

AN ASSESSMENT OF FACTORS AFFECTING THE INDEPENDENT MOBILITY OF CHILDREN IN DAR ES SALAAM

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ABSTRACT

The opportunity for children to move about freely in public outdoor environments without an accompanying adult is defined in the literature as 'child independent mobility'. Studies of child independent mobility in other parts of the world have led to the revision of the way that measures of child mobility, development, road safety, and general well-being are contextualised, assessed and catered for in national policies. As a result, child independent mobility and related subjects have become important issues in many parts of the world, but especially so in Africa where local conditions in support of walking and cycling are not good and access to education is of vital developmental importance. This paper reports upon the findings of a child independent mobility study conducted in Dar es Salaam in 2010. The study involved the collection of quantitative and qualitative data through the administration of questionnaires completed by both schoolchildren aged 7-15 years old, and their parents or guardians. The paper presents the study's findings with respect to schoolchildren participation in activities outside their home environments without an adult, and the issues that influence this. The paper concludes with a discussion on the implications the study findings have for policies aimed at improving children's independent mobility and safety and security in public outdoor environments.

Key words: child independent mobility, travel behaviour, road safety, walking, cycling

1 INTRODUCTION

The opportunity for children to move about freely in public outdoor environments without an accompanying adult is defined in the literature as 'children's independent mobility'. Studies of child independent mobility in other parts of the world have led to the revision of the way that measures of child mobility, development, road safety, and general well-being are contextualized, assessed and catered for in national policies. As a result, child independent mobility and related subjects are important issues in many parts of the world, but especially so in Africa where local conditions in support of walking and cycling are not good and access to education is of vital developmental importance.

Three types of definitions and operationalisations have been applied in children's independent mobility studies. The earliest studies analysed mobility by measuring the geographical distance from children's home to places where children are allowed to wander when playing and socializing. Later on, children's independent mobility was operationalised as 'a license' to move around independently in the public outdoor environment. In this case, independent mobility refers to a set of rules defined by parents concerning, for instance, permission to cross roads or to ride a bicycle independently.

Implementation of this approach was complemented by studies on degree of licenses or prohibitions, to go to certain places like the home of friends or shops. The third type of studies involved measurement of the level of children's actual mobility within a certain period of time using, for example, mobility diaries (Kyttä, 2004).

It has been observed that children degrees of a license to move around independently have diminished during the three decades in many countries. Mobility restrictions stem from a numbers of reasons including concerns about road safety (Hillman et al., 1990; Carver et al., 2008), parents' perception of social dangers (Carver et al., 2008), and practical reasons such as convenience or weather conditions, and school imposed restrictions. Kyttä (2004) points out that children's levels of independent mobility influence their physical health, social, cognitive and emotional development. Mobility restrictions can also affect emotional bonds between children and the natural environment, and consequently the development of children's sense of responsibility for the environment.

Previous studies in Dar es Salaam city have paid little attention to how children get around in public outdoor environment in the city, and consequently very little is empirically known about how children's daily travel is taking place. How do they travel to/from school, visit friends and reach an outdoor public facility, after school, and during the weekend? What difference does age and gender of a child make? How do features of the local neighbourhoods, road traffic conditions, attitudes of parents and the society in general, socioeconomic status and other factors influence the independent mobility of children in rural, suburban and urban areas? These and other questions have yet to be explored thoroughly for the case of Dar es Salaam city, and other Tanzanian cities and towns in general. Past travel surveys show that more than 90% of school trips are made by bus and walking. A recent feasibility study by Bwire (2009) found that the share of walking school trips is about 35% and about 59% are made by minibus (Daladala) whereas only 2% of trips are made by bicycles. The majority (74.7%) of the school children prefer to use school bus to travel to/from school and about 15.2% indicated that they would prefer Daladala. The level of cycling is higher in older children than among the younger children but the latter who are currently cycling showed interest in continuing with cycling as opposed to older ones who prefer reducing the level of cycling for school travel. On the other hand, even at distances less than 2 km, Daladala is most widely used by school children. It was also found that some school children walk greater distances as far as 5 km and beyond this distance, cycling and walking seem to be an unattractive travel option among the children. The majority of schoolchildren (56.6%) indicated distance and family income as the main factors influencing their choice of school travel mode. Other factors, in the order of their rank, are safety 47.2%, mode availability 37.9% and cost for mode use 30.2%.

