Safety and Security Consideration of School Pupils in the Neighbourhood

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Abstract

The neighbourhood concept of Clarence Perry established the relationship between the residential components of a neighbourhood and elementary schools at the centre of the neighbourhood within a walking distance. Although, many land subdivisions in the planned areas of Nigerian cities are based on this concept, with schools at the neighbourhood centre, yet the plans are not often implemented as designed. Instead, indiscriminate location of schools without consideration for through traffic, easy and short accessibility to homes prevails. Consequently, many pupils travel several kilometres to and from schools amidst complex urban transit system. This study examined home-school travel pattern of school pupils within Abeokuta metropolis with particular reference to mode of transit used by pupils in regards to safety and security considerations. A sample of 190 pupils was taken from 19 private and public schools, selected randomly through cluster sampling technique. Data were analysed using percentage and multinomial logistic regression analysis. The study revealed that 35.8% of pupils journey to school by organised school bus service, 25.8% by motorcycle/three wheeler, 6.8% by private car, 18.4% walked to school unaccompanied and 13.2% took public taxi. Safety and security vulnerability of pupils revealed 83.7% and 82.1% respectively. The study recommended review of planning standard on location of schools and as a matter of policy advice, strict enforcement of such standards to reduce vulnerability of pupils.

Keywords: Safety, Security, Transit, Travel Pattern, Vulnerability

INTRODUCTION

Safety and security is one fundamental factor an individual will consider in the process of making a choice of location of either residence or business. The current trend of safety and security threats in the country is making it more fundamental in the locational consideration of activities. Administrators as well as professionals are getting more concerned, Town planners in particular are concerned with creating a pleasing, functional and orderly environment where living and working with adequate protection will be ensured. Planners use land use planning as a tool of achieving this goal, hence planners are soft corps that protect the environment against safety and security threats.

The Neighbourhood Concept of Clearance Perry (1929) still remains a good reference, with focus on correcting urban social evils (Rachel & Hubert, 2000) brought about by the industrial revolution and the resultant chaotic urbanisation through planning of neighbourhood units. According to the concept, a neighbourhood unit is expected to be a self-contained unit of space that has basic infrastructural facilities and services that will enhance a safe and secure family living. Protection

of the environment and in particular the dwellers, especially the school pupils, is reflected in Perry's concept. This encompasses accessibility to school, separation of through traffic from within the neighbourhood and centralisation of school location enhance home-school journey of school pupils within their immediate environment and at a walking distance.

Contemporary social problems are not quite different from what Perry observed. Urban areas are becoming more chaotic and the attendant safety and security threat is on the increase, with frequency of rate of road crashes leading to fatality as well as the crime index are making urban areas insecure for different categories of dwellers. Children especially are vulnerable to these threats because of their physical, psychological and knowledge capabilities, and as such require adequate protection and care (Ajala, 2014). In recent time, children are often seen scrambling for public transport with adult on daily basis to make the obligatory school trips. These pupils are exposed to many threats arising from the complex urban transit system ranging from road crashes, missing of routes and the risk of been kidnapped. Cases of kidnapping of school children are being reported in Nigeria through the media, such as the case of Chibok girls in Borno, Dapchi girls in Yobe and those of Epe in Lagos State of recent.

Elementary School is a neighbourhood facility that should be provided with adequate consideration of traffic and accessibility to residents within the community. Clearance Perry (1929) proposed six principles upon which the Neighbourhood Concept is based which include:

a) The size of the neighbourhood in relation to the catchment area of an elementary school;
b) Boundary of the residential area should be bounded by arterial traffic;
c) Provision of open space that will meet the need of the neighbourhood;
d) An elementary school at the central point of the neighbourhood;
e) Location of shopping district at the circumference of the neighbourhood unit; and
f) Internal street system to facilitate circulation within the unit and discourage the use by through traffic (Nicholas, 2002).

From the aforementioned principles, the need to protect the school pupils from social evils of the complex urban system is understandable. The principle had brought to fore accessibility of elementary schools within the walking distance to support a catchment population. He also emphasised separation of through traffic and other activities i.e. commercial, that could attract traffic from within and outside the neighbourhood and locate such at the circumference of the neighbourhood unit. This concept in essence incorporate road safety features into land use and urban planning, and forms the basis for planners' role as soft corps protecting people against safety and security threat that complex urban system may bring.

