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# Child Portering and Africa's Transport Gap: Evidence from Ghana, Malawi and South Africa

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**Summary.** — Children's load-carrying has been largely invisible in studies of African economies, being commonly subsumed under women's or family labor. This paper, based on interdisciplinary qualitative and quantitative research in 24 sites, examines the role of child portering in helping to fill Africa's transport gap and considers its developmental significance for education, well-being, and health. It provides detailed information regarding the scale, nature, and perceived impacts of children's load-carrying work in domestic and commercial contexts, indicates the importance of gender and generational analysis, and explores key policy challenges.  
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**Key words** — child labor, gender, generational relations, education, health, cross-sectoral, head-loading

## 1. INTRODUCTION

Although the deficiencies in Africa's transport systems are widely acknowledged, detailed consideration of the social and developmental implications of the continent's "transport gap" remains remarkably limited. In urban and rural areas, wherever transport services are deficient, or households lack the purchasing power to acquire transport equipment or pay fares, much everyday transport work must be achieved through pedestrian load-carrying. Water and fuel commonly predominate among the loads being carried, even in urban areas, because of the widespread lack of domestic piped water and electricity (what Grieco (2009) terms "living infrastructure"); other items such as agricultural produce and groceries are also regularly transported in this way. Loads are carried to sustain the household and to facilitate participation in the cash economy. Observation suggests that more goods are pedestrian head-loaded in Africa than are carried by motor vehicle: the labor inputs in terms of time and effort are evidently enormous but remain substantially uncharted. This information deficit is strongly emphasized in a recent call for gender-disaggregated information on water collection to enable measurement of progress toward MDG and other goals (Seager,

2010). However, the significance of the knowledge gap extends much further than transport, water, and sanitation; it has vital cross-sectoral significance, affecting performance in areas as diverse as energy, agriculture, environment, and construction, as well as health and education.

Load-carrying has considerable significance for African household labor patterns, since the largest proportion of

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domestic load-carrying work is usually delegated to women and their children (Porter, 2011). Load-carrying,<sup>1</sup> as a low-status activity, is regarded culturally as a “female” activity in most African societies (Barwell, 1996, pp. 25, 51; Bryceson & Howe, 1993; Doran, 1990; Malmberg Calvo, 1994, p. 9). However, while women’s role as head loaders is well-established, children and young people’s domestic transport work is commonly subsumed under women’s work rather than receiving specific acknowledgment. Hemson (2007, p. 323), observing water collection at four remote rural sites in South Africa, reaches “the surprising conclusion” that children’s involvement apparently exceeds that of women. In this paper, we bring together detailed evidence from both qualitative and survey research across 24 sites, to examine the incidence of load-carrying among children in diverse urban and rural locations, and to explore its impacts on young lives.

Even in the child labor arena, research specifically focused on load-carrying is sparse, especially regarding detailed gender- and age-disaggregated information. Reynolds (1991) includes children’s load-carrying in her study of child labor in the Zambezi valley. She emphasizes their role in carrying harvest produce, which is seen as women’s work: “Boys help but fewer go than girls” (Reynolds, 1991, p. 55). There is some age- (but little gender-) disaggregated information in studies of West African cocoa production, where heavy loads are identified as one of children’s potentially hazardous tasks (International Institute of Tropical Agriculture (IITA), 2002, 2006). A small observational analysis of children’s work in Western Ghana’s cocoa areas emphasizes hazardous ergonomic exposures, but does not differentiate sufficiently between load-carrying and other agricultural tasks (Mull & Kirkhorn, 2005). A subsequent survey of children in cocoa-growing areas of Cote d’Ivoire and Ghana indicates that, although carrying (agriculture-related) heavy loads is widely experienced in agricultural households (35% children aged 5–17 in Cote d’Ivoire, 46% in Ghana), it is particularly prevalent in cocoa production (80% in Cote d’Ivoire, 69% in Ghana), especially among 12–17 year-olds (Tulane University, 2009).<sup>2</sup> A rare, gender- and age-disaggregated analysis of child labor in Ivoirian cocoa production by Nkamleu and Kielland (2006), including specific consideration of their role in transport of cocoa from the fields provides important detail. They find that while young girl children participate more than boys in cocoa transporting (11% of boys aged 6–9 years but 16% of girls in this age group), above 9 years boys’ participation increasingly dominates (39% boys 10–14 years, compared to 27% girls; 60% boys 15–17 years compared to 43% girls). We return to this later in the paper.

In transport studies, where load-carrying has received some attention, age- and gender-disaggregated data are also rare (Grieco, Apt, & Turner, 1996; Malmberg Calvo, 1994). However, research in five southern Ghana villages (Porter, 2002; Porter, Blaufuss & Owusu Acheampong, 2007; Porter, Blaufuss, & Owusu Acheampong, 2011) provides both gender- and age-specific information from traffic surveys and counting and weighing of head loads. Girls under 18 years were carrying loads of up to 36 kg and boys up to 39 kg; girls of 15+ were regularly carrying 20–30 kg.<sup>3</sup> These are not as high as loads measured among young Nepali hill porters (where boys aged 11–15 years carried 48 kg on their backs, equivalent to 134% of their body weight, see Malville & Malville, 1996) but are still very substantial. Discussion with parents, children, and teachers in the Ghana villages indicated a range of potential impacts and confirmed the importance of extending and intensifying research within a larger and more diverse population, which we have done in the current study.

We explore our data below, collected in diverse locational contexts, with particular reference to configurations of power embedded within families and communities that mold inter-generational and gender relations and impact strongly on urban and rural lives across Africa (e.g., Chant & Jones, 2005; Durham, 2000; Quisumbing & Pandolfelli, 2010), hypothesizing that these will have direct implications for patterns of child portage. Young people commonly occupy a lowly position in African social hierarchies and this shapes family and community expectations about the youth labor contributions that represent a precious resource, particularly in poor households (Kielland & Tovo, 2006, p. 100; Shimamura & Lastarria-Cornhiel, 2010). Bradley (1993) observes how, in many societies, young people’s labor tends to be allocated to the activities with lowest returns per hour, such as load-carrying of domestic water and fuelwood. Meanwhile, gender divisions of labor, which emphasize women’s contribution to household reproduction, typically assign pedestrian transport of goods to females: girls as well as women. Thus, Bradley argues that while women typically control the labor of girls and younger boys (who tend to occupy the same space as women), as boys grow older, they “make themselves less available to their mothers by escaping from the social spaces that their mothers control” (Bradley, 1993, 80). Consequently, boys from about 10 years move out of women’s sphere of influence, taking on adult male tasks and abandoning “female” tasks such as domestic load-carrying. The intersection of power relations associated with age and gender is thus likely to have considerable influence on who carries what, with important repercussions for young people’s educational achievement, health, and well-being. While much discussion of child labor highlights the role of income poverty and credit (e.g., Ersado, 2005), the impact of the transport gap presents a research question worthy of specific investigation: we ask, how widespread is load-carrying among girls and boys in our diverse research sites, how is this shaped by specificities of place, gender, and generational relations, and what are the perceived impacts on the lives and well-being of the young people concerned.

The paper commences by outlining data collection methods and study sites, then considers load-carrying in domestic and commercial contexts. This is followed by a discussion of potential impacts on schooling, educational achievement, health, and well-being. Attention is paid to differences associated with age, gender, and settlement context. In the conclusion we consider policy implications.

## 2. METHODS AND RESEARCH SITES

The research on load-carrying was conducted between 2006 and 2009 within a larger, interdisciplinary (anthropology/geography/transportation) study of daily mobility among young people aged approximately 7–18 years. (Henceforth we use the terms “children” and “young people” interchangeably to refer to this age group.) In addition to conventional academic research, 70 young people aged about 11–20 years participated as peer researchers. The young researchers’ detailed findings are not discussed in this paper, but are acknowledged because they fed into the themes and questions posed in the academic studies. The adult researchers conducted intensive qualitative research (individual interviews, life histories, focus group discussions, accompanied walks: over 1500 interviews in total) with children, their parents, and key informants in 24 study sites, followed by a survey of approximately 125 children aged 7–18 years per site ( $n = 2967$ ). The survey sample was obtained by taking households along transects, and

randomly selecting one child per household for interview (by drawing lots). We draw extensively on both qualitative and quantitative data sets in the discussion which follows. In-depth qualitative research helped provide a base for the selection and framing of our survey questions and an essential aid to reflection on subsequent survey results. Where statements from the qualitative research are cited, these are strongly representative of a wider set of material (unless the contrary is specifically stated).

In each country these studies took place in two contrasting agro-ecological zones: in Ghana, the coastal savanna and forest belts; in Malawi, the highlands and central plains; in South Africa, Eastern Cape and Gauteng/Northwest Province. In each zone four settlements were selected: poor, high density urban [U]; peri-urban [PU]; rural with basic services (a primary school, possibly a clinic) [RS] and remote rural without services [RR]. This gave eight sites per country, 24 sites in total, allowing us to compare load-carrying in diverse conditions. All remote rural sites [RR] in the three countries were located away from a paved road and very poorly served by motorized transport. The rural with service sites [RS] were also on unpaved roads, but were better served with transport, though fares tended to be considerably higher (often double) those on paved roads. In all rural sites except coastal Ghana, bicycles were quite commonly used by adult males for personal travel and some loads: in remote rural sites, for instance, 27% of survey children's households in Ghana had working bicycles, 58% in Malawi, and 33% in South Africa. However, these were often unavailable to children, especially girls. In rural Malawi bicycle-taxi services were also common, and in rural Malawi and South Africa's North West Province, ox-carts or donkey-carts provided transport in some (richer) households. In the majority of peri-urban sites [PU] a paved road with regular transport services was accessible within about 3 km of most homes. All the urban sites [U] had access to motorized transport services nearby, though the neighborhood itself could be served predominantly by poor unpaved roads.

### 3. CHILDREN'S UNPAID LOAD-CARRYING IN DOMESTIC SETTINGS

This section examines children's unpaid load-carrying, principally conducted for the benefit of the household in which they live (i.e., including themselves). Water, fuelwood, refuse and, in rural areas, farm produce, are the most common items carried on a regular basis.

#### (a) *Water*

Water is the most common load and is thus discussed in detail. It has to be carried in most sites because even if (as in the case of urban locations, especially South Africa) some houses have mains piped water, the supply is often broken. In remote rural areas water may have to be carried considerable distances, especially in the dry season. Table 1 gives an indication of the scale of children's reported water-carrying burden in the three countries. Over three-quarters of children surveyed in Ghana carried water every day in the week preceding the survey; the same was true of more than half of children in Malawi and more than a quarter of those in South Africa. Within countries, children's water-carrying activities varied by sex, age, settlement type, and agro-ecological zone: Table 2.

In the Ghana study sites, both boys and girls carry a heavy water burden, with no significant gender differences. In South Africa the burden carried by girls is somewhat higher than that

carried by boys, while in Malawi there is a very marked difference overall, with girls carrying substantially more frequently than boys. In both Malawi and South Africa, particularly in rural sites, boys may be sent out to herd cattle at an early hour in the morning and thus escape the daily water-carrying routine but, as our qualitative data below indicate, this may also be a function of perceived gender roles. The high water-carrying burden on both boys and girls in Ghana, and on girls in particular in Malawi, is further highlighted by considering the number of water-carrying journeys made in the most recent day when water was carried: Figure 1. Among Ghanaian girls and boys, the modal daily trip pattern was reported to be three journeys, with a substantial number making five or more trips, while in South Africa it was once per day for both girls and boys. The gender disparity in Malawi is reflected in girls reporting making more water-carrying trips per day (two to three) than boys (one to two), in addition to carrying water on more days per week.