This paper presents the findings of children's independent mobility (CIM) study conducted in Dar es Salaam city in 2010. It attempts to address some of the main issues of contemporary CIM. The study involved the collection of quantitative and qualitative data through the administration of survey questionnaires completed by both schoolchildren aged 7 - 15 years old, and their parents or guardians. It has five sections. The following section outlines the methodological aspects of the survey. Section 3 presents survey findings whereas section 4 concludes with the suggestions for improved children's independent mobility and safety in public outdoor environment.

2 METHODOLOGICAL ASPECTS OF THE SURVEY

Dar es Salaam city is subdivided into three municipalities: Kinondoni, Ilala, and Temeke. Once permission to carry out the study at the selected schools was obtained from the municipals directors, head teachers of selected schools were visited and asked to nominate a teacher and part of a class to participate in the study. The field visits at the schools sites were primarily conducted during October, November, and early December 2010. The characteristics of case study schools are presented in Table 1. Pen-and-paper self-completion questionnaires were given to the nominated teacher who in turn distributed them to schoolchildren. Parents were given questionnaires through their children and both questionnaires (for children and parents) were collected at school at a later date suggested by the teacher.

Table 1: Selected school for the study

S/no	Name of school	Location	Districts	Level	Type
1	Tegeta	Tegeta	Kinondoni	Secondary	Government
2	Bunju 'A'	Bunju	Kinondoni	primary	Government
3	Mugabe	Sinza	Kinondoni	primary	Government
4	Tungi	Kigamboni	Temeke	Secondary	Government
5	Levy	Kigamboni	Temeke	Secondary	Private
6	Kigamboni	Kigamboni	Temeke	Primary	Government
7	Ufukoni	Kigamboni	Temeke	primary	Government
8	Mchikichini	Kariakoo	Ilala	Secondary	Government
9	Liku	Gongolamboto	Ilala	Secondary	Private
10	Mzinga	Kitunda	Ilala	Secondary	Private
11	Buguruni	Buguruni	Ilala	Primary	Government
12	Bunge	Posta	Ilala	Primary	Government

Survey questionnaires and coding and variable definition in SPSS program were designed and provided for this study by the Policy Studies Institute of the Westminster University. The contents of the questionnaire for children covered questions on the following main items:

- Travelling to and from school;
- Walking;
- Cycling;
- Buses;
- Activities done at the weekend;
- Where children live; and
- Children particulars.

On the other hand, the contents of the questionnaire for parents/carers of children were designed to collect information on:

- Children coming home from school;
- Children's other journeys;
- Crossing roads;
- Going out after dark;
- Cycling;
- Buses;
- Mobile phones;

- Traffic;
- Parent/carer particulars; and
- Household particulars

A total of 300 questionnaires were distributed to the selected schools and 284 questionnaires, which make about 94.6% of distributed questionnaires, were filled and returned. Table 2 shows the distribution of questionnaires and the response rate per school. The table shows that about 96% and 88% of school children and parent questionnaires were filled and returned respectively.

Table 2: Survey Response Rate

S/n	Name of school	Children questionnaire			Parents questionnaire		
		Distributed	Returned	% return	Distributed	Returned	% return
1	Tegeta	20	17	85	5	3	60
2	Bunju 'A'	20	20	100	5	5	100
3	Mugabe	20	16	80	5	5	100
4	Tungi	20	20	100	5	3	60
5	Levy	20	19	95	5	5	100
6	Kigamboni	20	20	100	5	5	100
7	Ufukoni	20	20	100	5	4	80
8	Mchikichini	20	20	100	5	4	100
9	Liku	20	20	100	5	4	80
10	Mzinga	20	20	100	5	5	100
11	Buguruni	20	19	95	5	5	100
12	Bunge	20	20	100	5	5	100
Total		240	231	96.25	60	53	88.3

The age of school children respondents ranged between 7 and 15 years and 57% were female and 41% male (with 2% non-response for each of the two items). Five percent of the children were between 7 to 9 years old, 44% between 10 and 12 years and 49% between 13 to 15 years old. For parents respondents, under 30 years old were 13% and 53% between 30-44 years and 26% were 45 years old (with 8% item non-response). In terms of gender, 60% of parents respondents were male 34% female and 6% item non-response.

