., Vorria, P., Dobrova-Krol, N. A., & Gunnar, M. R. (2011). III. Attachment and emotional development in institutional care: Characteristics and catch up. *Monographs of the Society for Research in Child Development, 76*(4), 62-91. doi:10.1111/j.1540-5834.2011.00628.x

- Balachova, T. N., Bonner, B. L., Isurina, G. L., & Tsvetkova, L. A. (2007). Use of focus groups in developing FAS/FASD prevention in Russia. *Substance use & Misuse*, 42(5), 881-894.
- Barker, D. J. (1993). Fetal origins of coronary heart disease. *British Heart Journal*, 69(3), 195.
- Bartholet, E. (2007). International adoption: Thoughts on the human rights issues. Buffalo Human Rights Law Review, 13(Harvard Public Law Working Paper No. 07-19), 152.
- Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Directions in Psychological Science*, *16*(6), 351-355. doi:10.1111/j.1467-8721.2007.00534.x
- Beck, S., Wojdyla, D., Say, L., Betran, A. P., Merialdi, M., Requejo, J. H & Look, P. F.
 V. (2010). The worldwide incidence of preterm birth: A systematic review of maternal mortality and morbidity. *Bulletin of the World Health Organization*, 88(1), 31-38.
- Beckstrom, J. (1972). Adoption in Ethiopia ten years after the civil code. *Journal of African Law*, *16*(2), 145-168.
- Belsky, J., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2007). For better and for worse differential susceptibility to environmental influences. *Current Directions in Psychological Science*, 16(6), 300-304.

- Belsky, J., Hsieh, K., & Crnic, K. (1998). Mothering, fathering, and infant negativity as antecedents of boys' externalizing problems and inhibition at age 3 years:
 Differential susceptibility to rearing experience? *Development and Psychopathology*, *10*(02), 301-319.
- Bender, L., & Yarnell, H. (1941). An observation nursery. American Journal of Psychiatry, 97(5)
- Birnholz, J. C., & Benacerraf, B. R. (1983). The development of human fetal hearing. *Science (New York, N.Y.)*, 222(4623), 516-518.
- Böhm, B., Smedler, A., & Forssberg, H. (2004). Impulse control, working memory and other executive functions in preterm children when starting school. *Acta Paediatrica*, 93(10), 1363-1371.
- Bohus, B., De Kloet, E., & Veldhuis, H. (1982). Adrenal steroids and behavioral adaptation: Relationship to brain corticoid receptors. *Adrenal actions on brain* (pp. 107-148) Springer.
- Boris, N. W., Zeanah, C. H., Larrieu, J. A., Scheeringa, M. S., & Heller, S. S. (1998).
 Attachment disorders in infancy and early childhood: A preliminary investigation of diagnostic criteria. *American Journal of Psychiatry*, 155(2), 295-297.
- Boris, N. W., Hinshaw-Fuselier, S. S., Smyke, A. T., Scheeringa, M. S., Heller, S. S., & Zeanah, C. H. (2004). Comparing criteria for attachment disorders: Establishing

reliability and validity in high-risk samples. *Journal of the American Academy of Child & Adolescent Psychiatry, 43*(5), 568-577.

- Bos, K. J., Fox, N., Zeanah, C. H., & Nelson Iii, C. A. (2009). Effects of early psychosocial deprivation on the development of memory and executive function. *Frontiers in Behavioral Neuroscience*, *3*, 16. doi:10.3389/neuro.08.016.2009 [doi]
- Botting, N., Powls, A., Cooke, R. W., & Marlow, N. (1997). Attention deficit hyperactivity disorders and other psychiatric outcomes in very low birthweight children at 12 years. *Journal of Child Psychology and Psychiatry*, *38*(8), 931-941.
- Bowlby, J. (1969). In Bowlby J. (Ed.), *Attachment and loss, vol. I: Attachment*. New York: Basic Books.
- Bowlby, J. (1980). In Bowlby J. (Ed.), Attachment and loss, vol. III: Loss. New York: Basic Books.
- Bowlby, J. (1973). In Bowlby J. (Ed.), Attachment and loss, vol. II: Separation. New York: Basic Books.

Bowlby, J. (1951). Maternal care and mental health Geneva: World Health Organization.

Bowlby, J. (1951). Maternal care and mental health. *Bulletin of the World Health Organization*,

- Boyce, W. T. (2007). A biology of misfortune: Stress reactivity, social context, and the ontogeny of psychopathology in early life. *Multilevel Dynamics in Developmental Psychopathology: Pathways to the Future, 34*, 45-82.
- Boyce, W. T., Chesney, M., Alkon, A., Tschann, J. M., Adams, S., Chesterman, B., et al. (1995). Psychobiologic reactivity to stress and childhood respiratory illnesses:Results of two prospective studies. *Psychosomatic Medicine*.57, 411-422.
- Bramlett, M., Foster, E., & Frasier, A. (2010). In Vital Health and Statistics (Ed.), *Design* and operation of the national survey of adoptive parents. (1 (50) ed.). Washington:
 National Center for Health Statistics.
- Breuning, M. (2013). What explains openness to intercountry adoption? *Social Science Quarterly*, 94(1), 113-130. doi:10.1111/j.1540-6237.2012.00902.x
- Brown, J. D., & Bednar, L. M. (2006). Foster parent perceptions of placement breakdown. *Children and Youth Services Review*, 28(12), 1497-1511. doi: <u>http://dx.doi.org/10.1016/j.childyouth.2006.03.004</u>

Brown, J. D., Sigvaldason, N., & Bednar, L. M. (2005). Foster parent perceptions of placement needs for children with a fetal alcohol spectrum disorder. *Children and Youth Services Review*, 27(3), 309-327.

doi:http://dx.doi.org/10.1016/j.childyouth.2004.10.008

- Buitelaar, J. K., Smeets, K. C., Herpers, P., Scheepers, F., Glennon, J., & Rommelse, N.
 N. (2013). Conduct disorders. *European Child & Adolescent Psychiatry*, 22(1), 49-54.
- Burger, C., Sandstead, H., & Drummond, J. (1948). Malnutrition and starvation in Western Netherlands, September 1944 to July 1945. Part I and II. The Hague: General State Printing Office.
- Caley, L. M., Winkelman, T., & Mariano, K. (2009). Problems expressed by caregivers of children with fetal alcohol spectrum disorder. *International Journal of Nursing Terminologies and Classifications*, 20(4), 181-188. doi:10.1111/j.1744-618X.2009.01133.x
- Caley, L. M., Winkelman, T., & Mariano, K. (2009). Problems expressed by caregivers of children with fetal alcohol spectrum disorder. *International Journal of Nursing Terminologies and Classifications*, 20(4), 181-188. doi:10.1111/j.1744-618X.2009.01133.x
- Callaghan, W. M., MacDorman, M. F., Rasmussen, S. A., Qin, C., & Lackritz, E. M.
 (2006). The contribution of preterm birth to infant mortality rates in the United States. *Pediatrics*, *118*(4), 1566-1573. doi:118/4/1566 [pii]
- Cannon, W. (1929). Bodily changes in pain, hunger, fear and rage. An account of recent researches into the function of emotional excitement. New York: D. Appleton and CO.

Cannon, W. B. (1939). The wisdom of the body.

- Caravale, B., Tozzi, C., Albino, G., & Vicari, S. (2005). Cognitive development in low risk preterm infants at 3-4 years of life. *Archives of Disease in Childhood. Fetal and Neonatal Edition, 90*(6), F474-9. doi:adc.2004.070284 [pii]
- Caravale, B., Tozzi, C., Albino, G., & Vicari, S. (2005). Cognitive development in low risk preterm infants at 3-4 years of life. *Archives of Disease in Childhood. Fetal and Neonatal Edition, 90*(6), F474-9. doi:adc.2004.070284 [pii]
- Carlson, M., & Earls, F. (1997). Psychological and neuroendocrinological sequelae of early social deprivation in institutionalized children in Romania. *Annals of the New York Academy of Sciences*, 807(1), 419-428.
- Carp, E. W. (2002). Introduction: A historical overview of American adoption. . In E.W. Carp (Ed.), *Adoption in America: Historical perspectives* (pp. 1-26). Ann Arbor: University of Michigan Press.
- Ceccanti, M., Fiorentino, D., Coriale, G., Kalberg, W. O., Buckley, D., Hoyme, H. E, & Romeo, M. (2014). Maternal risk factors for fetal alcohol spectrum disorders in a province in Italy. *Drug and Alcohol Dependence*, *145*, 201-208.

