SIBLING CARE IN ZAMBIA: INFANT ATTACHMENT IN THE CONTEXT OF MULTIPLE CAREGIVERS

BY

HAATEMBO MOOYA

THESIS SUBMITTED TO THE UNIVERSITY OF ZAMBIA IN FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A DEGREE OF DOCTOR OF PHILOSPHY IN PSYCHOLOGY

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MAY 2015

DECLARATION

I, **HAATEMBO MOOYA**, hereby solemnly declare that this thesis and the work presented in it are my own and has been generated by me as a result of my own original work. I confirm that this work was done wholly while in candidature for the Doctoral Degree in Psychology at the University of Zambia and has been submitted to the University of Zambia within the framework of the said Doctoral program. This work has been developed and implemented with cooperation between the University of Zambia, Zambia and Leiden University, the Netherlands. It does not contain any published work or material from another University.

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CERTIFICATE OF APPROVAL

This Thesis by **HAATEMBO MOOYA** is approved as fulfilling the requirements for the award of the degree of Doctor of Philosophy of the University of Zambia.

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ABSTRACT

Parenting is one of the most significant features of any people's culture (Harkness & Super, 1995) and across cultures, the operationalization of parenting and parenting practices differ. Against this background, this study was conducted to explore parenting and caregiving in Zambia, from the perspective of attachment theory. This study specifically sought to examine maternal and sibling caregiving and to examine the quality of attachments of the infant to the mother and to his/her older sibling. It also sought to examine the factors that predict maternal investment in terms of socio-emotional support, the provision of learning materials and involvement.

The study was conducted in two phases. Phase one examined sib-care in Zambia and the Netherlands. Phase two examined infant-caregiver attachment and parenting investment in Zambia. To this effect, the following hypotheses were made. The first hypothesis was that sib-care is existent and occupies a significant portion of child rearing in Zambia and the Netherlands and that Zambian participants would perform more sib-care activities than their Dutch counterparts. The second hypothesis was that higher SES levels would be associated with more maternal socio-emotional and material investment and cognitive stimulation in the home. The third hypothesis, based on the universality and normativity hypotheses of attachment theory, was that that the infant-mother attachment construct in Zambia exists and the majority of children would be classified as securely attached to both their mothers and older siblings. The fourth hypothesis was that there would be no association between the infant-mother and infant sibling attachment i.e. children's quality of attachment to their mothers is not expected to be the similar to the quality of attachment to their siblings.

Self-report and observational (both scales and video) data were collected to measure demographic, sib-care variables and parental investment and attachment

variables, respectively. The results showed that sib-care is prevalent in both Zambia and the Netherlands and females performed more sib-care than boys. They further revealed that socio-economic, more than cultural variables are predictive of parental investment in different domains with higher socio-economic status predicting more parental investment. Finally the results showed that Zambian children do get attached (to both mother and sibling) and the majority appeared to be securely attached to both their mothers and siblings, a pattern similar to most African and Western norm samples, with some variations on specific classifications. As predicted there was also no correspondence of attachment quality within the same family pairs (mother-infant and sibling-sibling).

The findings of this study inspire the need for more empirical work to be conducted in the area of attachment and sib-care in the context of 'normal' families. There is also a need to develop parenting interventions that target family level structures to enhance parent child relationships. Finally, the need for the development and adaptation of local scientific tools is highlighted.

DEDICATION

To my late dad – A Son Never Forgets . . .

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Writing this last bit of text of my PhD project with the sound of my two children Luyando and Wila Mooya in the background makes me suddenly realize that I have neared the end of this incredible journey and joy, relief and introspection fill my heart. I realize that the end of this journey is only the beginning of another. There are many, too many to mention, whom I owe my deepest gratitude, without whom this PhD would not have been possible. First and foremost, I thank God, the Giver of life, without whom I could do nothing. To my late dad, Cyprian Mooya, thank you for making us believe in the importance of education. To my mom, Mercy Kalunga, thank you for always believing in me, even when I lost faith in myself – your words always ring in the innermost parts of my heart.

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ACRONYMS

AIDS	:	ACQUIRED IMMUNO DEFICIENCY SYNDROME
ECR - RS	:	EXPERIENCES IN CLOSE RELATIONSHIPS – RELATIONSHIP STRUCTURES
HOME	:	HOME OBSERVATION FOR THE MESUREMENT OF THE ENVIRONMENT
HIV	:	HUMAN IMMUNO-DEFICIENCY VIRUS
HPI	:	THE HOME POSSEESSIONS INDEX
SCC	:	SIB-CARE CHECKLIST
SES	:	SOCIOECONOMIC STATUS
SSP	:	STRANGE SITUATION PROCEDURE
UNZA	:	UNIVERSITY OF ZAMBIA

CHAPTER 1

"It takes a whole village to raise a child" – African proverb

1.0 INTRODUCTION

This chapter provides an introduction to this study. It highlights parenting and its operationalization from a cultural perspective. It then introduces the concept of infant attachment and the *multiple caregiver paradox.* Additionally, it introduces the concepts of sib-care and parental investment. The research problem is then stated and a justification to conduct the study highlighted. The study objective and hypotheses are subsequently posited. Finally, an operational definition of terms is provided.

1.01 Background

Culture can be broadly defined as patterns of behaviors, knowledge, and beliefs acquired through socialization processes, that distinguish one group from another group (e.g., Boyd & Richerson, 2005; Hofstede, 1984; Pagel, 2012). It is the organization of the developmental environment (Super & Harkness, 2002). There are several categorizations of models of culture and different dimensions of culture that have been proposed. Two of the most commonly used distinctions in the literature refer to *individualism* versus *collectivism* (Oyserman, Coon, & Kemmelmeier, 2002). One of the most significant features of any people's culture is parenting (Harkness & Super, 1995). It is suggested to be the main reason why people in different cultures, and within cultures, differ from one another (Super. Harkness, Barry & Zeitlin., 2011) and has been considered a powerful instrument for the transmission of values and practices between generations (Nsamenang, 1992). Parenting also constitutes an investment that shapes people's lives with respect to their

reproductive strategies and therefore influences their own parenting styles (Keller, 2001). As a result of this, parenting systems vary across cultures.

1.1 The caregiver-infant attachment relationship

One of the most influential paradigms on parenting is attachment theory. Attachment theory proposes a healthy relationship that occurs between a parent/caregiver (usually the mother) and an infant which results in a secure and safe haven for the infant, creating a bond between the two (Ainsworth & Bell, 1970; Bowlby, 1969, 2008; Stayton, Ainsworth & Main, 1973). Born out of the context of the devastating effects of the Second World War, attachment theory was originally developed as a means for explaining the strong emotional bond that develops between infants and their primary caregivers (Bowlby, 1969; Fraley and Tancredy, 2012). According to John Bowlby (1969/1982), the founder of attachment theory, caregiver-infant attachment is the emotional bond that exists between an infant and his or her caregiver(s). This *attachment* is expressed through what are called attachment behaviors - acts such as crying, clinging and following with the aim of maintaining proximity, especially in stressful situations (e.g. Bretherton, 1992). To say a child is attached to a caregiver means that the child has a strong disposition to seek proximity and contact with a specific figure, in most cases the mother (Van IJzendoorn, Sagi & Lambermon, 1992).

It is argued that early attachment experiences provide a secure emotional base by influencing children's feelings of confidence, worth and interpersonal trust (Bowlby, 1980). According to attachment theory, children who experience responsive, supportive and consistent caregiving develop high self-worth and are comfortable about depending on others. Unresponsive, abusive and inconsistent caregiving leads to a negative self-worth and discomfort about the availability of others (Bowlby, 1969/1980; Schmitt et al., 2004).

1.2 Infant attachment in the context of multiple caregivers

Although attachment examines quality of a dyadic interaction, John Bowlby was cognizant, early enough, of the assertion that the 'mother' was not just the 'biological mother' but anyone that took the role of a mother and provided care in an infant's life. This meant close kin and relations and even professional caregivers. Bowlby also reasoned that children could develop an attachment relationship to more than one person and consequently have more than one attachment figure (Bowlby, 1969/1982). In most cultures this includes, in addition to the biological parents, siblings and even grandparents (Cassidy, 2008). There is a general agreement in literature nevertheless that the biological mother (where present) remains the child's primary attachment figure. Until relatively recently, research on attachment and care focused primarily on the mother-infant dyad (Schuengel and Van IJzendoorn, 2001).

Some questions arise from the above background. If in most societies (some more than others) infant care is a collective enterprise and the child could indeed develop an attachment relationship to more than one person, as many studies have shown (e.g. Van IJzendoorn et al., 1992), what then is the nature of the quality of attachment that develops between the child and the non-maternal caregivers? Do these non-maternal caregivers e.g. siblings establish an attachment relationship equivalent to the infant-mother relationship, in every respect – a situation referred to by Van IJzendoorn & his colleagues (1992) as the *multiple caretaker paradox*.

1.3 Sibling participation in caregiving

The majority of people across the world grow up among siblings; as much as 80 % in the United States of America and Europe and more in Africa and other non-Western countries (Dunn, 2007). The care of young children by their older siblings or sib-care has been shown to be relatively widespread across cultures but is presumably more prevalent

in more collectivistic than individualistic societies. Several anthropology and psychology studies in diverse non-Western societies have shown that children play a significant role in caring for their younger siblings (Evans, 2012; Wane, 2000; Nsamenang, 1992). In most African societies, there exists a shared philosophy that children do not solely belong to their biological parents and that 'parenting' can be performed by 'others,' including grandparents, siblings and even neighbors. . In these African societies, older children are inevitably expected to look after their younger siblings, sometimes without adult supervision and for considerable periods, in order to free up time for mothers or caregivers to engage in other social reproductive or productive activities (Evans, 2012;). On the other hand children in Western societies are often perceived as *dependents* and *care recipients* rather than *contributors* or *caregivers*, reflecting a Western notion of children as 'precious rather than useful' (Miller, 2005, p2).

1.4 Parental investment and factors that affect parenting

Parenting constitutes an investment that shapes a child's development and parents across cultures invest in their children's immediate environment to harness optimal child development. To optimize development, parental investment in child rearing is a necessity. Parental investment in child development is multi-dimensional and an often-used distinction is that between parental *socio-emotional investment* and *cognitive investment*. Parental socio-emotional investment entails offering warmth, sensitive responsiveness and support to the child in the home. Cognitive investment on the other hand entails providing an environment that enables the cognitive stimulation of the child including the provision of inputs like books, educational materials at home and high quality child-care settings and schools (Bornstein, Chun-Shin Hahn, Suwalsky & Haynes, 2014; Bradley et al, 1997). The extent of parental investment in children's social-emotional and cognitive development has been shown to vary across cultures and contexts, (Bradley & Corwyn, 2001, 2005).

1.5 Statement of the problem

For a while now, research in developmental science focusing on parenting has been conducted with a bias towards the mother as the parent. An exploration of other parental figures has tended to focus on other adults providing care to children. Most developmental science scholars acknowledge the presence and to some extent the caregiving role that siblings may play in child-care but very few have undertaken a comprehensive examination of the sibling's role in child care. This is in spite of the reality that the majority of people, cross-culturally, grow up among siblings. The lack of research in this area has resulted in a lack of knowledge and understanding of the complex role that siblings play as 'carers' and has led to a gap in the literature.

In addition, the number of African empirical studies on attachment have remained 'absurdly small' (Van IJzendoorn & Sagi, 2008, see also Figure 6) against the backdrop of a surging body of literature in this area. There has not yet been any study on attachment conducted in Zambia. This has led to cross-cultural gaps in knowledge and consequently hampered interventions meant to harness cross-cultural attachment development. This situation has further led to a lack of understanding of the operationalization of the attachment construct as African norm samples against which a global understanding of attachment theory can be established are lacking.

1.6 Justification of the study

It is against this background that this study was conceptualized and conducted. In a context where child-headed households are a widespread, perhaps as a result of orphan hood (e.g. HIV/AIDS) or abandonment, an understanding of the role that older children perform to care for their younger siblings can lead to an exploitation of an existent, yet not harnessed resource – the older sibling as a carer. In addition, as most children indeed grow up among siblings, an understanding of the role that these 'other parents' play is pertinent.

Further, an empirical study on the concept of sib-care presents an opportunity for establishing scientific findings on a subject that is common but has not taken center stage. What perhaps justifies this study even more is the fact our literature search suggests that there has not been any study, to date, that has examined the quality of infant attachments to their older siblings. To the best of the author's knowledge, this study is the first of its kind to study sibling-infant attachment and presents a magnanimous opportunity to contribute such new and critical knowledge to developmental science.

Additionally, studying parenting and attachment from the non-Western perspective of Zambia offered an opportunity to test core hypotheses in attachment theory that have so far been suggested as universal (e.g. the sensitivity-security link) and also provided an opportunity to study a milieu whose living conditions differ from the predominantly middle-class Western environments in which most attachment research has been conducted (Causadias & Posada, 2013). It also allowed the researcher to evaluate commonly presented references to differences in maternal and cultural practices, preferences and values. Differences between samples from different countries are assumed to reflect cultural variations that presumably impact attachment relations. Despite the numerous studies that have been done in attachment research, there still remains no single study that has been conducted in Zambia on in this area.

1.7 Aim

The overall aim of this study therefore was to explore parenting and caregiving in Zambia from the perspective of attachment theory.

1.8 General Objective

The general objective of this study was to explore maternal and sibling caregiving in Zambia and to examine the quality of attachments of the infant with the main caregiver and his/her older sibling.

1.9 Specific objectives

The specific objectives of this study were to;

1. examine the nature and extent of sib-care in Zambia and the Netherlands;
2. examine socio-demographic factors associated with sib-care i.e. nationality, gender and family size between Zambia and the Netherlands;
3. investigate factors associated with maternal socio-emotional investment and cognitive stimulation in Zambian homes;
4. investigate the association between socio-economic status (SES) and maternal socio-emotional and cognitive stimulation in Zambian families;
5. explore infant-mother attachment patterns in Zambia;
6. explore infant-sibling attachment patterns in Zambia; and
7. investigate the relationship between infant-mother and infant-sibling attachment patterns in Zambia.

1.10 Hypotheses

It was hypothesized that

1. sibling caregiving is existent and occupies a significant portion of child rearing in Zambia and the Netherlands;
2. Zambian participants will perform more sib-care than Dutch participants;
3. Children from larger families will perform more sib-care and females will perform more sib-care than males
4. higher SES levels are associated with more maternal emotional and material investment and cognitive stimulation in the home;
5. the infant-mother attachment construct in Zambia exists and the majority of children would be classified as securely attached to their mothers;

6. the infant-sibling attachment in Zambia exists and the majority of children would be classified as securely attached to their older siblings
7. there would be no association between the infant-mother and infant sibling attachment i.e. the quality of the infant-mother will not be similar to the quality of infant-sibling attachment.

1.11 Operational definitions of terms

Sibling : A sibling refers to an elder or younger brother/sister who is biologically related to the index child and performs a significant amount of child care towards the index child. This child is aged between 7 to 13 years.

Sib-care : Refers to the child care performed towards the index child which includes activities such as bathing, feeding, playing with etc.

Attachment : Refers to the deep emotional connection that an infant forms with his/her primary caregiver, often (but not limited to) the mother.

Secure attachment : A child who is securely attached will explore freely while the caregiver is present, engages with strangers and often becomes upset when the caregiver departs and happy when the caregiver returns.

Insecure avoidant : An insecure avoidant child does not orient to their attachment figure while exploring the environment and appears independent of the attachment figure both physically and emotionally.

Insecure ambivalent : An insecure ambivalent child adopts an ambivalent behavioral style – exhibiting clingy and dependent behavior while rejecting the attachment figure when they engage in interaction.

Disorganized attachment: A child with a *disorganised attachment* shows actions that are often a combination of behaviors observable avoidant and ambivalent attachment.

CHAPTER TWO

2.0 LITERATURE REVIEW

This chapter provides an analysis of the literature that feeds into the study. It first provides the theoretical underpinning of attachment theory and then focusses on attachment research from a cross-cultural perspective – an African perspective in particular, while elaborating on the theoretical context from which the study needs to be understood. It then delves into a review of empirical literature on parenting in the context of multiple caregivers. Finally, it reviews literature on the factors that affect parental investment.

2.1 Attachment Theory

Attachment theory was first conceptualized by John Bowlby from his work as a pediatrician and psychoanalyst (Bowlby, 1969). It was rooted in psychoanalysis and ethology. Based on Bowlby's ideas, Mary Ainsworth conducted field research in Uganda and the united States and developed the methodology and a classification system for attachment (Ainsworth, 1961, 1967; Ainsworth & Bowlby, 1991). Contemporary attachment theory is based on the foundations established by Bowlby (1969, 2008) and Ainsworth (Ainsworth, 1961, 1967).

There are four general hypotheses that have been recognized in attachment theory (Van IJzendoorn & Sagi, 2008). The first is the universality hypothesis which postulates that, universally, there is a bias for infants to become attached (Van IJzendoorn & Sagi, 2008). The second is the infant secure-base behavior hypothesis which suggests that an infant is more likely to explore his environment when he or she feels protected and comforted by their primary caregiver's presence (van IJzendoorn & Sagi, 2008). The third hypothesis is the maternal sensitivity hypothesis which argues that maternal sensitivity is an antecedent to

infant attachment security (Ainsworth, 1967). The fourth is the future (cognitive and social) competence hypothesis which suggests that developmental and social competence in childhood and adulthood is directly related to an infant's attachment security that develops within the first years of life (Bradley, 2000; Morelli & Tronick, 1991;). Key among these, to this is study, is the *universality hypothesis*.

The *universality hypothesis* is embodied around three basic assumptions. Firstly, it is assumed that all infants form an attachment (secure or insecure) to their primary caregiver (Van IJzendoorn & Sagi, 2008; Rutgers et al, 2007). This will happen even in the context of development delays (Rutgers, van IJzendoorn, Bakermans-Kranenburg & Swinkels, 2007), neglect or abuse (Lyons-Ruth & Jacobbvitz, 2008) or parental psychopathology (Bradely, 2000).

The second assumption is that there are predictable or universal precursors and outcomes for secure caregiver-infant attachment (Van IJzendoorn & Sagi, 2008). This assumption also relates to two other hypotheses of attachment; the *maternal sensitivity* and *future competences* hypotheses. Firstly, it emphasizes the importance of maternal sensitivity as a precursor to secure attachment (Ainsworth, 1967; Ainsworth, Blehar, Waters & Wall, 2014; Bolwby, 1969, 1988; Main, 1999). Maternal sensitivity itself was defined by Mary Ainsworth as the mother's ability to perceive child signals, to interpret these signals correctly and respond to them promptly and appropriately (Ainsworth, Bell & Satyton, 1974) and has been associated with positive child outcomes in several domains (Bakermans-Kranenburg, van IJzendoorn & Juffer, 2003; Bernier, Carlson, & Whipple, 2010; Kochanska, 2002). A caregiver's inability to respond sensitively is often associated with insecure attachment patterns and non-optimal developmental outcomes (Axe, 2007; Claussen & Crittenden, 2000; De Wolff & Van IJzendoorn, 1997). Secondly, this assumption also suggests that developmental and social competence in childhood and adulthood are

directly related to an infant's attachment security that develops within the first years of life – that (in)competence is a consequence of attachment (in)security (Bernier et al., 2010; Eisenberg, et al., 2001; Bakermans-Kranenburg et al., 2003). Securely attached children are assumed to be more-autonomous and more likely to persist in problem solving and resilience while insecurely attached children are assumed to be less competent both cognitively and socially (Van IJzendoorn, Sagi & Lambermon, 1992).

The third assumption of the *universality hypothesis* and one of the most contested aspects of the cross-cultural attachment debate is that there is a predictable *global* or *standard* distribution of secure and insecure attachment patterns (Bakermans-Kranenburg, van IJzendoorn, & Kronenberg, 2004; Chao, 2001; Kondo-Ikemura, 2001; Van IJzendoorn & Sagi, 2008). These attachment patterns are based on Ainsworth et al.'s (1978) original Strange Situation Studies and attachment classifications. Based on this original study (Ainsworth, et al., 1978), these classifications were generally measured as *secure* attachment (B) – 67%; *insecure avoidant* (A) – 21%; and *insecure ambivalent/resistant* (C) – 14%. Later, after noticing that some children did not really fit any of the already established attachment categories, a *disorganized* attachment category (D) was added (Main & Solomon, 1990). When this category was added, the accepted proportions became 63% (secure - B); 14% (Avoidant - A), 9% (ambivalent/resistant - C) and; 14% (disorganized - D) (Main & Solomon, 1990; Van IJzendoorn et al, 1999). Meta-analyses of attachment studies in several countries (Van IJzendoorn & Kroonenberg, 1988; Van IJzendoorn, Schuengel & Bakermans-Kranbenburg, 1999) reported evidence on this trend when samples have been combined although there has been evidence to indicate within and between country variations (Van IJzendoorn & Kroonenberg, 1988; Van IJzendoorn & Sagi, 2008; True, Pisani & Oumar, 2001). Secure infant attachment has consistently been found to be the most prevalent attachment pattern in environments with few risk factors and it is generally believed that in any society, the majority of children will be securely attached.

