Growing up Among Caring Others: Sib-Care in Zambia and the Netherlands

Haatembo Mooya*

The University of Zambia

Corresponding author: Dr. Haatembo Mooya, P. O. BOX 32379, LUSAKA, ZAMBIA, 10101, Tel: +260 977 415 671;

Email: haatembo.mooya@unza.zm, haatembomooya@yahoo.com

Abstract

Cultural and gender differences in sib-care and attachment were explored using a retrospective survey instrument comparing Zambian ($n = 200$) and Dutch ($n = 194$) college students. Students from the University of Zambia and Leiden University, respectively. The total study sample (N = 394). Four main hypotheses were tested: (1) Zambian participants performed more sib-care than the Dutch participants; (2) female participants performed more sib-care than male participants, both among the Zambian and Dutch groups; (3) larger family size was associated with more sib-care; and (4) securely attached participants performed more sib-care than their less securely attached peers. Results indicated that sib-care was prevalent in both Zambian and Dutch samples. Zambian participants performed more sib-care than Dutch subjects, with females performing more care than males, both when parents were *at home* ($F(2, 244) = 62.09$, $p < .01$) and when parents were *not at home* ($F(2, 237) = 51.28$, $p < .01$). Family size and attachment related avoidance and anxiety were not significant predictors of sib-care. It was concluded that sib-care is understudied, not only in Western societies but also in Africa and that females perform more sib-care than males, especially when the parents are *not at home*. In addition, attachment related security appears to be more related to the quality than the quantity of care provided.

Keywords: Sibling; Sib-Care; Attachment; Zambia; the Netherlands

Introduction

Cross-culturally, exclusive maternal care of infants is an exception, rather than a rule [1-3]. In most traditional non-Western societies, child care is shared within the family; among relations and older siblings. In middle class Western societies, parents tend to rely more on 'hired hands' for support. The care of younger children by their older siblings or sib-care is widespread although interestingly, the phenomenon has remained relatively understudied. Most studies on sib-care have been conducted using ethnography where the majority of studies are qualitative and have considered sib-care as a response to crises (e.g. Orphan-hood, placement into foster homes, HIV etc) [1]. A synthesis of studies on sib-care found that almost all of the 'few' available studies [10] have used qualitative approaches and no study quantitatively measured sib-care [1]. The current study adds insight to the ongoing discourse on sib-care cross-culturally; specifically within Africa and Europe. This study explored sib-care from a *quantitative* perspective and within *normal families*, a perspective lacking in much of the current literature. The aim of this study was to examine cultural and gender differences in sib-care between a Zambian and Dutch sample. It also sought to ascertain the relation between attachment patterns and sib-care as attachment might

be a major force in establishing (caring) relationships.

Parenting is suggested to be a main reason why people in different cultures differ from one another[4,5] and has been considered a powerful instrument for the transmission of values and practices between generations [6,7]. Across cultures, parenting systems vary. 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 [6]. A cross cultural study by Keller [6], 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 exceptions and within-culture variations to this norm. In middle class Western societies, the infant spends most of their time in the first months only with the mother [8]. With few others within the household, infant care is performed mostly by the mother and very few close relations, like siblings and the father. Sib-care, the participation of older children in caring for younger siblings exists but is suggested not to be prominent. Among several African societies, especially rural societies, child care is a collective enterprise in which parents, kin and siblings are active participants [7].

The majority of people across the world grow up with siblings; as much as 80 % in the United States of America and Europe and more in Africa and other non-Western countries [9]. Sib-care itself is relatively widespread across cultures but presumably more in collectivistic than individualistic societies [10]. Research conducted in the West focusing on housework has shown that children are perceived as 'dependents' and 'care recipients' rather than 'contributors' or 'caregivers', reflecting a Western notion of children as 'precious rather than useful'[11]. This is in contrast to the dominant notion in African societies which seem to value older children as *carers* of younger siblings. Older children are expected to look after their younger siblings, sometimes without adult supervision and for considerable periods, in order to free up time for parents and more specifically mothers to engage in other social reproductive or productive activities [10].

Several anthropological and psychological studies in diverse non-Western societies have shown that children play a significant role in caring for their younger siblings [7,10,12]. In most African societies there exists a shared philosophy that views parenting as an integral component of survival which posits that children do not solely belong to their biological parents and that 'parenting' can be performed by 'others,' including siblings. Most siblings engage in caregiving from the age of 5 to 10 years and in some societies and instances even earlier than that [13]. This includes performing activities such as dressing, bathing, feeding, playing with and carrying their younger siblings [10]. These roles are viewed as an important part of

younger children's informal training and socialization within the family and community [10,14] . In fact, Zukow–Goldrin [13] makes an interesting point stating that in many non-Western societies "siblings are 'culture brokers', introducing their sisters and brothers to ways of acting and knowing through unique styles of interaction" (p. 278).