Center for the Developing Child Harvard University. Retrieved from http://developingchild.harvard.edu/

- Center on the Developing Child. (2009). Graph: "The Ability to Change Brains and Behavior Decreases Over Time." Data source: P. Levitt (2009). In*Core Concepts in the Science of the Early Childhood Development*. Retrieved from <u>http://developingchild.harvard.edu</u>.
- Chambers, C. D., Garavan, H., & Bellgrove, M. A. (2009). Insights into the neural basis of response inhibition from cognitive and clinical neuroscience. *Neuroscience & Biobehavioral Reviews*, 33(5), 631-646.
- Chambers, C. D., Garavan, H., & Bellgrove, M. A. (2009). Insights into the neural basis of response inhibition from cognitive and clinical neuroscience. *Neuroscience & Biobehavioral Reviews*, 33(5), 631-646.
- Chapin, H. D. (1911). The proper management of foundlings and neglected infants. *Medical Record*, 79, 283-288.
- Chapin, H. D. (1917). Systematized boarding out vs. institutional care for infants and young children. *Medical Journal*, *105*, 1009-1011.
- Chesney, M. (2008). Discrepancies between pre-adoption expectations and postadoption experiences for parents of children adopted from institutional care.
 (PhD). Available from ProQuest LLC. (UMI Microform 3328301).
- Chomat, A. M., Solomons, N. W., Montenegro, G., Crowley, C., & Bermudez, O. I. (2014). Maternal health and health-seeking behaviors among indigenous mam

mothers from Quetzaltenango, Guatemala. *Revista Panamericana De Salud Pública*, 35(2), 113-120.

- Chugani, H. T., Behen, M. E., Muzik, O., Juhász, C., Nagy, F., & Chugani, D. C. (2001).
 Local brain functional activity following early deprivation: A study of postinstitutionalized Romanian orphans. *Neuroimage*, *14*(6), 1290-1301.
- Cicchetti, D., & Rogosch, F. A. (2001). The impact of child maltreatment and psychopathology on neuroendocrine functioning. *Development and Psychopathology*, 13(04), 783-804.
- Clark, C. A., Woodward, L. J., Horwood, L. J., & Moor, S. (2008). Development of emotional and behavioral regulation in children born extremely preterm and very preterm: Biological and social influences. *Child Development*, 79(5), 1444-1462.
- Cochrane, J., Chen, H., Conigrave, K., & Hao, W. (2003). Alcohol use in China. *Alcohol and Alcoholism*, 537-542.
- Cochrane, J., Chen, H., Conigrave, K. M., & Hao, W. (2003). Alcohol use in China. Alcohol and Alcoholism (Oxford, Oxfordshire), 38(6), 537-542.
- Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Hillsdale: Ehrlbaum.
- Cohn, J. F., & Tronick, E. (1989). Specificity of infants' response to mothers' affective behavior. *Journal of the American Academy of Child & Adolescent Psychiatry*, 28(2), 242-248.

- Colvert, E., Rutter, M., Kreppner, J., Beckett, C., Castle, J., Groothues, C, & Sonuga-Barke, E. (2008). Do theory of mind and executive function deficits underlie the adverse outcomes associated with profound early deprivation? Findings from the English and Romanian adoptees study. *Journal of Abnormal Child Psychology*, *36*(7), 1057.
- Convention on the Rights of Children (1989).
- Cottrell, E. C., & Seckl, J. R. (2009). Prenatal stress, glucocorticoids and the programming of adult disease. *Frontiers in Behavioral Neuroscience*, *3*, 19. doi:10.3389/neuro.08.019.2009 [doi]
- Cozolino, L. (2002). Rebuilding the brain: Neuroscience and psychotherapy. *The Neuroscience of Psychotherapy: Building and Rebuilding the Human Brain*, 15-45.
- Cozolino, L. (2002). The neuroscience of psychotherapy: Building and rebuilding the human brain (Norton Series on Interpersonal Neurobiology) WW Norton & Company.
- Crockenberg, S. B. (1981). Infant irritability, mother responsiveness, and social support influences on the security of infant-mother attachment. *Child Development*, 857-865.
- Cummings, E. M., El-Sheikh, M., Kouros, C. D., & Keller, P. S. (2007). Children's skin conductance reactivity as a mechanism of risk in the context of parental depressive symptoms. *Journal of Child Psychology and Psychiatry*, *48*(5), 436-445.
- Darnaudéry, M., & Maccari, S. (2008). Epigenetic programming of the stress response in male and female rats by prenatal restraint stress. *Brain Research Reviews*, 57(2), 571-585.
- Davies, J. K., & Bledsoe, J. M. (2005). Prenatal alcohol and drug exposures in adoption. *Pediatric Clinics of North America*, 52(5), 1369-1393.
- Davies, J. K., & Bledsoe, J. M. (2005). Prenatal alcohol and drug exposures in adoption. *Pediatric Clinics of North America*, 52(5), 1369-1393.
 doi:http://dx.doi.org/10.1016/j.pcl.2005.06.015
- Davies, M. (2011). Intercountry adoption, children's rights and the politics of rescue. *Adoption & Fostering*, *35*(4), 50-62. doi:10.1177/030857591103500406
- de Rooij, S. R., Wouters, H., Yonker, J. E., Painter, R. C., & Roseboom, T. J. (2010).
 Prenatal under nutrition and cognitive function in late adulthood. *Proceedings of the National Academy of Sciences of the United States of America*, 107(39), 16881-16886. doi:10.1073/pnas.1009459107 [doi]
- Demographic, E. (2006). Health survey 2005 central statistical agency. *Addis Ababa, Ethiopia, RC Macro, Calverton, Maryland, USA,*
- Deutsch, J. (2000). The mind-brain relationship: Pally, Regina. London and New York: Karnac books, 2000, 196 pp. *Canadian Journal of Psychoanalysis*, 9(2), 280-282.
- Diamond, A. (2002). Normal development of prefrontal cortex from birth to young adulthood: Cognitive functions, anatomy, and biochemistry.

- DiPietro, J. A. (2012). Maternal stress in pregnancy: Considerations for fetal development. *Journal of Adolescent Health*, *51*(2), S3-S8.
- Dobrova-Krol, N. A., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Juffer, F. (2010). Effects of perinatal HIV infection and early institutional rearing on physical and cognitive development of children in Ukraine. *Child Development*, 81(1), 237-251.
- Dozier, M., Peloso, E., Lindhiem, O., Gordon, M. K., Manni, M., Sepulveda, S. & Levine, S. (2006). Developing evidence-based interventions for foster children: An example of a randomized clinical trial with infants and toddlers. *Journal of Social Issues*, 62(4), 767-785.
- Dozier, M., & Lindhiem, O. (2006). This is my child: Differences among foster parents in commitment to their young children. *Child Maltreatment*, 11(4), 338-345. doi: 10.1177/1077559506291263
- Dozier, M., Zeanah, C. H., Wallin, A. R., & Shauffer, C. (2012). Institutional care for young children: Review of literature and policy implications. *Social Issues and Policy Review*, 6(1), 1-25. doi:10.1111/j.1751-2409.2011.01033.x
- Dubinsky, K. (2007). Babies without borders: Rescue, kidnap, and the symbolic child. *Journal of Women's History*, 19(1), 142-150.

- Duncan, J., Emslie, H., Williams, P., Johnson, R., & Freer, C. (1996). Intelligence and the frontal lobe: The organization of goal-directed behavior. *Cognitive Psychology*, 30(3), 257-303.
- Eckerman, C. O., Hsu, H., Molitor, A., Leung, E. H., & Goldstein, R. F. (1999). Infant arousal in an en-face exchange with a new partner: Effects of prematurity and perinatal biological risk. *Developmental Psychology*, *35*(1), 282.
- Ellis, B. & Boyce, W. (2008). Biological sensitivity to context. *Current Directions in Psychological Science*, 17, 183-187.
- Ellis, B. J., Essex, M. J., & & Boyce, W. T. (2005). Biological sensitivity to context II: empirical explorations of an evolutionary–developmental theory. *Development and Psychopathology*, 17, 303-328.
- Ellis, B., Figueredo, A., Brumbach, B., & & Schlomer, G. (2009). Fundamental dimensions of environmental risk: The impact of harsh versus unpredictable environments on the evolution and development of life history strategies. *Human Nature*, 20, 204-268.
- Faraone, S., Sergeant, J., Gillberg, C., & Biederman, J. (2003). The worldwide prevalence of ADHD: Is it an American condition? World Psychiatry, 2(2), 104-113.