2.1.1 Attachment assessment and classifications

Mary Ainsworth was the first to empirically study attachment and its development when she observed 28 mother-infant dyads in Kampala, Uganda, in a longitudinal ethnographic study (Ainsworth, 1967). From her observations, she concluded that maternal sensitivity was the most cardinal determinant of the infant-caregiver attachment quality. She defined maternal sensitivity as "the ability to perceive and interpret accurately the signals and communications in the infant's behavior and, given this understanding, to respond to them appropriately and promptly" (Ainsworth et al., 1974, p. 127). She later tried to replicate the Uganda study in Baltimore (USA). She then created what has come to be known as one of the most prominent laboratory assessments in developmental psychology, the Strange Situation Procedure (SSP) (Ainsworth et al, 1978).

In this procedure, the child is observed in the laboratory for 20 minutes while the mother and a stranger enter and leave the room, alternately under conditions of increasing stress. Observing the child's responses with regard to the separation and reunion with the mother leads to the categorization of the infant-mother relationship into one of three attachment groups; (B) *securely attached*; (A) *insecurely avoidant* and (C) *insecurely ambivalent* attached. Further research by Main led to the addition to this original three-way classification of a fourth category, the (D) *disorganized attachment* (Main & Solomon, 1990). In effect, there are only two categories of attachment; secure and insecure attachment, with the latter being further subdivided into three categories i.e. avoidant, ambivalent and disorganized.

Consistent with Bowlby's initial assertion, *securely attached* children are often described as expressing more positive affect in the context of interactions with their attachment figure(s) than insecurely attached children. These children feel confident that their attachment figure will be available to meet their needs and they are easily soothed by the attachment figure when they are upset. They use the caregiver as a secure base for

exploration. *Avoidantly attached* children tend not to orientate themselves to their attachment figure while exploring the environment. These children are independent of the attachment figure both physically and emotionally and do not seek contact with the attachment figure when they are distressed (Behrens, Hesse & Main, 2007). In the Strange Situation Procedure, such children explore readily but superficially and have little display of affect or secure-base behavior (Solomon & George, 2008). It is argued that these children suppress attachment-related thoughts and emotions and inhibit unwanted urges to seek proximity.

Children who are *ambivalently attached* adopt an indecisive behavioral style towards the attachment figure often displaying clingy and dependent behavior yet will become rejecting of the attachment figure when they engage in interaction. During the Strange Situation Procedure, the child becomes visibly distressed upon entering the room, often fretful or passive and fails to engage in exploration (Solomon & George, 2008). Children with a *disorganised attachment* classification (Main & Solomon, 1990) show actions and responses to caregivers that are often a combination of behaviors observable in avoidantly and ambivalently attached children. During the Strange Situation Procedure, they display behavior that lacks an observable goal, intention or explanation. The disorganized attachment style classification was a later addition after Ainsworth's original categorizations (*secure*, *avoidant* and *ambivalent*) when researchers noted that some infants did not fit the three organized patterns (Main & Weston, 1981; Lyons-Ruth & Jacobvitz, 2008). It is important to note that *secure* (B) as well as both *insecure-avoidant* (A) and *insecure-ambivalent* (C) attachment classifications are considered to involve organized strategies, adaptive to a child's environment. Children with a disorganized attachment on the other hand lack any organized strategy for dealing with stress of separation from the caregiver. Attachment disorganization has been suggested to predict developmental

psychopathology (Main & Solomon, 1990). In most non-clinical samples, the majority of cases are assigned to the *secure* attachment classification.

2.1.2 Attachment and culture

As already stated, a key cornerstone to attachment theory is the universality hypothesis, which states that across cultures all infants become attached to one or more caregivers (Van IJzendoorn & Sagi, 2008). Despite this assertion implying universality of attachment – a challenge to be embraced by developmental scientists, the ensuing empirical studies in attachment research have not mirrored this notion. While North America and Europe are home to only 15% of the world population (Population Reference Bureau, 2014), almost all studies on attachment have been done in those parts of the world. There has been relatively few studies conducted in the other areas, and only a handful done on the African continent - a realization that drove Van IJzendoorn and Sagi (2008, p. 901, see also Figure 6) to remark that the number of studies on attachment outside Western populations are “absurdly small”.

2.1.3 Attachment research in Africa

While attachment research in Africa is limited, the empirical background of attachment research is literally “out of Africa”. As already highlighted, Ainsworth (1967) conducted her initial study of infant-caregiver attachment in Uganda where she described childrearing patterns between mothers and infants and found that maternal sensitivity is a crucial determinant of attachment quality. It took 10 years before the next study on attachment on the African continent was done. In Nigeria, among the Hausa, a study involving 18 infants and focused on the occurrence of attachment and exploratory behaviors revealed the existence of multiple attachments in a multiple-caregiver context, with a preference for one of the attachment figures (Marvin, VanDevender, Iwanaga, LeVine & LeVine, 1977). In the 1980s, Kermonian and Leiderman (1986) studied childrearing

in the context of multiple caregivers among the Gusii of Kenya. They examined whether infants would establish different attachment relationships with their mothers and other caregivers. Attachment was assessed using the Strange Situation procedure. The majority of the infants (61%) were classified as securely attached to their mothers and 54% were classified as securely attached to their non-maternal caregivers (Kermonian and Leiderman 1986). The researchers did not differentiate between the two insecure categories. They concluded that infants do become uniquely attached to a protective adult caregiver, regardless of the presence of one or more mother figures (Reed & Leiderman, 1981).

In 2001, a cross-cultural study of 26 mothers and their 1-year old infants among the Dogon of Mali was conducted (True, Pisani and Oumar). True et al., (2001) examined whether secure and insecure dyads were characterized by different mother-infant communication patterns in attachment related circumstances. Infant-mother attachment was measured using the traditional Strange Situation procedure, yielding the first Africa Strange Situation data where attachment was coded using the tripartite A-B-C system (True et al., 2001) as well as the additional system for disorganized/disoriented attachment behavior (George & Solomon, 2008). In the sample of 26 infants-mother dyads, 69% of the infants were securely attached, 8% were resistant and 24% were disorganized. The three-way attachment classification revealed 88% secure and 12% resistant. There were no avoidantly attached children.

In South Africa, Tomlinson, Cooper, and Murray (2005) studied a sample of 98 mother-infant dyads in Khayelitsha, a peri-urban settlement in Cape Town. They found that 62% of the infants were securely attached, 4% were avoidantly attached and 26% had a disorganized attachment. The three-way attachment classifications were 72% secure, 11% resistant and 17% avoidant (Tomlinson et al., 2005). This brief synthesis of studies conducted in Africa, based on Van IJzendoorn and Sagi (2008), support not only the

universality but also the normativity hypothesis – the notion that the majority of infants will be securely attached (Van IJzendoorn & Sagi, 2008).

2.1.4 Attachment models

When John Bowlby first postulated attachment theory, he suggested that for a secure attachment to develop between an infant and a mother/caregiver, the caregiver needed to be consistently present and stable and also predictable in the way they interacted with the infant (Bowlby, 1975). This would in turn allow infants to develop internal representations and confidence of the mother/caregivers' availability. This thinking led to bias towards the mother as the attachment figure since she was one that could, in principle, be the only one permanently available, although Bowlby himself resisted identifying the biological mother as the only mother figure. This led to the development of the concept of monotropy – being raised by only one person, in this case the mother.

Nevertheless, the concept of monotropy did not seem to fit well into the general discourse and the developments, at the time, in attachment theory and practice. Firstly, the assertion did not fit well into the context of multiple caregivers, as was evidenced by several caregiving environments, especially in non-Western settings, like Zambia. Secondly, even in Western settings, permanent availability of one and the same attachment figure did not occur in most families as parents had to fulfill other responsibilities than just child rearing. The question still remained – in the context of multiple caregivers, does an infant form non-maternal attachment relationships similar to those they form with mothers? To understand this, van IJzendoorn and his colleagues (1992) developed four models, by considering the Dutch (dual-earner families) in which both parents were away from home (for most of the day) and engaged the help of a professional caregiver; and the Israeli Kibbutz (at least three caregivers involved in child care) contexts – a situation which meant that the child was cared for by multiple caregivers.

The first model is *monotropy* (Bowlby, 1951). Monotropy implies that that one figure – mostly the mother—is an important attachment figure, and the influence of other caretakers is negligible, at least in terms of attachment. Using monotropy as a framework to understand the multiple caregiver paradox, we can assume that only the infant-mother attachment is related to later socio-emotional functioning. Other caregivers are not really important and are therefore futile in determining a child's development. The second model is *hierarchy* (Bowlby, 1984). This model posits that , one caregiver — mostly the mother—is the most important attachment figure, but other caretakers may be considered as secondary attachment figures who may serve the role of a secure base in the event that the principal attachment figure (mostly the mother) is not available. Using the *hierarchy* model, we can speculate that the infant-mother attachment relationship is the most powerful determinant of children's socio-emotional development but isn't the only factor involved. Other attachments may also be predictive in a lesser sense and independently of the specific developmental domain.

The third model that was proposed by Van IJzendoorn and his colleagues (1992) is *independence.* The Independence model suggests that that a child could potentially be attached similarly to several caretakers, but those attachment relationships may be functional only in those domains in which the child and a specific caretaker have been interacting over a long period of time. Each caregiver specializes in a certain realm, and only in that realm does the(ir) bond with the child act as an effective secure base for exploration. Using the independence model we can assume that children's attachments to all three caretakers are equally important in determining later socio-emotional functioning, but these different caretakers influence separate/different aspects of children's development, depending on their specialization. The fourth model is called *Integration.* According to this model of attachment, in case of a network of three attachment relationships, secure attachments may compensate for insecure attachments. The child

would best function in a network of three secure relationships, but two secure relationships would be better than one. In this situation, the child would be in a worse position if the attachment network only consists of insecure relationships. When we use the *integration* model we can assume that the strongest predictor of later socio-emotional development in children involves the quality of the entire attachment network. In this view, attachments of the same child with different attachment figures influence each other. The role of non-maternal caregivers like siblings is emphasized by predicting that the extended attachment network is more strongly related to later socio-emotional functioning than is the family attachment network involving only parental attachments.

In this study of both Dutch and Israeli mothers, fathers and professional caregivers, Van IJzendoorn and his colleagues (1992) studied 80 Dutch children (with their mothers, fathers and professional caregivers) and 86 Israeli children (with their mothers, fathers and professional caregivers) to better understand attachment in the context of multiple caregivers. A core question posed in this study was “how are multiple attachments interrelated?”. Attachment quality, for both samples was assessed using the Strange Situation Procedure. In this study, it was found that the quality of infant attachments to each of the three caregivers was independent of each other (Van IJzendoorn et al, 1992).There was no relationship between the quality of attachment relationship that existed between the three caregivers. These findings seem to suggest that because of the uniqueness in interactional style each dyad forms a specific attachment relationship. Consequently each child is capable of forming separate and independent attachment relationships with different people.

2.2 Parenting across cultures

Although a universal concept, parenting practices differ across cultures. It has generally been agreed that the different parenting strategies across cultures are related to

different developmental goals in those cultures (e.g. Keller, 2013). These goals are associated with the sociocultural orientations of independence and interdependence (Keller, 2003) which are used as adjustment mechanisms for certain environmental conditions. The influence of culture on the parenting and child development has been well documented, culminating in the formulation of theoretical constructs in studying development in context e.g. the *developmental niche* (Harkness & Super, 1986, 2002) which implies that a child's *developmental environment* is an interaction between his/her physical and social setting, child rearing practices and the parent's ethno-theories of parenting and child development (Harkness et al., 2011).

2.2.1 Parenting in the context of multiple caregivers

An important feature of parenting within African communities and Zambia in particular is that parenting is not necessarily based on biological ties. This suggests that children do not solely belong to their biological parents, but also to the extended family and the community at large (Nsamenang, 1992; Serpell, 1993; Wane, 2000). Therefore, especially in rural communities, child care is a collective enterprise in which parents, kin and siblings are active participants (Nsamenang, 1992). Meanwhile, even in this context of multiple caregivers, it is still well established that the biological mother is the primary caregiver. This assertion, however, needs to be made in the context of an understanding that although there are commonalities in parenting practices across African communities, generalizations need to be cautiously made because African communities across and within countries, are not homogeneous. Nevertheless, there appears to be a shared African philosophy that views communal parenting as an essential factor in the survival of its traditions and cultures, as evidenced by the African proverb "*it takes a village to raise a child*".

Parenting in most middle-class Western societies assumes a varied trajectory. In middle class Western societies, the infant spends most of their time only with the mother (Hewlet and Lamb, 2002). With few others within the household, infant care is performed mostly by the mother (and father) and very few close relations, such as siblings (when present). In these Western societies, the participation of kin and siblings in child care exists but is suggested not to be prominent.

It is well established, nevertheless, that cross-culturally the biological mother is the primary caregiver and therefore the (primary)attachment figure within the first half-year of an infant's life (Ainsworth, 1967). A cross cultural study by Keller (2013), to capture the social experiences of infants in the Gujarati (India) and Nso (Cameroon) villages as compared to middle – class German babies, confirmed the mother as the most important caregiver in all three communities. There are of course exceptions and within-culture variations to this norm.

2.2.2 Sib-care

Despite the majority of children across the world growing up amongst their siblings (Dunn, 2007), research on siblings has remained relatively small. Further, research on the role of siblings as caregivers has remained even 'scarcer' (Zukow-Goldring, 2002). There are, potentially, several reasons for this situation. Firstly, in non-Western societies where the mothers' workload correlates with children's assistance in household work (Super & Harkness, 2002) and older siblings are valued as caregivers of younger members of the community, the role of siblings in caregiving has been take for granted and dismissed as not deserving special attention – a situation that has led developmental scientists not to pay special attention. On the other hand, in most Western societies, despite situations of hardship, adults have ignored siblings as a resource for families (Zukow-Goldring, 2002). In these communities, adults have sometimes tended to judge the involvement of siblings in

child care as neglect, abuse or even bad parenting, a situation that has led to sib-care being studied mostly as a by-product of child neglect and other crises and not a stand-alone construct or aspect of parenting. Nevertheless, evidence has shown the existence of sib-care.

In a study by Evans (2012) investigating sibling caregiving in youth-headed households affected by AIDS in Tanzania and Uganda, she found that young people were involved in several child activities. She reported that these activities included supporting family members with household chores and child care (Evans, 2012, 2010). In many African societies, many older children are expected to care for their younger siblings and older siblings perform an important role in instructing, guiding, and playing with their younger siblings when performing household chores or engaged in other social productive activities like fetching water and firewood and bathing their younger siblings. Another study conducted among the Hausa of Northern Nigeria examining the variety of children's activities showed that children also participated in domestic work (unpaid) and child care activities (Robson, 2004). Among the Hausa, the childcare activities performed the most included feeding, playing with and watching over children, plaiting girls' hair, dressing and washing their clothes (Robson, 2004). In this study, Robson (200), noted that the children, especially the girls, took pride and enjoyed the responsibility and imitation of adult roles. On the contrary, studies conducted in the West focusing on house-work has shown that Western children are often perceived as *dependents* and *care recipients* rather than *contributors* or *caregivers*, reflecting a Western notion of children as 'precious rather than useful' (Miller, 2005, p2). This is in contrast to the dominant notion in African societies which seem to value older children as *carers* of younger siblings. In these African societies, older children are often expected to look after their younger siblings, sometimes without adult supervision and for considerable periods, in order to free up time for mothers or caregivers to engage in other social reproductive or productive activities (Evans, 2012;).

The majority of research in the last decade involving sib-care in the home, especially in an African context has focused on sib-care in the context of crises like the HIV pandemic and war (Morantz and Heymann, 2010; Yanagisawa et al., 2010; Robson et al., 2006; Payne, 2012). The devastating effects of the HIV epidemic have resulted into a significant increase in caregiver mortality and has led to more orphans. Coupled with the disintegration of the extended family structure in many African societies, many of these children do not get assimilated into the extended family unit or placed into foster homes, which are often not available. This means that the older children have had to assume the *parenting* role for their younger siblings (Morantz and Heymann, 2010; Evans, 2012; Payne, 2012; Yanagisawa et al., 2010) due to non-availability of other caregivers.

In Zambia, as in many other countries across the globe, sib-care is a common practice not limited to orphan-hood or other crises but in the context of AIDS orphans, it has meant that more "older children care for younger siblings without adult supervision "(Yanagisawa et al., 2010, p.122; Yamba, 2005). This situation of older children taking care of their younger siblings without an adult, however, is regarded as going beyond the usual cultural expectations of sibling caretaking (Kesby, Gwanzura-Ottemoller & Chizororo, 2006).This has meant that the range of tasks that older children perform in child care has expanded to accommodate this extra responsibility to include healthcare, personal care, emotional and practical support, and income generating activities (Evans 2012).

Cross-culturally, there is a gendered expectation to care - the notion of socializing girls to take over the 'mothering' or 'caring' responsibility (Spitz & Ward, 2000). Many of the studies that have explored the gender dynamics of care among children show that girls perform significantly more sib-care than boys in the home (Evans, 2012; Miller, 2005; Bray, 2003; Zukow-Goldrin, 2002). Despite cultural variations, findings confirm this notion. In an international comparative study on time use focusing on education, work and gender, it was found that girls performed more caregiving tasks more than boys (Bonke, 1995). They

(girls) also displayed more caregiving tasks in single parent, especially mother-headed, households than homes where both parents lived (Bonke, 1995).

A substantial amount of work in Africa has also shown that girls perform the majority of the care for their younger siblings, compared to boys even though boys also contribute somewhat to this role (Evans, 2012; Robson and Ansell, 2000). In the study of the Hausa of Northern Nigeria (Robson, 2004) which sought to document the variety of children's work activities by examining the divisions of labor and analyze how gender and age, among other variables, shaped lived experiences, it was found that there were gender differences in both the amount and type of work done. Boys spent more time on outdoor activities like playing and were therefore more available to run long errands while girls spent more time on indoor chores and were therefore more readily available for 'proximal' errands like assisting with child care. Overall, the girls performed more child care and also reported to enjoy child care more than the boys (Robson, 2004), a finding that was also confirmed by Payne (2012) when she examined the everyday social interactions of children in child headed households in Zambia. Additionally, a study on youth-headed households in Tanzania and Uganda found that girls were more involved in sib-care than boys, who often perceived their care contribution as typically economic (Evans, 2012). In examining the gender dynamics around sib-care it is important to note that other variables may potentially moderate this relationship, including age and sibling birth order. Generally boys serve as caregivers in the absence of an elder sister.

2.3 Parental socio-emotional and cognitive support

With regard to parental social-emotional investment in children, studies have shown that in many collectivistic societies, mothers seek to quiet and soothe their children while mothers from more individualistic societies use interaction styles in which verbal interactions and stimulation of children play an important role (Richman et al, 1988). For

example, Aina and her colleagues (1993) in their study of the Yoruba in Nigeria found that parents were not particularly responsive to their children in a verbal manner. Nevertheless, it has been contended that labeling non-Western mothers as non-responsive fails to appreciate how the relationship between parenting form and function in child-rearing practice is determined by broader cultural values (Bornstein, Hahn, Chun-Shin & Suwalsky, 2014). For instance, while body contact is an almost universal form of responsiveness, especially in the early life of an infant, this form of responsiveness tends to differ as the child develops in different cultures. Social-emotional support in this case entails beliefs and behaviors that foster parental warmth and responsiveness like body contact/proximity and verbal responsiveness. Socio-emotional support has been shown to predict positive child outcomes like emotional regulation (Bradley & Corwyn, 2005)

From a cognitive investment perspective, the distinction between cultures is not as clear-cut as from a socio-emotional perspective. Generally, Western societies have been shown to invest more in stimulation and instruction, a societal goal that fits with the attainment of higher-order skills and independence but so do parents in some non–Western societies including Asian countries such as Taiwan, South Korea and Japan (Bradley & Corwyn, 2005). Generally, parents from collectivistic societies (found in non-Western countries), are more likely to teach social skills like the exercise of responsible obedience and understanding of seniority and respect in social relations, which may contribute more towards social-emotional investment than to cognitive investment (Harkness & Super, 2011; Serpell, 1993). For example, among the Chewa of Eastern Zambia, as documented by Serpell (1993), the concept of socially responsible intelligence (*nzelu*) has been used by parents to describe desired qualities in their children. Learning materials and folklore are also centered around the reinforcement of these cultural tendencies. Parents from individualistic societies have been shown to use instructive language with their young children, teaching them numbers, and asking them questions in a way that lays the

foundation for competitive success in school, with its abstract learning and language – based curriculum. They further provide an environment and learning materials in which individualistic tendencies such as independence and autonomy are reinforced with praise and other cues e.g. structuring child's playtime and activities, providing specific play equipment (LeVine, LeVine & Schnell, 2001).