The majority of research in the last decade involving sibling care at home, especially in an African context, has focused on sib-care in the context of the HIV pandemic [1,15-17]. The devastating effects of the HIV epidemic have resulted into a significant increase in mortality and led to more orphans. In many cases these children have not been assimilated into the extended family unit or placed into foster homes and have had to assume the 'parenting' role for their younger siblings [1, 10,15,17] due to non-availability of other caregivers. In Zambia, as in many other African countries, sib-care is a common practice not limited to orphan-hood but in the context of AIDS orphans, it has meant that more "older children care for younger sibling without adult supervision " [1,18]. It has been shown that the range of caring tasks that children typically perform in the context of HIV, cross-culturally, include household chores, healthcare, personal care, childcare, emotional and practical support, and income generating activities [10].

Many of the studies exploring the gender dynamics of care among children show that girls perform significantly more care than boys in the home [10,11,13]. This is probably due to gendered expectations of girls' responsibilities for domestic work and constructions of care [10]; a notion of socializing and preparing girls to take over the 'mothering' responsibility. Despite cultural variations, findings confirm this notion. A study conducted in Denmark revealed that girls cared for their siblings more than boys. They also displayed more care in single parent, especially mother-headed, households than homes where both parents live within the same house [19]. A substantial amount of work in Southern 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 [10, 20]. 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 [10]. Nevertheless, 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.

Attachment theory was originally developed as a means for explaining the strong emotional bond that develops between infants and their primary caregivers [21,22]. According to John Bowlby, founder of attachment theory, infant-caregiver attachment is the emotional bong that exists between an infant and his/her caregiver [21,23]. It is argued that early attachment experiences provide a secure emotional base by influencing

children's feelings of confidence, worth and interpersonal trust [24]. 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 [21,24,25] . When attachment theory was initially conceptualized, one of the core assumptions was the prediction that attachment representations influence caregiving and care seeking behaviour [21]. Although most work initially focused on attachment and care seeking, subsequent work studied the caregiving perspective. A link between attachment representation and caregiving emerged that showed that securely attached individuals tend to report more sensitive caregiving [26,-30]. This was anchored on the assertion that early experiences shape internal working models in adults and consequently guide secure base components of caregiving in adulthood [27,31]. Therefore securely attached adults are more responsive to the world around them and will provide more sensitive care than their insecurely attached counterparts [1,27]. Securely attached individuals may see caregiving as a means of enhancing closeness towards others [26].

John Bowlby was cognizant of the fact that a mother was not just the 'biological mother' but anyone that took the role of the mother and provided care in an infant's life. He also reasoned that children could have more than one attachment figure [21,23]. In most cultures this includes, in addition to the biological parents, siblings and even grandparents [32]. Until relatively recently, research on attachment and care focused primarily on the mother-infant dyad [33]. However, the last 3 decades have produced research that has explored the possibility that other kinds of attachment relationships in adults and romantic relationships develop e.g. attachment to grandparents; teachers; friends and peers and even attachment to pets [34-36]. However, up to the best knowledge of the author, no studies to date have focused specifically on attachment and care in the context of the infant and their sibling, which is the focus of the present study. It appears that as infants grow older and siblings start participating in their (infants') care, older siblings become an important choice for an attachment figure, especially in the absence of adults [37] and provide a sense of comfort, safe haven and secure base. Studies have shown that children separated from their parents and other adults and are placed in foster homes with their siblings were less likely to experience placement disruption and more likely to experience permanent placement [38]. This is contrary to children separated from their siblings upon placement, as was found in a study on orphanage placement in Botswana where children found it difficult to adapt without their siblings [15].

In the current study, five main hypotheses were stated. Firstly, it was hypothesized that Zambian participants perform more sib-care than Dutch participants. Secondly, it was hypothesized that females perform more sib-care than male participants both within the Zambian and Dutch samples. Thirdly, participants from larger families perform more sib-care than their counterparts from smaller families in both countries. Additionally, participants from both countries perform more sib-care when parents are '*not at home'* than when parents are '*at home'*. Finally, it was hypothesized that more securely attached participants from both countries perform more sib-care than their less securely attached peers.