- Faraone, S. V., Sergeant, J., Gillberg, C., & Biederman, J. (2003). The worldwide prevalence of ADHD: Is it an American condition? *World Psychiatry: Official Journal of the World Psychiatric Association (WPA)*, 2(2), 104-113.
- Farran, D., Kasari, C., Comfort, M., & Jay, S. (1986). Parent/caregiver involvement scale. Vanderbilt University, Nashville,
- Fehrenbach, H. (2005). *Race after Hitler: Black occupation children in postwar Germany and America.* . Princeton: Princeton University Press.
- Feldman, R., Greenbaum, C. W., & Yirmiya, N. (1999). Mother–infant affect synchrony as an antecedent of the emergence of self-control. *Developmental Psychology*, 35(1), 223.
- Filippi, V., Ronsmans, C., Campbell, O. M., Graham, W. J., Mills, A., Borghi, J. & Osrin, D. (2006). Maternal health in poor countries: the broader context and a call for action. *The Lancet*, 368 (9546), 1535-1541.
- Fisher, L., Ames, E., Chisholm, K., & Savoie, L. (1997). Problems reported by parents of Romanian orphans adopted to British Columbia. *International Journal of Behavioral Development*, 20, 67-82.
- Fisher, A. P. (2003). Still "not quite as good as having your own"? Toward a sociology of adoption. *Annual Review of Sociology*, 29, 335-361. Retrieved from <u>http://www.jstor.org/stable/30036971</u>

- Fox, N. A., Almas, A. N., Degnan, K. A., Nelson, C. A., & Zeanah, C. H. (2011). The effects of severe psychosocial deprivation and foster care intervention on cognitive development at 8 years of age: Findings from the Bucharest Early Intervention Project. *Journal of Child Psychology and Psychiatry*, 52(9), 919-928. doi:10.1111/j.1469-7610.2010.02355.x
- Fries, A. B. W., Shirtcliff, E. A., & Pollak, S. D. (2008). Neuroendocrine dysregulation following early social deprivation in children. *Developmental Psychobiology*, 50(6), 588-599.
- Fries, E., Dettenborn, L., & Kirschbaum, C. (2009). The cortisol awakening response (CAR): Facts and future directions. *International Journal of Psychophysiology*, 72(1), 67-73.
- Gailey, C. W. (2010). Blue-ribbon babies and labors of love: Race, class, and gender in U.S. adoption practice. Austin: University of Texas Press.
- Ganzel, B. L., Morris, P. A., & Wethington, E. (2010). Allostasis and the human brain: Integrating models of stress from the social and life sciences. *Psychological Review*, *117*(1), 134.
- Gates, C. (1999). China's newly enacted intercountry adoption law: Friend or
 foe? Symposium: Globalization at the margins: Perspectives on globalization from
 developing states. *Indiana Journal of Global Legal Studies*, 7(1), 369-392.

- Glennen, S., & Masters, M. G. (2002). Typical and atypical language development in infants and toddlers adopted from Eastern Europe. *American Journal of Speech-Language Pathology*, 11(4), 417-433.
- Glover, R. (2006). China. Lyme Regis. In Colton, M. & Williams, M. (Ed.), Global perspectives on foster family care (pp. 134-168) Russell House Publishing.
- Gopnic, A., Melzoff, A., & Kuhl, P. (1999). *The scientist and the crib: What early learning tells us about the mind*. New York: Harper Collins Publishers.
- Graafmans WC, Richardus JH, Macfarlane A, et al. (2001). Comparability of published perinatal mortality rates in Western Europe: The quantitative impact of differences in gestational age and birthweight criteria. *British Journal of Obstetric Gynecology*, *108*, 1237-1245.
- Graff, E. J. (2010). The Baby Business. Democracy: A journal of ideas. Retrieved from http://www.democracyjournal.org/17/6757.php.
- Granger, D. A., Weisz, J. R., & Kauneckis, D. (1994). Neuroendocrine reactivity, internalizing behavior problems, and control-related cognitions in clinic-referred children and adolescents. *Journal of Abnormal Psychology*, *103*(2), 267.
- Groark, C. J., McCall, R. B., & Fish, L. (2011). Characteristics of environments, caregivers, and children in three Central American orphanages. *Infant Mental Health Journal*, 32(2), 232-250. doi:10.1002/imhj.20292

- Grotevant, H., & McRoy, R. (1990). Adopted adolescents in residential treatment: The role of the family. In D. Brodzinsky, & D. Schechter (Eds.). *The psychology of adoption* (pp. 167-186). New York: Oxford University Press.
- Grotevant, H. D., & McDermott, J. M. (2014). Adoption: Biological and social processes linked to adaptation. *Annual Review of Psychology*, 65, 235-265.
- Grotevant, H. D., McRoy, R. G., Elde, C. L., & Fravel, D. L. (1994). Adoptive family system dynamics: Variations by level of openness in the adoption. *Family Process*, 33(2), 125-146. doi:10.1111/j.1545-5300.1994.00125.x
- Groza, V., Ileana, D., & Irwin, I. (1999). A peacock or a crow: Stories, interviews and commentaries on Romanian adoptions Lakeshore Communications.
- 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), 181-197. doi:<u>http://dx.doi.org/10.1016/S0306-4530(01)00044-0</u>
- Gunnar, M. & Kertes, D. (2005). Prenatal and postnatal risks to neurobiological development in internationally adopted children. In Brodzinsky, D. & Palacios, J. (Eds.) (Ed.), *Psychological issues in adoption. Research and practice*, (1st ed., pp. 27-47). USA: Praeger.

- Gunnar, M., & Vazquez, D. (2001). Low cortisol and a flattening of expected daytime rhythm: Potential indices of risk in human development. *Developmental Psychopathology*, 13, 515-538.
- Gunnar, M. R. (2007). Stress effects on the developing brain. Adolescent Psychopathology and the Developing Brain: Integrating Brain and Prevention Science, 127-147.
- Gunnar, M. R., Morison, S. J., Chisholm, K., & Schuder, M. (2001). Salivary cortisol levels in children adopted from Romanian orphanages. *Development and Psychopathology*, 13(03), 611-628.
- Gunnar, M. R., & Van Dulmen, M. H. (2007). Behavior problems in postinstitutionalized internationally adopted children. *Development and Psychopathology*, 19(01), 129-148.
- Gunnar, M., & Quevedo, K. (2007). The neurobiology of stress and development. *Annual Review of Psychology*, 58, 145-173.
- Gunnar, M., Morison, S., Chisholm, K., & Schuder, M. (2001). Long-term effects of institutional rearing on cortisol levels in adopted Romanian children. *Development* and Psychopathology, 13(3), 611-628.
- Haley, D. W., Handmaker, N. S., & Lowe, J. (2006). Infant stress reactivity and prenatal alcohol exposure. *Alcoholism: Clinical and Experimental Research*, 30(12), 2055-2064.

- Haley, D. W., Handmaker, N. S., & Lowe, J. (2006). Infant stress reactivity and prenatal alcohol exposure. *Alcoholism: Clinical and Experimental Research*, 30(12), 2055-2064. doi:10.1111/j.1530-0277.2006.00251.x
- Hansen, B. M., Dinesen, J., Hoff, B., & Greisen, G. (2002). Intelligence in preterm children at four years of age as a predictor of school function: A longitudinal controlled study. *Developmental Medicine & Child Neurology*, 44(08), 517-521.
- Hao, W., CHEN, H., & SU, Z. (2005). China: Alcohol today. Addiction, 100(6), 737-741.
- Hawk, B. N., & McCall, R. B. (2011). Specific extreme behaviors of postinstitutionalizedRussian adoptees. *Developmental Psychology*, 47(3), 732.
- Hawk, B., McCall, R. B., Groark, C. J., Muhamedrahimov, R. J., Palmov, O. I., & Nikiforova, N. V. (2012). Age at adoption: A measure of time in the orphanage or child-specific factors? *Adoption Quarterly*, 15(1), 18-34.
- Hawk, B. N., & McCall, R. B. (2011). Specific extreme behaviors of postinstitutionalized
 Russian adoptees. *Developmental Psychology*, 47(3), 732-738.
 doi:10.1037/a0021108
- Healey, M. K., Campbell, K. L., & Hasher, L. (2008). Cognitive aging and increased distractibility: Costs and potential benefits. *Progress in Brain Research*, 169, 353-363.
- Hebb, D. (1968). The organization of behavior.