A number of factors have been shown to affect parental investment in the home environment. These factors include, among others, culture; socioeconomic status; and family size.

2.3.1 Culture

Culture has already been defined as patterns of behaviors, knowledge, and beliefs acquired through socialization processes, that distinguish one group from another group (e.g., Boyd & Richerson, 2005; Hofstede, 1984; Pagel, 2012). The influence of culture can be best understood from the perspective of the developmental niche (Harkness & Super, 1986, 2002) and focusing on the collectivism and individualism dimensions. Another important aspect of culture is religion (Cohen, 2009; Cohen & Hill, 2007). Religiosity has been shown to shape parental practices (De Roos et al., 2004; Petts, 2007), through the transmission of values and norms although the evidence for the direction of influence is rather non-conclusive. Considering that the role that religion plays in parenting is especially meaningful in non-Western contexts where the majority of the people are religious (Chikwendu, 2004; van Klinken, 2013), it is important that the contribution that religion plays in predicting parental investment in the home is considered.

2.3.2 Socioeconomic status and parental investment

Socio-economic status (SES) and its components have been shown to affect an array of developmental outcomes (Bradley & Corwyn, 2005). It has been shown to affect child development directly and also (indirectly) through the influence of proximal parenting

variables such as parenting beliefs and behaviors (Bornstein et al, 2014). The pervasiveness of SES has consistently emerged in studies across various domains and in parenting research, it has been shown that much of the observed variability in parenting behavior can be better explained by socio-economic variables (Cárcamo et al., 2014). The association between SES and parenting is perhaps best explained by the Family Stress and Family Investment Models (Conger & Donellan, 2007) which posits that financial challenges lead to parental stress, which in turn predicts lower quality of parenting and subsequent child outcomes and that a family's income is related to its investment in facilities and services that foster optimal child development and leads to (non) optimal child outcomes, respectively.

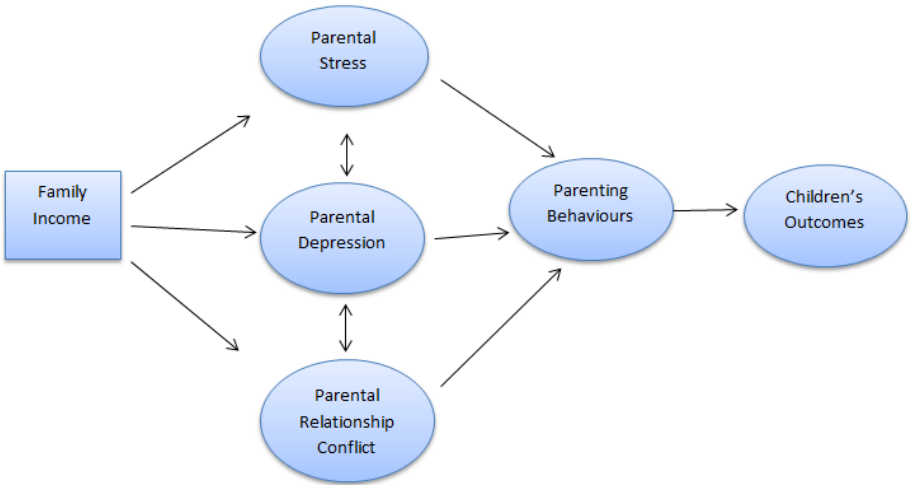
The role that socioeconomic status plays in human development in general and child development in particular can be best understood in the context of parental investment models. Access to economic resources has been argued as one of the strongest determinants of parental investment in child development. Growing up in an economically disadvantaged environment predisposes children to several developmental disadvantages. Two models that focus on the influence of the socioeconomic environment on family interactions can be used to understand this study: the Family Stress and Family Investment models.

2.3.2.1 The Family Stress Model

According to the Family Stress Model, economic hardship within the family context leads to certain economic pressures, defined as the inability to make ends meet and having to cut back on necessary expenses. According to the model, these pressures lead to an increase in the emotional distress of parents, possibly resulting into parental depression and leading to marital conflict and disrupted family relations. This then leads to non-optimal and uninvolved parenting which disrupts children's development outcomes

(Conger, Conger & Elder, 1997, Conger & Conger, 2002). According to this model, economic pressure influences the emotional state of the parent leading to altered parenting practices by reducing the level of warmth and involvement (Repettti, Taylor & Seeman, 2002) – antecedents to infant attachment security. Figure 1 below illustrates how the Family Stress Model is operationalized.

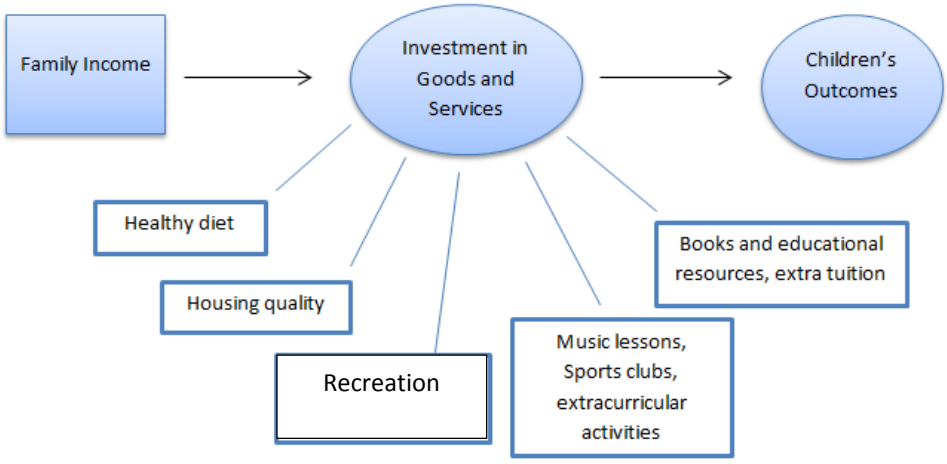
Figure 1: The Family Stress Model



2.3.2.2 The Family Investment Model

According to the Family Investment Model income is related to a family's investment in goods and services in the home. This model is anchored on the Economic Household production theory which posits that time and money are the two main basic resources that parents invest in children and that such investments, combined with children's traits are formative in shaping child developmental outcomes (Becker, 1991, Foster, 2002). This model suggests that children from low income families trail behind their economically advantaged peers because their (low income) parents are less able to acquire goods and services for their children, including books and educational materials and have less time to invest in their children due to the high prevalence of single parenthood, nonstandard working hours and inflexible work schedules (Gootman & Smolensky, 2003). Figure 2 below illustrates how the Family Investment Model is operationalized.

Figure 2: The Family Investment Model



2.3.3 Family constellations/size

Another socio-demographic factor that has been shown to predict parenting investment is family size. This is also related to the Family Stress Model. Parents with more children tend to show less investment and lower (general) parenting quality including less parental love and support (see Furman & Lanthier, 2002 for an overview), and sometimes even higher levels of child abuse (Euser, Van IJzendoorn, Prinzie, & Bakermans-Kranenburg, 2011). It is generally presumed that these findings relate to processes of increased family stress and lower (financial) resources when families have a larger number of children (Furman & Lanthier, 2002). In larger families, there is more stress exerted on the parents due to the high number of children. In addition, the financial resources are shared between the many children resulting to each child accessing only a fraction of the whole. In smaller families on the other hand, fewer children means parents can invest more time to spend with their children and the financial resources available can be easily shared among the children without much stress.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Chapter overview

This chapter highlights the methodology of the study. It begins by providing an overview of the study methodology. It then highlights the study design(s). It proceeds to highlight the study sample(s) and important demographic characteristics. After that, the study procedure(s) is (are) then explained and a detailed explanation of the research tools used for data collection is provided. It concludes with a consideration of the ethical considerations put in place for this study.

3.2 Study methodology overview

This study was conducted in two phases. Phase one was a retrospective study where University students (University of Zambia, Zambia and Leiden University, the Netherlands) were asked to recall the child care activities that they performed when they were aged between 7 and 13 years old. The aim of this study was to gain an understanding of the nature of sib-care in Zambia and the Netherlands and sought to explore cultural and demographic differences in sib-care not only within the Zambian context but also relative to other cultural contexts, based on the assumption that child care and indeed sib-care (in this context) differ across cultures (e.g. collectivistic and individualistic). Phase two was a cross-sectional study in which 'actual' parenting activities were recorded from siblings and mothers, towards the children. In this phase of the study data on parenting and its predictors and infant attachment were collected. In this phase, the aim was to examine the cultural, socio-economic and demographic predictors of parental investment. It also sought to examine infant-mother and infant-sibling attachment, the latter, a phenomenon that has not been studied yet, cross-culturally. The time difference between phases one and two was approximately six months.

3.3 PHASE ONE

As already stated, this phase aimed at gaining an understanding of the nature of sib-care in Zambia and the Netherlands. It specifically sought to explore cultural and gender differences in sib-care not only within the Zambian context but also relative to other cultural contexts, based on the assumption that child care and indeed sib-care (in this context) differ between cultures (e.g. collectivistic and individualistic). It created a baseline upon which an understanding of the phenomenon of sib-care was to be based.

3.3.1 Study design

In this phase, a retrospective cross-sectional design was employed. It sought to examine sib-care activities performed by 7 to 13 year old children as recalled by University students from the University of Zambia, Zambia and Leiden University, the Netherlands.

3.3.2 Study sample

The study sample in this phase consisted of 394 first and second year students (age range = 17 to 31 years, *M* = 20.16, *SD* = 2.29) from the University of Zambia in Zambia and Leiden University, in the Netherlands. The Zambian sample consisted of 200 first year Psychology students (17 to 31 years, *M* = 19.95, *SD* = 6.14; 65% females) at the University of Zambia. The Dutch sample consisted of 194 second year students in the department of Child and Family Studies at Leiden University (18 to 31 years, *M* = 20.38, *SD* = 2.06; 92.3% females). There were no age differences between the Zambian (M = 19.95; SD = 2.48) and the Dutch (M = 20.38; SD = 2.06): *t* (392) = -1.90; *p* = .06 (two tailed) groups.

Table1: Summary descriptive statistics for participants' background/family composition data showing family members present/absent and differences between Zambian and Dutch participants

Variable	Zambian†				Dutch*				
	N	%	M	SD	*N*	%	M	SD	*t* (*df*)
Nuclear family									
Mother	186	95			194	100			-1.61 (194)
Father	168	86			185	95			-3.29 (332)**
Older Sister	118	61			63	33			6.73 (297)**
Younger Sisters	116	60			68	35			6.18 (336)**
Older Brother	114	59			72	37			6.22 (300)**
Younger Brother	106	54			74	38			3.33 (387)**
Younger siblings (*n*)			1.99	1.10			1.51	0.78	
Sib 1 (age)			6.23	4.21			9.08	2.70	
Sib 2 (age)			2.55	3.30			2.50	3.80	
Sib 3 (age)			.75	1.90			.65	1.86	

Sib 4 (age)			.14	.84			.05	0.31
Total family – nuclear (*n)*			5.77	2.47			3.76	1.16
Extended family								
Grandmother	55	28			35	18		-0.22 (346)
Grandfather	18	9			32	17		-3.40 (286)**
Uncles	61	31			30	16		-0.97 (292)
Aunts	70	36			22	11		-0.47 (269)
Niece	31	16			19	10		-1.41 (251)
Nephew	25	13			18	9		-0.75 (388)
Cousin (older)	87	44			17	9		3.17(213)**
Cousin (younger)	40	20			19	10		1.09 (196)
Total family – extended (*n*)			9.50	4.65			6.94	9.03

Note: † 194<*n*<197; * *n* = 194

Zambian participants came from larger nuclear families (t (386) = 10.25; p< .01); extended families (t (385) = 3.50; p< .01); and had a larger number of younger siblings (t (276) = 4.12; p< .01) than the Dutch participants, as shown in Table 1.

3.3.3 Study procedure

Data were collected using a questionnaire which was administered to the participants in the study.

3.3.3.1 *Zambian sample*

Students from the Introductory Psychology classes at the University of Zambia were asked to complete the questionnaire during their various tutorial hours. At the end of each tutorial session, the questionnaires were collected by the researcher, with the assistance of the tutor present. The questionnaire took 15 – 20 minutes to complete

3.3.3.2 *Dutch sample*

Second year students from the Department of Child and Family Studies at Leiden University in the Netherlands were given the questionnaire to complete towards the end of one of their lecture sessions. The questionnaire took 15 - 20 minutes to complete.

3.3.4 Overview of measures

3.3.4.1 *Socio-economic status*

(SES) for the Zambian sample was assessed using the Home Possessions Index (HPI, see Appendix 7). The HPI is an 11 item scale with questions that assess the availability of basic facilities in the household. It contains items like “Did you have a television in your home?; Did you have a stove at home?; Did you have a car at home?” to which the participants responds with either a ‘Yes’ (1) or ‘No’ (0) response. Participant responses on the items of the HPI revealed a ceiling effect as most of the respondents answered the items to the affirmative. Consequently, eight of the items with the least/no variability were discarded from the scale. This left three items: ‘HPI 2 – did you have a stove at home?’; ‘HPI

5 – did you have a flushable toilet?'; and 'HPI 6 – did you have a car at home?' These items were then used to construct an SES measure for the Zambian sample. A reliability analysis of the new measure produced a Cronbach alpha, based on standardised items, of α = .71. These items referred to the time in participants' lives when they were between the ages of 7 to 13 years. SES for the Dutch sample was assessed using parental educational level. Thereafter, a global SES measure was computed by standardizing, averaging and merging the scores on the Zambian and the Dutch SES measures.

3.3.4.2 *Sib-care*

Sib-care was assessed by having participants complete the 'UNZA Sib-Care Checklist' (USC)(Mooya, Sichimba & Van IJzendoon, 2012; see Appendix 2). This is a checklist asking participants whether or not they participated in a range of sib-care activities including feeding, playing with, bathing, dressing, comforting, transporting, carrying the baby, toilet training, protection, setting limits and discipline; how frequently they engaged in these activities and how they felt while doing these activities, when they were between the age of 7 to 13 years. Participants responded 'yes' (1) or 'no' (0) to indicate which activities they had been engaged in. Participants with more 'yes' responses scored higher than those with more 'no' responses. A total caregiving scale was developed from the items of the scale. The alpha reliability coefficient, based on standardised scores, was α = .77. Sib-care activities were assessed for situations in which parents were 'at home' and when parents were 'not at home'.

3.3.4.3 *Attachment*

Attachment was assessed by having participants complete the Experiences in Close Relationships – Relationship Structures (ECR-RS) questionnaire (Fraley et. al., 2011). The ECR-RS is a self-report instrument designed to assess attachment patterns to a variety of close relationships. The same 9 items are used to assess attachment styles with respect to 4 targets (i.e., mother, father, romantic partner, and best friend). (Fraley et. al., 2011). In this

study participants' attachment classifications were assessed only to a mother and father figure. The same 9 items were used for both domains. For each item, participants were asked to indicate on a 7 – point scale the extent to which they agreed or disagreed with the items (1 = strongly agree; 7 = strongly disagree). The measure was designed to assess two fundamental dimensions underlying attachment patterns: anxiety and avoidance. The anxiety dimension represents the extent to which people tend to worry about attachment-related concerns, such as the availability and responsiveness of an attachment figure. The avoidance dimension represents the extent to which people are uncomfortable opening up to others and depending on them. Ideally, securely attached people tend to score low on both dimensions (Fraley et. al., 2011). Avoidance and anxiety scales were then developed. The alpha reliability coefficient for avoidance and anxiety to the mother were $\alpha = .81$ and $\alpha = .84$, respectively. For avoidance and anxiety to the father, the reliability coefficients were $\alpha = .81$ and $\alpha = .88$, respectively.

3.3.4.4 ***Demographic data*** which included *Age*; *Sex*; *Nationality* and *Ethnicity* were self-reported. Data on *Family composition* - the number of people that lived in participants' households at the time, were also obtained.

3.4 PHASE TWO

In this phase actual/current parenting constructs from mothers and sibling were investigated. The aim was to examine the cultural, socio-economic and demographic predictors of parental investment and infant attachment in Zambia. Specifically, predictors of parental socio-emotional and cognitive investment in the home environment were examined. Infant-mother and infant-sibling attachment were also examined – the latter, a phenomenon that has not been studied yet, cross-culturally . This phase was conducted in the context of a larger multi-generational study on caregiving of young children in Zambia.

3.4.1 Study design

A cross-sectional design was employed. It sought to examine actual parenting activities performed by mothers and siblings towards caring for young children in Zambia.

3.4.2 Study Sample

The sample was recruited in the context of a larger study on multi-generational caregiving of young children in Zambia. The recruitment of participants was based on the following inclusion criteria: (1) mother had a biologically own child aged between 12 months and 6 years at first enrolment; (2) mothers' biological mother (the infant's grandmother) participated in caregiving towards the target child; (3) neither mother nor child had a severe mental or physical disability. The sample was drawn from the low-income areas of Ng'ombe and Chazanga townships in Lusaka (the capital of Zambia). Table 2 shows the demographic characteristics of this sample.

The final sample included 105 mothers aged between 19 and 41 years (M = 26.6, SD = 5.4). They had on average 3.3 children (SD = 1.6) between the ages of 12 months and 6 years (M = 17.5 months, SD = 3.9).The majority of the participants (54%) had a secondary level of education and 4% of the sample had no formal education. These educational attainment statistics were representative of the patterns of educational attainment in the

context. The Central Statistics Office in the latest Zambian census report (Zamstats, 2012) educational attainment levels in Lusaka are Primary (27.2%); Secondary (41.6%) and Tertiary (23.2%). This trend is also evident in other urban areas (Zamstats, 2012).

Table 2: Summary demographic and descriptive statistics of the sample (study 2)

		n / %		M	SD
Child's age (months)				17.50	3.93
Child's gender	Boys	41	(39)		
	Girls	64	(61)		
Maternal age (years)				26.63	5.38
Maternal education	None	4	(4)		
	Primary	29	(28)		
	Secondary	57	(54)		
	Tertiary	15	(14)		
Maternal income[a]				17.49	35.60
HPI				6.40	2.18
Number of children				3.31	1.55
HOME socio-emotional support				9.61	3.25
HOME Learning materials				1.68	1.58
HOME Involvement				4.03	1.32
Religion in child-rearing				13.85	2.38
Individualism				16.92	4.89
Collectivism				27.28	2.15

Note: [a] Income in Zambian Kwacha (ZMK ,000)

3.4.3 Study procedure

Community leaders at community centers in Ngombe and Chazanga, in Lusaka, were contacted to help in the recruitment of the participants. Brochures with information about the study and eligibility criteria were distributed to all the recruiters. The researchers also organized meetings with all recruiters to answer their (recruiters) questions (if any) about the study and its procedures. Mothers who visited the community centers were informed about the study and invited to participate. Those who expressed interest to participate left their contact details at the community centers. This information was shared with the research team who then created a home visitation schedule according the participants' preferences.

The study procedure comprised of four visits to each participant: two home visits and two visits to the University of Zambia laboratory. During the first visit to the participants' homes, families that had expressed interest in participating were screened for eligibility. If the family met the inclusion criteria, they were informed about the study procedures and asked to participate. Written consent was obtained from all mothers. During this first visit, mothers filled in questionnaires with the help of research assistants about background variables and family characteristics (e.g., age, education, ethnicity). During the second visit to the home, the quality of the home environment were assessed. Each home visit took approximately two hours. The third visit involved inviting the participants to come to the University laboratory in the Psychology Department, during which infant-mother attachment was assessed. The fourth visit involved a return visit to the University laboratory during which infant-sibling attachment was assessed.

During the data collection process, some participants left the study due to various reasons. First, some people moved to other locations and follow up was impossible. Second, some participants dropped out of the study, especially at the point of coming to

the University lab as they were uncomfortable with the procedure (s), despite efforts to explain the safety of the procedure. This resulted in an attrition rate of 13%. An attrition analyses showed that mothers who dropped off did not significantly differ from the mothers who remained in the study with regard to their age, SES, or their infants' age (t (86) = 0.46, p = .65, t (86) = 1.09, p = .28, and t (86) = -1.06, p = .29, respectively). Consequently, the video data on which attachment classification were based included 88 Zambian mothers aged between 19 and 41 years (M = 29.7, SD = 5.1) in the study. They had on average 3.5 children (SD = 1.5) between the ages of 12 and 24 months (M = 17.5 months, SD = 3.9).