3 SURVEY FINDINGS

3.1 Children's travel behaviour and perceptions

3.1.1 *Travel to and from school*

The predominant modes of transport to and from school are walking and Daladala minibus. As Tables 3a and 3b show, the share of walking trips to school is 62% and 66% from school while 28% and 27% of school trips are made by Daladala to and from school respectively. It was found that 5% and 6% of trips to and from school, respectively, are made by school bus while out of the case study schools only one government school (Bunge primary) and one private school (Mzinga secondary) use school bus. The level of car use for school trips is very low (to school 3.5% and 0.4% from school). Out of the twelve case study schools, cycling to and from school is prevalent in three schools; Bunju A, Tegeta and Ufukoni. The three schools are located outside the central business district of Dar es Salaam city.

Table 3a: Travel to school

	School													Total
	Bunju 'A'	Tegeta	Tungi	Buguruni	Bunge	Kigamboni	School Kigamboni (private)	Liku	Mchikichini	Mugabe	Mzinga	Ufukoni		
Walked most or all the way	15	12	10	16	1	19	11	17	3	15	8	15	142	
	75.00%	70.60%	50.00%	84.20%	5.00%	95.00%	57.90%	85.00%	15.00%	93.80%	40.00%	75.00%	61.50%	
Cycled	2	0	1	0	0	0	0	0	0	0	0	2	5	
	10.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	2.20%	
School bus	0	0	0	0	11	0	0	0	0	0	1	0	12	
	0.00%	0.00%	0.00%	0.00%	55.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	5.20%	
Daladala	2	5	9	3	8	1	8	1	16	1	7	3	64	
	10.00%	29.40%	45.00%	15.80%	40.00%	5.00%	42.10%	5.00%	80.00%	6.20%	35.00%	15.00%	27.70%	
Car	1	0	0	0	0	0	0	2	1	0	4	0	8	
	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	5.00%	0.00%	20.00%	0.00%	3.50%	
Total	20	17	20	19	20	20	19	20	20	16	20	20	231	
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	

Table 3b: Travel from school

	School													Total
	Bunju 'A'	Tegeta	Tungi	Buguruni	Bunge	Kigamboni	School Kigamboni (private)	Liku	Mchikichini	Mugabe	Mzinga	Ufukoni		
Walked most or all the way	17	12	10	15	1	20	11	17	4	16	11	16	150	
	85.00%	70.60%	50.00%	78.90%	5.00%	100.00%	57.90%	85.00%	20.00%	100.00%	55.00%	80.00%	64.90%	
Cycled	1	0	0	0	0	0	0	0	0	0	0	2	3	
	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	1.30%	
School bus	0	0	0	0	12	0	0	0	0	0	2	0	14	
	0.00%	0.00%	0.00%	0.00%	60.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	6.10%	
Daladala	2	5	10	4	6	0	8	3	16	0	7	2	63	
	10.00%	29.40%	50.00%	21.10%	30.00%	0.00%	42.10%	15.00%	80.00%	0.00%	35.00%	10.00%	27.30%	
Car	0	0	0	0	1	0	0	0	0	0	0	0	1	
	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%	
Total	20	17	20	19	20	20	19	20	20	16	20	20	231	
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	

As shown in Figure 1a, it was found that 77% and 70% of schoolchildren travel unaccompanied to and from school and 12% and 27% travel to and from school accompanied with children of same age or younger, respectively. In terms of age, the majority (i.e. 67% to 76%) of children aged 10 years and above travel to and from school unaccompanied and 5% to 6% travel to school accompanied with children of same age or younger whilst the proportion of schoolchildren who travel from school with accompaniment is about 12% (Figures 1b and 1c). Further, 6% of children are taken to school by parents/carer (Figure 1d).