Frequency of water-carrying also varies by age, particularly for girls, with gender differences becoming more pronounced among older children. Again, this is most marked in Malawi: girls carry water increasingly frequently as they get older, while for boys there is no increased burden with age. Thus, by age 16–18 years, 84% of girls in Malawi reported carrying water daily, compared to just 34% of boys, while among 7–11 year-olds the gender differences were still evident but less pronounced (59% of girls and 27% of boys carried water daily). A similar pattern, although less marked, can be seen in Ghana and South Africa: girls' water-carrying duties increase over the teenage years, while boys' remain unchanged.

In all countries, there were substantial rural–urban differences in children's water-carrying, and differences between agro-ecological zones. These were most marked in Ghana, with over 90% of children in remote rural settlements carrying water daily, compared to just over 50% of urban children, a highly significant effect even after controlling for other factors. The more limited pattern of daily water carrying among children in urban areas (particularly in South Africa) is probably due to better availability of piped water and, in rural areas, to availability of intermediate transport (see below). Nonetheless, when the water pipes are dry, observation suggests water-carrying is regarded as a job for children. Gender also interacts with rural–urban differences, which are greater for girls than boys in all three countries; again, this is most marked in Malawi where settlement type has no significant impact on boys' water-carrying when other factors are controlled for, but where peri-urban and rural-dwelling girls suffer a particularly high burden.

*Qualitative* data for Malawi support the substantial gender differences in water-carrying identified in the survey. Many respondents (adults and children) in Malawi told us that boys of all ages only draw water when they want to take a bath, whereas girls have to collect water for the house as well as for bathing themselves. Boys reportedly refuse to carry water and this is apparently accepted by males and females as a reflection of "natural" gendered task differentiation. For instance, in urban Malawi a 12-year-old boy talked about hating to carry things on his head; a boys' focus group of 12–15 year olds was equally negative: "*Drawing and head loading water is a feminine job and parents are taking advantage of the concept of gender equality [when] they send the boy child to draw water.*" A peri-urban fathers' focus group observed that "*we send girls of good age [to collect water] as boys in most cases refuse*"; similar attitudes were evident across all Malawi sites. Females are seen as natural water carriers, and not only by men: in another peri-urban group, women observed: "*some*

Table 1. Reported frequency of water carrying (in week preceding survey) for girls and boys aged 7–18 years by country and settlement type: descriptive statistics

(a) Ghana						
Settlement type	Girls (N = 524)			Boys (N = 470)		
	Percentages reporting carrying water			Percentages reporting carrying water		
	Every day (%)	Some days (%)	Not at all (%)	Every day (%)	Some days (%)	Not at all (%)
Remote rural	95.9	4.1	0	89.1	5.9	5.0
Rural/services	89.4	9.1	1.5	78.5	12.4	9.1
Peri-urban	77.5	7.7	14.8	77.2	5.4	17.4
Urban	52.0	23.7	24.3	56.6	27.3	16.2
All	76.5	12.0	11.5	75.7	11.9	12.3
(b) Malawi						
Settlement type	Girls (N = 536)			Boys (N = 459)		
	Percentages reporting carrying water			Percentages reporting carrying water		
	Every day (%)	Some days (%)	Not at all (%)	Every day (%)	Some days (%)	Not at all (%)
Remote rural	75.6	20.3	4.1	22.8	27.6	49.6
Rural/services	75.7	20.9	3.5	34.8	22.2	43.0
Peri-urban	80.0	15.0	5.0	33.3	36.1	30.6
Urban	57.6	27.2	15.2	28.1	41.6	30.3
All	71.5	21.1	7.5	29.8	30.7	39.4
(c) South Africa						
Settlement type	Girls (N = 554)			Boys (N = 392)		
	Percentages reporting carrying water			Percentages reporting carrying water		
	Every day (%)	Some days (%)	Not at all (%)	Every day (%)	Some days (%)	Not at all (%)
Remote rural	34.4	33.1	32.5	19.6	48.6	31.8
Rural/services	39.1	26.3	34.6	22.2	37.0	40.7
Peri-urban	29.6	34.3	36.1	36.4	33.0	30.7
Urban	22.4	16.0	61.5	13.5	21.3	65.2
All	31.2	26.0	41.9	22.7	35.7	41.6

girl children start crying to head-load water as early as 4 years ... the girl child naturally knows how to centrally head-load the bucket while the boy head-loads poorly so that often the water spills...".

In Ghana's forest zone a similar cultural message emerged: girls are expected to carry loads such as water simply because they are girls: "It is only girls who fetch water... Our culture does not allow men to carry too much loads on their heads" [mother, rural site], although such divisions were less evident in Ghana's coastal zone. Similarly, in rural Eastern Cape (South Africa), water collection is often designated a girls' job, unless there are no girls in the family: "the girls start collecting water from an early age [from the river on the head in a bucket]... The boys do fetch water [but], they use the wheelbarrow...". In rural North West Province, where water is commonly carried by wheelbarrow or donkey-cart, boys and men play the main transporting role. One mother described how her family carried water in a 150 L container on their donkey cart. Her 11-year-old son harnesses the donkey while the girls [aged seven and 15] "just enjoy the ride and help in filling the water into the water cans". In urban South Africa, where water is only collected when the house tap is dry or there are only community taps, both girls and boys frequently use wheelbarrows.

The qualitative data support the observation that, in Malawi in particular, the gendered pattern of water-carrying becomes more firmly entrenched in late adolescence: "If you

see a boy aged more than 15 years head-loading ... then you know that he is either a fostered child or a houseboy" [rural highlands, men's group; see further below re fostering]. Older boys are often embarrassed to be seen carrying water, as one schoolteacher father observed: his daughters aged nine and six carry water three times per day in schooldays, up to six times per day during holidays, but his boys start refusing to carry water from about 12 years old: "it is the time they start to have girlfriends and they don't want to meet their girlfriend at the borehole" [highlands peri-urban]. Mothers also indulge their sons: "Sometimes the boy-child actually tells you that "girls will laugh at me" so as a parent you know that "now my boy-child has grown up" [rural highlands, mothers' group]. Similarly, in rural Eastern Cape, South Africa, a mother reported that her son of 20 "does not fetch water because fetching water is a girls' responsibility and he also claims he is too old to fetch water". Nonetheless, as the survey data show, some older boys in all countries do continue to transport water, often through force of circumstance: for example, where there are no girls in the household or where the girls are sick: "my only sister is away. If you want to eat you have to go and draw water" [rural highlands Malawi, boy 18 years].

#### (b) Fuelwood

Fuelwood is carried less regularly than water in all sites. Fewer than 5% of children overall reported having carried

Table 2. Multiple logistic regression analysis: predictors of carrying water every day in preceding week

(a) Ghana						
Independent variables	All children ( <i>N</i> = 994)		Girls ( <i>N</i> = 524)		Boys ( <i>N</i> = 470)	
	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)
Sex (REF = male)						
Female	0.117 <sup>ns</sup>	(0.167)	N/A		N/A	
Settlement type (REF = urban)						
PU	1.308 <sup>a</sup>	(0.205)	1.300 <sup>a</sup>	(0.276)	1.204 <sup>a</sup>	(0.308)
RS	1.719 <sup>a</sup>	(0.231)	2.437 <sup>a</sup>	(0.364)	1.117 <sup>b</sup>	(0.325)
RR	2.488 <sup>a</sup>	(0.312)	3.496 <sup>a</sup>	(0.570)	1.804 <sup>a</sup>	(0.402)
Age group (Ref = 7–11 years)						
12–15 years	0.412 <sup>c</sup>	(0.210)	0.826 <sup>c</sup>	(0.315)	0.273 <sup>ns</sup>	(0.283)
16–18 years	0.302 <sup>ns</sup>	(0.223)	0.782 <sup>c</sup>	(0.374)	0.117 <sup>ns</sup>	(0.328)
Zone (Ref = Forest)						
Coastal	1.463 <sup>a</sup>	(0.182)	1.276 <sup>a</sup>	(0.341)	1.791 <sup>a</sup>	(0.278)
Constant	−0.919 <sup>a</sup>	(0.236)	−1.270 <sup>a</sup>	(0.341)	−0.641 <sup>c</sup>	(0.305)
(b) Malawi						
Independent variables	All children ( <i>N</i> = 995)		Girls ( <i>N</i> = 536)		Boys ( <i>N</i> = 459)	
	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)
Sex (REF = male)						
Female	1.945 <sup>a</sup>	(0.153)	N/A		N/A	
Settlement type (REF = urban)						
PU	0.815 <sup>a</sup>	(0.209)	1.223 <sup>a</sup>	(0.279)	0.352 <sup>ns</sup>	(0.328)
RS	0.704 <sup>b</sup>	(0.208)	0.929 <sup>b</sup>	(0.282)	0.385 <sup>ns</sup>	(0.313)
RR	0.429 <sup>c</sup>	(0.207)	0.922 <sup>b</sup>	(0.277)	−0.207 <sup>ns</sup>	(0.328)
Age group (Ref = 7–11 years)						
12–15 years	0.531 <sup>b</sup>	(0.168)	0.910 <sup>a</sup>	(0.221)	0.023 <sup>ns</sup>	(0.256)
16–18 years	0.782 <sup>a</sup>	(0.201)	1.386 <sup>a</sup>	(0.315)	0.265 <sup>ns</sup>	(0.283)
Zone (Ref = Blantyre)						
Lilongwe	0.840 <sup>a</sup>	(0.146)	0.462 <sup>c</sup>	(0.202)	1.204 <sup>a</sup>	(0.216)
Constant	−2.252 <sup>a</sup>	(0.232)	−0.624 <sup>c</sup>	(0.237)	−1.722 <sup>a</sup>	(0.319)
(c) South Africa						
Independent variables	All children ( <i>N</i> = 946)		Girls ( <i>N</i> = 554)		Boys ( <i>N</i> = 392)	
	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)
Sex (REF = male)						
Female	0.669 <sup>a</sup>	(0.175)	N/A		N/A	
Settlement type (REF = urban)						
PU	0.883 <sup>a</sup>	(0.252)	0.604 <sup>ns</sup>	(0.335)	1.252 <sup>b</sup>	(0.399)
RS	1.019 <sup>a</sup>	(0.245)	1.616 <sup>a</sup>	(0.338)	0.576 <sup>ns</sup>	(0.401)
RR	0.812 <sup>b</sup>	(0.240)	1.245 <sup>a</sup>	(0.317)	0.407 <sup>ns</sup>	(0.408)
Age group (Ref = 7–11 years)						
12–15 years	0.356 <sup>ns</sup>	(0.200)	0.512 <sup>ns</sup>	(0.304)	−0.088 <sup>ns</sup>	(0.300)
16–18 years	0.117 <sup>ns</sup>	(0.224)	0.561 <sup>c</sup>	(0.282)	−0.015 <sup>ns</sup>	(0.349)
Zone (Ref = GNW)						
EC	2.436 <sup>a</sup>	(0.193)	3.307 <sup>a</sup>	(0.289)	1.414 <sup>a</sup>	(0.274)
Constant	−3.736 <sup>a</sup>	(0.318)	−4.125 <sup>a</sup>	(0.409)	−2.605 <sup>a</sup>	(0.410)

<sup>a</sup>  $p < 0.0005$ .<sup>b</sup>  $p < 0.005$ .<sup>c</sup>  $p < 0.05$ .<sup>ns</sup>  $p > 0.05$ .

fuelwood every day in the week preceding the survey, and it was very rare for children to make more than one journey carrying wood per day. However, over half of children in Ghana and around a quarter of those in Malawi and South Africa reported having carried fuelwood at least once in the preceding week: Table 3. Moreover, loads can be extremely heavy: in qualitative interviews children often reported firewood (along with maize, cassava, and building materials) as the heaviest load carried and a cause of sickness. Firewood carrying was also the most common context in which falls were reported (especially in Ghana), presumably because the load is so heavy

and the routes are often along narrow, difficult bush tracks. Firewood collection may also require travel to remote locations which can bring other dangers, as a 16 year-old girl in highland Malawi reported: “we usually go there in groups... we are afraid of being raped... a certain mother was raped in 2001”. Similar fears are current in rural Eastern Cape: “It is not safe for a girl to walk alone to go fetch firewood in the forest because of the boys who hide... and take advantage of them” [mother with young daughters].