Zambia is a multi-lingual society in which almost all individuals speak more than one language fluently, mostly including English (Benson, 2014; Serpell, 2014). All the assistants were fluent in English and at least two local languages including Bemba and Nyanja – two of the languages that are widely spoken within the local context. Mothers could speak at least one of the languages fluently and the majority spoke more than one language fluently. Because we anticipated that some mothers would be illiterate, research assistants helped the participants complete the questionnaires, regardless of their literacy levels. Because the nature of the measures administered in this phase were mainly observational, the instruments were not translated into the local language because the participants did not have to read anything but only received the instructions from the researchers. These assistants were thoroughly trained on the data collection process, in anticipation of any questions and field challenges. The data collection process was piloted in a community similar to the target community and the outcomes of a process evaluation proved satisfactory.

3.4.4 Overview of measures

3.4.4.1 *Parenting investment*

Parental investment was assessed using the Home Observation for the Measurement of the Environment Inventory (HOME; Caldwell and Bradley, 1984, see Appendix 3). The HOME was designed to measure the quality of support and stimulation available to a child in the home environment. It was designed to be administered via semi structured interview done in the home with the child and the child's primary caregiver. In this study, the Infant Toddler HOME (IT-HOME; Caldwell & Bradley, 2003) was used. For the current study, three subscales were created from the IT-HOME to measure Social-emotional support, Learning materials and parental involvement in the home environment.

To create the HOME socio-emotional support scale, item scores from the Responsivity and Acceptance subscales were combined and summed (correlation between these scales: $r = .58$, $p < .01$). Examples of items from the Responsivity subscale are "parent's voice conveys positive feelings toward the child" and "parent responds positively to praise of the child offered by the visitor". Examples of items from the Acceptance subscale are "parent does not express overt annoyance with or hostility to the child" and "parent does not shout at child (during visit).The internal consistency of the Social-emotional Support scale was $\alpha = .71$ These items have been shown to conceptually converge to provide a glimpse into the social-emotional environment of the home (Bradely & Corwyn, 2005). Before creating the scale, one item (family has a pet) was deleted from the Acceptance subscale because the item affected the reliability of the subscale and it did not seem to fit into the conceptual framework of the items, at least for the Zambian sample. The resulting subscales were then standardized and summed to create an 18-item Socio-emotional support scale.

The HOME Learning materials and Involvement subscales were used to measure the Learning materials at home and the parental involvement. Examples of items from the Learning materials subscale include "simple eye-hand coordination toys" and "parent provides toys for child to play with during visit". Examples of items from the Involvement

subscale include “parent provides toys that challenge child to develop new skills” and “parent structures child’s play periods”. Cronbach’s alpha for the Learning materials and Involvement subscales were .54 and .41 respectively.

3.4.4.2 *Individualism and Collectivism*

The cultural values of individualism and collectivism were assessed with a 16-item short version of the Cultural Value Scale (Singelis et al., 1995; Triandis & Gelfand, 1998, see Appendix 4) questionnaire reflecting the dimensions of collectivism versus individualism. These dimensions emphasize a specific cultural orientation. Individualism emphasises uniqueness and being distinct from the group and distinction in the hierarchy, in the form of status. Collectivism focuses on similarities and common goals with others and sacrificing personal goals for the group. The items were rated on a 7-point Likert scale ranging from *strongly disagree* (0) to *strongly agree* (6). Preliminary analyses revealed that some of the items on the scales affected the reliability of the scale. Therefore, a Principal Component Analysis (PCA) was conducted and summed those items that loaded highly on the two dimensions which could be labeled collectivism and individualism. The final collectivism scale included the following 5 items: *I feel good when I cooperate with others*; *parents and children must stay together as much as possible*; *it is my duty to take care of my family, even when I have to sacrifice what I want*; *family members should always stick together, no matter what sacrifices are required*; and *it is important to me that I respect the decisions made by my groups*. These items were standardized and summed, with a Cronbach’s alpha of = .74. The final individualism scale was composed of four items and included the items: *I’d rather depend on myself than others*; *I rely on myself most of the time; I rarely rely on others*; *I often do “my own thing”*; and *winning is everything*. The cronbach’s alpha for the Individualism scale was .70, based on standardized items.

3.4.4.3 *Religion*

The use of religion by mothers in child rearing was assessed using a four item questionnaire (Emmen, et al., 2012, see Appendix 4). Each item reflects the importance of using religion as a guide for child rearing. On a 5 point Likert scale, mothers reported their agreement from (0) *totally disagree* to (4) *totally agree*. An example of an item in this scale was '*I use my religion as a guideline for the parenting of my child*'. A total score was computed by summing the item scores. The cronbach's alpha for this scale was $\alpha = .90$.

3.4.4.4 *Caregiver-infant attachment.*

The quality of infant-caregiver attachment was assessed using the Strange Situation Procedure (SSP) (Ainsworth et al., 1978, 2014, see Appendix 5). This is a laboratory procedure that consists of a series of two separation and two reunion episodes of the attachment figure and the infant with the goal of heightening infant attachment behavior. In this study, the SSP was conducted twice, once with mother and infant and once with sibling and infant, with an intervening period of two months. Based on the infant's behavior during the SSP infant-mother and infant-sibling relationships were assigned to one of four attachment relationship classifications: secure (B); avoidant (A); resistant/ambivalent (C); and disorganized/disoriented (D) (Ainsworth et al., 1978, 2014; Main & Solomon, 1990). Mothers-infant and sib-infant Strange Situations were independently coded by Marinus H. Van IJzendoorn and Marian. J. Bakermans-Kranenburg, expert coders from the Department of Child and Family studies, Faculty of Social and Behavioral Sciences, Leiden University, the Netherlands. Inter-coder reliability was good; for the three-way classification (ABC) 92%, kappa = .86, for the four-way classification (ABCD) 92%, kappa = .88 ($n = 12$).

3.4.4.5 *Socio-economic status*

SES was measured by having the mothers complete the Home Possessions Index (HPI). A total score was computed by summing item scores for all the items, except two (do

you have at least 2 sets of clothes; do you have at least a bed/mat to sleep on) to which all participants responded to the affirmative. The Cronbach's alpha for this scale was .80. In addition to the HPI, maternal education was also measured by having mothers indicate their highest level of education attained, on a four-point scale from 0 to 3: (0) none; (1) primary school; (2) secondary school; and (3) tertiary education. Further, annual income for the family was also measured and categorized into four: (1) 0 – 2, 000 ; (2) 2, 001 – 5, 000; (3) 5, 001 – 8, 000 and (4) above 8, 000 (Zambian Kwacha; ZMK 1 = 0.20 US$). Although HPI, maternal education, income were moderately correlated (r = .26 to r = .47), they were not collapsed as a single measure of SES because they each, uniquely, predicted independent outcome variables.

3.4.4.6 *Demographics*

Mothers self-reported on background variables like age, ethnicity and number of children.

3.5 STUDY ETHICAL CONSIDERATIONS

This study was approved by the University of Zambia, School of Humanities and Social Sciences Research Ethics Committee. The ethical approval numbers were IBR 00006464 and IORG: 000376.

Informed consent (see Appendix 1 for consent form) was obtained from all the families that participated in this study by signing the consent form. All participants provided written (signed) consent. Participants were given codes (e.g. SGS A 01) as identifiers to ensure confidentiality and no information was collected that could link the data back to the participants. Study videos were kept under lock and key by the researcher(s) and were used only for the study purposes. Video data were coded only by the researcher(s) and supervisor(s).

CHAPTER FOUR

4.0 RESULTS

The results are presented in two parts, representing the two phases in which the study was conducted. The first part shows results from the cross-national comparison between Zambia and the Netherlands on sib-care. In this study, the nature and extent of sib-care between the two countries is shown. Cultural and gender differences are examined. Predictors of sib-care including family constellations and attachment to the caregiver are also examined. The second part shows results from an examination of parental investment and infant attachment in Zambia. Here, predictors of parental socio-emotional and cognitive investment in the home environment including the cultural dimensions of collectivism and individualism; SES and family size were examined; and findings of the examination of infant-mother and infant-sibling attachment in Zambia.

4.1 Overview of study preliminary analyses

In this section, the paper highlights preliminary data analysis procedures involved in the examination for missing data, skewness; kurtosis, and outliers. It states how the data were handled and prepared for analyses. The examination of the ECR scales revealed skewness on the ECR anxiety scales. The scales were later log transformed. Further analyses also revealed outliers ($z > |3.29|$, $p = .001$, cf. Tabachnick & Fidell, 2013) on income (in 2 cases). These values were winsorized to bring these values closer to the rest of the distribution within the relevant groups (Tabachnick & Fidell, 2013). Missing values were present on some of the predictor variables, and were replaced with the within-group means for income (5 cases), number of children (5 cases), maternal age (5 cases), and religion in parenting (3 cases).

4.2 MAIN RESULTS

4.2.1 Sib-care: A cross-national examination between Zambia and the Netherlands

This phase aimed at gaining an understanding of the nature of sib-care in Zambia and the Netherlands. It sought to explore cultural and gender differences in sib-care. Findings on the predictors of sib-care and attachment are also reported.

4.2.1.1 The nature and extent of sib-care in Zambia and the Netherlands

The majority of the participants in the sample had younger siblings; as high as 98% among the Zambian sample and 97.9 among the Dutch sample. 2.0% of the Zambian and 2.1% of the Dutch participants reported that they were the '*only child*' and did not have any siblings, respectively. Among the Zambian and Dutch subjects, 17% and 30% reported being the '*last born child*' and only had an elder sibling, respectively. Overall, 81% and 61% of the Zambian and Dutch subjects, respectively, reported having younger siblings. While preliminary findings included the subjects who were the '*only child'* and '*last-born*', all other analyses included only subjects that had younger siblings.

4.2.1.1.1 Sib care activities

We explored country differences in the sib-care activities that were performed and also examined the overall trend of sib-care by all participants. These data were considered in instances where parents were present *at home* and when parents *not at home*.

Zambian sample: Among the Zambian subjects, the activity performed the most in caring for a younger sibling was '*playing*'. This was the case both when parents were '*at home'* and when they were '*not at home'*. The activity performed the least when parents were '*at home'* was '*toilet training*' but this was not the case when parents were '*not at home'*. The activity performed the least when parents were '*not at home'* was '*carrying the*

baby on the back'. The majority (73%) of the '*last born*' children reported that they provided voluntary care for other young children like nieces/nephews or cousins (since they had no younger siblings).

Dutch sample: Among the Dutch subjects the activity performed the most in caring for a younger sibling, both when parents were '*at home*' and '*not at home*' was '*playing*'. The activity that was the least performed both when parents were at home and when they were not at home was '*toilet training'* (see Table 3). The majority (96%) of the 'last born' children reported that the sib-care they had provided was done out of obligation rather than voluntary. In both samples, participants who had a younger sibling performed various sib-care activities as shown in Table 3, both when parents were '*at home*' and when parents were '*not at home*'.

Table 3: Summary frequencies (percentages) of sib-care activities performed when parents were '*at home'* /'*not at home'*.

	Participants with younger siblings			
	Dutch		**Zambian**	
	Parents *at home*	Parents *not at home*	Parents *at home*	Parents *not at home*
ACTIVITY	***n*(%)**	***n*(%)**	***n* (%)**	***n* (%)**
Feeding	31 (26.7)	33 (30.3)	142 (76.8)	156 (83.9)
Playing	113 (96.6)	103 (92.0)	174 (93.0)	176 (93.0)
Bathing	20 (17.5)	13 (11.9)	139 (75.1)	139 (75.1)
Dressing	27 (23.5)	21 (19.1)	144 (77.8)	151 (82.5)
Comforting baby	83 (71.6)	93 (83.0)	128 (69.2)	133 (72.7)
Transporting Baby	27 (24.8)	25 (23.4)	71 (39.4)	86 (48.3)

Pushing/carrying baby	42 (37.2)	27 (25.0)	104 (55.6)	108 (59.0)
Toilet training	3 (2.7)	6 (6.0)	68 (37.2)	97 (53.9)
Protection from accidents	67 (58.3)	69 (61.6)	157 (84.4)	150 (81.1)
Setting limits	44 (39.3)	58 (52.7)	120 (65.9)	128 (29.3)
Disciplining	18 (16.2)	30 (27.5)	139 (74.3)	139 (75.1)

Note: Table includes only participants with younger siblings and excludes "*only children*" and "*last born children*"

4.2.1.2 Culture, gender and sib-care

We also tested for nationality and gender differences in sib-care and ran an Analysis of Variance (ANOVA). To do this, we created four groups aggregated by nationality and gender namely Zambian females; Zambian males; Dutch females and Dutch males. However, the number of male Dutch subjects was very low (n = 5), so they were excluded from this and subsequent statistical analyses. As a result, a 'nationality by gender' variable consisting of three groups (Zambian females; Zambian males; and Dutch females) was created. From this point onwards, all statistical analyses excluded Dutch males and included only the three groups that were created.

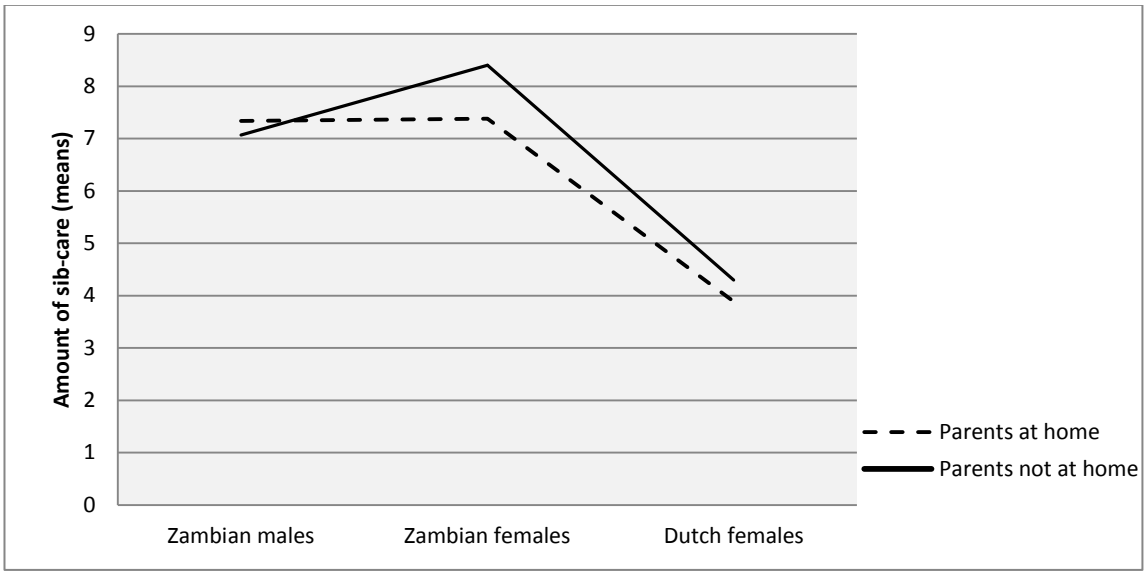
When parents were '*at home'*, the ANOVA showed significant differences in the total amount of sib-care performed by the subjects between the three 'nationality by gender' groups $F(2, 244) = 62.09$, $p < .01$. A Bonferroni post-hoc test revealed that Zambian females performed significantly more sib-care (mean caregiving = 7.39, SE = .40) than the Dutch females (mean caregiving = 3.89, SE = .35) but not the Zambian males (mean caregiving = 7.34, SE = .40).

When parents were '*not at home*' the ANOVA still revealed significant differences in the amount of sib-care performed between the three groups $F(2, 237) = 51.28$, $p< .01$). Post-hoc tests revealed that Zambian females performed significantly more sib-care than both the Zambian males and Dutch females (Zambian females: mean caregiving = 8.42, SE = .41; Zambian males: mean caregiving = 7.07, SE = .48; and Dutch females: mean caregiving = 4.30, SE = .41), respectively.

The results showed that Zambian females performed more sib-care than the other two groups both when parents were '*at home*' and when they were '*not at home*'. Meanwhile, Zambian males also performed more sib-care than the Dutch females. Further, the results revealed that within the Zambian group, significantly more sib-care was

performed by Zambian females when parents were '*not at home*' than when parents were '*at home*' as can be seen from *Figure 1*.

Figure 3: Total sib-care performed between the three '*nationality by gender*' groups



To test if these findings could possibly result from the Zambian subjects having more young siblings to care for, it was examined whether the Zambian participants (M = 1.99; SD = 1.06) had more younger siblings than the Dutch participants (M = 1.51; SD = .78): and it was found that indeed the Zambian participants had more younger siblings $t(276) = 4.12$, $p < .01$ (two tailed). Correlations were also run to assess if there was any relationship between the number of younger siblings and sib-care activities performed by participants. The number of younger siblings that participants had was moderately, yet significantly related to sib-care both when parents were '*at home*' $r = .26$, $p < .01$ and when parents were '*not at home*' $r = .27$, $p < .01$. We then controlled for the number of younger siblings a participant had and performed a MANCOVA to test for the nationality and gender differences in sib-care.

There was a significant main effect of the covariate *number of younger siblings* on total amount of sib-care participants performed $F(2, 247) = 3.42$, $p = <.05$. There was also a significant effect of '*nationality by gender'* on the total amount of sib-care $F(4, 496) = 30.64$. When the covariate *number of younger sibs* was controlled for there were still significant effects between groups for the amount of care given when parents were '*at home' F* (1, 23) = 4.18, $p = .04$ and when parents were '*not at home*' *F* (1, 48) = 6.42, $p = .01$. When parents were '*at home'*, Zambian females reported more sib-care (mean caregiving = 7.51, SE = .23) than Zambian males (mean caregiving = 7.11, SE = .31) and Dutch females (mean caregiving = 3.96, SE = .25) [means corrected for the co-variates]. When parents were '*not at home*', Zambian females still reported more sib-care (mean caregiving = 8.34, SE = .27) than Zambian males (mean caregiving = 6.94, SE = .25) and Dutch females (mean caregiving = 4.16, SE = .29).

Overall, Zambian females reported significantly higher levels of sib-care than Dutch females and Zambian males but the difference between the Zambian females and Zambian males was relatively small. In fact, Zambian females only performed significantly more sib-care on the task(s) '*carry baby on the back*' (M = .65, SD = .48) than Zambian males (M = .42, SD = .50), $t(261) = 9.02$; $p<.01$ both when parents were *at home* and when they were *not at home*. In effect, there was more sib-care performed when parents were '*not at home'* than when parents were '*at home*' *F* (2, 228) = 49.02, $p < .01$(Table 3a and 3b).

Table 4a: Summary descriptive statistics (with ***t-tests***) showing sib-care when parents '*are/not at home'* between Zambian females and Dutch females

	Parents *at home*			**Parents *not at home***		
	Zambian females	Dutch females		Zambian Females	Dutch females	
ACTIVITY	M (SD)	M (SD)	*t*	M (SD)	M (SD)	*t*
Feeding	.74 (.44)	.74 (.44)	-9.34**	.86 (.35)	.81 (.40)	-10.18**
Playing	.95 (.23)	.89 (.31)	.51	.95 (.23)	.91 (.29)	-.47
Bathing	.70 (.46)	.78 (.42)	-10.23**	.77 (.42)	.69 (.47)	-13.22**
Dressing	.78 (.41)	.75 (.44)	-10.34**	.85 (.36)	.75 (.44)	-13.06**
Comforting child	.70 (.46)	.63 (.49)	-.18	.80 (.40)	.62 (.49)	.74
Transporting baby	.37 (.49)	.45 (.50)	-1.81	.52 (.50)	.47 (.50)	-4.21**
Pushing/carrying baby	.63 (.49)	.40 (.49)	-4.38**	.70 (.46)	.43 (.50)	-7.15**
Toilet training	.36 (.48)	.39 (.49)	-6.95**	.55 (.50)	.47 (.50)	-10.33**
Protection	.81 (.40)	.85 (.36)	-4.17**	.85 (.36)	.75 (.44)	-3.89**
Setting limits	.60 (.50)	.71 (.46)	-3.55**	.74 (.44)	.66 (.48)	-3.03**
Discipline	.74 (.44)	.75 (.44)	-10.95**	.84 (.37)	.64 (.48)	-9.52**

Note: ** $p<.01$; * $p<.05$.