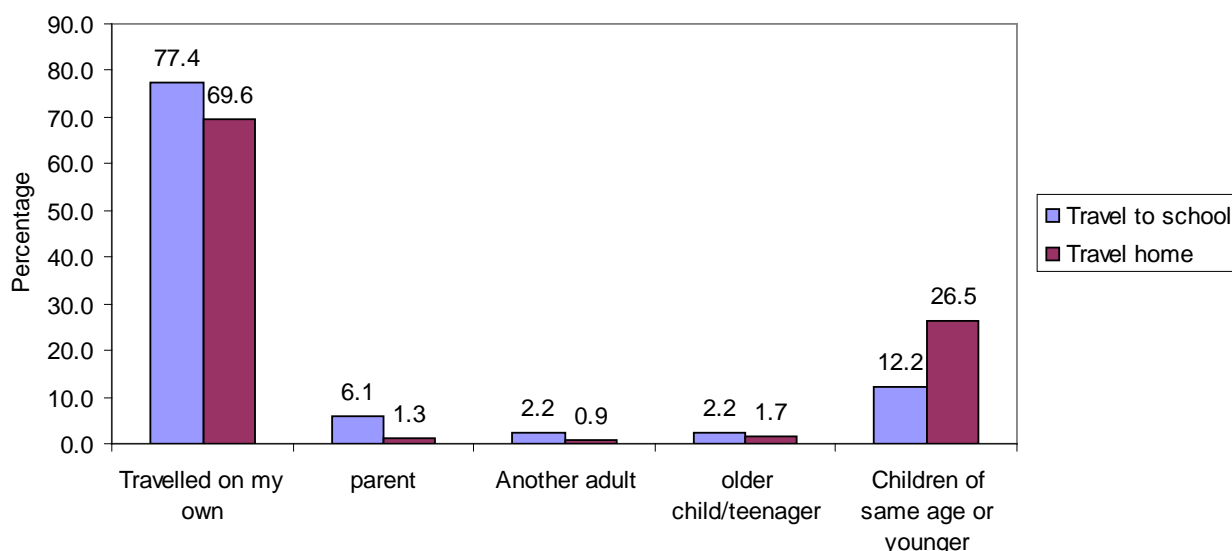


Figure 1a: Travel to/from school accompanied/unaccompanied (N = 230)



Figure 1b: Children crossing main road to school, there is neither zebra crossing nor sign for school children

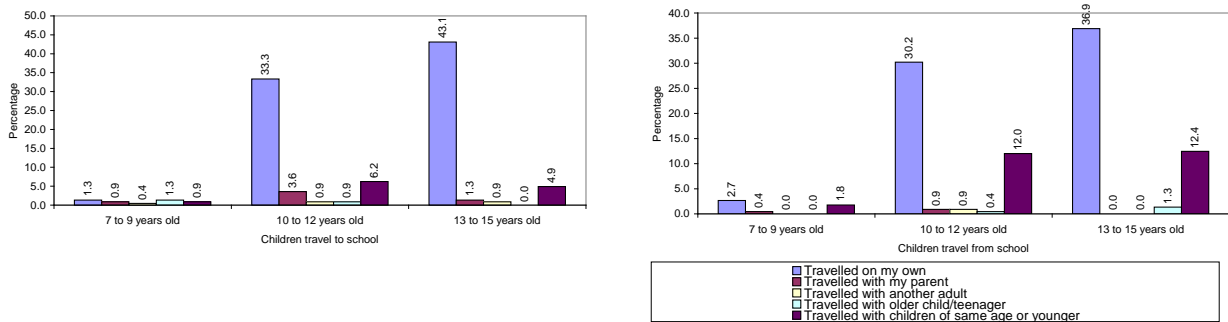


Figure 1c: Travel to/from school accompanied/unaccompanied (N = 225)



Figure 1d: A child taken to school by her carer/parent the busy traffic

3.1.2 Preference of school travel modes

Figure 2 shows schoolchildren preferences of school travel modes. As shown, the majority of schoolchildren prefer school bus transport (63%) and 13% prefer walking and cycling modes of transport. In terms of age of children, the majority (72%) of older children (13 years and above) are the ones who prefer most school bus transport. In contrast, the majority (15% to 18%) of younger children (7 to 12 years) prefer walking and cycling modes.