- Hebb, D. O. (2002). *The organization of behavior: A neuropsychological theory* Psychology Press.
- Heider, F. (1958). The psychology of interpersonal relations. . New York: Wiley.
- Heijmans, B. (2008). Persistent epigenetic differences associated with prenatal exposures to famine in Humans. *PNAS*, *105*(44), 17046-17049.
- Heijmans, B. T., Tobi, E. W., Stein, A. D., Putter, H., Blauw, G. J., Susser, E. S., & Lumey, L. (2008). Persistent epigenetic differences associated with prenatal exposure to famine in humans. *Proceedings of the National Academy of Sciences*, 105(44), 17046-17049.
- Hertsgaard, L., Gunnar, M., Erickson, M. F., & Nachmias, M. (1995). Adrenocortical responses to the strange situation in infants with disorganized/disoriented attachment relationships. *Child Development*, *66*(4), 1100-1106.
- Hinshaw-Fuselier, S., Boris, N. W., & Zeanah, C. H. (1999). Reactive attachment disorder in maltreated twins. *Infant Mental Health Journal*, 20(1), 42-59.
- Hoek, H., Brown, A., & Susser, E. (1998). The Dutch famine and schizophrenia spectrum disorders. *Social Psychiatry and Psychiatric Epidemiology*, *33*(8), 373-379.
- Holsboer, F., Lauer, C.J., Schreiber, W., Krieg, J. (1995). Altered hypothalamic– pituitary–adrenocortical regulation in healthy subjects at high familial risk for affective disorders. *Neuroendocrinology*, 62, 340-347.

- Horwood, L. J., Mogridge, N., & Darlow, B. A. (1998). Cognitive, educational, and behavioural outcomes at 7 to 8 years in a national very low birthweight cohort.
 Archives of Disease in Childhood. Fetal and Neonatal Edition, 79(1), F12-20.
- Horwood, L. J., Mogridge, N., & Darlow, B. A. (1998). Cognitive, educational, and behavioural outcomes at 7 to 8 years in a national very low birthweight cohort.
 Archives of Disease in Childhood. Fetal and Neonatal Edition, 79(1), F12-20.
- Hostinar, C. E., & Gunnar, M. R. (2013). The developmental effects of early life stress an overview of current theoretical frameworks. *Current Directions in Psychological Science*, 22(5), 400-406.
- Hostinar, C. E., & Gunnar, M. R. (2013). Future directions in the study of social relationships as regulators of the HPA axis across development. *Journal of Clinical Child & Adolescent Psychology*, 42(4), 564-575.
- Hughes, C. (2011). Changes and challenges in 20 years of research into the development of executive functions. *Infant and Child Development*, 20(3), 251-271.
- Hüppi, P. S., Warfield, S., Kikinis, R., Barnes, P. D., Zientara, G. P., Jolesz, F. A. & Volpe, J. J. (1998). Quantitative magnetic resonance imaging of brain development in premature and mature newborns. *Annals of Neurology*, *43*(2), 224-235.
- Huttenlocher, P. R. (1979). Synaptic density in human frontal cortex-developmental changes and effects of aging. *Brain Research*, *163*(2), 195-205.

- Intercountry country adoption by sending country. (February 22, 2014). Retrieved from http://adoption.state.gov/country_information/country_specific_info.php?country-select=vietnam
- Iusmen, I. (2013). Policy entrepreneurship and eastern enlargement: The case of EU children's rights policy *Comparative European Politics*, 11, 511-529. doi:10.1057/cep.2012.27
- Jacobson, J. L., & Jacobson, S. W. (1994). Prenatal alcohol exposure and neurobehavioral development. *Alcohol Health and Research World*, *18*(1), 30-35.
- Jacobson, J. L., & Jacobson, S. W. (1994). Prenatal alcohol exposure and neurobehavioral development. *Alcohol Health and Research World*, *18*(1), 30-35.
- Jenista, J. A. (2005). Special topics in international adoption. *Pediatric Clinics of North America*, 52(5), 1479-1494.
- Johnson, D. (2000). The impact of orphanage rearing on growth and development. Paper presented at *The Effects of Adversity on Neurobehavioral Development: Minnesota Symposia on Child Psychology, 31* 113-162.
- Jones, K., & Smith, D. (1973). Recognition of the fetal alcohol syndrome in early infancy. *The Lancet*, *302*(7836), 999-1001.
- Jones, K., Smith, D., Ulleland, C., & Streissguth, A. (1973). Pattern of malformation in offspring of chronic alcoholic mothers. *The Lancet*, *301*(7815), 1267-1271.

- Joyce, K. (2013). The child catchers: Rescue, trafficking, and the new gospel of adoption. . New York: Public Affairs. doi:978-1-586-48942-7
- Juffer, F., & van IJzendoorn, M. H. (2005). Behavior problems and mental health referrals of international adoptees: A meta-analysis. *JAMA*, *293*(20), 2501-2515.
- Juffer, F., Palacios, J., Le Mare, L., Sonuga-Barke, E. J. S., Tieman, W., Bakermans-Kranenburg, M. J., & Verhulst, F. C. (2011). II. Development of adopted children with histories of early adversity. *Monographs of the Society for Research in Child Development*, 76(4), 31-61. doi:10.1111/j.1540-5834.2011.00627.x
- Julian, M. M. (2013). Age at adoption from institutional care as a window into the lasting effects of early experiences. *Clinical Child and Family Psychology Review*, 16(2), 101-145.
- Juster, R., McEwen, B. S., & Lupien, S. J. (2010). Allostatic load biomarkers of chronic stress and impact on health and cognition. *Neuroscience & Biobehavioral Reviews*, 35(1), 2-16.
- Kapstein, E. B. (2003). The baby trade. *Foreign Affairs*, 82(6), 115-125. Retrieved from http://www.jstor.org/stable/20033761
- Kingkade, W. W., & Vasin, S. (1997). Mortality by cause of death in Russia's recent past: Regional variations before and after the break-up.

- Kingkade, W. (1997). *International brief: Population trends Russia*. (No. IB/96-2 Issued February 1997). USA: U.S. Department of Commerce Economics and Statistics Administration Bureau of the Census.
- Klebanov, P. K., Brooks-Gunn, J., & McCormick, M. C. (1994). Classroom behavior of very low birth weight elementary school children. *Pediatrics*, 94(5), 700-708.
- Kleberg, A., Westrup, B., & Stjernqvist, K. (2000). Developmental outcome, child behaviour and mother–child interaction at 3 years of age following newborn individualized developmental care and intervention program (NIDCAP) intervention. *Early Human Development*, 60(2), 123-135.
 doi:<u>http://dx.doi.org/10.1016/S0378-3782(00)00114-6</u>
- Kline, S. L., Chatterjee, K., & Karel, A. I. (2009). Healthy depictions? Depicting adoption and adoption news events on broadcast news. *Journal of Health Communication*, 14(1), 56-69. doi:10.1080/10810730802592254
- Kodituwakku, P., Coriale, G., Fiorentino, D., Aragón, A. S., Kalberg, W. O., Buckley, D., . . . May, P. A. (2006). Neurobehavioral characteristics of children with fetal alcohol spectrum disorders in communities from Italy: Preliminary results. *Alcoholism: Clinical and Experimental Research*, *30*(9), 1551-1561.
- Kopp, C. B. (1989). Regulation of distress and negative emotions: A developmental view. *Developmental Psychology*, 25(3), 343.

- Kreppner, J. M., O'Connor, T. G., Rutter, M., & English and Romanian Adoptees Study Team. (2001). Can inattention/overactivity be an institutional deprivation syndrome? *Journal of Abnormal Child Psychology*, 29(6), 513-528.
- Kreppner, J. M., Rutter, M., Beckett, C., Castle, J., Colvert, E., Groothues, C., & Sonuga-Barke, E. (2007). Normality and impairment following profound early institutional deprivation: A longitudinal follow-up into early adolescence. *Developmental Psychology*, 43(4), 931-946. doi:10.1037/0012-1649.43.4.931
- Kristjanson, A. F., Wilsnack, S. C., Zvartau, E., Tsoy, M., & Novikov, B. (2007).
 Alcohol use in pregnant and nonpregnant Russian women. *Alcoholism: Clinical and Experimental Research*, 31(2), 299-307.
- Kroupina, M. G., Fuglestad, A. J., Iverson, S. L., Himes, J. H., Mason, P. W., Gunnar, M. R., & Johnson, D. E. (2012). Adoption as an intervention for institutionally reared children: HPA functioning and developmental status. *Infant Behavior and Development*, 35(4), 829-837. doi: <u>http://dx.doi.org/10.1016/j.infbeh.2012.07.011</u>
- Landgren, M., Andersson Grönlund, M., Elfstrand, P., Simonsson, J., Svensson, L., & Strömland, K. (2006). Health before and after adoption from Eastern Europe. *Acta Pædiatrica*, 95(6), 720-725. doi:10.1111/j.1651-2227.2006.tb02321.x
- Landry, S. H., Chapieski, M. L., Richardson, M. A., Palmer, J., & Hall, S. (1990). The social competence of children born prematurely: Effects of medical complications and parent behaviors. *Child Development*, *61*(5), 1605-1616.