Methods

Study design

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

Participants

The study sample (actual participants) consisted of 394 first and second year University students (age range = 17 to 31 years, M = 20.16, SD = 2.29) from the University of Zambia, Zambia and Leiden University, the Netherlands. Students were asked to participate only if they had a younger sibling. These students participated in the classes that the author taught, at both Universities. 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 Child and Family Studies at Leiden University (18 to 31 years, M = 20.38, SD = 2.06; 92.3% females

Procedure

Data were collected using a questionnaire. In the Zambian sample, participants were asked to complete the questionnaire during various tutorial hours. At the end of each tutorial session, the questionnaires were collected. In the Dutch sample, participants were given the questionnaire towards the end of one of their lecture sessions to complete. In both cases, the questionnaire took between 15 to 20 minutes to complete. All students in the class/tutorials were allowed to fill in the questionnaires but only data from participants who had siblings were included in the final study.

In the Zambian sample instruments were administered in English and among the Dutch instruments were administered in Dutch. In Zambia, English is the formal language of communication spoken and written by the majority of the people and by all secondary and tertiary level students. In the Netherlands, the English version of the tools were translated and back translated by Dutch experts.

Overview of measures

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

Socio-economic status (SES) for the Zambian sample was assessed using the *Home Possessions Index* (HPI) – a household wealth index that has been used in that country's demographic and health survey. The HPI is an 11-item scale with questions that assessed the availability of basic facilities in the household. Because the study sought to examine sib-care activities performed by the participants when they were aged 7 to 13 years old, the items on this scale referred to the time in participant's lives when they were between the ages of 7 to 13 years. 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?*". Participants' 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 ceiling effects were discarded from the measure because participants responded to the affirmative and thus revealed no variability. 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. SES for the Dutch sample was assessed using parental educational level. A global SES measure was computed by standardizing, averaging and merging the scores on the Zambian and the Dutch SES measures. While educational levels could best predict SES in the Dutch context, the same measure may not be the best predictor in the Zambian context thus the use of a household wealth index as a measure of SES. Standardizing the overall scale ensure that bias was eliminated.

Sib-care was assessed by having participants complete the 'UNZA Sib-care checklist' (USC) [39]. This is a checklist that assesses whether or not participants participate 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 did they engage in these activities and how they feel while doing these activities. This was asked of the participants 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*'. The tool was pilot tested and in both contexts, participant responses conformed to expectations.

Infant ***Attachment*** was assessed by having participants complete the *Experiences in Close Relationships – Relationship Structures (ECR-RS)* questionnaire [40]. 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)[40] . 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 measure 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 [40]. Avoidance and anxiety scales were then developed. The alpha reliability coefficient for avoidance and anxiety to the mother were α = .81 and α = .84, respectively. For avoidance and anxiety to the father, the reliability coefficients were α = .81 and α = .88, respectively. The ECR-RS has been proved to be reliable on the parental domain α = .80 [40].

Ethical consideration: Ethical approval to conduct the study was obtained from the University of Zambia Humanities and Social Sciences Research Ethics committee (IBR 00006464 and IORG: 000376). Participants were asked to sign consent forms before participating on the study.

Data analysis : Preliminary analyses were conducted for data cleaning and revealed outliers (z > |3.29|, p = .001). These cases were excluded from subsequent analyses. To test for nationality and gender differences on sib-care, four groups of nationality by gender were created (Zambian males; Zambian females; Dutch males; and Dutch females). However the number of Dutch male participants was very low (n = 5), so they were excluded from subsequent statistical analyses. Consequently a 'nationality by gender' variable consisting of three groups (Zambian males; Zambian females; Dutch females) was computed.

Results

Demographics

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.

	Zambian†				Dutch*				
Variable	*n*	%	M	SD	*N*	%	M	SD	*t* (*df*)
Participant family composition									
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)**
OlderBrother	114	59			72	37			6.22 (300)**
YoungerBrother	106	54			74	38			3.33 (387)**
Youngersiblings (*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	
Total family – extended (*n*)			9.50	4.65			6.94	9.03	

Note: † 194<*n*<197; * *n* = 194: *p*<.05.   **p*<.01.

Zambian participants came from larger families (*t* (386) = 10.25; *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 above.

Dutch sample:

217 Dutch students were recruited to participate in this study. Of these, twenty were either *last-born* or the *only child*. Three students refused to participate in the study. Both groups were not included in the final study. The sib-care activity mostly performed to care for younger siblings was *playing,* both when parents were '*at home*' and '*not at home*'. The sib-care activity least performed both when parents were *at home* and when they were *not at home* was '*toilet training'* (Table2).

Zambian sample:

232 Zambian students were recruited to participate in this study. Of these, 7 were either last-born or the *only child.* 25 students refused to participate in the study. Both groups were not included in the final study. The sib-care activity performed the most in caring for their 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 least performed when parents were '*not at home'* was '*carrying the baby on the back*'. Participants who had a younger sibling reported performing various sib-care activities as shown in Table 2, both when parents were '*at home*' and when parents were '*not at home*'.