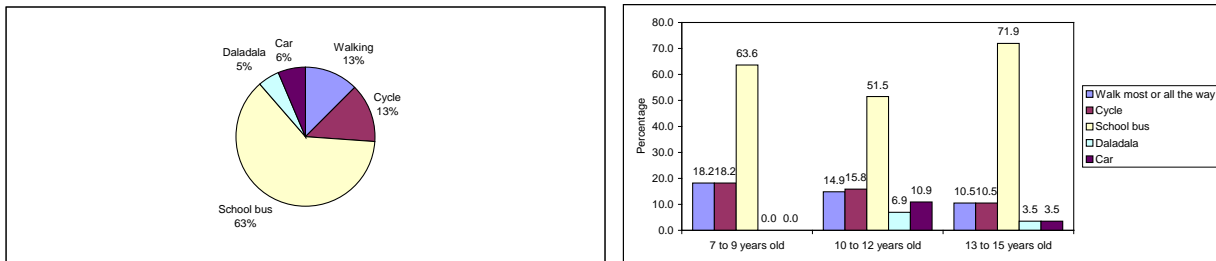


Figure 2: School travel mode preference

Besides the school bus, Figure 3 shows that children in many schools which are located in the outskirts of the city centre prefer cycling and walking. Interestingly, car travel is equally mostly preferred by Bunju A schoolchildren and completely not preferred by some schools (e.g. Tegeta, Tungji, Buguruni, Kigamboni and Ufukoni) which are also located at the outskirts of the city centre.

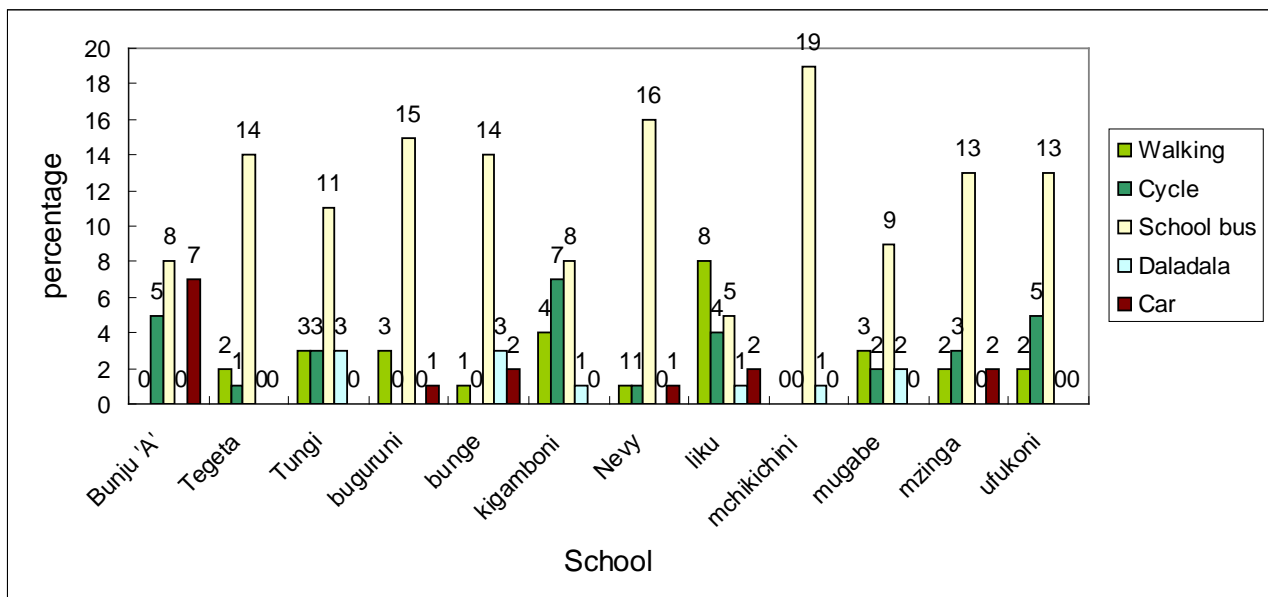


Figure 3: Travel mode preference of selected schools

3.1.3 Crossing main roads

The children were also asked to indicate whether they are allowed to cross main roads on their own by walking. It was found that 54% of children are allowed to cross main roads on their own whilst 46% are not allowed (N=223 excluding item non-response), but 18% of the later would like to be allowed to cross main roads on their own. As Figure 4 shows, the age at which the children were first allowed to cross main roads ranges from 5 to 15 years with the majority of children being allowed when they were 7 to 10 years old.