Presently, planning and location of schools is being influenced by market forces. Schools, especially private, bid for inner city area for reason of feasibility and high patronage contrary to the catchment area and the catchment population the school should serve. Therefore, elementary schools that should be closer to home are now located faraway in the city centre making children to compete with adult in the movement to city centre. Cities, being the centres of secondary and tertiary service i.e. manufacturing and industrial service with logistic distribution of material and finished product brought about complexity of activities and traffic system (Oyesiku, 2010).

Mammen *et al.* (2012) and Oluyomi *et al.* (2014), identified distance travel between home and school as one of the factors that influence safety and security of school pupils and they suggested that children should not walk farther than 1.35 mile (2.2 kilometers) to/from school. In the same manner Al-Dawamy & Sulaiman, (2010) in Mariana *et al.* (2017) identified increasing rate of crime against school pupils yearly, and as such walking to school is no longer safe. In the United States, Evers *et al.* (2014) showed that walking rates to school among children remain low because parents are concerned for their children safety. Safety in this case is not limited to only crime, but also road safety (Fatimah & Osman, 1997).

Safety and security of children is entrenched in the United Nation (UN) convention on the right of the child (1989). Every child has right to protection and it is the responsibility of the society to expand children's opportunities in life. According to UNICEF-Nigeria (2014), one billion children globally experience some form of violence every year, of which one dies every five minutes. UNICE-Nigeria (2014) further reported that children living and working on the streets are more prone to various violence or threat. In Nigeria, six out of ten children in the country faced this threat and more than 70% experience the violence repeatedly, especially at school or while going or coming from school (UNICEF, 2017)

Over the years there has been tremendous improvement in child safety in vehicles. However, some of the safety key factors in school pupils transportation identified in the literature are the driving behaviour of road users, the vehicle condition, the road environment, the student's behaviour and safety knowledge, as well as the technological equipment available to ensure safety. Emphasising the road environment, Evers *et al.* (2014), opined that the existence of appropriate sidewalks along the roads plays a crucial role in students' safety and stress while contrarily poor surface pavements, routes interrupted by trees, light poles or other fixed obstacles greatly reduce the level of safety.

The factors that affect pupils in transit to school are numerous. The distance from the residence to the bus stop, the road network, the absence of sidewalks, the absence of attendants within the school buses and the absence of appropriate seatbelts are factors that highly affect the levels of pupils' safety in the journey to school (Morfoulaki *et al.* 2013). Furthermore, the use of appropriate transit mode and maintenance of such also contribute to the safety level of pupils (Transportation Research Board, 2002).

Gibson et al, (2002) and Markowitz et al, (2001) opined that positive social relations and cohesion that exists among neighbourhood residents, and willingness to exercise informal social control within neighbourhood determines the level of collective efficacy that exists within that neighbourhood. Consequently, neighbourhoods with high levels of collective efficacy have high levels of informal social control which should lead to lower levels of fear, delinquency, and crime as well as regulating the behaviour of their residents which will in turn enhance the security of all. (Sampson and Raudenbush, 1997).

This study aims at assessing safety and security consideration of home-school journeys of pupils with the following objectives: a) examining home-school travel pattern of pupils within Abeokuta; b) identify mode of transit used by school pupils; and c) examine the effects of mode of transit on safety and security of the pupils.

METHODOLOGY

Abeokuta is the capital city of Ogun state, located in the South West Nigeria. It lies on latitude 7^0 $6^{"}$ $00^{'}$ – 7^0 $12^{"}$ $00^{'}$N and longitude 3^0 $16^{"}$ $00^{'}$ – 3^0 $25^{"}$ $30^{'}$ E. The city is about 81km south-west of Ibadan, capital of Oyo State and 106km North of Lagos State, with a population of 235,389 in 2006 (NPC, 2006).

Abeokuta is one of the major South-West cities with influence of colonial administration, the city grew to become one of the educational service providers. The quality of education service provided by the city gave it a niche in the sector and at present Abeokuta has three Universities, a Polytechnic and two Colleges of education, 87 public and private secondary schools and a total of 123 public and private primary schools. Abeokuta metropolis constitute two local government areas, Abeokuta South and Abeokuta North with some part of Obafemi-Owode and Odeda local council areas in the suburb.