Table 4b: Summary descriptive statistics (with ***t-tests***) showing sib-care when parents '*are/not at home'* between Zambian females and Zambian Males

	Parents *at home*			**Parents *not at home***		
	Zambian females	Zambian males		Zambian females	Zambian males	
ACTIVITY	M (SD)	M (SD)	*t*	M (SD)	M (SD)	*t*
Feeding	.74 (.44)	.74 (.44)	-.78	.86 (.35)	.81 (.40)	-.81
Playing	.95 (.23)	.89 (.31)	-1.31	.95 (.23)	.91 (.29)	-.73
Bathing	.70 (.46)	.78 (.42)	.59	.77 (.42)	.69 (.47)	-1.48
Dressing	.78 (.41)	.75 (.44)	-.79	.85 (.36)	.75 (.44)	-2.01
Comforting child	.70 (.46)	.63 (.49)	-1.41	.80 (.40)	.62 (.49)	-2.46
Transporting baby	.37 (.49)	.45 (.50)	1.11	.52 (.50)	.47 (.50)	-.28
Pushing/carrying baby	.63 (.49)	.40 (.49)	-3.40**	.70 (.46)	.43 (.50)	-3.31**
Toilet training	.36 (.48)	.39 (.49)	.47	.55 (.50)	.47 (.50)	-1.41
Protection	.81 (.40)	.85 (.36)	.25	.85 (.36)	.75 (.44)	-1.61
Setting limits	.60 (.50)	.71 (.46)	1.15	.74 (.44)	.66 (.48)	-.99
Discipline	.74 (.44)	.75 (.44)	.16	.84 (.37)	.64 (.48)	-2.49

Note: ** $p<.01$; * $p<.05$.

Figure 4a: Sib-care activities when parents are 'at home.'

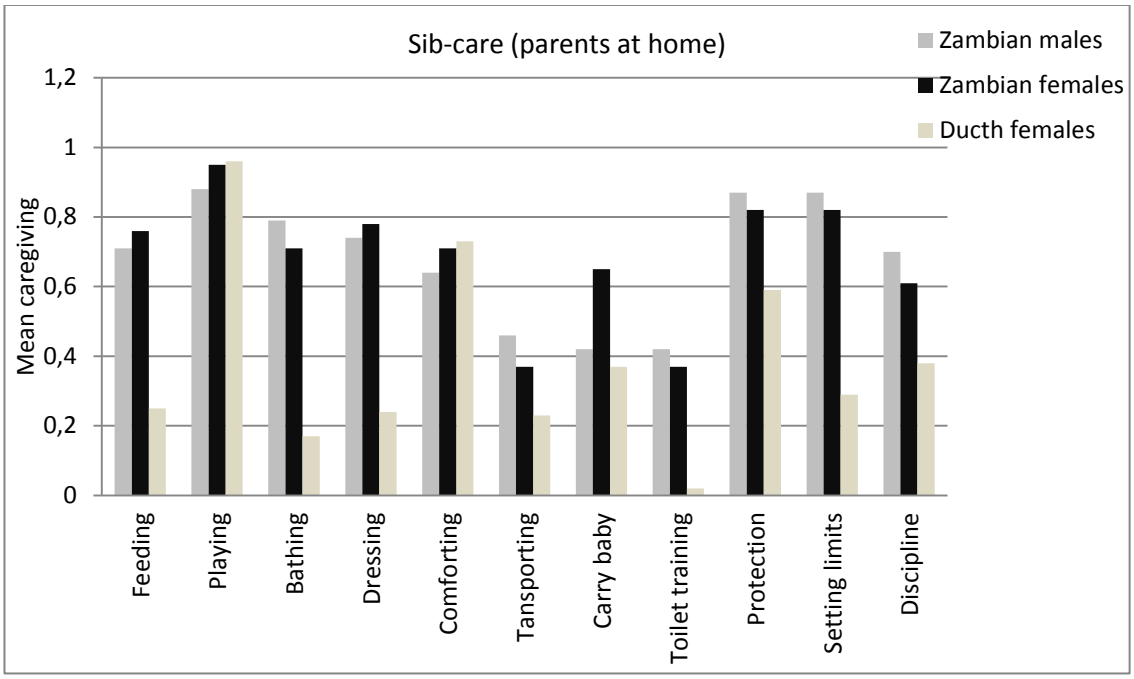
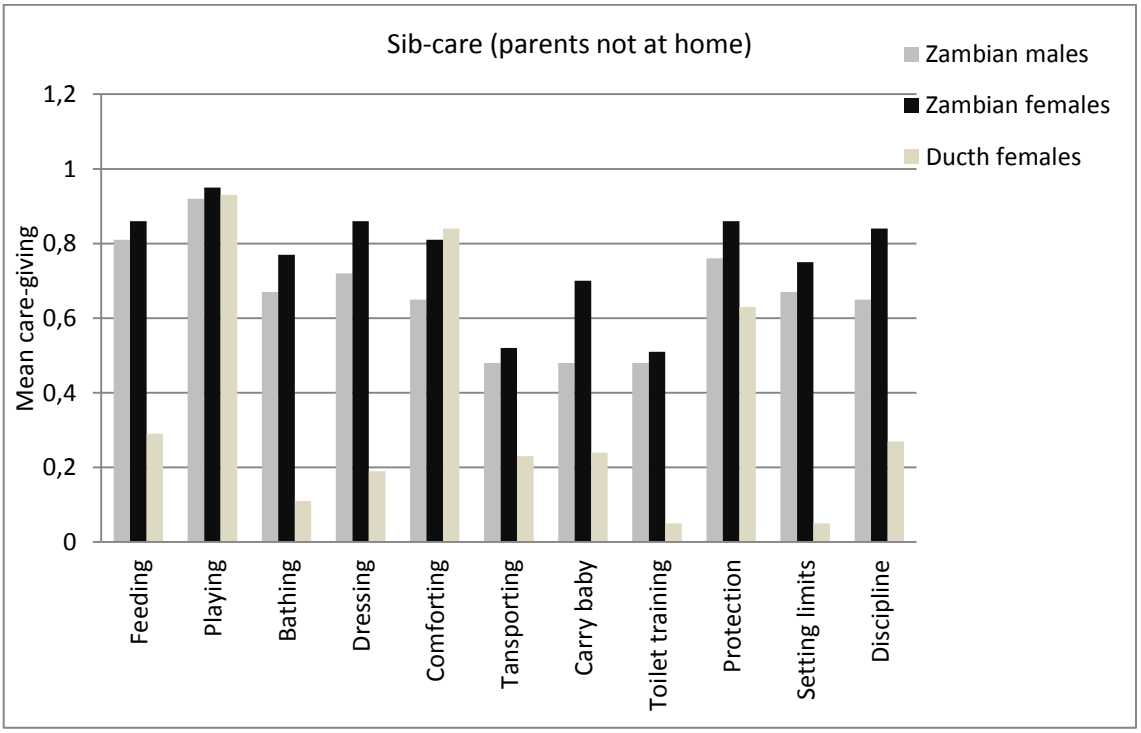


Figure 4b: Sib-care activities when parents are 'not at home.'



4.2.1.3 Family constellations, attachment and sib-care

We examined participants' family backgrounds and their attachment to their caregivers to test whether they predicted sib-care. Preliminary analyses showed that Dutch participants came from smaller families (M = 3.76, SD 1.16) than Zambian participants (M = 5.73, SD = 2.31; *t*(276) = 10.52, p <.01 and had fewer younger siblings (M = 1.51, SD = 0.78 and M = 1.69, SD = 1.21), respectively. We ran an ANOVA to test for differences in attachment between the three nationality by gender groups.

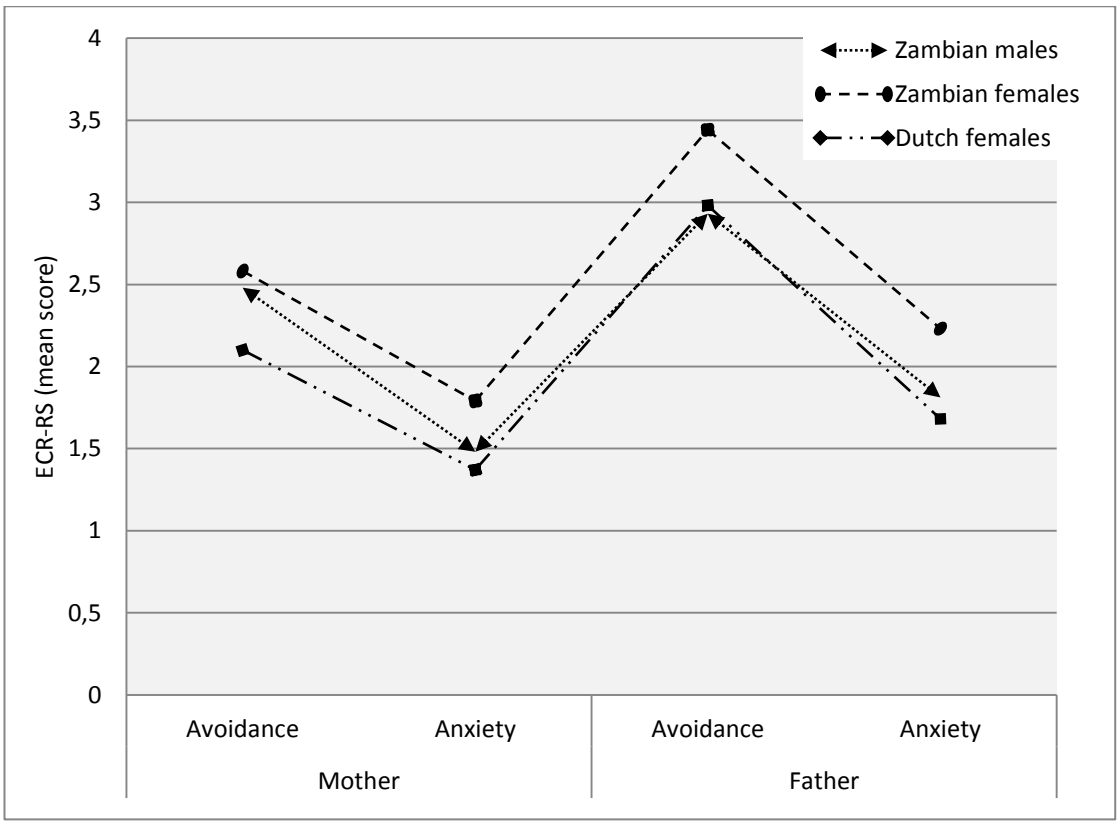
The ANOVA model in Table 5 showed significant differences between the three groups on the *avoidance* domain of the ECR for both mother and father but not on anxiety; *F*(2, 367) = 6.97, *p*<.01 and *F*(2, 353) = 4.90, *p*<.01, respectively. Planned contrasts revealed that Zambian females reported significantly higher levels of *avoidance* to the mother compared to the Dutch females (*t*(218) = -3.30, *p*<.01 but not the Zambian males (see Table 5)). Zambian females also reported significantly higher levels of *avoidance* to the father compared to both Zambian males and Dutch females (*t*(353) = -2.87, *p*<.01 and *t*(353) = -2.41, *p* =.02, respectively). In general, Zambian females reported more *avoidance* to both mother and father, compared to the Zambian males and Dutch females*(*see Figure 3*).*This was not the case with *anxiety* to both the mother and father.

Table 5: ANOVA table showing the domains of the ECR on the 'nationality by gender' groups and contrasts

		Zambian males	Zambian females	Dutch females	
		M (SD)	M (SD)	M (SD)	*F*
Mother	Avoidance	2,48 (1,04)[a]	2,58 (1,37)[a]	2,1 (1,04)[b]	6,97**
	Anxiety	.10 (.21)	.15 (.26)	.09 (.17)	2.43
Father	Avoidance	2,93 (1,37)[a]	3,44 (1,45)[b]	2,98 (1,29)[a]	4,9**
	Anxiety	.17 (.25)	.21 (.31)	.15 (.23)	2.39

Note: ** $p<.01$; * $p<.05$. $356 < n < 371$: Table based on transformed data.

Figure 5: *Nationality by gender* outcomes on the ECR



Note: Figure based on untransformed data.

Among the three groups, avoidance to the mother was significantly and positively related to anxiety to the mother and avoidance to the father was also significantly and positively related to anxiety to the father. There was a moderate yet significant relationship between anxiety to the father and anxiety to the mother. There was also a weak to moderate positive relationship between anxiety to the father and avoidance to the father, but only significant for the Dutch subjects (Table 6)

Table 6: Summary correlations between the two domain of the ECR for both mother and father

			Avoidance(mother)	Anxiety(mother)	Avoidance(father)
Zambian males	Mother	Avoidance	-		
		Anxiety	.49**	-	
	Father	Avoidance	.28*	.11	-
		Anxiety	.23	.26*	.56**
Zambian females	Mother	Avoidance	-		
		Anxiety	.57**	-	
	Father	Avoidance	.31**	.09	-
		Anxiety	.10	.25**	.53**
Dutch females	Mother	Avoidance	-		
		Anxiety	.63**	-	
	Father	Avoidance	.36**	.18*	-
		Anxiety	.25**	.38**	.62**

Note: ** $p < .01$; * $p < .05$

To assess which variables predicted sib-care among the participants, two hierarchical regression analyses were conducted; one examining predictors when parents were '*at home*' and the other when parents were '*not at home*'. Predictors were entered in the following order: Step 1 included variables on SES; the '*number of younger siblings'* participants had and *family composition*, Step 2 included the background variables '*nationality*' and '*gender*'. Step 3 included the attachment variables on the 2 domains of the '*ECR' (see Table 7a and 7b)*.

Results from the hierarchical regression analysis predicting sib-care when parents are '*at home*' (Table 4a.) showed that the first model significantly predicted sib-care. *Family composition* was positively and significantly associated with sib-care. When parents were *at home*, family composition (the number of people in a family) significantly predicted the amount of caregiver participants performed ($\beta = 0.29$, $p < .01$). Participants who came from larger families performed more sib-care when parents were '*at home'*. The second model also significantly predicted sib-care. When *nationality* and *gender* were added, the model still significantly predicted sib-care, accounting for 36% of the total variability in sib-care by participants ($R^2 = .36$, $p < .01$). In the second model, it was the *number of younger siblings* and *nationality, not family composition,* that significantly predicted sib-care. Adding the scales of the ECR in the third model did not significantly increase the predictive power of the model and only accounted for a 1% increase in the explained variance of sib caregiving. Overall, *nationality* appeared to be the strongest predictor of sib caregiving when parents were '*at home*' with Zambian participants performing more sib-care than their Dutch peers (Table 4a).

Table 7a: Results of hierarchical regression predicting sib-care with various background variables and ECR scales (*parents at home*)

	Model 1			Model 2			Model 3		
	B	SE	β	*B*	SE	B	*B*	SE	β
SES	-.06	.23	-.02	-.06	.19	-.01	-0.06	0.20	-0.02
Younger sibling(s) (*n*)	.17	.19	.16	.30	.16	.10*	0.27	0.16	0.10
Family composition (*n*)	.40	.09	.29**	.05	.08	.04	0.04	0.09	0.03
Nationality				-3.45	.37	-.58**	-3.42	0.37	-0.57**
Gender				.21	.39	.03	0.15	0.40	0.02
ECR Avoidance (mother)							0.03	0.17	0.11
ECR Anxiety (mother)^{LG}							0.77	0.98	0.06
ECR Avoidance (father)							0.08	0.16	0.04
ECR Anxiety (father)^{LG}							-0.23	0.81	-0.02
R^2	**.10****			**.36****			**.36**		
Δ R^2	**.10**			**.26**			**.01**		
***F* change**	**8.34**			**47.77**			**.43**		

Note: * *p*< .05. **p*< .01: β - standardized regression coefficient: ^{LG} = log transformed variable: Sex (0 = male, 1 = female): SES = Socio-economic Status

When parents were '*not at home'*, the first model of the regression significantly predicted sib-care, accounting for 6% of the variability in sib-care, attributed to *family composition* ($\beta = 0.19$, $p < .01$). Adding *nationality* and *gender* in the second model significantly increased the prediction power to account for 32% of the variability in sib-care. In the second model, it was the *number of younger siblings*, *nationality* and *gender* that significantly predicted the total amount of sib-care that participants performed ($R^2 = .32$, $p < .01$). Adding the scales of the ECR in the third model did not significantly increase the predictive power of the model and only accounted for a 1% increase in the explained variance of sib-care. Overall, when parents were '*not at home*'; the *number of younger siblings*, *nationality* and *sex* seemed to be the unique predictors of sib-care. Zambian participants performed more sib-care. Participants with more younger siblings performed more sib-care and females performed more sib-care than males (see Table 4b).

Table7b: Results of hierarchical regression predicting sib-care with various background variables and ECR scales (*parents not at home*).

	Model 1			Model 2			Model 3		
	B	SE	β	*B*	SE	β	*B*	SE	β
SES	-0.37	0.27	-0.09	-0.37	0.23	-0.09	-0.38	0.24	-0.09
Younger sibling(s) (*n*)	0.33	0.22	0.10	0.57	0.19	0.18**	0.56	0.20	0.17**
Family composition (*n*)	0.31	0.11	0.19**	-0.71	0.10	-0.04	-0.64	0.11	-0.40
Nationality				-4.06	0.44	-0.59**	-3.98	0.45	-0.58**
Gender				1.29	0.48	0.16**	1.27	0.48	0.16**
ECR Avoidance (mother)							0.15	0.21	0.06
ECR Anxiety (mother)^{LG}							-0.29	1.16	-0.02
ECR Avoidance (father)							0.05	0.19	0.02
ECR Anxiety (father)^{LG}							0.71	0.97	0.06
R^2	**.06****			**.32****			**.33**		
Δ R^2	**.06**			**.26**			**.01**		
***F* change**	**5.14**			**42.27**			**0.72**		

Note: * *p*< .05. **p*< .01: β standardized regression coefficient: ^{LG} = log transformed variable: Sex (0 = male, 1 = female). SES = Socio-economic Status

A hierarchical regression analysis for the 3 nationality by gender groups (*parents at home*; Tables 8a, 8b) revealed that models 1 & 2 were not significant predictors of sib-care for both Zambian males and females respectively but that model 1 significantly predicted total sib-care among the Dutch females (R^2 = .27, *p*< .01) (Table 8c). Among the Dutch females, participants with more *younger siblings* tended to perform more sib-care (β = -0.51, p <.01). This was not the case with Zambian participants. SES did not significantly predict caregiving. When parents were *not at home*, model 2 was significant for Zambian (R^2 = .13, *p*< .05) and Dutch females (R^2 = .17, *p*< .01) (Tables 8b, 8c). Among the Zambian females, anxiety towards the father was a significant predictor of sib-care (β = -0.17, p <.05). Females with higher levels of anxiety towards the father tended to perform less sib-care. Among the Dutch females, the *number of younger siblings* was a significant predictor of sib-care (β = -0.41, p <.01). Dutch females with more *younger siblings* tended to perform more sib-care when parents when not at home.

Table 8a: Hierarchical Regression predicting sib-care (parents *at home*) with background variables and ECR scales for Zambian males.

	Model 1			Model 2		
	B	SE	β	*B*	SE	β
SES	.23	.36	.09	0.16	0.37	0.06
Younger sibling(s) (*n*)	-.01	.23	-.03	-0.04	0.24	-0.02
ECR Avoidance (mother)				-0.29	0.37	-0.14
ECR Anxiety (mother)^{LG}				-0.76	1.86	-0.07
ECR Avoidance (father)				-0.11	0.30	-0.07
ECR Anxiety (father)^{LG}				1.27	1.75	0.14
R^2	**.01**			**.05**		
Δ R^2	**.01**			**.04**		
***F* change**	**.25**			**.47**		

Note: * $p < .05$; ** $p < .01$. β - standardized regression coefficient. Sex (1 = male, 2 = female); SES = Socio-economic Status; LG = log transformed variable

Table 8b: Hierarchical Regression predicting sib-care (parents *at home*) with background variables and ECR scales for Zambian females.

	Model 1			Model 2		
	B	SE	β	*B*	SE	β
SES	-.31	.32	-.01	-0.38	0.34	-0.12
Younger sibling(s) (*n*)	.03	.22	.01	-0.06	0.24	-0.03
ECR Avoidance (mother)				0.18	0.27	0.10
ECR Anxiety (mother)^{LG}				0.78	1.39	0.09
ECR Avoidance (father)				0.08	0.26	0.05
ECR Anxiety (father)^{LG}				-0.03	1.18	0.00
R^2	**.01**			**.04**		
Δ R^2	**.01**			**.03**		
***F* change**	**.49**			**.76**		

Note: * *p*< .05; ***p*<.01. β - standardized regression coefficient. Sex (1 = male, 2 = female); SES = Socio-economic Status; LG = log transformed variable

Table 8c: Hierarchical Regression predicting sib-care (parents *at home*) with background variables and ECR scales for Dutch females.