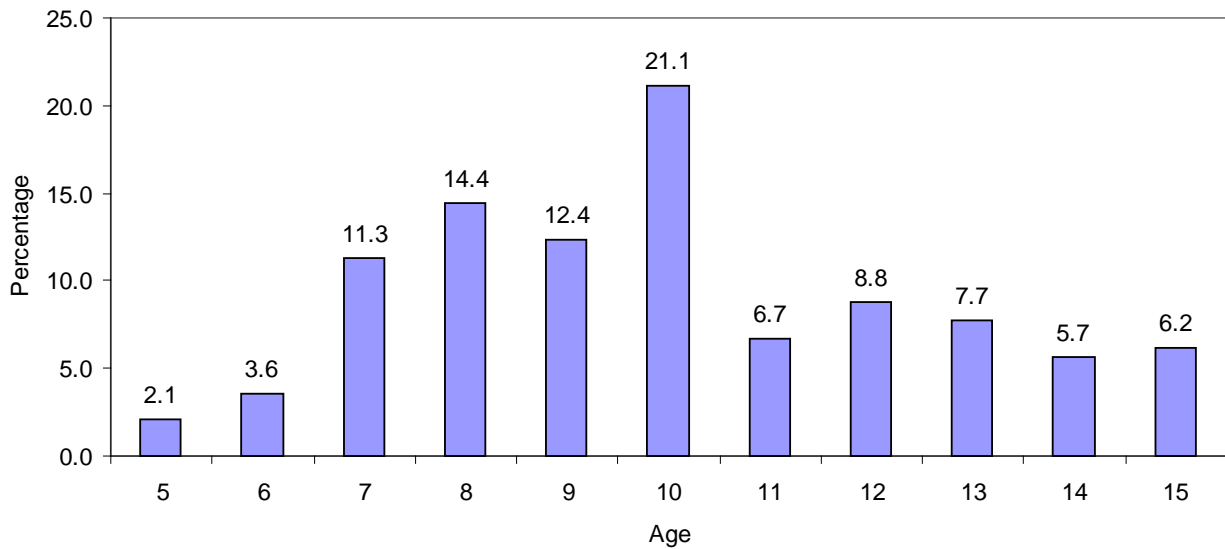


Figure 4: Age at which children were allowed to cross main roads by walking

On the other hand, the majority (83%) of children do not have a bicycle and only 17% of the 223 children respondents have a bicycle and out of them 23% are allowed to cycle on main roads. The age when children were first allowed to cycle on main roads ranged from 3 to 15 years old. Additionally, 78% of children indicated that they are allowed to go on local buses on their own and about 22% are not allowed.

3.1.4 Children’s perceptions of public outdoor environment

The children’s perceptions of their local neighbourhood are shown in Figure 5. Most children perceived their local neighbourhood to be safe. Further analysis of the results showed that the majority of children aged 10 years and above perceived their local neighbourhood to be safe. On children not allowed out alone, further analysis of results showed that the majority (72%) of them were girls aged 10 years and above.