Lawn J, Davidge R, Paul V, et al. (2012). Preterm baby survival and care around the world. In Howson CP, Kinney MV, Lawn JE (Ed.), *Born too soon: The global action report on preterm birth*. (pp. 60-77). New York: March of Dimes, PMNCH, Save the Children, World Health Organization.

Lazarus, R. S. (1966). Psychological stress and the coping process.

- Lazarus, R. S., & Folkman, S. (1984). Stress. Appraisal, and Coping, 725
- Lehto, J. E., Juujärvi, P., Kooistra, L., & Pulkkinen, L. (2003). Dimensions of executive functioning: Evidence from children. *British Journal of Developmental Psychology*, 21(1), 59-80.
- Lemoine, P., Harousseau, H., Borteyru, J., & Menuet, J. (1968). Les enfants de parents alcoholiques: Anomalies observees a propos de 127 cas. *Ouest Méd*, *21*(476-482), 2.
- Lieberman, A. F., & Pawl, J. H. (1990). Disorders of attachment and secure base behavior in the second year of life: Conceptual issues and clinical intervention.
- Lieberman, A. & Zeanah, C. (1995). Disorders of attachment in infancy. Child and Adolescent Psychiatric Clinics of North America, 4(3), 571-587.
- Lindstrom, D. P. (2003). Rural–Urban migration and reproductive behavior in Guatemala. *Population Research and Policy Review*, 22(4), 351-372.
- Liu, M., & Zhu, K. (2009). Orphan care in China. Social Work & Society, 7 (1).

- Lovelock, K. (2000). Intercountry adoption as a migratory practice: A comparative analysis of intercountry adoption and immigration policy and practice in the United States, Canada and New Zealand in the post W.W. II period. *International Migration Review*, *34*(3), 907-949. Retrieved from <u>http://www.jstor.org/stable/2675949</u>
- Lowe, J., Woodward, B., & Papile, L. (2005). Emotional regulation and its impact on development in extremely low birth weight infants. *Journal of Developmental & Behavioral Pediatrics*, 26(3), 209-213.
- Lupien, S. J., McEwen, B. S., Gunnar, M. R., & Heim, C. (2009). Effects of stress throughout the lifespan on the brain, behaviour and cognition. *Nature Reviews Neuroscience*, 10(6), 434-445.
- Lupien, S., Lecours, A. R., Lussier, I., Schwartz, G., Nair, N. P., & Meaney, M. J. (1994).
 Basal cortisol levels and cognitive deficits in human aging. *The Journal of Neuroscience: The Official Journal of the Society for Neuroscience, 14*(5 Pt 1), 2893-2903.
- Luthar, S. S. (2006). Resilience in development: A synthesis of research across five decades. Cicchetti, Dante (Ed); Cohen, Donald J. (Ed), (2006). *Developmental psychopathology, 3: Risk, disorder, and adaptation* (2nd ed.)., (pp. 739-795).
 Hoboken, NJ, US: John Wiley & Sons Inc, xvi, 944 pp.
- Main, M., & Solomon, J. (1986). Discovery of an insecure-disorganized/disoriented attachment pattern. Main, Mary; Solomon, Judith Brazelton, T. Berry (Ed);

Yogman, Michael W. (Ed), (1986). *Affective development in infancy*., (pp. 95-124). Westport, CT, US: Ablex Publishing, v, 161 pp.

- Marini, A., & Gragnolati, M. (2003). Malnutrition and poverty in Guatemala. .*1*(World Bank Policy Research Working Paper No. 2967).
- Marshall, P. J., Reeb, B. C., Fox, N. A., Nelson, C. A., & Zeanah, C. H. (2008). Effects of early intervention on EEG power and coherence in previously institutionalized children in Romania. *Development and Psychopathology*, *20*(03), 861-880.
- Mattson, S. N., Schoenfeld, A. M., & Riley, E. P. (2001). Teratogenic effects of alcohol on brain and behavior. *Alcohol Research and Health*, 25(3), 185-191.
- May, P. A., & Gossage, J. P. (2001). Estimating the prevalence of fetal alcohol syndrome: A summary. *Alcohol Research and Health*, 25(3), 159-167.
- May, P. A., Gossage, J. P., Kalberg, W. O., Robinson, L. K., Buckley, D., Manning, M., & Hoyme, H. E. (2009). Prevalence and epidemiologic characteristics of FASD from various research methods with an emphasis on recent in-school studies. *Developmental Disabilities Research Reviews*, 15(3), 176-192.
- McCall, R. B. (2013). Review: The consequences of early institutionalization: Can institutions be improved? Should they? *Child and Adolescent Mental Health*, 18(4), 193-201. doi:10.1111/camh.12025
- McCarton, C. M., Wallace, I. F., Divon, M., & Vaughan, H. G. (1996). Cognitive and neurologic development of the premature, small for gestational age infant through

age 6: Comparison by birth weight and gestational age. *Pediatrics*, *98*(6), 1167-1178.

- McCreery Bunkers, K., Groza, V., & Lauer, D. P. (2009). International adoption and child protection in Guatemala: A case of the tail wagging the dog. *International Social Work*, 52(5), 649-660. doi:10.1177/0020872809337676
- McDermott, J. M., Troller-Renfree, S., Vanderwert, R., Nelson, C. A., Zeanah, C. H., & Fox, N. A. (2013). Psychosocial deprivation, executive functions, and the emergence of socio-emotional behavior problems. *Frontiers in Human Neuroscience*, *7*, 167. doi:10.3389/fnhum.2013.00167
- McEwen, B. S., & Gianaros, P. J. (2010). Central role of the brain in stress and adaptation: Links to socioeconomic status, health, and disease. *Annals of the New York Academy of Sciences*, 1186(1), 190-222.
- McEwen, B. S., & Seeman, T. (1999). Protective and damaging effects of mediators of stress: Elaborating and testing the concepts of allostasis and allostatic load. *Annals of the New York Academy of Sciences*, 896(1), 30-47.
- McEwen, B. S., & Stellar, E. (1993). Stress and the individual: Mechanisms leading to disease. *Archives of Internal Medicine*, *153*(18), 2093-2101.
- McGuinness, T. M., & Pallansch, L. (2007). Problem behaviors of children adopted from the former Soviet Union. *Journal of Pediatric Health Care*, *21*(3), 171-179.

- Merz, E. C., McCall, R. B., & Groza, V. (2013). Parent-reported executive functioning in postinstitutionalized children: A follow-up study. *Journal of Clinical Child & Adolescent Psychology*, 42(5), 726-733.
- Merz, E. C., McCall, R. B., Wright, A. J., & Luna, B. (2013). Inhibitory control and working memory in post-institutionalized children. *Journal of Abnormal Child Psychology*, 41(6), 879-890.
- Mezmur, B. D. (2009). From Angelina (to Madonna) to Zoe's Ark: What are the 'A–Z' lessons for intercountry adoptions in Africa? *International Journal of Law, Policy and the Family, 23*(2), 145-173. doi:10.1093/lawfam/ebn013
- Miller, L., Chan, W., Reece, R., Grey, L., Tirella, L., & Pertman, A. (2007). Child abuse fatalities among internationally adopted children. *Child Maltreatment*, 12(11), 378-380.
- Miller, L., Chan, W., Tirella, L., & Perrin, E. (2009). Outcomes of children adopted from Eastern Europe. *International Journal of Behavioral Development*, doi:10.1177/0165025408098026
- Miyake, A., Friedman, N.P., Emerson, M.J., Witzki, A.H., Howerter, A., & Wager, T.D. (2000). The unity and diversity of executive functions and their contributions to complex "frontal lobe" tasks: A latent variable analysis. *Cognitive Psychology, 41*, 41-100.

- Mukherjee, R., Wray, E., Commers, M., Hollins, S., & Curfs, L. (2013). The impact of raising a child with FASD upon carers: Findings from a mixed methodology study in the UK. *Adoption & Fostering*, 37(1), 43-56. doi:10.1177/0308575913477331
- Mullen, E. (1985). Manual for the Infant Mullen Scales of Early Learning. *Cranston, RI: TOTAL Child,*
- Murray, C.; & Lopez, A. (1998). *Health dimensions of sex and reproduction. Global burden of disease and injury series* (3). Boston: Harvard University Press.
- Nedelcu, C., & Groza, V. (2012). Child welfare in Romania. In J. Gibbons & K. Rotabi (Eds.), Intercountry adoption: Policies, practices, and outcomes (pp. 91–102).Surrey, U.K.: Ashgate Press
- Negeri, D. (2006). Guddifachaa practice as child problem intervention in Oromo society: The case of Ada'A liban district. (Unpublished Masters in Social Work).
 Addis Ababa University,
- Nelson, C. A. (2007). A neurobiological perspective on early human deprivation. *Child Development Perspectives, 1*(1), 13-18.
- Nelson, C. A., Fox, N. A., & Zeanah, C. H. (2014). *Romania's abandoned children* Harvard University Press.
- Nemtsov, A. V. (2002). Alcohol-related human losses in Russia in the 1980s and 1990s. *Addiction*, 97(11), 1413-1425.