Gender differences in children's fuelwood portage tend to mirror those for water. The burden is highest overall in Gha-

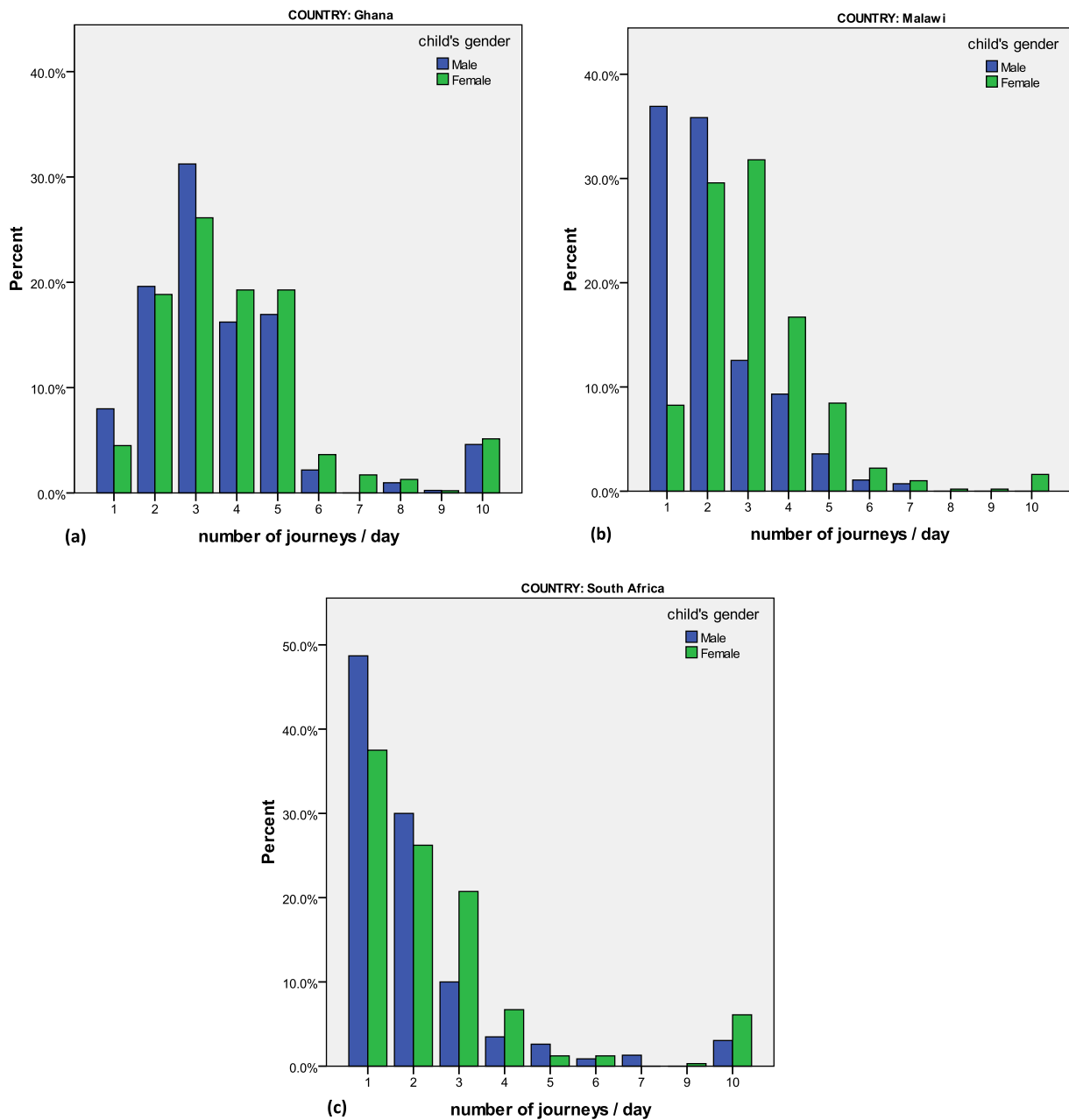


Figure 1. Numbers of water-carrying journeys made by children in the most recent day when water was carried, by gender, in (a) Ghana, (b) Malawi, and (c) South Africa.

na; girls carried fuelwood slightly more frequently than boys, when controlling for other factors, but the differences are relatively small and only marginally significant. In South Africa and Malawi, fewer children overall carry fuelwood, but the gender differences are more marked, particularly in Malawi where 41% of girls reported having carried fuelwood at least once in the preceding week, compared with 16% of boys. As with water, girls' burdens tend to increase with age in both Malawi and South Africa (Table 4); in contrast, boys' burdens do not increase as they get older, and fuelwood portage tails off markedly for boys aged 16 plus in Malawi. Again, the upshot is that gender differences become more pronounced by the late teens: in Malawi, the proportions of 7–11-year-old girls and boys reporting having carried fuelwood in the

preceding week were 37% and 19%, respectively, but by age 16–18 years, the disparities had increased substantially: 51% for girls *versus* just 16% for boys.

Not surprisingly, there were marked differences in children's fuelwood portage between settlements in all three countries: Tables 3 and 4. Rural–urban differences are most marked in Ghana, where 87% of children living in remote rural areas had carried fuelwood in the preceding week, compared with only 14% of their urban counterparts. In South Africa it is extremely rare for urban children to carry fuelwood at all. By contrast, nearly half of South African children living in remote rural settlements (and more than a third of children in remote rural settlements in Malawi) reported having carried fuelwood in the preceding week. This mirrors patterns of

Table 3. Reported frequency of fuelwood carrying (in week preceding survey) for girls and boys aged 7–18 years by country and settlement type: descriptive statistics

(a) Ghana						
Settlement type	Girls (N = 523)			Boys (N = 469)		
	Percentages reporting carrying fuelwood			Percentages reporting carrying fuelwood		
	Every day (%)	Some days (%)	Not at all (%)	Every day (%)	Some days (%)	Not at all (%)
Remote rural	11.1	75.8	13.1	5.9	72.3	21.8
Rural/services	9.2	74.0	16.8	2.5	54.2	43.3
Peri-urban	0.7	48.6	50.7	3.4	53.0	43.6
Urban	2.6	10.6	86.8	3.0	12.1	84.8
All	5.4	49.1	45.5	3.6	48.8	47.5
(b) Malawi						
Settlement type	Girls (N = 533)			Boys (N = 459)		
	Percentages reporting carrying fuelwood			Percentages reporting carrying fuelwood		
	Every day (%)	Some days (%)	Not at all (%)	Every day (%)	Some days (%)	Not at all (%)
Remote rural	3.3	54.1	42.6	0.8	15.1	84.1
Rural/services	2.6	45.2	52.2	0.7	11.1	88.1
Peri-urban	11.5	33.1	55.4	2.8	13.8	83.5
Urban	8.9	12.1	79.0	3.4	16.9	79.8
All	6.9	34.3	58.7	1.7	13.9	84.3
(c) South Africa						
Settlement type	Girls (N = 552)			Boys (N = 394)		
	Percentages reporting carrying fuelwood			Percentages reporting carrying fuelwood		
	Every day (%)	Some days (%)	Not at all (%)	Every day (%)	Some days (%)	Not at all (%)
Remote rural	7.0	43.7	49.4	3.8	39.6	56.6
Rural/services	3.8	39.2	56.9	0	20.7	79.3
Peri-urban	0	10.3	89.7	2.3	8.0	89.9
Urban	0	0	100.0	0	3.4	96.6
All	2.9	23.7	73.4	1.5	19.0	79.4

household fuel use. In rural areas, the majority of households only use wood: sole-wood-use figures for children's households in remote rural areas are respectively Ghana 96%, Malawi 90%, South Africa 61%, compared to 16%, 33%, and 0% for urban households in the three countries, respectively, where other fuels predominate (charcoal in Ghana and Malawi, electricity in South Africa). Additionally, in rural areas, wood is sometimes also collected for sale rather than domestic use. (Such exploitation for commercial purposes often results in longer head-loading distances for girls and women when the nearby exploitable wood resources are depleted: see Mashiri, Sarkar & Motha, 1998.) Gender interacts with rural–urban differences in Malawi, as it does for water: while boys' burdens remain uniformly relatively low across all settlements, the extra burden incurred in rural areas appears to be picked up almost entirely by girls.

Turning to qualitative information, gender biases (as with water) are strongly apparent: in a girls' focus group in rural central Malawi, for instance, we were told that boys only go for firewood if the girls in the family are ill. In Ghana's forest zone firewood portage is also seen as a female activity: one male teacher from the peri-urban site observed how they all go to the farm on Saturdays and all weed: "But on return the females carry the food items and firewood. The females can carry the load so there is no need for the others [i.e., males] to carry anything". In a remote rural hamlet a mother observed that her son aged 10 may carry cassava and sometimes

carries water like her (younger) daughter, but only the girl carried firewood: "In our hometown [in Ghana's northern region] a boy does not do the work of a woman".

Similarly, in rural Eastern Cape (South Africa) a woman teacher observed, "it is a norm among almost every household that a girl child has the responsibility of collecting water and firewood before she comes to school". In South Africa, references to boys moving firewood were rare and always involved transport equipment, whether wheelbarrow, oxcart, donkey cart, or sleigh.