Table 2. Summary frequencies (percentages) of sib-care activities.

	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/carry 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)
Discipline	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*"; Sib care activities performed over a period of one week.

An Analysis of Variance (ANOVA) was conducted to test for nationality and gender differences on sib-care between the three groups of nationality by gender that were created (Zambian males; Zambian females; and Dutch females).

When parents were '*at home*', an ANOVA showed significant differences in the total amount of sib-care performed by participants 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. Overall, 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*'. Nevertheless, Zambian males performed more sib-care than the Dutch females. It also appears that within the Zambian females group, more sib-care was performed when parents were '*not at home*' than when parents were '*at home*' as can be seen from *Figure 1:*

Figure 1: Total sib-care performed between the three '*nationality by gender*' groups
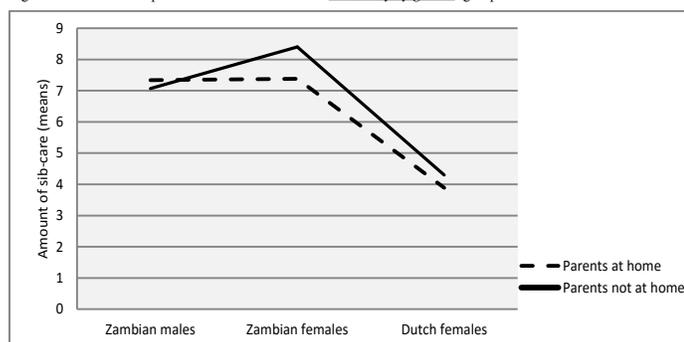
To test if these findings could possibly result from the Zambian sample having more young siblings to care for, it was examined whether the Zambian participants (M = 1.99; SD = 1.06) had more younger siblings than the Dutch participants (M = 1.51; SD = .78): and it was found that indeed the Zambian participants 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 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*' $r = .27$, $p < .01$. The influence of the number of younger siblings on sib-care was then controlled for and a MANCOVA was performed to test for 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).

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 '*carry baby on the back*' (M = .65, SD = .48) than Zambian males (M = .42, SD = .50), $F(2, 261) = 9.02$; $p < .01$ both when parents were *at home* and when they were *not at home*. Overall, there was more sib-care done when parents were '*not at home*' than when parents were '*at home*' $F(2, 228) = 49.02$, $p < .01$ (Table 3a and 3b).

Family constellations and caregiving

Dutch participants came from smaller families (M = 3.76, SD 1.16) than Zambian participants.

Table 3a: MANCOVA and summary descriptive statistics 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)	F	M (SD)	M (SD)	F
Feeding	.74 (.44)	.23 (.42)	44.71**	.86 (.35)	.28 (.45)	56,44**
Playing	.95 (.23)	.96 (.20)	1.18	.95 (.23)	.92 (.27)	0,06
Bathing	.70 (.46)	.15 (.36)	61.13**	.77 (.42)	.12 (.33)	75,56**
Dressing	.78 (.41)	.20 (.40)	55.08**	.85 (.36)	.18 (.39)	80,75**
Comforting child	.70 (.46)	.72 (.45)	.94*	.80 (.40)	.84 (.37)	6,31**
Transporting baby	.37 (.49)	.23 (.42)	3.36*	.52 (.50)	.24 (.43)	7,84**
Pushing/carrying baby	.63 (.49)	.34 (.48)	10.89**	.70 (.46)	.24 (.43)	25,05**
Toilet training	.36 (.48)	.02 (.14)	22.56**	.55 (.50)	.05 (.23)	38,78**
Protection	.81 (.40)	.56 (.50)	14.79**	.85 (.36)	.62 (.49)	5,94**
Setting limits	.60 (.50)	.36 (.48)	13.34**	.74 (.44)	.54 (.50)	3,83*
Discipline	.74 (.44)	.14 (.35)	66.55**	.84 (.37)	.27 (.45)	39,01**

Note: Covariate(s) – Number of young siblings
F tests in MANCOVA are based on the un-corrected model.
*p<.05. **p<.01.