- Oberlander, T. F., Weinberg, J., Papsdorf, M., Grunau, R., Misri, S., & Devlin, A. M. (2008). Prenatal exposure to maternal depression, neonatal methylation of human glucocorticoid receptor gene (NR3C1) and infant cortisol stress responses. *Epigenetics*, *3*(2), 97-106.
- Obradovic, J., Bush, N. R., Stamperdahl, J., Adler, N. E., & Boyce, W. T. (2010).
 Biological sensitivity to context: The interactive effects of stress reactivity and family adversity on socio-emotional behavior and school readiness. *Child Development*, *81*, 270-289.
- O'Connor, T. G., & Rutter, M. (2000). Attachment disorder behavior following early severe deprivation: Extension and longitudinal follow-up. *Journal of the American Academy of Child & Adolescent Psychiatry*, *39*(6), 703-712.
- O'Connor, T. G., Rutter, M., & English and Romanian Adoptees Study Team. (2000). Attachment disorder behavior following early severe deprivation: Extension and longitudinal follow-up. *Journal of the American Academy of Child & Adolescent Psychiatry*, 39(6), 703-712.
- Ohgi, S., Arisawa, K., Takahashi, T., Kusumoto, T., Goto, Y., Akiyama, T., & Saito, H. (2003). Neonatal behavioral assessment scale as a predictor of later developmental disabilities of low birth-weight and/or premature infants. *Brain and Development*, 25(5), 313-321.

Oliver, M. (2004). The journey. In New and selected poems- 1. Boston: Beacon Press.

- Olsavsky, A. K., Telzer, E. H., Shapiro, M., Humphreys, K. L., Flannery, J., Goff, B., & Tottenham, N. (2013). Indiscriminate amygdala response to mothers and strangers after early maternal deprivation. *Biological Psychiatry*, *74*(11), 853-860.
- Osmond, C., & Barker, D. J. (2000). Fetal, infant, and childhood growth are predictors of coronary heart disease, diabetes, and hypertension in adult men and women. *Environmental Health Perspectives*, *108* (Suppl 3), 545-553.
- Ouellette, E. M., Rosett, H. L., Rosman, N. P., & Weiner, L. (1977). Adverse effects on offspring of maternal alcohol abuse during pregnancy. *New England Journal of Medicine*, 297(10), 528-530.

Pally, R., & Olds, D. D. (2000). The mind-brain relationship Other Press, LLC.

- Pascual-Leone, A., Amedi, A., Fregni, F., & Merabet, L. B. (2005). The plastic human brain cortex. *Annual .Review Neuroscience*, 28, 377-401.
- Perez, L. M. (2008). Situation faced by institutionalized children and adolescents in shelters in Guatemala. Guatemala City: USAID and Holt International Children Services.
- Pertman, A. (2000). Adoption nation: How the adoption revolution is transforming America. New York: Basic Books.
- Pollak, S. D., Nelson, C. A., Schlaak, M. F., Roeber, B. J., Wewerka, S. S., Wiik, K. L., Gunnar, M. R. (2010). Neurodevelopmental effects of early deprivation in postinstitutionalized children. *Child Development*, 81(1), 224-236.

- Pollak, S. D., Nelson, C. A., Schlaak, M. F., Roeber, B. J., Wewerka, S. S., Wiik, K. L., . Gunnar, M. R. (2010). Neurodevelopmental effects of early deprivation in postinstitutionalized children. *Child Development*, 81(1), 224-236.
- Popa-Mabe, M. (2010). "Ceausescu's orphans": Narrating the crisis of Romanian international child adoption. (Unpublished Ph.D.). Bryn Mawr College,
- Post, R. M., Weiss, S. R., Smith, M., Li, H., & McCann, U. (1997). Kindling versus quenching. *Annals of the New York Academy of Sciences*, 821(1), 285-295.
- Post, R. M., Weiss, S. R., Smith, M., Li, H., & McCann, U. (1997). Kindling versus quenching. *Annals of the New York Academy of Sciences*, 821(1), 285-295.
- Pridemore, W. A., & Kim, S. (2006). Democratization and political change as threats to collective sentiments: Testing Durkheim in Russia. *The Annals of the American Academy of Political and Social Science*, 605(1), 82-103.
- Pridemore, W. A., & Kim, S. (2006). Research note: Patterns of alcohol-related mortality in Russia. *Journal of Drug Issues*, 36(1), 229-248. doi:10.1177/002204260603600110

Programme Highlights 2012 (2013). Addis Ababa: The African Child Policy Forum.

Quillen, E. E., Chen, X., Almasy, L., Yang, F., He, H., Li, X. & Deng, H. (2014).ALDH2 is associated to alcohol dependence and is the major genetic determinant of "daily maximum drinks" in a GWAS study of an isolated rural Chinese sample.

American Journal of Medical Genetics Part B: Neuropsychiatric Genetics, 165(2), 103-110.

- Random case review of 350 case files for international adoption', compiled by PGN at request of UNICEF Guatemala. (2007). (November ed.). Guatemala City: Procuraduría General de la Nación (PGN).
- Rao, R., & Georgieff, M. K. (2007). Iron in fetal and neonatal nutrition. *Seminars in Fetal and Neonatal Medicine*, 12(1), 54-63.
 doi:http://dx.doi.org/10.1016/j.siny.2006.10.007
- Rawn, C. D., & Vohs, K. D. (2006). The importance of self-regulation for interpersonal functioning. In K. D. Vohs E. J. Finkel (Ed.), (pp. 15-31). New York, NY, US: Guilford Press.
- Reeb, K. (1987). Predicting low birth weight and complicated labor in urban black women: A biopsychosocial perspective. *Social Science Medicine*, 25, 1321-1327.
- Roby, J. L., & Ife, J. (2009). Human rights, politics and intercountry adoption: An examination of two sending countries. *International Social Work*, 52(5), 661-671. doi:10.1177/0020872809337680
- Roby, J. L., Shaw, S. A., & George, L. H. (2014). Perceived food and labor equity and school attendance among Ugandan children living in kin care. *International Journal* of Social Welfare, 23(2), 205-214. doi:10.1111/ijsw.12051

- Ronsmans C, Graham WJ. (2006). Maternal mortality: who, when, where and when. *Lancet*. DOI:10.1016/ S0140-6736(06)69380-X.
- Rosas, J., & McCall, R. B. (2010). Characteristics of institutions, interventions, and resident children's development. *International Journal of Behavioral Development*,
- Rose, S. A., Feldman, J. F., Rose, S. L., Wallace, I. F., & McCarton, C. (1992). Behavior problems at 3 and 6 years: Prevalence and continuity in full-terms and preterms. *Development and Psychopathology*, 4(03), 361-374.
- Rose, S. A., Feldman, J. F., Wallace, I. F., & McCarton, C. (1989). Infant visual attention: Relation to birth status and developmental outcome during the first 5 years. *Developmental Psychology*, 25(4), 560.
- Roseboom, T. J., Painter, R. C., van Abeelen, A. F., Veenendaal, M. V., & de Rooij, S. R. (2011). Hungry in the womb: What are the consequences? Lessons from the Dutch famine. *Maturitas*, 70(2), 141-145.
- Rotabi, K., & Gibbons, J. (2012). Does the Hague convention on intercountry adoption adequately protect orphaned and vulnerable children and their families? *Journal of Child and Family Studies*, 21(1), 106.
- Rouquette, J. (1957). Influence of parental alcoholic toxicomania on the physical and psychic development of young children [doctoral dissertation]. *Paris, France: University of Paris.*

- Rutter, M. & the English and Romanian Adoptees (E.R.A.) Study Team. (1998).
 Developmental catch-up, and deficit, following adoption after severe early privation. *Journal of Child Psychology and Psychiatry*, 39, 465-476.
- Rutter, M. (1998). Developmental catch-up, and deficit, following adoption after severe global early privation. *Journal of Child Psychology and Psychiatry*, *39*(04), 465-476.
- Rutter, M., Colvert, E., Kreppner, J., Beckett, C., Castle, J., Groothues, C. & Sonuga-Barke, E. (2007). Early adolescent outcomes for institutionally-deprived and nondeprived adoptees. I: Disinhibited attachment. *Journal of Child Psychology and Psychiatry*, 48(1), 17-30. doi:10.1111/j.1469-7610.2006.01688.x
- Saffran, J. R., Werker, J. F., & Werner, L. A. (2006). The infant's auditory world: Hearing, speech, and the beginnings of language. *Handbook of Child Psychology*,
- Saffran, J. R., Werker, J. F., & Werner, L. A. (2006). The infant's auditory world: Hearing, speech, and the beginnings of language. *Handbook of Child Psychology*,
- Sameroff, A. (2006). Identifying risk and protective factors for healthy child development. *Families Count: Effects on Child and Adolescent Development*, 53-76.
- Sameroff, A. J., & Chandler, M. J. (1975). Reproductive risk and the continuum of caretaking casualty. *Review of Child Development Research*, 4, 187-244.
- Sanchez, M., Ladd, C. O., & Plotsky, P. M. (2001). Early adverse experience as a developmental risk factor for later psychopathology: Evidence from rodent and primate models. *Development and Psychopathology*, *13*(03), 419-449.