### (c) Other loads

Refuse usually represents a lighter load than firewood or water, though as Grieco (2009) emphasizes (regarding urban Accra) it may be an extremely unpleasant task, possibly including disposal of human excrement. Girls are significantly more likely to carry refuse than boys in both Malawi and Ghana. Ghana has the more pronounced gender differences: 72% of girls reported carrying rubbish at least once in the week preceding the survey, compared with 40% of boys: Tables 5 and 6. Moreover, as with firewood, Malawian boys' refuse portage drops off markedly for those aged 16 plus; this effect is even more markedly pronounced for boys in Ghana, while older girls continue to carry refuse in both countries. In South Africa, fewer children overall report carrying refuse and trips appear to be fairly evenly distributed gender-wise: Table 6. In



Table 4. Multiple logistic regression analysis: predictors of carrying fuelwood all or some days in preceding week (reported)

(a) Ghana						
Independent variables	All children ( <i>N</i> = 994)		Girls ( <i>N</i> = 524)		Boys ( <i>N</i> = 470)	
	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)
Sex (REF = male)						
Female	0.327 <sup>c</sup>	(0.150)	N/A		N/A	
Settlement type (REF = urban)						
PU	1.988 <sup>a</sup>	(0.220)	1.875 <sup>a</sup>	(0.299)	2.081 <sup>a</sup>	(0.334)
RS	2.774 <sup>a</sup>	(0.234)	3.696 <sup>a</sup>	(0.355)	2.018 <sup>a</sup>	(0.341)
RR	3.465 <sup>a</sup>	(0.267)	4.102 <sup>a</sup>	(0.416)	2.976 <sup>a</sup>	(0.376)
Age group (Ref = 7–11 years)						
12–15 years	0.406 <sup>c</sup>	(0.188)	0.583 <sup>ns</sup>	(0.301)	0.414 <sup>ns</sup>	(0.262)
16–18 years	0.216 <sup>ns</sup>	(0.226)	0.284 <sup>ns</sup>	(0.362)	0.249 <sup>ns</sup>	(0.307)
Zone (Ref = Forest)						
Coastal	0.015 <sup>ns</sup>	(0.151)	−0.806 <sup>b</sup>	(0.235)	0.747 <sup>a</sup>	(0.215)
Constant	−2.321 <sup>a</sup>	(0.265)	−1.954 <sup>a</sup>	(0.362)	−2.387 <sup>a</sup>	(0.354)
(b) Malawi						
Independent variables	All children ( <i>N</i> = 995)		Girls ( <i>N</i> = 536)		Boys ( <i>N</i> = 459)	
	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)
Sex (REF = male)						
Female	1.449 <sup>a</sup>	(0.162)	N/A		N/A	
Settlement type (REF = urban)						
PU	0.760 <sup>a</sup>	(0.217)	1.169 <sup>a</sup>	0.264	−0.115 <sup>ns</sup>	(0.371)
RS	0.701 <sup>b</sup>	(0.222)	1.307 <sup>a</sup>	0.275	−0.511 <sup>ns</sup>	(0.380)
RR	1.061 <sup>a</sup>	(0.217)	1.691 <sup>a</sup>	0.272	−0.250 <sup>ns</sup>	(0.362)
Age group (Ref = 7–11 years)						
12–15 years	0.146 <sup>ns</sup>	(0.170)	0.292 <sup>ns</sup>	(0.221)	−0.082 <sup>ns</sup>	(0.286)
16–18 years	0.142 <sup>ns</sup>	(0.202)	0.752 <sup>b</sup>	(0.234)	−0.815 <sup>c</sup>	(0.386)
Zone (Ref = Blantyre)						
Lilongwe	0.006 <sup>ns</sup>	(0.148)	−0.154 <sup>ns</sup>	(0.187)	0.139 <sup>ns</sup>	(0.260)
Constant	−2.507 <sup>a</sup>	(0.246)	−1.570 <sup>a</sup>	(0.256)	−1.302 <sup>a</sup>	(0.339)
(c) South Africa						
Independent variables	All children ( <i>N</i> = 946)		Girls ( <i>N</i> = 554)		Boys ( <i>N</i> = 392)	
	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)
Sex (REF = male)						
Female	0.571 <sup>b</sup>	(0.184)	N/A		N/A	
Settlement type (REF = urban)						
PU	2.307 <sup>a</sup>	(0.631)	excl		1.219 <sup>ns</sup>	(0.691)
RS	3.950 <sup>a</sup>	(0.603)	excl		2.046 <sup>b</sup>	(0.634)
RR	4.670 <sup>a</sup>	(0.602)	excl		3.157 <sup>a</sup>	(0.623)
Age group (Ref = 7–11 years)						
12–15 years	0.426 <sup>c</sup>	(0.212)	0.685 <sup>c</sup>	(0.321)	0.273 <sup>ns</sup>	(0.319)
16–18 years	0.330 <sup>ns</sup>	(0.238)	0.398 <sup>ns</sup>	(0.351)	0.450 <sup>ns</sup>	(0.364)
Zone (Ref = GNW)						
EC	1.298 <sup>a</sup>	(0.184)	2.660 <sup>a</sup>	(0.228)	−0.186 <sup>ns</sup>	(0.272)
Constant	−5.934 <sup>a</sup>	(0.639)	excl		−3.536 <sup>a</sup>	(0.631)

[excl: Wald statistic = 0 so excluded from the model].

<sup>a</sup>  $p < 0.0005$ .<sup>b</sup>  $p < 0.005$ .<sup>c</sup>  $p < 0.05$ .<sup>ns</sup>  $p > 0.05$ .

qualitative interviews, discussion of refuse carrying overall was fairly sparse. The topic came up most frequently in urban sites, where other loads may play a less significant role in children's lives (notably in Malawi, where urban boys reported in the survey carrying refuse much more frequently than their rural counterparts—a highly statistically significant effect). Refuse loads tend to be relatively light, and both boys and girls are often expected to undertake this task as a matter of course, “he has to start now or he will not do it when he becomes an

adult” [urban Ghana]; “he must get used to doing outside work” [urban North West Province, South Africa].

The other common major domestic load in rural Ghana and Malawi was *agricultural produce* which had to be carried from field to homestead and sometimes, in the case of maize, further long distances to the mill for grinding. Fifty-five percentage of children in Ghana and 43% of those in Malawi reported having carried produce from farms to their homes at least once in the week preceding the survey (even though the surveys were

Table 5. Reported frequency of refuse carrying (in week preceding survey) for girls and boys aged 7–18 years by country and settlement type: descriptive statistics

(a) Ghana						
Settlement type	Girls (N = 524)			Boys (N = 471)		
	Percentages reporting carrying refuse			Percentages reporting carrying refuse		
	Every day (%)	Some days (%)	Not at all (%)	Every day (%)	Some days (%)	Not at all (%)
Remote rural	71.7	4.0	24.2	36.0	10.0	54.0
Rural/services	71.2	6.1	22.7	19.8	9.1	71.1
Peri-urban	58.5	4.9	36.6	27.5	11.4	61.1
Urban	52.3	19.9	27.8	29.7	18.8	51.5
All	62.4	9.4	28.2	27.8	12.1	60.1
(b) Malawi						
Settlement type	Girls (N = 538)			Boys (N = 459)		
	Percentages reporting carrying refuse			Percentages reporting carrying refuse		
	Every day (%)	Some days (%)	Not at all (%)	Every day (%)	Some days (%)	Not at all (%)
Remote rural	12.2	33.3	54.5	0.8	11.8	87.4
Rural/services	23.5	23.5	53.0	5.2	22.2	72.6
Peri-urban	28.4	24.8	46.8	15.7	22.2	62.0
Urban	22.0	25.2	52.8	23.6	28.1	48.3
All	21.7	26.6	51.7	10.0	20.5	69.5
(c) South Africa						
Settlement type	Girls (N = 558)			Boys (N = 394)		
	Percentages reporting carrying refuse			Percentages reporting carrying refuse		
	Every day (%)	Some days (%)	Not at all (%)	Every day (%)	Some days (%)	Not at all (%)
Remote rural	11.3	8.8	80.0	9.4	17.0	73.6
Rural/services	7.5	7.5	85.0	3.6	10.8	85.6
Peri-urban	11.9	12.8	75.2	8.0	22.7	69.3
Urban	5.1	19.2	75.6	3.4	23.6	73.0
All	8.8	12.2	79.0	6.1	18.0	75.9

conducted in the rainy season rather than at harvest when produce-carrying from farm to homestead or granary is likely to be at its height): Table 7. This tends to be a job for older children, because of the distances and, sometimes, the weights involved (e.g., 50 kg sacks of maize); in all three countries, older children carried more frequently than younger ones: Table 8. Carrying produce from the fields seems to be widely perceived as appropriate for boys, probably because it can be presented as commercially-oriented (as opposed to domestic) work. In Ghana and South Africa, boys reported more frequent journeys than girls; while there was no statistically significant gender difference in Malawi, this should be understood in the context of strong female biases in other load-carrying activities: Table 8.

By contrast, carrying maize to grinding mills was seen predominantly as a girls' job. Malawian boys were reportedly embarrassed to be seen head-loading maize to the mill (as with water) and often used a bicycle: "let women and girls go for milling maize... it is their duty" [rural plains, out of school boys, 13–18 years]. "They [parents] get you a bicycle because boys are shy to head load on the way to the maize mill" [peri-urban highlands, boy 13 years]. Another observed that boys aged 8–14 years are able to head load when going to the maize mill but, "when a boy of 15 years and above thinks of head-loading the general feeling is that he will lose his status in the community mostly to girls that he is eyeing for courtship". These observations are reflected in the survey data, where girls were significantly more likely than boys to report transporting grain

to mills in both Ghana and Malawi: Tables 9 and 10. In Malawi, there is a sharp drop in boys doing this kind of work when they reach their mid-teens: Table 10. In our South African sites, such work is rarer for both boys and girls, since the majority of domestic food loads tend to be bought-in groceries.

#### (d) How domestic loads are carried

In Ghana, children's portering is almost always done by headloading. Over 95% of reported journeys to transport water, fuelwood, and agricultural produce entailed headloading, with very few differences between boys and girls: Table 11. Headloading also dominates in Malawi as a means for children to transport water, fuelwood, and grain for milling (—the limited importance of headloading in farm goods movement in Malawi may be due to mostly very small loads being carried for home consumption at the time of the survey, which was outside the harvest period). However, there are gender differences: while headloading is almost ubiquitous for girls, boys more commonly reported carrying loads in their hands or using carts or bicycles. In South Africa, both boys and girls make use of nonmotorized transport, although still with gender differences: for example, 40% of girls and 23% of boys reported headloading water (most recent journey), while 35% of girls and 44% of boys used carts or bicycles, reflecting several girls' comments (in interviews) that their brothers usually had first call on any available wheelbarrow for transporting water.

Table 6. Multiple logistic regression analysis: predictors of carrying refuse all or some days in preceding week (reported), by settlement type, agro-ecological zone, sex, and age group