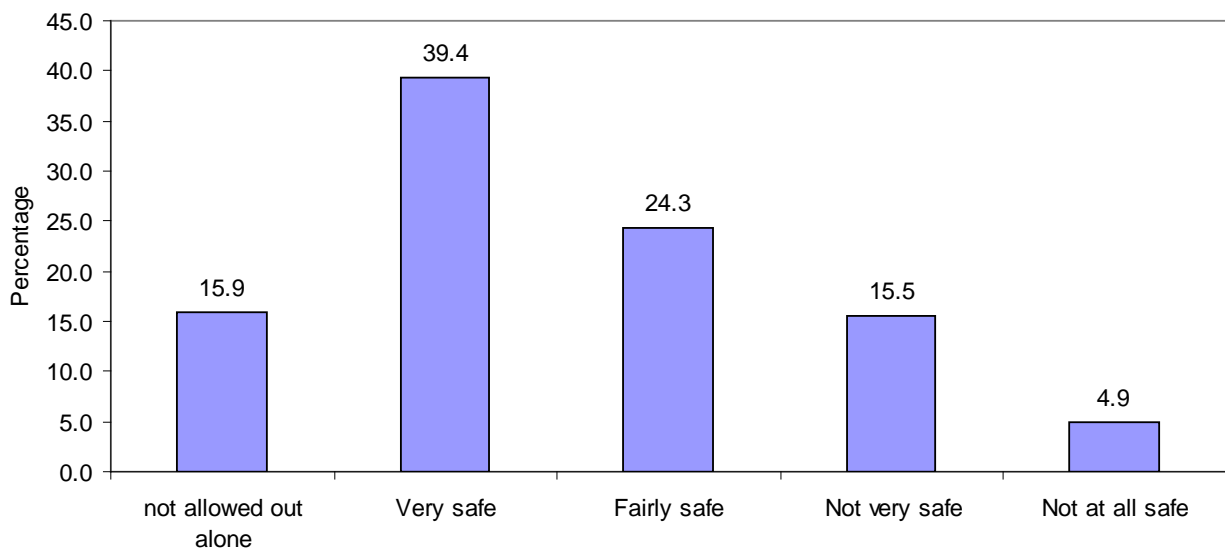


Figure 5: Children’s concern over safety in their local neighbourhood (n=226)

Children were also asked to select issues which worry them when they are outside on their own or with friends. Figure 6 presents a summary of concerns selected by the case study schoolchildren. It can be seen that major concerns for most children are bullying (80%), getting lost (78%), stranger danger (75%), road traffic (65%) [as illustrated in Figure 7], and 51% don't feel that they are old enough to go about on their own, and 19% don't know what do if someone speaks to them.

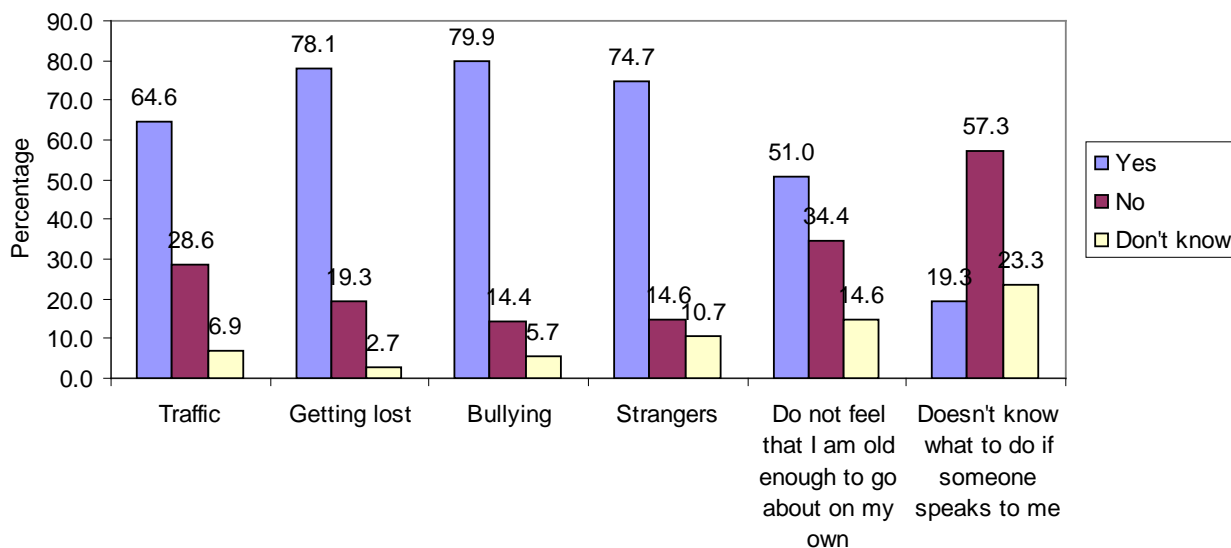


Figure 6: Children's concerns about outside environment (N varied due to item non-response)



Figure 7: Buguruni primary school compound near a main road

3.2 Parent's responses and concerns

3.2.1 *Coming home from school*

Of the 52 parent respondents, 90.4% indicated that children travel home from school alone and 9.6% not alone. The age at which parents first let their children to travel home alone ranges from 5 to 17 years old with the majority being first let at 6 and 7 years old.