- Sanchez, M., Ladd, C. O., & Plotsky, P. M. (2001). Early adverse experience as a developmental risk factor for later psychopathology: Evidence from rodent and primate models. *Development and Psychopathology*, *13*(03), 419-449.
- Sapolsky, R. M., Romero, L. M., & Munck, A. U. (2000). How do glucocorticoids influence stress responses? Integrating permissive, suppressive, stimulatory, and preparative actions 1. *Endocrine Reviews*, 21(1), 55-89.
- Schafer, D. S., & Moersch, M. S. (1981). *Developmental programming for infants and* young children: Stimulation activities University of Michigan Press/ESL.
- Schore, J. R., & Schore, A. N. (2008). Modern attachment theory: The central role of affect regulation in development and treatment. *Clinical Social Work Journal*, 36(1), 9-20.
- Schore, J. R., & Schore, A. N. (2008). Modern attachment theory: The central role of affect regulation in development and treatment. *Clinical Social Work Journal*, *36*(1), 9-20.
- Seeman, T. E., Singer, B. H., Rowe, J. W., Horwitz, R. I., & McEwen, B. S. (1997). Price of adaptation—allostatic load and its health consequences: MacArthur studies of successful aging. *Archives of Internal Medicine*, 157(19), 2259-2268.
- Selman, P. (2009). From Bucharest to Beijing: Changes in countries sending children for international adoption 1990 to 2006. . In G. Woerbel, & E. Neil (Eds.),

International advances in adoption research for practice (pp. 575-595). Hoboken: Wiley.

Selman, P. (2012). The global decline of intercountry adoption: What lies ahead? *Social Policy and Society*, *11*(03), 381-397. doi:10.1017/S1474746412000085

Selye, H. (1950). The physiology and pathology of exposure to stress.

- Selye, H. (1956). The stress of life.
- Shang, X., & Wu, X. (2003). Protecting children under financial constraints: 'Foster mother villages' in Datong. *Journal of Social Policy*, 32(04), 549-570. doi:10.1017/S0047279403007141
- Shonkoff, J. P. (2010). Building a new biodevelopmental framework to guide the future of early childhood policy. *Child Development*, *81*(1), 357-367.
- Shonkoff, J. P., & Garner, A. S. (2012). Committee on psychosocial aspects of child and family health; committee on early childhood, adoption, and dependent care; section on developmental and behavioral pediatrics. The lifelong effects of early childhood adversity and toxic stress. *Pediatrics, 129*(1), e232-e246.
- Siegel, D. J. (1999). *The developing mind: Towards a neurobiology of personal experience*. New York: Guilford.
- Simon, R. J., & Alstein, H. (1991). Intercountry adoption. A Multinational Perspective, New York, Westport-Connecticut & London,

- Sloutsky, V. M., & Napolitano, A. C. (2003). Is a picture worth a thousand words?
 Preference for auditory modality in young children. *Child Development*, 74(3), 822-833.
- Smolin, D. (2007-2008). Child laundering as exploitation: Applying anti-trafficking norms to intercountry adoption under the coming Hague regime. *Vermont Law Review*, 32(1), 1.
- Smyke, A. T., Dumitrescu, A., & Zeanah, C. H. (2002). Attachment disturbances in young children. I: The continuum of caretaking casualty. *Journal of the American Academy of Child & Adolescent Psychiatry*, 41(8), 972-982.
- Smyke, A. T., & Zeanah, C. (1999). Disturbances of attachment interview. *Unpublished Manuscript*,
- Solms, M., & Turnbull, O. (2002). *The brain and the inner world: An introduction to the neuroscience of subjective experience* New York: Karnac Books.
- Solomon, J., George, C., & De Jong, A. (1995). Children classified as controlling at age six: Evidence of disorganized representational strategies and aggression at home and at school. *Development and Psychopathology*, 7(03), 447-463.
- Sonuga-Barke, E. J., Schlotz, W., & Kreppner, J. (2010). V. Differentiating developmental trajectories for conduct, emotion, and peer problems following early deprivation. *Monographs of the Society for Research in Child Development*, 75(1), 102-124.

- Spangler, G., & Grossman, K. (1999). Individual and physiological correlates of attachment disorganization in infancy. Individual and physiological correlates of attachment disorganization in infancy. Solomon, Judith (Ed); George, Carol (Ed), (1999). Attachment disorganization. , (pp. 95-124). New York, NY, US: Guilford Press, xxiii, 420 pp.
- Sroufe, L. A., Egeland, B., Carlson, E., Collins, W. A., Grossmann, K., Grossmann, K., & Waters, E. (2005). Placing early attachment experiences in developmental context. *Attachment from Infancy to Adulthood: The Major Longitudinal Studies*, 48-70.
- St. Petersburg-USA Orphanage Research Team. (2005). Characteristics of children, caregivers, and orphanages for young children in St. Petersburg, Russian Federation. *Applied Developmental Psychology*, 26, 477-506.
- State of the World's Children: Celebrating 20 years of the convention on the rights of the child: Special edition. Washington: UNICEF.
- Stein, Z., Susser, M., Saenger, G., & Marolla, F. (1972). Nutrition and mental performance. *Science*, 178(4062), 708-713.

Sterling, P., & Eyer, J. (1988). Allostasis: A new paradigm to explain arousal pathology.

Stevens, S. E., Sonuga-Barke, E. J., Kreppner, J. M., Beckett, C., Castle, J., Colvert, E., Rutter, M. (2008). Inattention/overactivity following early severe institutional deprivation: Presentation and associations in early adolescence. *Journal of Abnormal Child Psychology*, *36*(3), 385-398.

- Stratakis, C. A., & Chrousos, G. P. (1995). Neuroendocrinology and pathophysiology of the stress system. *Annals of the New York Academy of Sciences*, 771(1), 1-18.
- Stratton, K. R., Howe, C. J., & Battaglia, F. C. (1996). *Fetal alcohol syndrome: Diagnosis, epidemiology, prevention, and treatment* National Academies.
- Streissguth, A., Aase, J., Clarren, S., Randels, S., LaDue, R., & Smith, D. (1991). Fetal alcohol syndrome in adolescents and adults. *Journal of the American Medical Association*, 265, 1961-1967.
- Streissguth, A. P. (1997). *Fetal alcohol syndrome: A guide for families and communities.* Paul H Brookes Publishing.
- Stroop, J. R. (1935). Studies of interference in serial verbal reactions. Journal of Experimental Psychology, 18(6), 643.
- Sullivan, W. (1899). A note on the influence of maternal inebriety on the offspring. . Journal of Mental Science, 45, 489-503.
- Sykes, D. H., Hoy, E. A., Bill, J. M., McClure, B. G., Halliday, H. L., & Reid, M. M. (1997). Behavioural adjustment in school of very low birthweight children. *Journal* of Child Psychology and Psychiatry, 38(3), 315-325.
- Tau, G. Z., & Peterson, B. S. (2010). Normal development of brain circuits. *Neuropsychopharmacology*, 35(1), 147-168.