(a) Ghana						
Independent variables	All children ( <i>N</i> = 994)		Girls ( <i>N</i> = 524)		Boys ( <i>N</i> = 471)	
	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)
Sex (REF = male)						
Female	1.332 <sup>a</sup>	(0.138)	N/A		N/A	
Settlement type (REF = urban)						
PU	-0.316 <sup>ns</sup>	(0.188)	-0.391 <sup>ns</sup>	(0.254)	-0.302 <sup>ns</sup>	(0.271)
RS	-0.343 <sup>ns</sup>	(0.195)	0.298 <sup>ns</sup>	(0.282)	-0.536 <sup>b</sup>	(0.294)
RR	-0.077 <sup>ns</sup>	(0.188)	0.210 <sup>ns</sup>	(0.309)	-0.326 <sup>ns</sup>	(0.297)
Age group (Ref = 7–11 years)						
12–15 years	0.054 <sup>ns</sup>	(0.177)	0.199 <sup>ns</sup>	(0.248)	-0.118 <sup>ns</sup>	(0.241)
16–18 years	-0.491 <sup>c</sup>	(0.190)	0.084 <sup>ns</sup>	(0.310)	-1.162 <sup>a</sup>	(0.313)
Zone (Ref = Forest)						
Coastal	0.438 <sup>b</sup>	(0.139)	0.283 <sup>ns</sup>	(0.199)	0.656 <sup>b</sup>	(0.201)
Constant	-0.290 <sup>ns</sup>	(0.210)	0.671 <sup>c</sup>	(0.286)	-0.061 <sup>ns</sup>	(0.207)
(b) Malawi						
Independent variables	All children ( <i>N</i> = 997)		Girls ( <i>N</i> = 538)		Boys ( <i>N</i> = 459)	
	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)
Sex (REF = male)						
Female	0.661 <sup>a</sup>	(0.137)	N/A		N/A	
Settlement type (REF = urban)						
PU	-0.021 <sup>ns</sup>	(0.184)	0.247 <sup>ns</sup>	(0.233)	-0.404 <sup>ns</sup>	(0.299)
RS	-0.393 <sup>c</sup>	(0.187)	-0.008 <sup>ns</sup>	(0.246)	-0.930 <sup>b</sup>	(0.294)
RR	-0.789 <sup>a</sup>	(0.192)	-0.068 <sup>ns</sup>	(0.242)	-1.977 <sup>a</sup>	(0.346)
Age group (Ref = 7–11 years)						
12–15 years	0.054 <sup>ns</sup>	(0.153)	0.130 <sup>ns</sup>	(0.195)	-0.056 <sup>ns</sup>	(0.250)
16–18 years	-0.253 <sup>ns</sup>	(0.184)	0.077 <sup>ns</sup>	(0.244)	-0.629 <sup>c</sup>	(0.298)
Zone (Ref = Blantyre)						
Lilongwe	0.332 <sup>c</sup>	(0.134)	0.075 <sup>ns</sup>	(0.175)	0.634 <sup>b</sup>	(0.217)
Constant	-0.617 <sup>b</sup>	(0.193)	-0.228 <sup>ns</sup>	(0.216)	-0.133 <sup>ns</sup>	(0.283)
(c) South Africa						
Independent variables	All children ( <i>N</i> = 952)		Girls ( <i>N</i> = 558)		Boys ( <i>N</i> = 394)	
	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)
Sex (REF = male)						
Female	-0.229 <sup>ns</sup>	(0.161)	N/A		N/A	
Settlement type (REF = urban)						
PU	0.108 <sup>ns</sup>	(0.223)	0.085 <sup>ns</sup>	(0.297)	0.188 <sup>ns</sup>	(0.342)
RS	-0.659 <sup>b</sup>	(0.237)	-0.515 <sup>ns</sup>	(0.312)	-0.796 <sup>c</sup>	(0.365)
RR	-0.097 <sup>ns</sup>	(0.212)	-0.136 <sup>ns</sup>	(0.279)	-0.019 <sup>ns</sup>	(0.330)
Age group (Ref = 7–11 years)						
12–15 years	0.164 <sup>ns</sup>	(0.196)	0.424 <sup>ns</sup>	(0.273)	-0.124 <sup>ns</sup>	(0.288)
16–18 years	0.462 <sup>c</sup>	(0.209)	0.626 <sup>c</sup>	(0.285)	0.303 <sup>ns</sup>	(0.315)
Zone (Ref = GNW)						
EC	0.702 <sup>a</sup>	(0.161)	0.830 <sup>a</sup>	(0.218)	0.571 <sup>c</sup>	(0.244)
Constant	-1.543 <sup>a</sup>	(0.240)	-2.019 <sup>a</sup>	(0.311)	-1.321 <sup>a</sup>	(0.319)

<sup>a</sup> *p* < 0.0005.<sup>b</sup> *p* < 0.005.<sup>c</sup> *p* < 0.05.<sup>ns</sup> *p* > 0.05.

#### 4. CHILDREN'S PAID LOAD-CARRYING

This section focuses on children's paid work as porters (whether the payment goes to them or to other family members). We were surprised that only 9% of children in Ghana, 11% in Malawi, and 5% in South Africa reported that they had an "occupation." Of these, none reported their occupation as porter (generally regarded as a very low-status occupation); any commercial carrying they do seems to be mostly subsumed

in the category "casual labor." Perhaps children do not feel such work qualifies for the designation "occupation". When asked whether they earned money (for themselves or their families) from head-loading, the proportions of children (both genders) responding in the affirmative was under 5% in the vast majority of settlements, the largest percentage being reported by boys in remote rural Malawi sites (9.7%), where charcoal-carrying predominated. However, in-depth interviews suggest for Malawi, in particular, that commercial

Table 7. Proportions of girls and boys reporting having carried agricultural produce from farms at least once in the week preceding the survey, by country and settlement type: descriptive statistics

	Percentage of children reporting having carried produce from farm to home at least once in the week preceding the survey					
	Ghana		Malawi		South Africa	
	Girls (%)	Boys (%)	Girls (%)	Boys (%)	Girls (N = 556) (%)	Boys (N = 392) (%)
Remote rural	67.7	83.2	67.2	64.3	18.2	28.0
Rural/services	68.9	89.3	62.6	62.2	8.4	15.7
Peri-urban	47.2	64.4	33.3	43.1	0.9	0
Urban	7.9	21.0	5.0	3.3	1.3	0
All	45.2	65.5	38.9	46.7	7.7	12.0

portage is more important in children's lives than the survey data indicate. Payment was less commonly reported in Ghana where, as a number of key informants observed, load-carrying mostly takes place within an (unpaid) family context. In South Africa, we encountered only one case of paid load-carrying: an 18-year-old young man in peri-urban Eastern Cape who carried logs for building.

The heaviest loads commonly carried for pay in both Ghana and Malawi included charcoal, fuelwood, farm produce, sand, and bricks. These very heavy loads could often be transported by cart or motor vehicle but child portage is a cheaper option: "People here can't afford to pay for minibus especially when transporting loads so they employ children" [schoolboys' focus group, urban plains Malawi]; "People can't afford to hire bicycles and ox cart, which are costly, they would rather hire a child whom they will pay less" [mothers' focus group, remote rural plains Malawi]. In South Africa, by contrast, ownership of nonmotorized transport is far more common, even among quite poor populations, so that wheelbarrows and donkey- and ox-carts commonly provide low-cost alternatives to child labor for load-carrying.

In Malawi both out-of-school and in-school children in all sites reported carrying loads for pay. Most often, it was boys who reported earning money from load-carrying, because girls were fully occupied with household chores: "[boys] have more time and energy to carry loads" [mother, rural plains Malawi]. Earnings from load-carrying often go to the household to pay for essentials such as food, clothes, soap, and salt: for some children it also contributes to secondary school fees or school requirements such as exercise books, especially in poor, rural households. By contrast, many urban and peri-urban schoolboys in Malawi reported using the money they earned as pocket-money for sweets, biscuits, snacks, or to watch videos, which some parents resented: "children may say they are doing the piece-work in order to buy notebooks but when they get the money... instead they just use the money to watch movies or [for] buying snacks" [fathers' focus group, Malawi plains peri-urban]. Some boys confessed that they were involved in the work without their parents' knowledge, sometimes diverting to the market to find a load when supposedly en-route for school. Several parents observed how many young children "would rather make money than spend the day in school" [peri-urban Malawi plains], and how this eventually leads to drop-out: "once they start earning money at a tender age, chances of them going to school and listening to a parent is slim" [father, rural plains Malawi]. Most such stories of children preferring to carry loads than attend school concern boys.

To summarize the picture so far, girls and boys in all three countries carry a variety of loads: water, fuelwood, farm produce, and refuse. Many of these loads are very heavy and require a substantial investment of time and effort. However, there are

important differences between and within countries, according to gender, age, and settlement type and location. Children in Ghana bear the highest burden in terms of transporting water, fuelwood, and agricultural produce, mostly by headloading, particularly those living in rural areas. However, gender differences in children's load-carrying in Ghana are few (particularly in coastal settlements). By contrast, Malawian children carry fewer loads overall, but gender patterns are far more marked. In the Malawi survey there is thus a clear tailing-off in portage of firewood, refuse, and grain for milling (although, interestingly, not water) among boys aged 16+, while boys of this age-group carry other agricultural loads with increasing frequency, as an income-generating activity. This resonates with earlier observations by Bradley (1993) that young people's labor tends to be allocated to the activities with lowest returns per hour, and with the age- and gender-disaggregated research by Nkamele and Kielland (2006) on child labor in Ivorian cocoa farms, which similarly suggests a pattern of boys moving outside the domestic sphere and into activities with potential for income-generation as they enter their teens: as porters, these young men will still be working in relatively low status (albeit male, nondomestic, possibly paid) jobs—a position they may well have to occupy for some years. In Ghana and South Africa, as in Malawi, gender differentials in domestic load-carrying also tend to increase in the mid-teens, but this is largely a function of girls' load-carrying duties increasing, rather than boys' diminishing.<sup>4</sup> Children in our South African sites carried fewer loads overall than their Ghanaian or Malawian counterparts, and were more likely (especially boys) to use carts or other nonmotorized transport for carrying water, fuelwood and farm produce. In all three countries, head-loading for domestic purposes is considered to be principally a girls' task. Moreover, wherever transport equipment is available as a substitute for head-loading (notably in South Africa), boys commonly have first option to access it (Flanary, 2004; Mahapa, 2000; Porter et al., 2007). The qualitative data emphasize the reluctance of boys over 15 years to head-load in Malawi (and the other locations to a lesser extent), unless they are carrying for money, and widespread normative acceptance of this stance. These findings accord with the literature that suggests that boys above about 15 years do not usually carry domestic loads (e.g., Doran, 1990, p. 30; Malmberg Calvo, 1994, p. 28; Potgieter, Pillay, & Rama, 2006, p. 15).

##### 5. POTENTIAL IMPACTS OF CHILDREN'S LOAD-CARRYING ON SCHOOLING AND EDUCATIONAL ACHIEVEMENT

The broad significance of children's workloads for school attendance is widely recognized (e.g., Andvig, 2001; Avotri,

Table 8. Multiple logistic regression analysis: predictors of carrying agricultural produce all or some days in preceding week (reported), by settlement type, agro-ecological zone, sex, age group

(a) Ghana						
Independent variables	All children ( <i>N</i> = 995)		Girls ( <i>N</i> = 524)		Boys ( <i>N</i> = 471)	
	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)
Sex (REF = male)						
Female	−0.924 <sup>a</sup>	(0.156)	N/A		N/A	
Settlement type (REF = RR)						
RS	0.153 <sup>ns</sup>	(0.232)	−0.050 <sup>ns</sup>	(0.291)	0.505 <sup>ns</sup>	(0.398)
PU	−1.143 <sup>a</sup>	(0.220)	−1.218 <sup>a</sup>	(0.304)	−1.070 <sup>b</sup>	(0.326)
Urban	−3.222 <sup>a</sup>	(0.264)	−3.517 <sup>a</sup>	(0.393)	−2.963 <sup>a</sup>	(0.369)
Age group (Ref = 7–11 years)						
12–15 years	0.475 <sup>c</sup>	(0.190)	0.618 <sup>c</sup>	(0.259)	0.303 <sup>ns</sup>	(0.290)
16–18 years	0.725 <sup>b</sup>	(0.237)	0.935 <sup>c</sup>	(0.339)	0.470 <sup>ns</sup>	(0.341)
Zone (Ref = Forest)						
Coastal	−0.210 <sup>ns</sup>	(0.157)	−0.265 <sup>ns</sup>	(0.210)	−0.119 <sup>ns</sup>	(0.238)
Constant	1.458 <sup>a</sup>	(0.236)	0.567 <sup>c</sup>	(0.276)	1.458 <sup>a</sup>	(0.356)
(b) Malawi						
Independent variables	All children ( <i>N</i> = 997)		Girls ( <i>N</i> = 537)		Boys ( <i>N</i> = 460)	
	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)
Sex (REF = male)						
Female	0.127 <sup>ns</sup>	(0.161)	N/A		N/A	
Settlement type (REF = RR)						
RS	−0.258 <sup>ns</sup>	(0.201)	−0.205 <sup>ns</sup>	(0.288)	−0.338 <sup>ns</sup>	(0.284)
PU	−1.386 <sup>a</sup>	(0.204)	−1.514 <sup>a</sup>	(0.280)	−1.277 <sup>a</sup>	(0.304)
Urban	−4.106 <sup>a</sup>	(0.351)	−3.969 <sup>a</sup>	(0.427)	−4.287 <sup>a</sup>	(0.635)
Age group (Ref = 7–11 years)						
12–15 years	1.395 <sup>a</sup>	(0.185)	1.386 <sup>a</sup>	(0.251)	1.399 <sup>a</sup>	(0.277)
16–18 years	1.894 <sup>a</sup>	(0.222)	1.500 <sup>a</sup>	(0.315)	2.217 <sup>a</sup>	(0.322)
Zone (Ref = Blantyre)						
Lilongwe	−0.355 <sup>c</sup>	(0.160)	−0.037 <sup>ns</sup>	(0.222)	−0.673 <sup>b</sup>	(0.234)
Constant	−0.144 <sup>ns</sup>	(0.201)	−0.096 <sup>ns</sup>	(0.262)	−0.086 <sup>ns</sup>	(0.265)
(c) South Africa						
Independent variables	All children ( <i>N</i> = 948)		Girls ( <i>N</i> = 556)		Boys ( <i>N</i> = 392)	
	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)
Sex (REF = male)						
Female	−0.623 <sup>c</sup>	(0.272)	N/A		N/A	
Settlement type (REF = RR)						
RS	−1.065 <sup>a</sup>	(0.289)	−1.171 <sup>b</sup>	(0.425)	−1.003 <sup>c</sup>	(0.398)
PU	−4.634 <sup>a</sup>	(1.025)	−3.631 <sup>a</sup>	(1.042)	[Excl]	
Urban	−4.064 <sup>a</sup>	(0.739)	−3.440 <sup>a</sup>	(0.762)	[Excl]	
Age group (Ref = 7–11 years)						
12–15 years	1.259 <sup>b</sup>	(0.362)	1.623 <sup>b</sup>	(0.556)	0.943 <sup>ns</sup>	(0.485)
16–18 years	1.356 <sup>a</sup>	(0.388)	1.322 <sup>c</sup>	(0.587)	1.520 <sup>b</sup>	(0.534)
Zone (Ref = GNW)						
EC	3.111 <sup>a</sup>	(0.414)	3.646 <sup>a</sup>	(0.743)	2.769 <sup>a</sup>	(0.514)
Constant	−3.891 <sup>a</sup>	(0.490)	−5.194 <sup>a</sup>	(0.849)	−3.468 <sup>a</sup>	(0.586)