Table 4 shows the parent's major reasons for picking children up from school. The indicated reasons are varied, but the most frequently indicated reason is the concern about traffic danger, children unreliable or too young, danger from adults, school too far away, and opportunity to spend time with their children and meet other people.

Table 4: Reasons for picking children up from school

Reasons	Number of 'yes' responses	Percent
Opportunity to spend time with my child	12	9.9
Opportunity for exercise or get out of house	8	6.6
Concern about traffic danger	25	20.7
Child unreliable or too young	17	14.1
Danger from adults	14	11.6
Fear of bullying by other children	11	9.1
Opportunity to meet people (teachers, other parents etc)	12	9.9
Shopping, visiting a relative, etc., on the way to an activity for you or the child	9	7.4
School too far away	13	10.7
Total	121	100

3.2.2 *Other journeys*

Parents were also asked to indicate whether they allow their children to go alone to places other than school that are within walking distances and the results (with 6% item non-response) show that 34% of parents allow their children to go alone and 11% indicated that their children are usually taken there and 49% varied (i.e. children can be allowed to go alone or be taken there).

3.2.3 *Crossing roads*

With the 6% of item non-response, 68% of parent's respondents indicated that they allow their children to cross main roads alone and 26% of parents do not allow it. The age at which a child is first allowed to cross main road was reported to range between 5 years and 16 years with the majority (17%) of parent respondents indicating that they first allow children at the age of 7 years.

3.2.4 *Going out after dark*

On the issue of allowing children to go out after dark, 91% of parent respondents do not allow their children to go out after dark (item non-response, 2%). The main reasons reported by the respondents for not allowing children to go out after dark include concerns about not being safe since it is dark, afraid of bad things, afraid of rape, afraid of thieves, accident risk, and keep children away from bad group of friends.

3.2.5 *Traffic*

Sixty percent (60%) of parents respondents indicated that they are very worried about the risk their children being involved in road traffic crashes whereas 21% indicated that they are quite worried, 9% not very worried, and 8% are not sure/don't know about the risk. Item non-response was 2%.

4 CONCLUSIONS

This paper has presented some results on children independent mobility in Dar es Salaam city. The main focus in this paper has been on the schoolchildren travel to and from school and how this is influenced by whether or not they are accompanied, preference of school travel modes, permission to cross main roads and how this is influenced by age, and how children perceive their local neighbourhood and issues which worry them and their parents most and hence reasons for picking children up from school.

Walking and Daladala are the major modes used by school children to get to/from school and few of them use cycling, school bus and car to/from school. Although school bus transport mode is still highly favoured by the majority of schoolchildren, it is interesting to note that about 13% of schoolchildren preferred cycling for school trips.

Basing on the parent's and children's responses; the majority of schoolchildren travel to school and to other places unaccompanied and are allowed to cross main roads alone. Although the majority of schoolchildren, especially those aged 10 years and above, perceive their local neighbourhood to be safe, the major issues which worry them when they are outside their home places on their own or with friends are bullying, getting lost, stranger danger, road safety, and feeling that they are not old enough to about on their own. On the other hand, ten percent of the parents respondents perceive road safety, children unreliable or too young, danger from adults, and opportunity to spend time with children and meet other people as the major reasons for them to pick children up from school. The results show that children mobility is highly restricted after dark as about 91% of parents do not allow their children to go out after dark.

Interventions which may help to quell worries and concerns of the schoolchildren and parents when children are outside on their own or with friend and encourage walking and cycling include physical environmental interventions, social interventions such as designated days on which walking and cycling to school is encouraged, as well as walking- and cycling school buses, enforcement and road safety education.

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REFERENCES

- Bwire H, 2009. School Travel Modes Preferences in Dar Es Salaam City. *World Transport Policy and Practice*, 15 (3), pp 22 - 34.
- Carver A, Timperio A, Crawford D, 2008. Playing it safe: The influence of neighbourhood safety on children's physical activity – A review. *Health & Place*, pp 217-227.
- Hillman M, Adams J and Whitelegg J, 1990: One false move: A study of children's independent mobility, Policy Studies Institute, London.

Kyatta M, 2004. The extent of children's independent mobility and the number of actualized affordances as criteria for child-friendly environments. *Journal of Environmental Psychology*, 24, pp 179-198.