Table 3b. MANCOVA and summary descriptive statistics 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)	F	M (SD)	M (SD)	F
Feeding	.74 (.44)	.74 (.44)	44.71**	.86 (.35)	.81 (.40)	56,44**
Playing	.95 (.23)	.89 (.31)	1.18	.95 (.23)	.91 (.29)	0,06
Bathing	.70 (.46)	.78 (.42)	61.13**	.77 (.42)	.69 (.47)	75,56**
Dressing	.78 (.41)	.75 (.44)	55.08**	.85 (.36)	.75 (.44)	80,75**
Comforting child	.70 (.46)	.63 (.49)	.94*	.80 (.40)	.62 (.49)	6,31**
Transporting baby	.37 (.49)	.45 (.50)	3.36*	.52 (.50)	.47 (.50)	7,84**
Pushing/carrying baby	.63 (.49)	.40 (.49)	10.89**	.70 (.46)	.43 (.50)	25,05**
Toilet training	.36 (.48)	.39 (.49)	22.56**	.55 (.50)	.47 (.50)	38,78**
Protection	.81 (.40)	.85 (.36)	14.79**	.85 (.36)	.75 (.44)	5,94**
Setting limits	.60 (.50)	.71 (.46)	13.34**	.74 (.44)	.66 (.48)	3,83*
Discipline	.74 (.44)	.75 (.44)	66.55**	.84 (.37)	.64 (.48)	39,01**

Note: Covariate(s) – *Number of young siblings*
F tests in MANCOVA are based on the un-corrected model
*p<.05. **p<.01.

Figure 2a

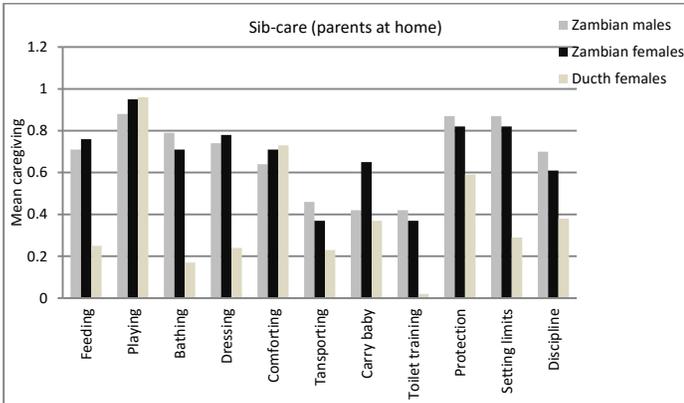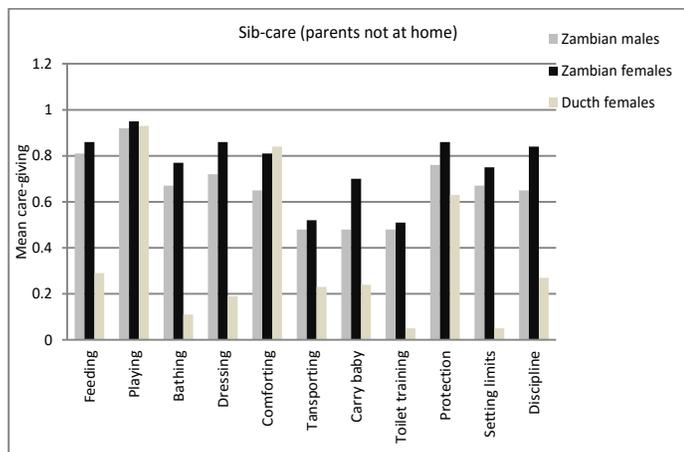Sib-care activities when parents are 'at home.'

Figure 2b

Sib-care activities when parents are 'not at home.'

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* appears 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).

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* (β = 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 a higher number of younger siblings performed more sib-care and females performed more sib-care than males (see Table 4b).

A hierarchical regression analysis for the 3 nationality by gender groups (*parents at home*) (Tables 7a, 7b in the Appendix) revealed that models 1 & 2 were not significant predictors of sib-care for both Zambian females and males but that model 1 significantly predicted total sib-care among the Dutch females (R^2 = .27, *p*< .01) (Table 7c). 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 sibcare (β = -0.41, p <.01). Dutch females with more *younger siblings* tended to perform more sib-care when parents were not at home.

(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. To assess which variables predicted sib-care among the participants, two hierarchical regression analyses were conducted; one on sib-care when parents were *at home* and another on sib-care 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 2 domains of the '*ECR*' *(see Table 4a and 4b)*.

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 (β = 0.29, p <.01). Participants who came from larger families performed more sib-care when

Table 4a. Results of hierarchical regression predicting sib-care (parents *at home*) with various background variables and ECR scales.

	Model 1			Model 2			Model 3		
	B	SE	β	*B*	SE	β	*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
R²	.10**			.36**			.36		
Δ R²	.10			.26			.01		
F change	8.34			47.77			.43		

Note: * *p*< .05.   ** *p*< .01. βstandardised regression coefficient. [LG] = log transformed variable

        Sex (0 = male, 1 = female). SES = Socio-economic Status.

Table 4b. Results of hierarchical regression predicting sib-care (parents *not at home*) with various background variables and ECR scales.