<sup>a</sup> *p* < 0.0005.<sup>b</sup> *p* < 0.005.<sup>c</sup> *p* < 0.05.<sup>ns</sup> *p* > 0.05.

Owusu-Darko, Eghan, & Ocansey, 1999; Bass, 2004; Serra, 2009; Shimamura & Lastarria-Cornhiel, 2010). Heady (2003), for instance, emphasizes that work outside the home in Ghana has a substantial effect on learning achievement in reading and mathematics, possibly caused by exhaustion or a diversion of interest away from academic concerns. The specific impact of load-carrying on schooling and educational achievement in Africa, however, has received little attention, though the impact of water collection on later arrival and

tiredness in class is identified by Hemson (2007) in South Africa, while Kielland and Tovo (2006, p. 67), drawing on UNDP data on time spent water-carrying in a rural Benin village (especially by girls aged 6–14 years), calculate that within-settlement water provision could free up enough time to almost triple school attendance rates. Linkages between load-carrying and punctuality, truancy and poor concentration have been observed in rural Ghana (Porter *et al.*, 2011) while, in urban Ghana, Grieco (2009) identifies refuse

Table 9. Proportions of girls and boys reporting having carried grain to grinding mills at least once in the week preceding the survey, by country and settlement type: descriptive statistics

	Percentage of children reporting having carried produce from farm to home at least once in the week preceding the survey					
	Ghana		Malawi		South Africa	
	Girls ( <i>N</i> = 523) (%)	Boys ( <i>N</i> = 471) (%)	Girls ( <i>N</i> = 536) (%)	Boys ( <i>N</i> = 458) (%)	Girls ( <i>N</i> = 556) (%)	Boys ( <i>N</i> = 394) (%)
Remote rural	52.6	31.7	53.7	32.3	6.3	8.5
Rural/services	47.0	20.0	62.6	23.9	1.5	2.7
Peri-urban	42.0	30.2	51.8	38.9	0.9	0
Urban	34.4	19.8	45.9	29.2	0	1.1
All	43.0	25.7	52.8	30.8	2.3	3.3

Table 10. Multiple logistic regression analysis: predictors of carrying grain to mill all or some days in preceding week (reported), by settlement type, agro-ecological zone, sex, age group

(a) Ghana						
Independent variables	All children ( <i>N</i> = 995)		Girls ( <i>N</i> = 523)		Boys ( <i>N</i> = 471)	
	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)
Sex (REF = male)						
Female	0.966 <sup>a</sup>	(0.148)	N/A		N/A	
Settlement type (REF = RR)						
RS	-0.521 <sup>c</sup>	(0.212)	-0.332 <sup>ns</sup>	(0.280)	-0.911 <sup>c</sup>	(0.340)
PU	-0.490 <sup>c</sup>	(0.209)	-0.643 <sup>c</sup>	(0.293)	-0.464 <sup>ns</sup>	(0.310)
Urban	-0.902 <sup>a</sup>	(0.220)	-0.941 <sup>b</sup>	(0.288)	-0.974 <sup>c</sup>	(0.358)
Age group (Ref = 7–11 years)						
12–14 years	0.313 <sup>ns</sup>	(0.178)	0.496 <sup>c</sup>	(0.236)	0.170 <sup>ns</sup>	(0.280)
15–18 years	-0.096 <sup>ns</sup>	(0.222)	0.062 <sup>ns</sup>	(0.301)	-0.120 <sup>ns</sup>	(0.335)
Zone (Ref = Forest)						
Coastal	-1.363 <sup>a</sup>	(0.152)	-1.077 <sup>a</sup>	(0.189)	-1.833 <sup>a</sup>	(0.269)
Constant	-0.204 <sup>ns</sup>	(0.214)	0.500 <sup>ns</sup>	(0.265)	0.115 <sup>ns</sup>	(0.319)
(b) Malawi						
Independent variables	All children ( <i>N</i> = 994)		Girls ( <i>N</i> = 536)		Boys ( <i>N</i> = 458)	
	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)	<i>B</i>	(Std Error)
Sex (REF = male)						
Female	0.932 <sup>a</sup>	(0.137)	N/A		N/A	
Settlement type (REF = RR)						
RS	0.010 <sup>ns</sup>	(0.188)	0.378 <sup>ns</sup>	(0.266)	-0.299 <sup>ns</sup>	(0.287)
PU	0.114 <sup>ns</sup>	(0.187)	-0.060 <sup>ns</sup>	(0.249)	0.471 <sup>ns</sup>	(0.287)
Urban	-0.279 <sup>ns</sup>	(0.189)	-0.316 <sup>ns</sup>	(0.243)	-0.182 <sup>ns</sup>	(0.308)
Age group (Ref = 7–11 years)						
12–14 years	0.270 <sup>ns</sup>	(0.151)	0.340 <sup>ns</sup>	(0.197)	0.144 <sup>ns</sup>	(0.233)
15–18 years	-0.336 <sup>ns</sup>	(0.185)	0.332 <sup>ns</sup>	(0.248)	-1.312 <sup>a</sup>	(0.323)
Zone (Ref = Blantyre)						
Lilongwe	-0.041 <sup>ns</sup>	(0.134)	0.160 <sup>ns</sup>	(0.176)	-0.391 <sup>ns</sup>	(0.215)
Constant	-0.803 <sup>a</sup>	(0.186)	-0.160 <sup>ns</sup>	(0.235)	-0.428 <sup>ns</sup>	(0.251)

<sup>a</sup>  $p < 0.0005$ .<sup>b</sup>  $p < 0.005$ .<sup>c</sup>  $p < 0.05$ .<sup>ns</sup>  $p > 0.05$ .

removal as another significant load-carrying task commonly performed before school, which may contribute further to delayed attendance.

The current study has enabled us to chart educational impacts of load-carrying across diverse research sites. Impacts were found in five main areas:

(a) *Contribution to school fees and other schooling costs from paid portage*

As noted above, for some of the poorest children, money earned from commercial head-loading is essential for access to schooling, even if (primary) education is supposedly free:

Table 11. Means of portage

Type of load	Means of transportation	Ghana		Malawi		South Africa	
		Girls	Boys	Girls	Boys	Girls	Boys
Water	Head	96.9%	93.8%	98.8%	91.4%	40.2%	22.8%
	Hands	3.1%	5.5%	1.2%	7.6%	24.5%	33.5%
	Cart/bike	0	0.7%	0	1.1%	35.3%	43.8%
Wood	Head	96.8%	97.6%	85.6%	69.9%	76.8%	38.0%
	Hands	3.2%	2.0%	14.4%	28.8%	5.3%	5.1%
	Cart/bike	0	0.4%	0	1.4%	17.9%	57.0%
Refuse	Head	87.6%	83.3%	9.5%	5.0%	6.5%	8.9%
	Hands	12.4%	16.7%	90.1%	94.2%	84.3%	66.7%
	Cart/bike	0	0	0.4%	0.7%	9.3%	24.4%
Farm goods	Head	97.8%	96.9%	9.7%	7.7%	9.5%	0
	Hands	2.2%	1.8%	89.6%	90.8%	85.7%	68.8%
	Cart/bike	0	1.3%	0.7%	1.4%	4.8%	31.3%
Grain to mill	Head	97.3%	96.7%	98.9%	85.7%	53.8% <sup>1</sup>	33.3% <sup>1</sup>
	Hands	2.7%	0	0.5%	3.6%	46.2%	33.3%
	Cart/bike	0	3.3%	0.7%	10.7%	0	33.3%

Chi<sup>2</sup> tests: [Ghana and Malawi: head *versus* other means  $\times$  sex for each type of load (1 df). South Africa: sex  $\times$  all means for each load (2 df)]. No shading: not significant; light shading:  $p < 0.05$ ; dark shading:  $p < 0.005$ .

<sup>a</sup>Numbers of South African children transporting grain to mill were very small (13 girls, 12 boys).

for uniform, exercise books, PTA dues, even soap (to wash the uniform). The story told by a 15 year-old boy in peri-urban coastal Ghana is not untypical in illustrating associated negative impacts. It also highlights the temptation to carry dangerously heavy loads when money is urgently needed.

*Last Christmas I went to carry sand to get some money. I wanted to get more money so I increased the load per each trip. After the job, I suffered from back and neck pains . . . I used the money to buy books and clothes.*

#### (b) Late arrival at school

Many children are required to carry loads before school (particularly water) or on their journey to school (e.g., grain for grinding). This delays arrival so that classes are missed: consequent punishments include beatings and exclusion from class. Such lateness is especially prevalent in Ghana: in the survey 33% of girls and 33% of boys (compared to 8% of girls and 3% of boys in Malawi) reported being late at least one day the previous week because of fetching water. Qualitative data suggest that girls are often disproportionately affected because pre-school work is predominantly composed of "female" domestic chores. In rural and urban Malawi, teachers and children referred to water and firewood collection and journeys to the maize mill as a common cause of lateness, especially for girls. Some girls (12–15 years) interviewed in one village were particularly upset at being required to do these jobs during school examinations. Lateness is also common among boys, though in Malawi and South Africa this is more often because of herding duties than load-carrying. In coastal and forest Ghana, children are often required to help carry loads to market before school:

*children have to help their parents to the market by carrying foodstuffs in the morning. This activity delays children and they get to school tired. That is a peculiar [sic] problem with girls. . . . They just join the day's lesson midway and they cannot catch up with their colleagues . . . [male teacher, rural coastal site].*

Some children get up extremely early to avoid being late for school. One mother in urban coastal Ghana reported how she wakes her two foster daughters (aged 11 and 13) between 4.30

and 5 a.m. to start their chores, notably carrying firewood and water, so they are never late for school. Poor punctuality commonly leads to severe punishment: the primary headmaster of a rural school in lowland Malawi, for instance, observed a range of punishments for lateness applied in his school such as cleaning lavatories and sweeping. However, if children arrive after 8am they are sent back home. He observed, unsurprisingly, "Such children fail to perform well in class".