- Taylor, H. G., Minich, N., Bangert, B., Filipek, P. A., & Hack, M. (2004). Long-term neuropsychological outcomes of very low birth weight: Associations with early risks for periventricular brain insults. *Journal of the International Neuropsychological Society, 10*(07), 987-1004.
- Tizard, B., & Hodges, J. (1978). The effect of early institutional rearing on the development of eight year old children. *Journal of Child Psychology and Psychiatry*, 19(2), 99-118.
- Tottenham, N. (2012). Risk and developmental heterogeneity in previously institutionalized children. *Journal of Adolescent Health*, *51*(2), S29-S33.
- U.S. Department of State (2014). Retrieved from http://adoption.state.gov/about_us/statistics.php
- Ulleland, C. N., Wennberg, R. P., Igo, R. P., & Smith, N. J. (1970). The offspring of alcoholic mothers. *Pediatric Research*, *4*, 474.
- van Baar, A. L., van Wassenaer, A. G., Briët, J. M., Dekker, F. W., & Kok, J. H. (2005).
 Very preterm birth is associated with disabilities in multiple developmental domains. *Journal of Pediatric Psychology*, 30(3), 247-255. doi:10.1093/jpepsy/jsi035
- van den Dries, L., Juffer, F., van Ijzendoorn, M. H., & Bakermans-Kranenburg, M. J.
 (2010). Infants' physical and cognitive development after international adoption from foster care or institutions in china. *Journal of Developmental and Behavioral Pediatrics: JDBP*, *31*(2), 144-150. doi:10.1097/DBP.0b013e3181cdaa3a [doi]

- van der Vegt, E., van der Ende, J., Ferdinand, F., Verhulst, C., & Tiemeier, H.
 (2009). Early childhood adversities and trajectories of psychiatric problems in adoptees: Evidence for long lasting effects. *Journal of Abnormal Child Psychology*, *37*(2), 239-249.
- Van der Vegt, Esther JM, van der Ende, J., Ferdinand, R. F., Verhulst, F. C., & Tiemeier, H. (2009). Early childhood adversities and trajectories of psychiatric problems in adoptees: Evidence for long lasting effects. *Journal of Abnormal Child Psychology, 37*(2), 239-249.
- Van IJzendoorn, M. H., & Juffer, F. (2006). The Emanuel Miller Memorial Lecture 2006: Adoption as intervention. Meta-analytic evidence for massive catch-up and plasticity in physical, socio-emotional, and cognitive development. *Journal of Child Psychology and Psychiatry*, 47(12), 1228-1245.
- Vandivere, S., Malm, K., & Radel, L. (2009). Adoption USA: A Chartbook Based on the 2007 National Survey of Adoptive Parents. US Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation.
- Verhulst, F. C., Althaus, M., & Versluis-Den Bieman, H. J. (1990). Problem behavior in international adoptees: I. an epidemiological study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 29(1), 94-103.
- Verhulst, F. C., Althaus, M., & Versluis-Den Bieman, H. J. (1992). Damaging backgrounds: Later adjustment of international adoptees. *Journal of the American Academy of Child & Adolescent Psychiatry*, 31(3), 518-524.

Verhulst, F. C., Althaus, M., & Versluis-Den Bieman, H. (1990). Problem behavior in international adoptees: I. an epidemiological study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 29(1), 94-103. doi:<u>http://dx.doi.org/10.1097/00004583-199001000-00015</u>

Verhulst, F. C., Althaus, M., & Versluis-Den Bieman, H. (1992). Damaging backgrounds: Later adjustment of international adoptees. *Journal of the American Academy of Child & Adolescent Psychiatry*, 31(3), 518-524. doi:<u>http://dx.doi.org/10.1097/00004583-199205000-00020</u>

Verhulst, F. C., & Versluis-Den Bieman, H. J. M. (1995). Developmental course of problem behaviors in adolescent adoptees. *Journal of the American Academy of Child & Adolescent Psychiatry*, 34(2), 151-159. doi:http://dx.doi.org/10.1097/00004583-199502000-00010

- Vicari, S., Caravale, B., Carlesimo, G. A., Casadei, A. M., & Allemand, F. (2004). Spatial working memory deficits in children at ages 3-4 who were low birth weight, preterm infants. *Neuropsychology*, 18(4), 673.
- Vohr, B. R., & Msall, M. E. (1997). Neuropsychological and functional outcomes of very low birth weight infants. Paper presented at the *Seminars in Perinatology*, 21(3) 202-220.
- Vorhees, C. V. (1986). Principles of behavioral teratology. *Handbook of behavioral teratology* (pp. 23-48) Springer.

- Vorria, P., Papaligoura, Z., Dunn, J., Van IJzendoorn, M. H., Steele, H., Kontopoulou, A., & Sarafidou, Y. (2003). Early experiences and attachment relationships of Greek infants raised in residential group care. *Journal of Child Psychology and Psychiatry*, 44(8), 1208-1220.
- Wadhwa, P. e. a. (1993). The association between prenatal stress and infant birth weight and gestational age at birth: A prospective investigation. *American Journal of Obstetrics & Gynecology*, 169, 858-865.
- Walker, S. P., Chang, S. M., Vera-Hernandez, M., & Grantham-McGregor, S. (2011).
 Early childhood stimulation benefits adult competence and reduces violent behavior. *Pediatrics*, 127(5), 849-857. doi:10.1542/peds.2010-2231 [doi]
- Webb, S. J., Monk, C. S., & Nelson, C. A. (2001). Mechanisms of postnatal neurobiological development: Implications for human development. *Developmental Neuropsychology*, 19(2), 147-171.
- Wegar, K. (2000). Adoption, family ideology, and social stigma: Bias in community attitudes, adoption research, and practice. *Family Relations*, 49(4), 363-369. doi:10.1111/j.1741-3729.2000.00363.x
- Weinberg, J., Sliwowska, J. H., Lan, N., & Hellemans, K. G. C. (2008). Prenatal alcohol exposure: Foetal programming, the hypothalamic-pituitary-adrenal axis and sex differences in outcome. *Journal of Neuroendocrinology*, 20(4), 470-488. doi:10.1111/j.1365-2826.2008.01669.x
- Wellberg, L. & Seckl, J. (2001). Prenatal stress, glucocorticoids and the programming of the brain. *Journal of Neuroendocrinology*, 13, 113-128.
- Welsh, J. A., Viana, A. G., Petrill, S. A., & Mathias, M. D. (2008). Ready to adopt: Characteristics and expectations of preadoptive families pursuing international adoptions. *Adoption Quarterly*, *11*(3), 176-203. doi:10.1080/10926750802421982
- Westrup, B., Kleberg, A., von Eichwald, K., Stjernqvist, K., & Lagercrantz, H. (2000). A randomized, controlled trial to evaluate the effects of the newborn individualized developmental care and assessment program in a Swedish setting. *Pediatrics*, 105(1), 66-72.
- Wilson, S. L. (2003). Post-institutionalization: The effects of early deprivation on development of Romanian adoptees. *Child and Adolescent Social Work Journal*, 20(6), 473-483.
- Woo, T., Pucak, M., Kye, C., Matus, C., & Lewis, D. (1997). Peripubertal refinement of the intrinsic and associational circuitry in monkey prefrontal cortex. *Neuroscience*, 80(4), 1149-1158.
- World Health Organization (2005). *The World Health Report 2005: make every mother or child count*. Geneva: World Health Organization.
- Zamostny, K. P., O'Brien, K. M., Baden, A. L., & Wiley, M. O. (2003). The practice of adoption: History, trends, and social context. *The Counseling Psychologist*, *31*(6), 651-678. doi:10.1177/0011000003258061

Zeanah Jr, C. H., Mammen, O. K., & Lieberman, A. F. (1993). Disorders of attachment.

- Zeanah, C. H., Boris, N. W., & Lieberman, A. F. (2000). Attachment disorders of infancy. *Handbook of developmental psychopathology* (pp. 293-307) Springer.
- Zeanah, C. H., Danis, B., Hirshberg, L., Benoit, D., Miller, D., & Scott Heller, S. (1999).
 Disorganized attachment associated with partner violence: A research note. *Infant Mental Health Journal*, 20(1), 77-86.
- Zeanah, C. H., Scheeringa, M., Boris, N. W., Heller, S. S., Smyke, A. T., & Trapani, J.
 (2004). Reactive attachment disorder in maltreated toddlers. *Child Abuse & Neglect*, 28(8), 877-888.
- Zeanah, C. H., & Smyke, A. T. (2008). Attachment disorders in family and social context. *Infant Mental Health Journal*, *29*(3), 219-233.
- Zeanah, C. H., Smyke, A. T., & Dumitrescu, A. (2002). Attachment disturbances in young children. II: Indiscriminate behavior and institutional care. *Journal of the American Academy of Child & Adolescent Psychiatry*, 41(8), 983-989.
- Zeanah, C., Nelson, C., Fox, N., Smyke, A., Marshall, P., Parker, S., & Koga, S. (2003).
 Designing research to study the effects of institutionalization on brain and behavioral development: The Bucharest Early Intervention Project. *Development and Psychopathology*, *15*(04), 885-907. doi:10.1017/S0954579403000452

- Zello, R. M., (2012). The Scope of the Malnutrition Epidemic in Guatemala: Its Implications on the Development of the Child and of the Nation. *Senior Honors Theses.* Paper 293. http://digitalcommons.liberty.edu/honors/293
- Ziegler, J. (2006). *The right to food: Mission to Guatemala. Report of the special rapporteur on the right to food.* UN Food and Agriculture Organization.