	Model 1			Model 2			Model 3		
	B	SE	β	*B*	SE	B	*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
R²	.06**			.32**			.33		
Δ R²	.06			.26			.01		
F change	5.14			42.27			0.72		

Note: * *p*< .05.   ** *p*< .01. βstandardised regression coefficient. [LG] = log transformed variable

        Sex (0 = male, 1 = female). SES = Socio-economic Status

Attachment and caregiving

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.

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 participants (Table 6).

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 4a, 4b). Specifically, only among Zambian females did attachment predict sib-care. Those female participants who reported higher levels of anxiety towards their fathers performed less sib-care compared to their counterparts (see Table 8b in appendix).

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

M (SD)		Zambian males	Zambian females	Dutch females	
		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 3

Nationality by gender outcomes on the ECR
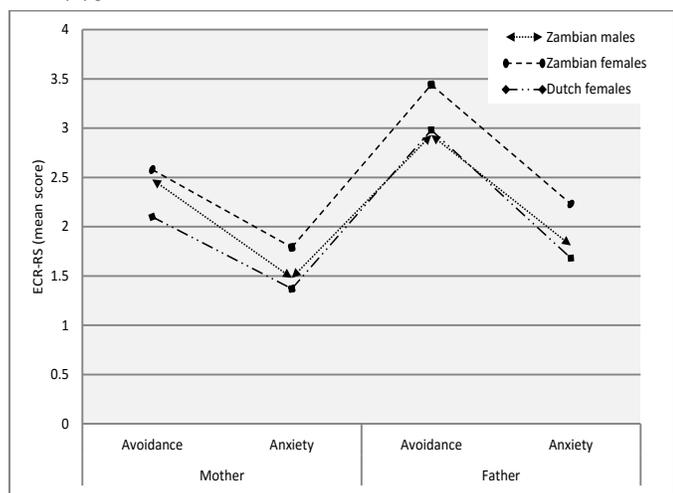
Note: Figure based on untransformed data.

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

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**

	Mother	Avoidance	-		
		Anxiety	.63**	-	
Dutch females	Father	Avoidance	.36**	.18*	-
		Anxiety	.25**	.38**	.62**

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

Discussion

The aims of this research were to study cultural and gender differences in sib-care between a Zambian and Dutch college student sample and establish/explore the relations between attachment-related avoidance and anxiety to sib-care. Our results demonstrated that Zambian participants performed more sib-care than the Dutch participants. This was the case whether the sib-care activities were performed when parents were *at home* or when parents were *not at home*. It was also found that females performed more sib-care than males. Consequently it was shown that Zambian females performed more sib-care than Zambian males and Dutch females. Although the Zambian participants came from larger families i.e. had significantly more younger siblings than the Dutch subjects, results showed that the number of younger siblings one had did not really influence the amount of sib-care one performed care. It was also found that attachment related avoidance and anxiety did not predict the amount of sib-care performed by an individual.

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 also made a distinction between sib-care performed when parents were *at home* and when parents were *not at home*. Zambian subjects 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 research on care that has shown that in more collectivistic societies there is more child participation in care than compared to more individualistic societies [11,41]. Interestingly there is evidence that suggests 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 [11]. 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 but more of a 'leisure' construct.

The notion of sib(ling) 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.

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 caregiving in general [11,13,] and sib-care in specific [10] and tends to uphold the assertion that these 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* [41]. 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 [10].

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 dichotomy of individualism and collectivism, respectively. The findings showed that participants from larger families and had more younger siblings performed more sib care giving than their counterparts. This is to be expected considering that the larger the number of your 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 [10]. 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.

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 participants 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 suggests that subjects in more individualistic societies report being more 'avoidantly' attached than those in more collectivistic societies [25,42].

This study further explored the relationship between attachment and sib-care. It focused on the attachment of the care-giver and not that of the care-seeker – the latter which has been the focus of most work on attachment, especially attachment in infancy. 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 [26-28,42]. 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.* This finding maybe 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[26, 28,42] .

There were a number of limitations to the present study. Firstly was its retrospective design. There is a possibility that participants did not 'accurately' recall the frequency and intensity of sib-care they performed. However, as part of a larger study, this design enabled the researchers to capture pertinent cross-sectional data important for analysis that also formed the basis for subsequent studies. Secondly, the key research tools used were self-report measures. Despite memory loss that may arise with time and age, it has been shown that this does not affect highly practiced everyday activities [43] and therefore it seemed plausible to use self-report instruments to collect data on sib-care activities as these were everyday activities, especially among the Zambian sample [10]. Finally, participants were selected from a group of university students. It has been shown that such a sample comes from a homogeneous SES group. Nevertheless, it was desirable that a homogeneous group be obtained for between country comparisons because otherwise differences would have arisen from confounding variables not associated with the variables of interest. Lastly, because of the few Dutch male participants, the group was excluded 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 and this limits the study's generalizability to Dutch females.