#### (c) Absence from school

Given the prospect of punishments for late arrival at school, many boys, in particular, admitted to taking the day off, if they are late:

*on market days I don't usually like coming to school . . . This is because after finishing my usual household chores, I have to carry my mother's wares to the market by which time I will be late to school. So I don't usually come because when you are late you are lashed [primary boy 14 years, rural coastal Ghana].*

Where loads have to be carried a long distance, there may be no possibility of attending school. In rural highland Malawi it was observed that the "child who goes to the maize mill will be absent from school that particular day because she cannot manage to go to the maize mill and still have time to go to school" [Men's group]. In Malawi, maize is carried principally by girls, as noted above. Moreover, some teachers reflected that, when the load is extremely heavy, the child may simply be too exhausted or ill to attend school next day. One boy in Ghana's rural forest zone was reportedly so ill after carrying a heavy load of maize home from the farm (as required by his father) that he was unable to attend school for a week. However, as observed earlier, some young boys in Malawi find the earnings from commercial load-carrying so attractive that they prefer to deceive their parents and play truant.

#### (d) School drop-out

For some boys, the attractions of the proceeds obtainable from portage are such that they drop out of school altogether, as boys in Malawi recounted: "[portage]

*impacted negatively on my schooling because... I was so much involved in these tasks at the expense of my education. I was busy looking for money... [and] the fear of being punished was an excuse for absenteeism*" [life history, 22 year-old man, peri-urban highlands]. In Ghana similar situations arose and a teacher observed how, as boys in his (rural coastal) village became involved in commercial carrying of farm produce and building materials, "*the problem becomes more prominent because of their exposure to money paid them after carrying the things*". In other cases the effort of trying to combine heavy work and school is simply too much to bear. Constant punishment for late arrival and difficulties of keeping up with other pupils when they miss morning classes encourages drop-out. A 17 year old boy in rural highland Malawi recounted how he dropped out of school because he was

*constantly being sent to the maize mill and whenever I came back my legs were sore. It was therefore hard for me to go back to school. [Moreover] every time I went back to school I could find my [mates] well ahead of me. They had covered lots of topics and it was not easy for me to catch up... My sisters [14 and 8 years]... do not go to school because they were being asked to go to the maize mill whenever I said I was tired. They would come back with aching legs and they were eventually forced out of school*

(e) *Exhaustion affecting concentration and performance*

Whether or not children manage to get to school on time after head-loading, they may suffer from exhaustion which affects concentration and academic performance. This was observed wherever loads are substantial, in all three countries:

[Head portage, common especially in the evenings] *affects the concentration of children in school the following day. Right from primary class 1, children are made to get involved in some kind of head loading but it is more common among the girls. [urban coastal Ghana, female primary teacher].*

*When children are sent to fetch firewood before school they usually come to school late or do not come to school at all... fetching water and firewood make pupils feel tired and they lose concentration in class. This and lateness eventually result in children's poor performance [peri-urban highland Malawi, male secondary school teacher].*

*If I didn't do most of these activities [fetching water and firewood, cooking, cleaning the house, laundering at the river] I would probably have time to do my school work and study my books but by the time I start doing my homework I'm already tired and I want to sleep [rural Eastern Cape, 17 year-old girl, eldest of three children].*

Not everyone agreed that head-loading impacts on education were substantial. Many parents emphasized that it only took place after school or at weekends or in the holidays or that, despite the morning load-carrying tasks, their children always got to school on time: "*by 6 am the maize mill is already open. That gives my children [daughter 12, son nine] ample time to go... and get to school in good time*" [mother, urban highland Malawi]. A woman in coastal Ghana with two foster daughters observed that "*portage also benefits the children... it is a form of training for them to be hardworking now for the future*". In lowland rural Malawi, several parents argued that carrying domestic loads benefited their children: "*They get knowledge about how to work [and]... it makes them strong*" (though this mother also acknowledged that if the load-carrying and other work were less she would send her children to school more regularly). Clearly, much depends on specific conditions experienced by individual children, but the overall conclusions are not encouraging.

## 6. IMPACTS OF CHILDREN'S LOAD-CARRYING ON HEALTH AND WELL-BEING

Most adults interviewed were sanguine about the health and well-being impacts of children's load-carrying; occasionally head-loading was even presented as beneficial to health. A 23-year-old woman, for instance, observed:

*when coming to collect firewood and from the maize mill [in childhood] then I demanded that they should give me more of the load because I did not want to be seen and treated as a baby or just a small child... [so] I can carry very heavy loads now that I am on my own. My bones became strong [Malawi highlands PU, life history].*

The potential value of load-carrying for bone density is an important point, but this woman's health history also includes persistent headaches since childhood. In one remote rural site in Malawi, women told the sad story of an under-fed boy's death following excessive load-carrying (70 kg charcoal), and a few other references were made to potential health problems: "*it makes them not to grow well [prompt] because as young ones their bones become compressed due to heavy loads, they end up having a stunted growth*" [mother 48 years, remote rural plains Malawi]. "*it makes them to become strong but a child [who] carries more load than his/her weight, the child doesn't usually grow well*" [father 30 years, urban plains Malawi]. Most adults, however—men and women—seem to see load-carrying as simply a natural job for females.

In a southern Ghana study (Porter *et al.*, 2011) rural parents explained how load weight is increased as the child grows older and stronger: a boy or girl of 4–5 years can carry half a rubber of maize (4 kg); at 8 years 8 kg; at 10 years 16–20 kg. By 15 years girls are expected to be able to carry a full adult load (40–70 kg), whereas boys are thought to mature later. We met this load-for-age concept in interviews with children too. In Malawi a 9-year-old primary-school girl observed, "*when I go to collect firewood I try to carry an amount that is equivalent to my age*" [prompt]... *if I have carried too much then it is 20 kg and if too little it weighs 10 kg*". [peri-urban, highlands].

From a Western perspective, such loads seem enormous, but clear identification of impacts on current and future health is difficult because sound medical evidence is sparse (although, for instance, a WaterAid pamphlet in 1996 suggested that water loads have especially serious implications for girls, notably damage to head, neck, and spine; see also Geere, Hunter, & Jagals, 2010; Geere, Mokoena, Jagals, Poland, & Hartley, 2010). Detailed research is needed to answer important questions regarding whether, when and how the load-carrying we have documented translates into long-term bodily damage (or advantage, i.e., in terms of improved bone density).

In our survey we asked children whether they had experienced any problems from carrying heavy loads, with particular reference to the previous week. Overall, two-thirds of girls and boys said that they had experienced pain (headache, neckache, or "waist-pain") in the preceding week as a direct result of load-carrying: Table 12. A further 4.6% of children, overall, mentioned tiredness as a problematic consequence of their load-carrying activities.

Clearly, this is a complex topic because pain is such a subjective issue; however, these figures suggest this is an area where further (medical) investigation is required, especially in Ghana where figures are particularly high. Not surprisingly, more pain was reported in rural areas (over 80% overall), where load-carrying is most widespread. This is reflected in high rates of self-medication for work-induced pain reported by children in our Ghana field-sites (Hampshire, Porter, Owusu, Tanle, & Abane, 2011). In Malawi the reports of pain are lower overall, but still over 30% of boys and nearly 40% of



Table 12. Reported physical pains incurred from load-carrying in week preceding the survey

	% Reporting any pain (headache, neck pain, waist-pains) resulting from load-carrying in preceding week					
	Ghana		Malawi		South Africa	
	Girls (N = 513) (%)	Boys (N = 458) (%)	Girls (N = 520) (%)	Boys (N = 397) (%)	Girls (N = 540) (%)	Boys (N = 389) (%)
All	69.6	72.1	38.3	31.2	18.1	11.8
By settlement type						
RR	85.0	82.0	45.0	38.6	30.5	20.0
RS	85.6	78.8	44.1	37.9	22.3	12.8
PU	66.4	67.1	36.2	27.8	10.4	9.2
U	46.8	60.6	30.5	16.9	7.8	3.4
By age group						
7–11 years	77.3	74.5	39.3	24.8	14.2	11.5
12–15 years	68.8	72.4	38.8	33.9	19.0	12.7
16–18 years	62.0	68.9	35.0	34.3	20.8	10.8
By agro-ecological zone						
Forest/Blan/GNW	64.7	65.4	43.9	30.8	4.3	3.5
Coast/Lilong/EC	74.2	79.4	33.6	31.7	33.3	20.6

Table 13. Multiple logistic regression analysis of reported pain from load-carrying in Ghana, Malawi, and South Africa

Independent variables	Ghana (N = 971)		Malawi (N = 917)		South Africa (N = 929)	
	B	(Std Error)	B	(Std Error)	B	(Std Error)
Sex (REF = male)						
Female	-0.078 <sup>ns</sup>	(0.149)	0.414 <sup>b</sup>	(0.145)	0.713 <sup>b</sup>	(0.216)
Settlement type (REF = urban)						
RR	1.447 <sup>a</sup>	(0.235)	0.806 <sup>a</sup>	(0.205)	2.043 <sup>a</sup>	(0.324)
RS	1.424 <sup>a</sup>	(0.214)	0.784 <sup>a</sup>	(0.205)	1.479 <sup>a</sup>	(0.335)
PU	0.651 <sup>a</sup>	(0.185)	0.393 <sup>ns</sup>	(0.206)	0.579 <sup>ns</sup>	(0.375)
Age group (Ref = 7–11 years)						
12–14 years	-0.233 <sup>ns</sup>	(0.191)	0.182 <sup>ns</sup>	(0.162)	0.306 <sup>ns</sup>	(0.249)
15–18 years	-0.256 <sup>ns</sup>	(0.227)	0.091 <sup>ns</sup>	(0.195)	0.345 <sup>ns</sup>	(0.272)
Zone (Ref = Forest)						
Coastal	0.535 <sup>a</sup>	(0.149)	-0.269 <sup>ns</sup>	(0.142)	2.453 <sup>a</sup>	(0.216)
Constant	0.076 <sup>ns</sup>	(0.221)	-1.319 <sup>a</sup>	(0.218)	-5.239 <sup>a</sup>	(0.448)

<sup>a</sup>  $p < 0.0005$ .<sup>b</sup>  $p < 0.005$ .<sup>c</sup>  $p < 0.05$ .<sup>ns</sup>  $p > 0.05$ .

girls reported pains incurred from load-carrying, again with the highest proportions in rural areas. The substantially lower level of reported pain by children in the GNW sites in South Africa reflects the overall lower levels of load-carrying in that area; however, in Eastern Cape, where loads are carried much more frequently, 33% of girls and 21% of boys reported associated pains. In both Malawi and South Africa, the gender differences in reported pain were statistically significant, even when controlling for other factors (Table 13). Age does not appear to be associated with reported pain, even though, as we have seen, patterns of some load-carrying activities vary by age.