	Model 1			Model 2		
	B	SE	β	*B*	SE	β
SES	.24	.25	.09	0.30	0.26	0.11
Younger sibling(s) (*n*)	1.49	.27	.51**	1.42	0.27	0.49**
ECR Avoidance (mother)				-0.09	0.24	-0.05
ECR Anxiety (mother)^{LG}				2.87	1.72	0.24
ECR Avoidance (father)				0.29	0.23	0.17
ECR Anxiety (father)^{LG}				-1.50	1.31	-0.17
R^2	**.27****			**.31**		
Δ R^2	**.27****			**.04**		
***F* change**	**16.14****			**1.16**		

Note: *p< .05; **p<.01. β - standardized regression coefficient. Sex (1 = male, 2 = female); ; SES = Socio-economic Status; LG = log transformed variable

Table 9a: Hierarchical Regression predicting sib-care (parents *not at home*) with background variables and ECR scales for Zambian males

	Model 1			Model 2		
	B	SE	β	*B*	SE	β
SES	-1.22	.50	-.33*	-1.25	.51	-.34*
Younger sibling(s) (*n*)	.08	.31	.04	.02	.32	.01
ECR Avoidance (mother)				-.24	.45	-.09
ECR Anxiety (mother)^{LG}				-.57	.27	-.04
ECR Avoidance (father)				-.60	.39	-.27
ECR Anxiety (father)^{LG}				3.58	2.27	.29
R^2	**.12**			**.19**		
Δ R^2	**.12**			**.70**		
***F* change**	**3.17**			**.97**		

Note: * $p < .05$; ** $p < .01$. β - standardized regression coefficient. Sex (1 = male, 2 = female); ; SES = Socio-economic Status; LG = log transformed variable

Table 9b: Hierarchical Regression predicting sib-care (parents *not at home*) with background variables and ECR scales for Zambian females.

	Model 1			Model 2		
	B	SE	β	*B*	SE	β
SES	-.13	.37	-.04	-.09	0.37	-0.02
Younger sibling(s) (*n*)	.37	.25	.15	.41	0.26	0.17
ECR Avoidance (mother)				.08	0.31	0.04
ECR Anxiety (mother)^{LG}				-.95	1.57	-0.09
ECR Avoidance (father)				.74	0.29	0.38
ECR Anxiety (father)^{LG}				-1.57	1.30	-0.17*
R^2	**.03**			**.13**		
Δ R^2	**.03**			**.10***		
***F* change**	**1.24**			**2.60***		

Note: * $p < .05$; ** $p < .01$. β - standardized regression coefficient. Sex (1 = male, 2 = female); ; SES = Socio-economic Status; LG = log transformed variable

Table 9c: Hierarchical Regression predicting sib-care (parents *not at home*) with background variables and ECR scales for Dutch females.

	Model 1			Model 2		
	B	SE	β	*B*	SE	β
SES	.29	.33	.09	0.23	0.34	0.07
Younger sibling(s) (*n*)	1.39	.34	.41**	1.41	0.35	0.42**
ECR Avoidance (mother)				0.13	0.34	0.05
ECR Anxiety (mother)^{LG}				0.60	2.28	0.04
ECR Avoidance (father)				-0.08	0.30	-0.04
ECR Anxiety (father)^{LG}				2.06	1.69	0.19
R^2	**.17****			**.22**		
Δ R^2	**.17****			**.05**		
***F* change**	**8.80**			**1.19**		

Note: * $p < .05$; ** $p < .01$. β - standardized regression coefficient. Sex (1 = male, 2 = female); SES = Socio-economic Status; LG = log transformed variable

The overall regression models showed that attachment did not significantly predict sib-care among the participants both when parents were *at home* and when they were *not at home* (Tables 7a, 7b). Specifically, only among Zambian females did attachment predict sib-care. Those female participants that reported higher levels of anxiety towards their fathers performed less sib-care compared to their counterparts (see Table 9b).

4.2.2 Parental investment and Infant-caregiver attachment

As already stated, this phase aimed at examining the cultural, socio-economic and demographic predictors of parental investment and infant-caregiver attachment in Zambia. In this section, findings on the predictors of parental socio-emotional and cognitive investment in the home environment are reported. Infant-mother and infant-sibling attachment is also reported

4.2.2.1 Preliminary analyses

Table 10 shows the correlations between all variables included in this study. The three SES variables were significantly but only moderately inter-correlated, and showed significant negative relations with *number of children*. *Maternal education* and *HPI* were also significantly and negatively associated with *individualism*, and positively with observed maternal *social-emotional investment*, *cognitive stimulation* and *learning materials*. Mothers with higher tendencies to use *religion in child rearing* reported higher levels of *collectivism*, and were observed to have more *learning materials* in the home. Finally, mothers reporting more *collectivism* were observed to provide more *social-emotional support* to their children.

Table 10: Correlation matrix of various predictor and outcome variables.

		1	2	3	4	5	6	7	8	9	10
1	Education	-									
2	Income	.26**	-								
3	HPI	.47**	.27**	-							
4	Number of children	-.36**	-.24*	-.23*	-						
5	Collectivism	.19	-.02	.14	-.11	-					
6	Individualism	-.29**	-.17	-.29**	.19	.07	-				
7	Religion in childrearing	.21	-.06	.15	.01	.34**	-.05	-			
8	Socio-emotional support	.31**	-.12	.22*	-.12	.22*	.15	-.01	-		
9	Learning materials	.32**	.10	.40**	-.07	-.06	-.08	.24*	.11	.82**	-
10	Involvement	.06	.12	.29**	-.13	.04	.02	-.06	.11	.82**	.36**

Notes: * p < .05, ** p <.01; HPI – Home Possessions Index

4.2.2.2 Predictors of parental investment

To examine the independent predictive value of the cultural, socioeconomic and demographic factors in relation to the observations of the quality of the home environment, we conducted hierarchical multiple regression analyses. The first block of variables in the regression models included socio-economic and demographic variables (education, income, the HPI and number of children*)*. The second block consisted of cultural values (collectivism, individualism and religion in child rearing). The results of these analyses are presented in Table 11.

Table 11: Independent predictors of parental socio-emotional support; learning materials and parental involvement.

	Socio-emotional support		Learning Materials		Involvement	
	β	SE	*β*	SE	*β*	SE
Block 1: Socio-economic						
Education	.30**	.29	.26*	.15	-.01	.17
Income	-.13	.16	.08	.08	.10	.09
HPI	.19	.10	.38**	.05	.31**	.06
Number of children	-.00	.13	-.02	.07	-.11	.08
Block 2: Cultural						
Collectivism	.15	.10	-.27*	.05	-.01	.05
Individualism	.18	.04	.05	.02	.08	.03
Religion in child rearing	-.15	.10	.22*	.10	-.09	.12
	R^2 = .21**		R^2 = .31**		R^2 = .12	

Notes: *p < .05; **p< .01

The hierarchical regression analysis showed that overall, both models were significant for social-emotional support and learning materials but not for parental involvement. Maternal socio-emotional support was significantly predicted by maternal education. The availability of learning materials in the home was predicted by the availability of basic facilities/services in the home (HPI). Both material support and involvement were significantly predicted by the HPI. Material support was also significantly predicted by maternal education, collectivism and the use of religion by parents in childrearing (see Table 11). More material support was provided by mothers from wealthier homes and were more involved in their children's cognitive stimulation. Our findings also showed that mothers with higher levels of education tended to provide more materials in the home environment. Further, mothers with more collectivistic orientations tended to provide less material support compared to their counterparts. The use of religion in child rearing positively predicted material support. The overall model for involvement was not significant.

4.2.3 Infant attachment in Zambia

This study also examined infant-mother and infant-sibling attachment and the findings are reported below

4.2.3.1 Mother-infant attachment classifications.

4.2.3.1.1 *Forced ABC classifications.*

Of the 41 mother-infant dyads the majority was classified as securely attached (59%) according to the forced-classification guidelines, without taking disorganized attachments into account (see Table 13). The forced ABC classification distribution did not differ significantly from the middle class North American norm distribution although one of the frequencies, B classifications seemed to be under represented (standardized residual of -3.5). The distribution also did not significantly deviate from the overall distribution found in other African samples, although in Zambia there tended to be relatively more securely attached dyads and fewer ambivalently attached dyads (see Table 13) than in the rest of Africa. For low SES samples a suitable norm distribution could not be found.

4.2.3.1.2 *Four-way ABCD classifications.*

The distribution of ABCD attachment classifications in Zambia did not significantly differ from the North American middle class norm sample but the percentage of disorganized attachments was almost twice as large in the Zambian case (29% versus 15%). Because the Zambian sample was from a low socio-economic background comparison with the low SES North American norm distribution is was more relevant because the demographic characteristics were more similar. Again, there was no significant difference in distributions, and moreover no single classification (A, B , or C) seemed to deviate from the norm group (see Table 13). The Zambian sample did significantly differ, however, from the only other African sample for which the whole spectrum of attachment classifications was

assessed, namely the Mali sample (True et al., 2001), with much more avoidantly attached infants and less securely attached infants in the Zambian case (True et al., 2001).

4.2.3.2 Sibling-infant attachment classifications.

4.2.3.2.1 *Forced ABC classifications.*

Of the 43 sibling-infant dyads attachments, a minority (42%) were classified as insecurely attached which significantly deviated from the North American norm group. Significantly more sibling-infant dyads were classified as insecure-ambivalently attached. When only those sibling-infant dyads who were rated as definitely attached (n = 31) were taken into account, the distribution of attachment classifications did not differ significantly from the distribution in the total group, and the deviation from the norm group remained highly significant (see Table 13). The sibling-infant distribution did not differ from the African mother-infant forced distribution.

4.2.3.2.2 *Four-way ABCD classifications.*

The distribution of ABCD sibling-infant attachment classifications in Zambia was significantly different from the North American norm group, and again disorganized attachment was over represented whereas secure attachments were under represented (see Table 13). Compared to the African ABCD sample, the sibling-infant attachment distribution was significantly different, with more avoidantly attached and securely attached infants, and less disorganized attachments. Teen mothers might be more similar to sib caretakers in terms of age and SES, so we compared the distribution of North American teen mother attachments with the Zambian sibling-infant distribution. The overall distributions were not significantly different although we found less avoidantly attached sibling-infant dyads and more disorganized attachments (see Table 13).

4.2.3.3 Comparing mother-infant and sibling-infant attachment.

The distributions of mother-infant and sibling-infant attachment forced and four-way classifications did not differ significantly (X^2 (2) = 3.72, p = .16 and X^2 (2) = 1.47, p = .69, respectively). In Table 11 we cross-tabulated mother-infant and sibling-infant attachment (n = 84) and we did not find a correspondence of attachment quality within the same family. Computing correlations between the continuous security scale derived from the mother-infant SSPs and that of the sibling-infant SSPs we did not find significant associations. Attachment seemed to be a characteristic of the dyad and not similar for each relationship of the infant. Taking into account only the sibling-infant classifications coded for dyads who appeared to be attached without much doubt, the same findings emerged.

Table 12: Cross-tabulation (*with X^2 statistic*) of mother-infant and sibling-infant attachment classifications

	Classification	Mother (n)	Sib (n)	X^2
Attachment classification (3 way)	Avoidant	10	10	.16
	Secure	24	18	
	Ambivalent/resistant	7	15	
Attachment classification (4 way)	Avoidant	8	10	.69
	Secure	19	15	
	Ambivalent/resistant	2	4	
	Disorganized	12	14	

Table 13

Distributions (Frequencies, Percentages and Standardized Residuals) of Norm American and Zambian SSP classifications and Multinomial Tests for the Comparison with the Norm Group

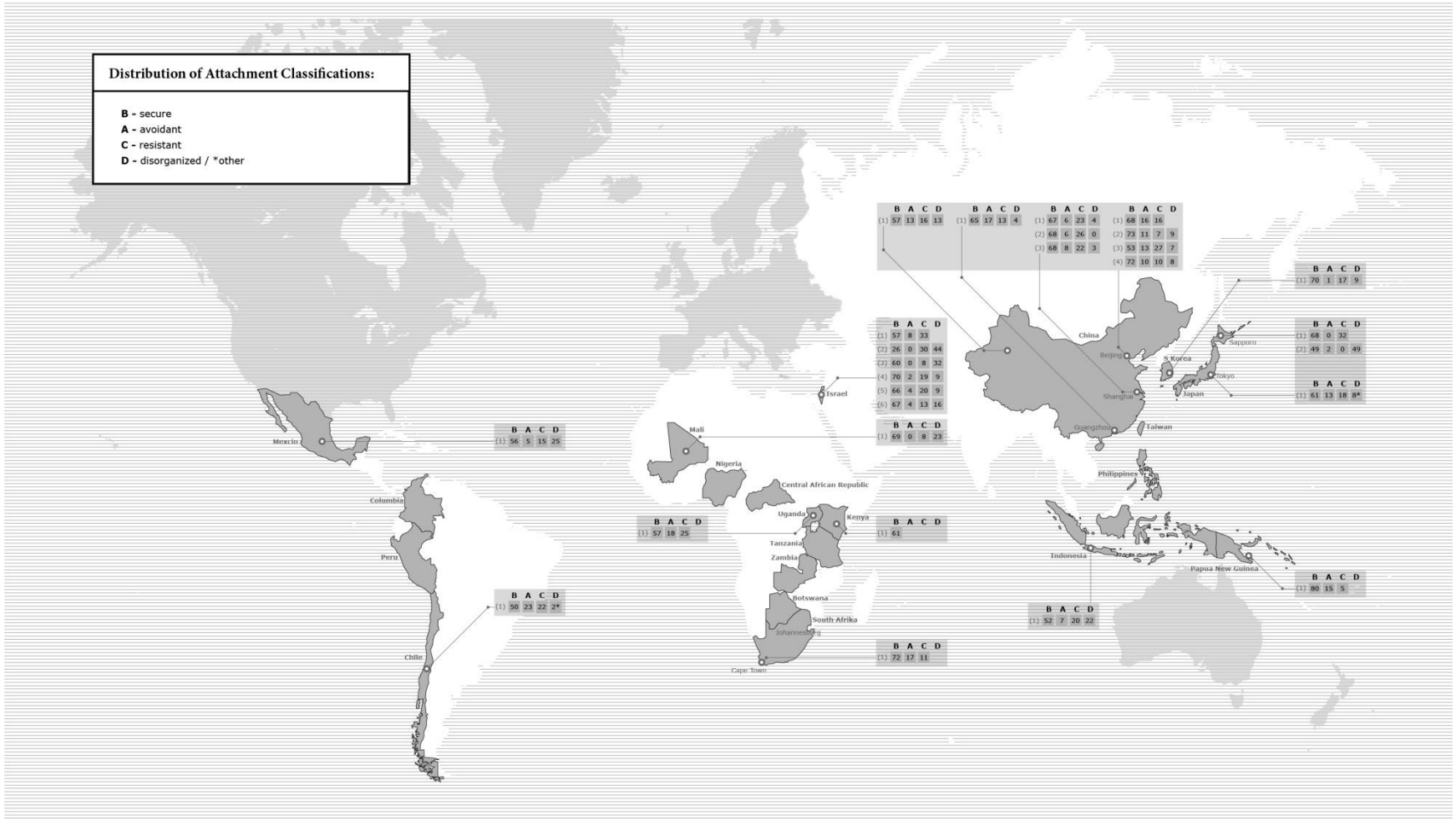
	Three-way					Four-way					
		A	B	C	χ^2		A	B	C	D	χ^2
	N	%	%	%		*N*	%	%	%	%	
North American norm sample	1584	325	1062	197		306	70	168	23	45	
		(21%)	(67%)	(12%)			(23%)	(55%)	(7%)	(15%)	
Attachment to mother	41	10	24	7		41	8	19	2	12	
		(24%)	(59%)	(17%)	1.54		(20%)	(46%)	(5%)	(29%)	6.60
		1.4	-3.5**	2.1			-1.4	-3.6**	-0.9	5.9**	
Attachment to siblings	43	10	18	15		43	10	15	4	14	
		(23%)	(42%)	(35%)	22.93**		(23%)	(35%)	(9%)	(33%)	12.33**
		1.0	-10.8**	9.8**			0.1	-8.7**	1.0	7.6**	
Attachment to siblings (att score 4-5)	31	4	15	12		31	4	12	4	11	
		(13%)	(48%)	(39%)	21.00**		(13%)	(39%)	(13%)	(36%)	13.09**
		-2.5*	-5.8**	8.3**			-3.1	-5.1**	1.8	6.4**	
North American norm low SES						586	97	282	60	147	

							(17%)	(48%)	(10%)	(25%)	
Attachment to mother	41	10	24	7		41	8	19	2	12	
		(24%)	(59%)	(17%)	1.54		(20%)	(46%)	(5%)	(29%)	1.55
							1.0	-0.7	-2.1	1.8	
African norm sample	142	26	68	48		26	0	18	2	6	
		(18%)	(48%)	(34%)			(0%)	(69%)	(8%)	(23%)	
Attachment to mother	41	10	24	7		41	8	19	2	12	
		(24%)	(59%)	(17%)	5.33		(20%)	(46%)	(5%)	(29%)	146.20**
		2.6	4.3	-6.9			7.6	-9.0	-1.2	2.7	
North American norm teen mothers						282	93	113	10	66	
							(33%)	(40%)	(4%)	(23%)	
Attachment to siblings	43	10	18	15		43	10	15	4	14	
		(23%)	(42%)	(35%)	22.93**		(23%)	(35%)	(9%)	(33%)	6.25
							-4.2**	-2.2	2.3	4.1	

African norm sample	142	26	68	48		26	0	18	2	6	
		(18%)	(48%)	(34%)			(0%)	(69%)	(8%)	(23%)	
Attachment to siblings	43	10	18	15		43	10	15	4	14	
		(23%)	(42%)	(35%)	1.01		(23%)	(35%)	(9%)	(33%)	224.26**
		2.3	-2.6	0.4			9.6	-14.4	0.6	4.2	

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

Figure 6: A global overview of attachment distributions (excluding the North America, Europe and Australia)



Adapted from Mesman, Van IJzendoorn & Sagi-Schwartz (in press)

CHAPTER FIVE

5.0 DISCUSSION

In this chapter the research findings of the this study are discussed. This chapter is presented in four parts. The first section presents a synopsis of the major findings of the two phases of the study. The second and third part of this section will focus on the discussions of the findings in the separate phases. Finally, a general conclusion of the overall findings will be made.

5.1 Overview

The general objective of this study was to examine sib-care in Zambia and the Netherlands by studying its prevalence and extent and the socio-cultural and socio-emotional factors associated with it. This study also sought to examine the factors that predict parental socio-emotional and material investment and involvement in the home. Finally, this study explored infant attachment in Zambia by examining infant-mother and infant-sibling attachment patterns, the latter, to the best knowledge of the author, a task not yet undertaken in developmental science.

Our findings revealed that Zambian participants performed more sib-care than the Dutch participants both when parents were *at home* and when parents were *not at home*. Females performed more sib-care than males and Zambian females performed more sib-care than both Zambian males and Dutch females. Although the Zambian subjects came from larger families i.e. had significantly more younger siblings than the Dutch subjects, the results showed that the number of younger siblings one had did not really influence the amount of sib-care one performed. Attachment related avoidance and anxiety were not significant predictors of the amount of sib-care performed by an individual. Further, our findings showed that socio-economic and cultural variables are associated with levels of

parental investment in different domains. Higher-educated mothers who lived in 'wealthier' homes and embraced the use of religion in child rearing tended to provide more learning materials to their children. The findings also showed that the social-emotional support was best predicted by maternal education. In addition, the study found that the majority of infants in sample were securely attached to both their mothers and siblings, a pattern similar to most African and Western middle class norm samples, with some variations on specific classifications. There was nonetheless no concordance of attachment quality between the infant-mother and infant-sibling dyads within the same family.

5.2 Sib-care: A cross-national examination between Zambia and the Netherlands

In trying to study the cultural differences in sib-care, overall the results showed that Zambian participants performed more sib-care, compared to the Dutch. This study made an explicit distinction between sib-care performed when parents were *at home* and when parents were *not at home*. Zambian participants performed significantly more sib-care on all the sib-care activities except *playing* with the child, both when the parents were *at home* and when they were *not at home*. This finding is compatible with other cross cultural findings on care that have shown that in there is more participation in child care in collectivistic societies compared to individualistic - a distinction comparable to Zambia and the Netherlands, respectively. This could be explained by the hypothesis that in more collectivistic societies child participation in child care is perceived as an obligation while in more individualistic societies children participating in household chores might ask for payment or other forms of compensation (Miller, 2005). This is also evidenced by the responses of Dutch 'last born' participants who stated that the care they provided was out of obligation rather than voluntary. This notion could well explain why *playing*, of all the activities, seemed to be performed equally by both groups because conceptually playing would not qualify as a 'work' construct.