Recommendations for future research: Despite the empirical [9] and much anecdotal evidence of the existence of sib-care, especially in the African setting and the Zambian setting in particular, future studies should 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.

Implications for practice: If sib-care is so prevalent, cross-culturally, there is a need to harness this resource for child development within the home setting. The participation of children in rearing children has often been perceived as a deviation from *normal* parenting and as such tended to be labeled as a misnomer [11, 13]. Nevertheless, if older children do indeed constitute a substantial amount of their younger siblings' lives parenting practice and indeed family therapies could take advantage of this huge untapped potential to harness positive parenting and while doing so, inculcating within the children valuable parenting resources that they could in turn use, when and if the task is called upon them.

Conclusion

In conclusion, this study reveals several important outcomes to the cross-cultural study of sib caregiving between Zambia and the Netherlands. Sib-care is very prevalent, both in Netherlands and Zambia with more of it in the latter. Females performed more sib-care than males and more care was performed when elder siblings were alone at home with their younger siblings than when the parents were also present, especially for females. Participants from larger families and with younger siblings performed more sib caring than their counterparts and attachment related avoidance and anxiety did not influence the amount of sib caregiving an individual performed. Considering that the majority of people in the world are born among siblings, sibling involvement in caregiving is a phenomenon that will continue existing and should be understood and harnessed to achieve optimal child development.

References

1. Yanagisawa S, Poudel KC, Jimba M. Sibling caregiving among children orphaned by AIDS: synthesis of recent

studies for policy implications. Health policy. 2010, 98(2): 121-130.

2. Werner EE. Overcoming the odds. Journal of Developmental & Behavioral Pediatrics. 1994, 15(2): 131-136.

3. Lamb ME, Sternberg KJ, Prodromidis M. Nonmaternal care and the security of infant-mother attachment: A reanalysis of the data. Infant Behavior and Development. 1992, 15(1):71-83.

4. Super CM, Harkness S, Barry O, Zeitlin, M. Think locally, act globally: Contributions of African research to child development. Child Development Perspectives. 2011, 5(2): 119-125.

5. Keller H. Socialization for competence: Cultural models of infancy. Human Development. 2003, 46(5): 288-311.

6. Keller H. Cultures of infancy. Psychology Press. 2013.

7. Nsamenang AB. Human development in cultural context: A third world perspective (Vol. 16). Sage Publications. 1992.

8. Hewlett BS, Lamb M E. 11 Integrating evolution, culture and developmental psychology:

9. explaining caregiver-infant proximity and responsiveness in central Africa and the USA. Between culture and biology: Perspectives on ontogenetic development. 2002, 8: 241.

10. Dunn J. Siblings and socialization. Handbook of socialization: Theory and research. 309.

11. Evans R. Sibling caring scapes: Time–space practices of caring within youth-headed households in Tanzania and Uganda. Geoforum. 2012, 43(4): 824-835.

12. Miller P. Useful and priceless children in contemporary welfare states. Social Politics: International Studies in Gender, State and Society. 2005, 12(1): 3-41.

13. Wane NN. Reflections on the mutuality of mothering: Women, children, and othermothering. Journal of the Motherhood Initiative for Research and Community Involvement. 2000, 2(2).

14. Zukow-Goldring P. Sibling caregiving. Handbook of parenting. 2002, 3: 253-286.

15. Serpell R, Mumba P, Chansa-Kabali T. Early educational foundations for the development of civic responsibility: An African experience. New directions for child and adolescent development. 2011, (134): 77-93.

16. Morantz G, Heymann J. Life in institutional care: the voices of children in a residential facility in Botswana. AIDS care. 2010, 22(1): 10-16.

17. Robson E, Ansell N, Huber US, Gould WTS, van Blerk L.

Young caregivers in the context of the HIV/AIDS pandemic in sub-Saharan Africa. Population, Space and Place. 2006, 12(2): 93-111.

18. Payne R. 'Extraordinary survivors' or 'ordinary lives'? Embracing 'everyday agency'in social

19. interventions with child-headed households in Zambia. Children's Geographies. 2012, 10(4): 399-411.

20. Yamba CB. Loveness and her brothers: trajectories of life for children orphaned by HIV/AIDS in Zambia. African journal of AIDS research. 2005, 4(3): 205-210.

21. Bonke J. Education, work and gender, an international comparison. In European Institute-European Forum Papers .1995.

22. Robson E, Ansell N. Young carers in Southern Africa: Exploring stories from Zimbabwean secondary school students. In Children's Geographies: Playing, Living, Learning, Holloway SL, Valentine G (eds). Routledge: London. 2000, 174–193.