Interestingly, pain and negative health impacts from carrying emerged as a far stronger theme in in-depth discussions with boys than with girls, who tend to simply refer in passing to headache, neckache, backache, or “waist-pain” from carrying (to which they also occasionally attribute bouts of malaria). The following stories from men and boys are not untypical. A Ghanaian man of 30 observed that as young child he “fetched water, carried cassava and plantain... I believe that is what led to the constant headaches I was experiencing and still experience. I believe if I had not stopped it might have ended in my death” [Peri-urban forest zone]. Another story of extreme

pain came from a 15 year-old boy in peri-urban highlands Malawi:

*We buy fertilizer ... and I carry 50 kg ... I had a critical health problem from carrying fertilizer this year ... in the night as I was sleeping I started feeling pain in my neck ... we went to the health centre where they established I had sprained one of my nerves and they sedated me with anaesthetic and straightened my neck back.*

An 18 year-old boy in peri-urban Ghana observed how the weight of the foodstuffs brought neck and back pains: “You can notice people who cannot turn the head even through 90 degrees”. Another boy of the same age in rural Malawi likened the commercial work he does carrying charcoal to slave trade.

Why it should be that boys emphasize pain more in interviews, while the survey data suggest that girls are more likely to experience load-carrying induced pain, is unclear. Perhaps the emphasis on load-carrying as an essential skill for females in most sites encourages girls to make a more careful assessment of load weight as they carry domestic loads—what Jackson (1997) refers to as building up “body capital”—whereas boys, by contrast, take less care, especially when they are earning money for carrying. But girls also, perhaps, are simply

raised expecting to suffer to some degree, since load-carrying is an integral element of being female.

In this paper, we have focused particularly on analysis of load-carrying frequency and impacts by gender, age, and settlement type/location, since these were the most prominent factors to emerge in the analysis of both qualitative and quantitative data. However, it is worth making brief mention of other factors that can come into play. For example, household context may also influence load-carrying practice. When we asked about excessive loads, parents and children tended to refer in particular to poor (women-headed) households and, above all, to fostered children, particularly in Ghana: "*those who are fostered carry more load to get money than those who stay with their own parents because most of their needs are not catered for*" [coastal zone peri-urban focus group, out-of-school boys 15–19]. An 18-year-old unemployed boy suggested, "*Sometimes... commercial carriers tend to be foster children who will have to do so to help meet ends... [such] as exercise books or meals at schools*" [peri-urban coastal Ghana]. In many cases children are fostered specifically to assist with chores and sometimes it was observed (by these children and others in their communities) that they took the largest burden of load-carrying, even where there were other resident children, supporting earlier work in southern Ghana (Porter *et al.*, 2011)—a load perhaps "beyond their age" in terms of head-loading, as in many other domestic duties (Bledsoe & Brandon, 1992; Kielland & Tovo, 2006, pp. 31–34). However, analysis of the survey data suggests a rather more ambiguous relationship between fostering and load-carrying, an issue we explore in depth elsewhere (Hampshire *et al.*, submitted for publication).

## 7. CONCLUSION: REVIEW AND PROSPECT

Although there are differences in patterns of head-loading between and within our three study countries, relating to gender, age, and settlement type, load-carrying in many locations across Africa is clearly essential for household production and reproduction. From a careful review of qualitative and survey evidence, we conclude that it may substantially damage children's current lives and future life chances. Our data suggest that many boys and girls experience considerable disadvantage as a result of the part they are expected to play in filling Africa's transport gap, whether their load-carrying work is for domestic or commercial purposes. Domestic load-carrying may have a particularly strong impact on education, because many tasks such as water collection are required to commence early in the morning prior to school, affecting punctuality, concentration, etc. The impacts of domestic load-carrying on health and well-being are more difficult to ascertain, partly because the subjective experience of pain may be mediated by cultural (gendered) expectations. However, the high proportions of children reporting pain as a direct result of load-carrying clearly indicate the need for further (medical) research. Commercial carrying in many sites is dominated by boys (since girls' time is commonly limited by domestic demands) and may have severe impacts on both their education and health, in the case of education leading to truancy and early drop-out and in the case of health and well-being to overloading, pain and possible long-term injury. While the impacts of load-carrying on formal education and immediate well-being (pain/discomfort) are mostly clearly negative, the impacts on longer-term health are essentially unknown, underscoring the need for a program of health-focused research on children's headloading.

Our conclusion brings to the fore some reflections regarding possible constraints on the continent's likely developmental

potential if current load-carrying patterns persist. Our data suggest that many of today's children may reach adulthood substantially disadvantaged in terms of their educational attainment and possibly also with long-term physical impairment associated with load-carrying, as we heard in some life histories of men and women in their twenties: persistent headaches, waist-pain, restricted neck movement, etc. (see also Avotri & Walters, 1999). These disadvantages must inevitably impact on productivity, livelihoods, and life chances. Moreover, the lower status of females of all ages, which remains characteristic of many African societies, is reflected in and arguably reinforced by their continued assignment as domestic beasts of burden. Given the strongly gendered pattern of load-carrying in adult populations, gender not surprisingly emerges as a key component of difference among children, especially as they move into their teens. This is evident not only in terms of load-carrying activity *per se*, but also regarding whether this work is remunerated or not.

However, this study also indicates some interventions which could help reduce the transport gap or at least ameliorate the role which children currently play in filling it. Sensitization of adults may have significant impact on children's portering work, especially in *commercial contexts* where there are increasing pressures toward corporate social responsibility. A learning exercise introduced through the International Institute for Tropical Agriculture's Sustainable Tree Crop Programme in its Farmer Field School curriculum in Ghana in 2003, to reduce this and other child labor hazards on cocoa farms, reportedly had statistically significant impact on carrying of heavy loads among children (notably 12–14 year olds) (International Institute of Tropical Agriculture (IITA), 2006). The remediation activities of the International Cocoa Initiative in Ghana and Cote d'Ivoire are also impressive (almost 88% reduction in the number of children carrying heavy loads in nine Ghanaian communities and almost 84% in 22 Ivoirian communities monitored) (Tulane University, 2011), though whether loads were redistributed to other people or to means of transport in these contexts is unclear. This latter point is important: if child portering is simply banned, it is likely that in poor families dependent on such income women will be expected to fill the gap, when most are already time-poor: this may not only increase their work burden but also arguably further reduce their status, since portering is among the very lowest status tasks in the livelihoods repertoire.

Legislation without accompanying sensitization is also unlikely to have impact, especially where reference is simply made to "heavy loads"; from this perspective it is noteworthy that Government of Ghana legislation (Ministry of Manpower, Youth and Employment, Hazardous child labor activity framework, June 2008) now requires that children under 18 years working in the cocoa industry do not carry more than 30% of their body weight for more than two miles (3 km) (Tulane University, 2010). Ensuring the implementation of such legislation, however, will be difficult, especially in remote rural areas. Moreover, widespread implementation of legislation restricting commercial load-carrying by children (or other interventions to reduce its prevalence) could have repercussions for the very poorest families, among whom portering is often a key income source. Consequently, where such interventions are made it will be essential to ensure that other (less damaging) income sources are made available to those families which would otherwise suffer severe income loss. As noted above, moreover, simple reassignment of commercial loads from children to women is not a satisfactory solution, given its implications for women's status and (often already excessive) work-burden.

Part of the solution to the *domestic* load-carrying problem is likely to include improving domestic water supplies, as Kieland and Tovo (2006, p.69) advocate, given that water-carrying dominates domestic load-carrying work. Accessible woodlots could also do much to reduce fuelwood carrying in rural areas (a common cause of accidents and one of the heaviest loads). As with all development initiatives, however, these interventions need careful planning within a broader multisectoral development program, to avoid unexpected adverse impacts, a point emphasized by Gibson and Mace (2006) in their analysis of a water intervention in rural Ethiopia.<sup>5</sup>

For other loads, such as agricultural produce, low-cost transport is required, whether motorized or nonmotorized. However, resistance to IMTs (Intermediate Means of Transport, often perceived as technologically backward), is widespread in Africa (e.g., IT Transport Ltd., 1996 re Zambia; Tengey, Glyde, & Kwashie, 1999 re Ghana). Resistance to animal-drawn vehicles in those regions with no tradition of live-stock-keeping is particularly strong. At the same time, in an increasingly carbon-constrained world and rapidly rising oil prices, it appears unlikely that cheap oil-fueled motor transport will offer a widespread alternative. Perhaps solar-powered vehicles will provide part of the solution in the very long-term, but in the near future it would be unrealistic to imagine that the need for human-power will disappear. One possibility may be to focus more on production of very simple, cheap forms of IMT such as wheelbarrows and push trucks, which can be operated by adults and children alike: in southern Ghana a small IMT action research project, for example, showed

that the introduction of push trucks encouraged young boys to take over some water and firewood transport from their sisters and mothers (Porter, Blaufuss, & Owusu Acheampong, 2012): even 20 months after the intervention they perceived operating the trucks as play, not work. Although IMT interventions are often captured by men, redistribution of load-carrying work along these lines could substantially reduce female time-poverty in many locations (as is evident in some of our South African sites) and in the longer term might contribute to redressing gender inequalities. IMT seems to have gone out of fashion recently among donors: perhaps, given the extent to which child load-carrying currently fills the transport gap, and the breadth and depth of the implications this has for children's lives and life chances, a reassessment of IMT developmental potential is required.

To conclude, there is a widespread tendency in the development community to underestimate the significance of transport—as absence of transport-related parameters from the MDGs reflects—but, as we have illustrated in this paper with reference to child portage, its inter-sectoral connections are remarkably pervasive and its developmental implications substantial, in many diverse locations, rural and urban. While children's burden of load-carrying is only one part of the wider developmental problem associated with Africa's transport gap, it has far-reaching significance for the human development of the continent. Concerted efforts are needed to bring together the diversity of interventions required to address what is arguably one of Africa's most significant, yet least recognized, development constraints.

## NOTES

1. Throughout the paper wherever we refer to load-carrying we are concerned with head-loading (which is the main form of pedestrian load-carrying), unless we state otherwise.

2. The age break-down (not gender-disaggregated) is as follows: in Cote d'Ivoire 77.5% of 5–11 year olds, 81.5% of 12–14 year-olds, and 83.5% of 15–17 year olds ( $n = 658$ ) involved in cocoa work carried heavy loads, compared to 27.2%, 53.5%, and 52.8%, respectively ( $n = 2,165$ ) living in agricultural households (including nonworking children). Respective figures for young Ghana cocoa workers (by age group) were 67.4%, 70.1%, 70.1% ( $n = 1,000$ ) and in agricultural households 34.9%, 61.2%, 61.1% ( $n = 2,074$ ) (Tulane university, 2009).

3. The commonest head loads were cassava, maize, fuel wood, vegetables, and charcoal. In addition, girls and young boys head-loaded many water loads every day between the water points and their homes; these went unrecorded because the weighing points were located to capture farm and market traffic rather than domestic loads.

4. Eighteen-year-old boys (but not 16–17-year-olds) in Ghana did appear to have a reduced frequency of water-carrying, so it may be simply that the age at which boys assume men's work activities is higher in Ghana than Malawi; however, the numbers of boys aged 18 are too small in each settlement to test this effect statistically.

5. A World Bank project to aid female fuelwood porters in Ethiopia thus focused not only on improving working conditions but also developing agro-forestry and alternative income sources for women <http://go.worldbank.org/S9UF4PDRN0>. However, the project only refers to girls aged 16 years and over, whereas many younger girls also appear to work as carriers. Gibson and Mace's (2006) study in an Ethiopian village community found that village taps introduced to reduce the time and energy that women spent carrying water was associated with an increase in birth rates and decreased mortality, with consequences for family size which they suggested could increase childhood malnutrition. They do not refer to impacts on child labor in the paper.

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