5.2.1 Complementary vs Replacement sib-care

The notion of sib-care itself has not been without controversy. For a long time, and perhaps because of the paucity of research in the area, there has been a tendency of 'lumping' the outcomes of what can be termed as complementary vis a vis replacement sib-care into one 'pot'. Complementary sib-care entails the additional participation in sib-care - the expected involvement of older siblings under adult supervision in the home context. Contrary, replacement sib-care is the involvement or indeed 'taking over', in child care, by older siblings in contexts where parental care is diminished or indeed impossible e.g. sickness, death, abandonment. Studying sib-care without making this important distinction between these two constructs has resulted in inaccurate findings and effect sizes. For instance there is a danger of reporting inflated amounts of sib-care in a 'complementary' context when in actuality the sample involved was derived from a 'replacement' context such as sib-care in the context of HIV/AIDS and child headed households. The impact of complementary versus replacement sib-care on the siblings as well as on the sib-caretakers might well be very different. There is therefore a need to disentangle and contextualize sib-care.

5.2.2 Gender

In examining the gender dynamics embedded in sib-care our analyses showed that females indeed performed more sib-care than males. These findings are compatible with several studies conducted within the discourse of child care in general (Zukow-Goldrin, 2002; Bray, 2009; Miller, 2005) and sib-care in particular (Evans, 2012) and tends to uphold the assertion that this results from gendered expectations of girls' responsibilities for domestic work and constructions of care – the belief that girls should be socialized to take over the *mothering* responsibility. Our findings further support this assertion by showing that girls performed more sib-care when parents were *not at home* compared to when parents were *at home.* This suggests that when parents are *not at home* girls are more

likely to assume the 'mothering' role in the home, compared to boys. Overall, there was more sib-care performed by both genders when parents were *not at home* than when parents were *at home* suggesting that in the absence of parents, children assume more responsibility over their younger siblings. Similar findings have been replicated in studies on child and youth headed households but this domain was beyond the scope of the current study.

5.2.3 Family constellations

Dutch participants came from smaller families and had fewer younger siblings than the Zambian participants. This was of course to be expected considering the Western and non-Western demographics (non-Western societies have larger [nuclear] family sizes) and the dichotomy of individualism and collectivism (Triandis, 1994), respectively (non-Western societies live in the context of larger [extended] families). The findings showed that participants from larger families and with more younger siblings performed more sib caregiving than their counterparts. This is to be expected considering that the larger the number of one's siblings, the more work is performed in taking care of them. It also appears that growing up in a home with more people entails more work which includes caring for younger siblings. What is interesting to note in the regression analyses is that family composition always appeared as a significant predictor of sib caregiving in the first model but not the number of younger siblings, the latter always appearing as a significant predictor in the second model and even in the third when parents were *not at home*. It might be that this interplay is a result of the relationship between the number of younger siblings and family composition ($r = .32$, $p < .001$) but this association is not strong enough to explain the alternating roles of these predictors. Most importantly, even adjusting for number of siblings the sib-care differences we found between gender groups and between countries still emerged.

5.2.4 Attachment and culture

There is some evidence that individualism and collectivism are related to differences in attachment. Attachment avoidance scores were significantly higher in the Zambian sample compared to the Dutch sample but anxiety scores were not. Zambian female participants reported more avoidance, compared to both Zambian males and Dutch females, to the father but did not differ on avoidance to the mother when compared to Zambian males. These findings suggest that Dutch subjects felt more secure, on average, compared to the Zambian participants. These findings seem not to match with what has been found in some cross-cultural studies which suggest that subjects in more individualistic societies report being more 'avoidantly' attached than those in more collectivistic societies (Schmitt et al., 2004, Frias, et al, 2014). A possible explanation here is that the absence of male participants in the Dutch sample may have affected the outcome. It is also possible to speculate that the instrument used to measure attachment in our 'young adult' sample assessed was more tailored towards Western samples.

Phase one of this study further explored the relationship between attachment and sib-care. The study focused on the attachment of the care-giver/provider and not that of the care-seeker – the latter which has been the focus of most work on attachment, especially attachment in infancy. In the current study, none of the attachment domains significantly predicted sib-care after controlling for some other pertinent differences between the participants. Regardless of whether participants reported higher/lower avoidance/anxiety, the amount of sib-care provided did not change. This was regardless of whether parents were *at home* or *not at home.* A number of studies that have focused on care have supported the hypothesized link between secure attachment and the provision of more care suggesting that securely attached individuals tend to provide and receive more sensitive care and social support (Frias et al, 2014; Feeney and Hohaus, 2001; Waters et al, 2013; & Belsky and Fearon, 2002). This finding maybe merged because the current study

focused on the quantity of sib-care, not the quality. It might suffice to suppose that attachment might affect the *quality* of sib-care but not the *quantity*, as has been shown in other studies focusing on quality of care in adults (e.g. Frias et al, 2014; Waters et al, 2013; & Belsky and Fearon, 2002).

5.3 Parental investment and Infant-caregiver attachment

In this phase, the study first sought to examine the factors that predict parental socio-emotional and material investment and parental involvement. Based on literature within and across cultures and disciplines (e.g. Bradley & Corwyn, 2005, Cárcamo et al., 2014; Conger et al., 2007; Fernald et al., 2011; Oakes & Rossi, 2003 etc.), it was hypothesized, that higher-SES would be associated with more socio-emotional and material parental investment and involvement in the home environment. In addition, the study sought to explore the use of contextually appropriate SES measures. Secondly this study sought to explore infant attachment in Zambia by examining infant-mother and infant-sibling attachment patterns. To this effect, the following hypotheses were stated. It was hypothesized, based on the normativity hypothesis, that infant attachment in Zambia exists and the majority of children would be classified as securely attached to both their mothers and siblings. It was also hypothesized that there would be no relationship between infant-mother and infant-sibling attachment patterns i.e. children's attachment patterns to the mother would not be related to their attachment patterns to their older siblings.

5.3.1 Predictors of parental investment in the home

5.3.1.1 *Culture and religion*

Parental social-emotional investment was not predicted by cultural or religious orientation. However, collectivism and the use of religion in child rearing significantly predicted the availability of learning materials in the home. Less collectivistic homes tended to provide more learning materials than their more collectivistic counterparts. It may seem

plausible here that less collectivistic homes may have had smaller family sizes, a notion associated with this type of cultural orientation, and therefore the availability of more resources that could be used to acquire learning materials for the child. This interpretation is made with caution however, as we did not measure family size. It is also possible that higher-SES homes had lower collectivistic tendencies (a notion supported by literature) and more learning materials in the home.

Mothers who relied more on religion to rear their children tended to provide more learning materials than mothers that used religion less. This finding supports some literature which has shown that more religious parents make higher investments in parenting (Pearce & Axinn, 1998). This is done in several ways, including religious books that religious parents read. It is possible that in the process of acquiring the many 'Christian' (all the participants were Christian) resources like books and other resources like instructive audio material for religious purposes, these parents will also acquire materials like books and other stimulating resources that their children will use. Other studies have also found that more religious homes provide contexts that foster higher academic achievement (Milot & Ludden, 2009), which may show that mothers that use religion more to raise their children provide more cognitive stimulation to their children. Interestingly, this effect of religion on learning materials has been found to be stronger in low-income communities, compared to more affluent communities (Regnerus & Elder, 2003) which could explain why in the current setting, this relationship is evident.

5.3.1.2 *Socioeconomic status*

Our findings showed that higher maternal education was related to material investment but not parental involvement. A higher Home Possessions Index (HPI) was related to higher levels of both material investment and parental involvement in the home. These findings fit well into the context of the theoretical models of the Family Stress and

Family Investment Models (Donellan et al., 2007) which argue that parental stress, often resulting from economic hardships affects parenting behaviours leading to non-optimal child outcomes; and that economically stable contexts lead to parental investment in goods and services (e.g. books, education, extracurricular activities) which results in optimal child outcomes, respectively. These findings are also in line with previous research that has shown that high-SES mothers are more supportive of their children than low-SES mothers (Bornstein, et al, 2014, Hart & Risely, 1992, Kelly et al, 1993). Low-SES samples tend to show non-optimal levels of investment in the home environment (Bradley & Corwyn, 2005, 2002; Oakes & Rossi, 2003). Consistent with this notion, studies in Africa (Barbarin & Khomo, 1997) and other non-Western countries (Cárcamo et al., 2014) have shown that much of the variability in the quality of the child's environment can be explained by socio-economic variables.

Related to our third hypothesis, the results showed that in Zambia, the measurement of home possessions was a better predictor of parenting investment than income and maternal education, with the HPI consistently predicting material investment and involvement, but household income not relating to any of the three parental investment outcomes measured. This may be explained by the different meanings of income and home possessions in the context of Zambia. For example, two families with quite different income levels might both live in an area without running water or a tarred road. A higher income does not do much towards obtaining those facilities if the locality simply is not serviced with these resources. Thus, the (dis)comforts of daily living circumstances and potentially stress levels, depend more on the availability of such facilities than on the family's income. This therefore makes it easier for individuals to distinguish their wealth levels with things they have control over, more than the things they don't have control over. Only if a household's wealth levels become significantly different from what is normative in their locality, is it feasible for a family to opt to move to a better

state-serviced locality. It seems plausible therefore to suggest that even within contexts of inadequacy, parents can still provide varying investment in their children, which would in turn lead to better developmental outcomes both social-emotionally and even in the school and education setting. Perhaps social-developmental and educational programs targeted at vulnerable communities can be just as successful, if not more successful if they target individual households than communities. At this moment, this generalization can only be made to low income communities but this assertion leaves room for further exploration.

Another reason why household possessions were found to predict parental investment above and beyond the more common SES indicator of maternal education is that the Zambian education system is structured in such a way that technical skills and trades, attributes that enable a distinction between what one can person can do different from the next, are only introduced at the tertiary level of education. This means that even though someone with a secondary level of education is more knowledgeable than the one with only a primary education, the substance of the knowledge that they possess does not necessarily make them more capable of *doing* more than one with a primary education. Thus, the employment that one with primary education can get is similar to that which can be given to the one with a secondary education and therefore education attainment at this level is insignificant in relation to employment. This distinction however changes when an individual has attained a tertiary level education as they can get employed in the civil service, banks etc. It can be speculated that in Zambia, the interplay between education, employment and income starts making a difference at tertiary training. This means therefore that drawing a conclusion on SES within low income samples, in Zambia, based on education alone might not truly reflect the dynamics at play within those SES variations.

5.3.2 Infant attachment

In exploring infant attachment patterns to mothers and siblings, it was found that the Zambian infants had formed attachments to their mothers. All of the children in the sample had formed an attachment to their mother, fitting into a core assumption of the *universality hypothesis* that all infants form an attachment (secure or insecure) to their primary caregiver (Rutgers et al, 2007, Van IJzendoorn & Sagi, 2008) even in a non-optimal context e.g. neglect or abuse (Lyons-Ruth & Jacobvitz, 1999) or parental psychopathology (Bradely, 2000). Of the total (n = 43) infant-sibling dyads, the majority (n = 31) were classified as definitely attached. In addition and consistent with the *universality hypothesis*, the majority of the children were securely attached to both their mothers and siblings. In this study, in both the *forced* and *four-way* attachment classifications, the majority of the children were securely attached to both their mothers and siblings.

The attachment distributions were compared to both an African (where it was available) and a middle-class North American norm distribution (see Table 11). When compared, the Zambian ABC classifications did not significantly deviate from the African norm sample. Comparatively, it should be noted that the Zambian sample appeared to have relatively more securely attached dyads and fewer ambivalently attached dyads. Compared to the North American norm sample, the forced ABC distribution did not significantly differ although there tended to be an under representation of the secure classification.

For the four way ABCD classifications, the Zambian sample did not significantly differ from the African norm sample. It is important to note here that all African attachment studies except one, among the Dogon of Mali (True et al, 2001), have limited their classification to the forced ABC classification. The Dogon study had much fewer avoidantly attached infants and more securely attached infants compared to the Zambian sample. There was no significant deviation of the Zambian sample when compared to the

North American norm sample. However, the representation of the disorganized classification was almost double in the Zambian sample. Because the Zambian sample was from a low SES background, a low SES North American sample was used for comparison. When this was done, the results revealed that there were no significant differences between the two groups.

We also compared the infant-sibling group to the African ABC distribution, as there was no similar norm group that could be used for this purpose. To the best of the author's knowledge, there is no appropriate comparison group for this group as there has never been any study conducted to assess infant attachment to their siblings, within this age range. When compared to the African forced classification distribution the sibling-infant distributions did not differ. For comparison with a North American norm group, the closest comparison group, demographically, was consisting of teenage mothers. These were closer to siblings in terms of age and also in terms of socio-economic status to the Zambian sample. When compared to the North American teen norm group, the infant-sibling dyads significantly deviated from the norm group as significantly more Zambian dyads were classified as ambivalently attached. This was not the case when only the cases classified as definitely attached (n = 31) were compared to the total group. Nevertheless, the deviation still remained significant when this group (n = 31) was compared to the North American teen norm group.

For the four way classification, the sibling-infant dyads were compared to the African ABCD sample (True, Pisani & Oumar, 2001) and it was found that the Zambian sample had more avoidantly and securely attached but less disorganized infants. Because of the demographic similarities the Zambian sibling sample was compared to a North American teen norm sample and it was found that, overall, the distributions were not significantly different although the Zambian sample had fewer avoidant but more

disorganized attachments. Compared to the North American norm group of mothers, there was an over representation of disorganized attachments and an under representation of secure attachments in the Zambian sample.

5.3.2.1 *Mother-infant and sibling-infant attachment*

A comparison of mother-infant and sibling-infant attachment for both the forced ABC and four-way ABCD classifications revealed no association between the attachment relationships within the same family. One plausible explanation is that while the mother might interact in a similar manner with both children, the child also brings something into the attachment relationship which is unique to each child. This means that while the relationship input (from the mother) may be the same, the output, which is a product of the input and the process (the child's temperament) will be different. Indeed studies have shown that there is a relationship between a child's temperament and attachment even though this influence is restricted to the type of insecurity (e.g. van derr Mark, Van IJzendoorn & Bakermans-Kranenburg, 2002, Susman-Stillman et al., 1996).

Another plausible explanation for this finding is that the quality of interaction between a mother and a given child will not necessarily translate into the quality of interaction of that mother and another child, - a finding that has been obtained in several studies. For instance, early in the discourse on attachment, Lamb, Thompson, Gardner & Charnov, 1985) reported that the quality of attachment to the mother is independent of the quality of attachment to the father. Bretherton (1985) ascribed this difference to the differences in the interaction style provided by these attachment figures. In addition, Goosens and Van IJzendoorn (1990) also found that the quality of infant-caregiver attachment was independent for both mothers and fathers. They further reported that even among professional caregivers who cared for more than one child at a given moment,

those professional caregivers did not have similar types of attachment classifications to all infants with whom they were observed.

These findings can also be understood from the vantage point of the attachment models proposed by Van IJzendoorn and his colleagues (1992) in understanding the infant caregiver paradox. According to the model of monotropy, the only infant attachment relationship that matters to the child is that of the mother. This means that there is no necessity for the child to develop non maternal attachment relationships that are similar to that of the mother. Using the hierarchy model which posits that the mother is the most important attachment figure but other caretakers may be considered as secondary attachment figures, it seems meaningful that the quality of attachment that the child would develop to the mother might differ from that developed towards the sibling. This is because, to the child, the mother sits on top of the 'attachment hierarchy' and the quality of (attachment) relationship to her is more important than to all others. This means that even when securely attached to the primary caregiver, the child could 'settle' for an insecure attachment relationship with other caregivers. From the perspective of the model of independence, we can assume that the similarity of attachment between mother and sibling would only be important in the event that both caregivers perform the same functions, which is most instances is not the case. Therefore in the event that the sibling and mother are not performing the 'same' mothering role, there is no need to have similar attachment relationships to the child.

CHAPTER 6

6.0 SUMMARY, CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

This chapter provides a synoptic overview of the study and a conclusion based on the major findings in this study with a focus on the contribution that this study made to the scientific knowledge enterprise. It also highlights important limitations, both methodological and procedural, encountered in this study. Thereafter recommendations and suggestions for future studies are made.

6.1 Summary

As already stated, one of culture's most significant features is parenting (Harkness & Super, 1995) - suggested to be the main reason why people in different cultures, and within cultures, differ from one another (Super et al., 2011) and a powerful instrument for the transmission of values and practices between generations (Nsamenang, 1992). Attachment theory is one of the most significant frameworks within which parenting is understood highlighting the importance of the dyadic interaction that takes place between the 'mother' and child. Cross-culturally, the operationalization of parenting and parenting practices is different. A significant feature of different cultures is the caregiver context – with some cultures having more than one caregiver and others having predominantly one, usually the biological mother. A unique and significant but often overlooked participant in caregiving in the Zambian context is the sibling. Attachment itself, as an interpretation of the quality of the relationship between the mother and child is related to the amount of investment that a parent makes in the home environment of the child. An often used distinction in the study of the investments that mothers make in the development of their children is socio-emotional and cognitive investment.

The primary purpose of this study was to explore parenting and caregiving in Zambia from the perspective of attachment theory. It sought to examine maternal and sibling caregiving in Zambia and to examine the quality of attachments of the infant with the main caregiver and his/her older sibling. It further sought to examine factors that predict maternal investment in terms of socio-emotional support, the provision of learning materials and involvement. Our findings showed that sib-care is prevalent and females performed more sib-care than boys. Our findings further revealed that socio-economic, more than cultural variables are associated with levels of parental investment in different domains with higher socio-economic status predicting more parental investment. Finally this study found that Zambian children do get attached and the majority of were securely attached to both their mothers and siblings, a pattern similar to most African and Western middle class norm samples, with some variations on specific classifications. There was nonetheless no correspondence of attachment quality between the same family pairs i.e. infant-mother and infant-sibling pairs within the same family.

6.2 Conclusion

In conclusion, this study reveals that sib-care is very prevalent, both in Zambia and the Netherlands with more of it in the former. Females perform more sib-care than males and more sib-care is performed when children are alone at home with their younger siblings than when the parents are present. Consistent with the gendered expectation of care, this study also shows that girls are more likely to assume the parenting role in the absence of parents, than boys. Family size does not really predict sib care. This study also shows that attachment related avoidance and anxiety do not influence the amount of sib-care performed and are probably more related to the quality than the quantity of sib-care.

In addition this study contributes to the growing evidence for the effect of socio-economic status on parenting investment and expanding this evidence beyond the Western

context where the majority of studies which examine this relationship have been conducted. This study has shown that it is mostly socio-economic rather than cultural variables are mostly responsible for the variability in parenting investment. This study also emphasizes the importance of context-sensitive measures of SES. This means that parenting programs aimed at enhancing parental investment in the home should also consider providing support at the household level, rather than at community levels to optimize impact

Further, this study reveals that infant attachment is a universal construct and children across the globe will become attachment to one or more attachment figures (maternal or non-maternal), further confirming the universality hypothesis of attachment theory. It also shows that there was no relationship between the quality of attachment between the infant-mother and infant-sibling pair, further shedding light on the multiple caregiver paradox. If infants will become attached, regardless of the caregiver and the quality care provided, it suffices to argue that there is great need to enhance parenting skills within the communities so that when the children do become attached (which they do, regardless), they will become attached to sensitive parents which will lead secure attachment – the gold standard of infant attachment relations.

6.2.1 Contribution to attachment research

This study makes several contributions to both the empirical and theoretical tenets of parenting and attachment research in Zambia , Africa and globally which can be categorized in three: parenting research; Attachment research and science and theory.

Firstly, it adds to the understanding of parenting in Zambia. In Zambia, like in many other countries across the globe, the study of parenting has focused on the mother. Where other dimensions of parenting have been considered, the focus has tended to be biased towards fathers and the role that they play in parenting. Very rarely, as already alluded to,

has the focus of parenting zoomed into the role played by the sibling (Zukow-Goldring, 2002) despite the majority of people in the world growing up among siblings (Dunn, 2007). This study therefore provides, from a unique vantage point, an understanding of the nature and dynamics of parenting in Zambia which can be relatively generalized to other countries, especially within Africa and collectivistic societies.