23. Bowlby J. Attachment Vol. 1 of Attachment and loss.1969.

24. Fraley RC, Tancredy CM. Twin and sibling attachment in a nationally representative sample. Pers Soc Psychol Bull. 2012, 38(3): 308-316.

25. Bowlby J. Attachment: Attachment. Basic Books.1982.

26. Bowlby J. Attachment and loss: Volume 3. Loss. New York: Basic.1980.

27. Schmitt D P, Alcalay L, Allensworth M, Allik J, Ault L et al. Patterns and Universals of Adult Romantic Attachment Across 62 Cultural Regions Are Models of Self and of Other Pancultural Constructs? Journal of Cross-Cultural Psychology. 2004, 35(4): 367-402.

28. Feeney JA, Hohaus L. Attachment and spousal caregiving. Personal Relationships. 2001, 8(1): 21-39.

29. Waters TE, Brockmeyer SL, Crowell JA. AAI coherence predicts caregiving and care seeking behavior: Secure base script knowledge helps explain why. Attachment and human development. 2013, 15(3): 316-331.

30. Belsky J, Fearon RP. Early attachment security, subsequent maternal sensitivity, and later child development: does continuity in development depend upon continuity of caregiving? Attachment & Human Development. 2002, 4(3): 361-387.

31. van IJzendoorn MH. Adult attachment representations, parental responsiveness, and infant attachment: A meta-analysis on the predictive validity of the Adult Attachment Interview. Psychological Bulletin. 1995, 117: 387-403.

32. Hesse E. (2008). The adult attachment interview. Histor-

ical and current perspectives. In J. Cassidy & P. R. Shaver (Eds.), Handbook of attachment (pp. 395-433). New York: Guilford Press.

33. Bretherton I, Munholland KA. Internal working models in attachment relationships: Elaborating a central construct in attachment theory. 2008.

34. Cassidy J. The nature of the child's ties. In J. Cassidy & P. R. Shaver (Eds.), Handbook of attachment (pp. 3–20). New York: Guilford Press. 2008.

35. Schuengel C, van Ijzendoorn MH. Attachment in mental health institutions: A critical review of assumptions, clinical implications, and research strategies. Attachment and Human Development. 2001, 3(3): 304-323.

36. Mikulincer M, Shaver PR. Attachment in adulthood: Structure, dynamics, and change. Guilford Press. 2010.

37. Seibert AC, Kerns KA. Attachment figures in middle childhood. International Journal of Behavioral Development. 2009.

38. Grabill CM, Kerns KA. Attachment style and intimacy in friendship. Personal Relationships. 2000, 7(4): 363-378.

39. Conger KJ, Stocker C, McGuire S. Sibling socialization: The effects of stressful life events and experiences. New directions for child and adolescent development. 2009, (126): 45-59.

40. Leathers SJ. Separation from siblings: Associations with placement adaptation and outcomes among adolescents in long-term foster care. Children and Youth Services Review. 2005, 27(7): 793-819.

41. Mooya H, Sichimba F, van IJzendoorn M. The UNZA sib-care checklist. Unpublished manuscript. Department of Psychology, University of Zambia, Lusaka, Zambia. 2012.

42. Fraley RC, Heffernan ME, Vicary AM, Brumbaugh CC. The experiences in close relationships—Relationship Structures Questionnaire: A method for assessing attachment orientations across relationships. Psychological assessment. 2011, 23(3): 615.

43. Robson E. Children at work in rural northern Nigeria: patterns of age, space and gender. Journal   of Rural Studies. 2004, 20(2): 193-210.

44. Frias MT, Shaver PR, Díaz-Loving R. Individualism and collectivism as moderators of the association between attachment insecurities, coping, and social support. Journal of Social and Personal Relationships. 2014, 31(1): 3-31.

45. Rabbitt P, Abson V. 'Lost and Found': Some logical and methodological limitations of self-report questionnaires as tools to study cognitive ageing. British Journal of Psychology. 1990, 81(1):1-16.

Table 7a. 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
R²	.01			.05		
Δ R²	.01			.04		
F change	.25			.47		

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

Table 7b. 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
R²	.01			.04		
Δ R²	.01			.03		
F change	.49			.76		

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

Table 7c. 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
R²	.27**			.31		
Δ R²	.27**			.04		
F change	16.14**			1.16		

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

Table 8b. 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*
R²	.03			.13		
Δ R²	.03			.10*		
F change	1.24			2.60*		

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

Appendix

Table 8a. 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
R²	.12			.19		
Δ R²	.12			.70		
F change	3.17			.97		

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

Table 8c. 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
R²	.17**			.22		
Δ R²	.17**			.05		
F change	8.80			1.19		

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