In addition, a strong reliance on oral traditions in Zambia and most African societies has meant many rich and valuable traditions, including parenting, have gone un-documented for a very long time. In Zambia, much of the knowledge on parenting and parenting practices is based on anecdotal evidence. Most of the time, this has resulted in the loss and potential distortion of the knowledge on parenting as generations evolve and the local culture are influenced by global trends, respectively. This study has provided empirical evidence of the construct of parenting in Zambia. Further, the sample in this study was very unique. Much of the studies that have examined the concept of siblings have tended to focus on participants in their late teens (15 – 18). This study focused on a sample aged between 7 to 13 years, largely ignored in science as potential caregivers. It shows that children are socialized and assume parenting roles and responsibilities far much earlier than previously thought.

Secondly, this study has made a unique contribution to attachment research globally, in many ways. To start with, a snapshot examination of attachment research in Africa reveals a very huge gap in empirical evidence on the continent (see Figure 4). To date, there are only four (4) documented empirical studies on attachment on the whole continent, despite being the cradle of attachment research. This has limited the African representation in attachment research on the global scientific frontier. This study therefore adds to this 'absurdly small' (Van IJzendoorn & Sagi, 2008) number of attachment studies in Africa – a scenario that needs to change sooner than later. In addition, of those four studies

conducted to date, this study becomes the second to have classified attachment using the ABCD classification, after the Mali study (True et al, 2001). This is a huge milestone towards the establishment of African norms in attachment. Furthermore, this study examined a concept not yet studied anywhere before, to the author's best knowledge – infant attachment to its older sibling. While the majority of studies have examined the infant-mother; infant-father; infant-caregiver (professional and otherwise) (e.g. Van IJzendoorn et al., 1992) and even peer (among siblings) (e.g. Fraley & Tancredy, 2011) attachment relationships, this is the only study to date that has addresses the infant-sibling attachment relationship in the context where the sibling acts as a caregiver to the infant.

Finally, this study has contributed to ameliorating the gap in knowledge in science that has existed in the area of parenting and attachment and contributed to theory. The findings of this study have added to the ongoing discourse on parenting and attachment and added a voice to a population that has otherwise been under represented in this domain. In addition to being the first empirical study on attachment in Zambia, this study has also added to the number of attachment studies in Africa and the world. Additionally, this study has also added to the studies that have been conducted on sib-care – a subject in developmental research which has not assumed prominence so far. The findings of this study have also added to parenting and attachment theory. For example the findings of this study have shown that indeed girls are more predisposed to assume the parenting role in the absence of parents, affirming the gendered notion of parenting in parenting research. Further, the findings in this study have shown that there is no concordance in attachment representation between two children of one mother, affirming and further strengthening the multiple caregiver paradox models of monotropy, hierarchy and independence (Van IJzendoorn et al, 1992).

6.3 Limitations

There were a number of limitations to the present study. In examining sib-care, some of the key research tools used were self-report measures. There is a school of thought that argues that observational measures are better than self-report measures, sometimes because of memory loss. However, despite the memory loss that could have potentially risen with time and age, it has also been shown that this does not affect the memory of daily practiced activities (Rabbit & Abson, 1990). It therefore seemed apprpriate to use self-report instruments to collect data on sib-care activities as these are everyday activities, especially among the Zambian sample (Evans, 2012, Yamba, 2005). In making cross-country comparisons in sib-care, because of the few Dutch male participants (n = 5) , we were forced to exclude them from further analysis. It would have been desirable to have included a larger group of males to also make gender comparisons among the Dutch sample. This situation made it difficult to extend the study's generalizability *within* the Dutch sample.

In investigating the factors that predict parental investment, the reliability coefficients for some of the HOME scales (e.g. responsivity and involvement) were not particularly high, although they were similar to or even higher than those found in other samples (Groeneveld, et al., 2011; Linver, et al., 2004). In addition, the use of research tools e.g. the HOME Inventory which were primarily developed for Western societies limited the scope of the contextual milieu that the instrument could tap. For example, in many Zambian homes owning a pet does not necessarily signify acceptance. On the contrary, in more rural and agrarian (which tend to be more superstitious) contexts in Zambia, owning a pet like a cat or an owl might signify witchcraft. It should be pointed out quickly here nevertheless that this is based on anecdotal evidence. It should also be noted that, because the HOME places emphasis on manufactured 'toys', it is possible that homes that used 'non-manufactured' play materials for cognitive stimulation may have been overlooked,

omitting an important aspect of contextual cognitive stimulation that may not necessarily be accounted for. Although we omitted such items when developing the scales, thus enhancing the reliability of the scales, what this did in turn was to reduce the number of items on which the scales were based – a situation that is methodologically undesirable.

In assessing infant-mother and infant-sibling attachment, the time space between the infant-mother and infant-sibling Strange Situation Procedure sessions was at least one month apart to reduce/eliminate memory effects on the child. This however resulted in the loss of participants due to relocation and general fatigue. The result of this was a reduction in the number of infant-mother and infant-sibling family pairs. We did however manage to obtain more that 50% infant-mother/infant-sibling pairs from the total study sample.

6.4 Recommendations

Despite the common knowledge of the existence of sib-care, especially in the African setting and the Zambian setting in particular, there is need for future studies document empirical evidence on the prevalence, extent, and nature of this phenomenon. This is especially important because while anecdotal evidence alludes to the prominence of sib-care within most family structures, the majority of the empirical evidence on sib-care has been documented in the context of crises e.g. child headed households, children living on the streets etc. There is need to explore this phenomenon within 'normal' families. Future research studies should consider the 'complementary-replacement' sib-care contrast and consider reporting findings within the different contexts.

In addition, an examination of the phenomenon of attachment and care across generations would help contextualize care and its transmission. Further, studies focusing on attachment and care should consider not only the quantity of care provided but both quality and quantity of care. From the findings on the prevalence of sib caregiving, it is clear

that this phenomenon is widespread. Consequently, the involvement of elder siblings in child care, especially in institutions should be seriously considered if optimal child development is to be attained.

There is also need for scholars, especially local scholars, to develop and validate or at least adapt research tools that are context sensitive, yet comparable to global variations. Such cultural consideration has been made in some other studies, especially in Africa. For example, Aina and her colleagues (1993) in Nigeria and Holding (2003) in Kenya both adapted the HOME Inventory to obtain credit for certain items there were not being tapped into by the original Inventory. Future studies also need to replicate the use of household possessions as a proxy of SES in other low income samples.

There is a need to conduct more empirical attachment research in Zambia. Being the first empirical study on attachment theory in Zambia, this study reveals inadequacies in multiple domains that can be moderated and even eliminated by conducting more research. Firstly, future research should examine a larger sample and across varying socio-economic backgrounds. This will help provide a clearer picture of the context and also enable the establishment of local norms against which subsequent findings can be compared. Studying attachment relationships only from economically disadvantaged backgrounds, empirically shown to be related to lower parenting quality and even child abuse (Euser, Van IJzendoorn, Prinzie, & Bakermans-Kranenburg; Furman & Lanthier, 2002; Stith et al., 2009)could potentially inflate insecure classifications – a relationship that has been well documented in previous research. Therefore, including samples from relatively stable socio-economic two parent families will help establish a baseline against which to make a determination of Zambian attachment norms.

Based on the current findings, with an over-representation of disorganized attachments, there is also need for agencies (both government and non-governmental) to

institute parenting interventions that are aimed at enhancing the quality of infant-caregiver attachment. Empirical evidence has shown that disorganized attachment is related to several child developmental problems including aggressive and fearful peer relations in early school years; psychopathology during adolescence and difficulty in intimate relationships in adulthood (Lyons-Ruth & Jacobvitz, 2008). To enhance child development therefore, there is urgent need for attachment based parenting interventions to be implemented.

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APPENDICES

APPENDIX 1: STUDY CONSENT FORM

THE UNIVERSITY OF ZAMBIA
DIRECTORATE OF RESEARCH ND GRADUATE STUDIES

Telephone:	290258/	P. O. Box 32379
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HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE

CONSENT FORM

TITLE OF RESEARCH: **INFANT PARENTING AND ATTACHMENT IN ZAMBIA**

REFERENCE TO PARTICIPANT INFORMATION SHEET:

1.Make sure that you read the Information Sheet carefully, or that it has been explained to you to your satisfaction.

2.Your permission is required if tape, audio or video recording is being used.

3. Your participation in this research is entirely voluntary, i.e. you do not have to participate if you do not wish to.

4.Refusal to take part will involve no penalty or loss of services to which you are otherwise entitled.

5.If you decide to take part, you are still free to withdraw at any time without penalty or loss of services and without giving a reason for your withdrawal.

6.You may choose not to answer particular questions that are asked in the study. If there is anything that you would prefer not to discuss, please feel free to say so.

7.The information collected in this session will be kept strictly confidential.

8.If you choose to participate in this research study, your signed consent is required below before I proceed with the interview with you.

VOLUNTARY CONSENT

I have read (or have had explained to me) the information about this research as contained in the Participant Information Sheet. I have had the opportunity to ask questions about it and any questions I have asked have been answered to my satisfaction.

I now consent voluntarily to be a participant in this project and understand that I have the right to end the interview at any time, and to choose not to answer particular questions that are asked in the study.

My signature below says that I am willing to participate in this research:

Participant's name (Printed): ……..

Participant's signature: …… Consent Date:……..

Researcher Conducting Informed Consent (Printed) …….

Signature of Researcher: …….. Date: ……

Signature of parent/guardian: …… Date: ……..

APPENDIX 2: THE UNIVERSITY OF ZAMBIA (UNZA) SIB-CARE CHECKLIST

Below is a list of activities that children normally do to help take care of their younger siblings. Please mark/answer where appropriate.

While your parents were 'at home'/'not at home'						
Activity	Yes	No	# of times per week	How you feel while doing it		
				Positive	Negative	Neutral
Feeding						
Playing						
Bathing						
Dressing						
Comforting child when distressed						
Transporting Baby						
Carrying child on back						
Toilet training						
Protection from accidents						
Setting limits						
Discipline						

APPENDIX 3: THE HOME OBSERVATION FOR THE MESASUREMENT OF THE ENVIRONMENT

Infant/Toddler HOME
Bettye M. Caldwell and Robert H. Bradley
Summary Sheet

Family name_____ Date_____ Visitor_____
Address_____
Phone_____
Child's name_____ Birth date _____ Age _____ Sex____
Interviewee_____ If other than parent, relationship to child _____
Family composition_____
_____
(persons living in household, including sex and age of children)

Family Ethnicity_____	Language spoken_____	Maternal education_____	Paternal education_____

Is mother employed? _____Type of work when employed? _____Hrs/wk_____
Is father employed? _____Type of work when employed? _____Hrs/wk_____
Current child care arrangements_____
_____
Summarise past year arrangements_____
_____
Other person(s) present during visit_____
Notes_____
_____

SUMMARY

Subscale	Possible score	Median	Actual score	Comments
RESPONSIVITY	11	9		
ACCEPTANCE	8	6		
ORGANISATION	6	5		
LEARNING MATERIALS	9	7		
INVOLVEMENT	6	4		
VARIETY	5	3		
TOTAL SCORE	**45**	**32**		

Infant/Toddler HOME Record Form

Place a plus (+) or minus (-) in the box alongside each item depending on whether the behavior is observed during the visit, or if the parent reports that the conditions or events are characteristic of the home environment. Enter the subtotals and the total on the Summary Sheet. **Observation (O), Either (E), or Interview (I) is indicated for each item.**

I. RESPONSIVITY		24. Child has a special place for toys and treasures. **E**	
1. Parent permits child to engage in "messy" play. **I**		25. Child's play environment is safe. **O**	
2. Parent spontaneously vocalizes to child at least twice. **O**		**IV. LEARNING MATERIALS**	
3. Parent responds verbally to child's vocalizations or verbalizations. **O**		26. Muscle activity toys or equipment. **E**	
4. Parent tells child name of object or person during visit. **O**		27. Push or pull toy. **E**	
5. Parent's speech is distinct, clear, and audible. **O**		28. Stroller or walker, kiddie car, scooter, or tricycle. **E**	
6. Parent initiates verbal interchanges with Visitor. **O**		29. Cuddly toy or role-playing toys. **E**	
7. Parent converses freely and easily. **O**		30. Learning facilitators—mobile, table and chair, high chair, play pen. **E**	
8. Parent spontaneously praises child at least twice. **O**		31. Simple eye-hand coordination toys. **E**	
9. Parent's voice conveys positive feelings toward child. **O**		32. Complex eye-hand coordination toys. **E**	
10. Parent caresses or kisses child at least once. **O**		33. Toys for literature and music. **E**	
11. Parent responds positively to praise of child offered by Visitor. **O**		34. Parent provides toys for child to play with during visit. **O**	
II. ACCEPTANCE		**V. INVOLVEMENT**	

12. No more than 1 instance of physical punishment during past week. **I**		35. Parent talks to child while doing household work. **I**	
13. Family has a pet. **E**		36. Parent consciously encourages developmental advance. **I**	
14. Parent does not shout at child. **O**		37. Parent invests maturing toys with value via personal attention. **I**	
15. Parent does not express overt annoyance with or hostility to child. **O**		38. Parent structures child's play periods. **I**	
16. Parent neither slaps nor spanks child during visit. **O**		39. Parent provides toys that challenge child to develop new skills. **I**	
17.Parent does not scold or criticize child during visit. **O**		40. Parent keeps child in visual range, looks at often. **O**	
18. Parent does not interfere with or restrict child more than 3 times during visit. **O**		**VI. VARIETY**	
19. At least 10 books are present and visible. **E**		41. Father provides some care daily. **I**	
III. ORGANIZATION		42. Parent reads stories to child at least 3 times weekly. **I**	
20. Child care, if used, is provided by one of 3 regular substitutes. **I**		43. Child eats at least one meal a day with mother and father. **I**	
21. Child is taken to grocery store at least once a week. **I**		44. Family visits relatives or receives visits once a month or so. **I**	
22. Child gets out of house at least 4 times a week. **I**		45. Child has 3 or more books of his/her own. **E**	
23. Child is taken regularly to doctor's office or clinic. **I**			
TOTALS I____ II____ III____ IV____ V____ VI____ TOTAL ____			

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APPENDIX 4: CULTURE AND RELIGION IN CHILD REARING

CULTURE

Instructions

Indicate to what extent you agree with the following statements.

	Strongly disagree	Disagree	Slightly disagree	Neither agree, nor disagree	Slightly agree	Agree	Strongly agree
1. I'd rather depend on myself than others.	O	O	O	O	O	O	O
2. I rely on myself most of the time; I rarely rely on others.	O	O	O	O	O	O	O
3. I often do "my own thing."	O	O	O	O	O	O	O
4. My personal identity, independent of others, is very important to me.	O	O	O	O	O	O	O
5. It is important that I do my job better than others.	O	O	O	O	O	O	O
6. Winning is everything.	O	O	O	O	O	O	O
7. Competition is the law of nature.	O	O	O	O	O	O	O
8. When another person does better than I do, I get tense and aroused.	O	O	O	O	O	O	O
9. If a coworker or acquaintance gets a prize, I would feel proud.	O	O	O	O	O	O	O
10. The well-being of my coworkers and acquaintances is important to me.	O	O	O	O	O	O	O
11. To me, pleasure is spending time with others.	O	O	O	O	O	O	O
12. I feel good when I cooperate with others.	O	O	O	O	O	O	O
13. Parents and children must stay together as much as possible.	O	O	O	O	O	O	O
14. It is my duty to take care of my family, even when	O	O	O	O	O	O	O

1 have to sacrifice what I want.							
15. Family members should stick together, no matter what sacrifices are required.	O	O	O	O	O	O	O
16. It is important to me that I respect the decisions made by my groups.	O	O	O	O	O	O	O

RELIGION

Instructions

For some people religion plays an important role in the parenting of their child(ren). For other people the religion is not important or only somewhat. We would like to know what your opinion is about this. Indicate for every statement to which extent this applies to you.

	Totally disagree	**Disagree**	**Neither disagree, nor agree**	**Agree**	**Totally agree**	**N/A**
1. I use my religion as a guideline for the parenting of my child.	O	O	O	O	O	O
2. My religion helps me to rear my child well.	O	O	O	O	O	O
3. I teach my child a lot about my religion.	O	O	O	O	O	O
4. I teach my child that religion plays an important role in our life.	O	O	O	O	O	O

APPENDIX 5: THE STRANGE SITUATION PROCEDURE

Episode	Person	Activities	Task/instruction given to mother/sib
1	Mother, child, experimenter	Let mother and child go in, Point a chair, Let mother read the card Let mother hear the knock.	"You can go take a seat here. "The knock sounds like this: (**knock**)"
2	Mother, child	**After 3 min.** stranger goes in	
3	Mother, child, stranger	**Turn on the stopwatch** **After 1 min.** knock, **After 2 min.** knock, **After 3 min.** knock. <<*Reset stopwatch*>>	
4	Child, stranger	Take care of the mother, Let mother watch with you, Make positive comments, **After 1.50 min.** explanation episode 5, **After 2.40 min.** knock, **After 3 min. (2.55)** mother goes back in. *Reset stopwatch*	*"When you go in again shortly, would you please call (**name child**)'s name first in the corridor, before you go in, then knock on the door, then open the door and when you go in call his/her name again. I would like to ask you then to stay there for a moment and then you can go further into the room. (**If the child cries**: If so desired you can comfort (**name child**)) You can then take a seat again and start reading. (**Name child**) can then go playing again. Then I will give another knock on the window, then I would like to ask you to leave again. You can say bye to (**name child**). You will be waited for over here again and then I will explain the next part to you. Please do not say that you will go to the toilet, because experience tells us that there is a big chance then that the child wants that too.* *So call his/her name in the corridor, knock, open the door and say his/her name again, stay there for a moment and then go on. And when you hear the knock, leave the room again. "*

5	Child, mother	**After 3 min. knock**. *<<Reset stopwatch>>*	
6	Child	Take care of mother, Let mother watch with you, Make positive comments, **After 3 min. (2.55)** stranger goes back in *<<Reset stopwatch>>*	
7	Child, stranger	**After 1.50 min.** instructions, **After 2.40 min.** knock, **After 3 min. (2.55)** Mother goes back in. *<<Reset stopwatch>>*	*"When you go in later, you can immediately knock, then open the door and when you go in, call (**name child**)'s name. First you need to stand there for a moment and then you can go in the room further. (**If the child cries**: If desired, you can comfort (**name child**)) Then you can take a seat and read again, and (**name child**) can then play again. Next, I will come in again for the break.* *So first knock, open the door, call name, stand there for a moment and then go further."*
8	Mother, child	Let stranger get a drink! **After 3 min. (2.55)** experimenter goes back in	

APPENDIX 6: THE EXPERIENCES IN CLOSE RELATIONSHIPS QUESTIONNAIRE

This part of the questionnaire is designed to assess the way in which you mentally represent important people in your life. You'll be asked to answer questions about your parents. Please indicate the extent to which you agree or disagree with each statement by circling a number for each item.

Please answer the following questions about your *mother or a mother-like figure*

---

1. It helps to turn to this person in times of need.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

2. I usually discuss my problems and concerns with this person.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

3. I talk things over with this person.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

4. I find it easy to depend on this person.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

5. I don't feel comfortable opening up to this person.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

6. I prefer not to show this person how I feel deep down.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

7. I often worry that this person doesn't really care for me.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

8. I'm afraid that this person may abandon me.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

9. I worry that this person won't care about me as much as I care about him or her.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Please answer the following questions about your *father or a father-like figure*

---

1. It helps to turn to this person in times of need.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

2. I usually discuss my problems and concerns with this person.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

3. I talk things over with this person.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

4. I find it easy to depend on this person.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

5. I don't feel comfortable opening up to this person.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

6. I prefer not to show this person how I feel deep down.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

7. I often worry that this person doesn't really care for me.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

8. I'm afraid that this person may abandon me.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

9. I worry that this person won't care about me as much as I care about him or her.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

APPENDIX 7: THE HOME POSESSIONS INDEX

Instructions

Below is a checklist of things/items that are sometimes found in people's homes. Please mark in the appropriate circle.

	Yes	No
HP1 Do you have a television at home?		
HP2 Do you have a stove at home?		
HP3 Do you have electricity at home? (including solar electricity)		
HP4 Do you have running water, from any source, at home?		
HP5 Do you have a flushable toilet?		
HP6 Do you have a car at home?		
HP7 Do you have at least 2 sets of clothes?		
HP8 Do you have at least one set of shoes?		
HP9 Does the household own a radio?		
HP10 Do you have a bed or a mat to sleep on?		
HP11 Do you have cement or tiled floors in your home?		