For the purpose of this study Abeokuta is divided into five zones, including the city centre and the four suburb areas. The city centre comprises of the core area including the Central Business District (CBD) of Ibara, the other four suburb zones represent the four cardinal areas of the city.

a) City Centre — Sapon, Ibara, Adatan, Ijaye
b) Zone A — Obantoko, oke- Aregba and Saje area
c) Zone B — Onikolobo, Adigbe, Ibara housing Area
d) Zone C — Ita-Oshin,Olomore, Sabo area
e) Zone D — Idi-Aba, Oke-Mosan area

A sample of 190 pupils was taken from 19 schools, private and public, selected randomly from a cluster of schools in the above mentioned delimited suburbs areas of the city. A structured questionnaire was administered on pupils in the upper primary classes (primary 3 to 6) with the help of their teachers in the selected schools. Data were analysed using simple percentage and multinomial logistic regression analysis to measure the likelihood ratio of safety and security vulnerability. The multinomial logistic regression model is given by:

$$y = \frac{\ell^{\beta_0 + \beta_1 X_1}}{1 + \ell^{\beta_0 + \beta_1 X_1}} + \ell_1 \quad (1)$$

Where y = Safety or Security
X_1 = Transit mode
β_0 & β_1 = Regression estimates
ℓ = Error term

RESULTS AND DISCUSSION

Results

Home-school travel pattern

An origin and destination matrix of the home-school zone is presented in Table 1. A cross tabulation of the home (origin) and school (destination) data revealed that 8.9% had their homes within the city centre while 37.9% had their schools there. Likewise, 30.5% had their homes in

zone A and 16.3% school in the zone, for zone B, 12.6% lived within the zone and 22.1% school in the zone, and for zone C and D, 30% and 17.9% lived within the zones and 16.8% and 6.8% attended schools within the zones respectively.

Table 1: Home Zone- School Zone Cross-tabulation

HOME ZONE		SCHOOL ZONE					
		CITYCENTRE	SUBUB-A	SUBUB-B	SUBUB-C	SUBUB-D	Total
CITY CENTRE	Count	13	0	4	0	0	17
	% within SCHOOL ZONE	18.1%	0.0%	9.5%	0.0%	0.0%	8.9%
	% of Total	6.8%	0.0%	2.1%	0.0%	0.0%	8.9%
SUBUB-A	Count	19	7	3	19	10	58
	% within SCHOOL ZONE	26.4%	22.6%	7.1%	59.4%	76.9%	30.5%
	% of Total	10.0%	3.7%	1.6%	10.0%	5.3%	30.5%
SUBUB-B	Count	5	12	5	2	0	24
	% within SCHOOL ZONE	6.9%	38.7%	11.9%	6.3%	0.0%	12.6%
	% of Total	2.6%	6.3%	2.6%	1.1%	0.0%	12.6%
SUBUB-C	Count	28	0	20	9	0	57
	% within SCHOOL ZONE	38.9%	0.0%	47.6%	28.1%	0.0%	30.0%
	% of Total	14.7%	0.0%	10.5%	4.7%	0.0%	30.0%
SUBUB-D	Count	7	12	10	2	3	34
	% within SCHOOL ZONE	9.7%	38.7%	23.8%	6.3%	23.1%	17.9%
	% of Total	3.7%	6.3%	5.3%	1.1%	1.6%	17.9%
Total	Count	72	31	42	32	13	190
	% within SCHOOL ZONE	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	37.9%	16.3%	22.1%	16.8%	6.8%	100.0%

Pupils living with Parent/Guardian

The level of safety and security care a child has could be a function of whom he or she lives with. Naturally parents have very strong love for their children and tend to protect them against all forms of threat. Table 2 below revealed that 54.2% of the pupils lived with their two parents, while 20.5% lived with only their mothers, the remaining 25.3% lived with guardian of which 6.3 lived with male guardian,7.4% with female guardian and 11.1% with grandparents. Over 50% lived with their parents and another 20.5% with their mothers, by implication, it means that over 70% had direct parental care while less than 30% are cared for by surrogate parents (guardians).

Table 2: Pupils living with parent/guardian

	Frequency	Percent (%)
Both parents	103	54.2
Guardian – male	13	6.8
Guardian – female	14	7.4
Single parent -female	39	20.5
Grand parent	21	11.1
Total	190	100.0

Vehicle ownership status of parents and guardian

Motor vehicle ownership status is a significant determinant of travel pattern and modal choice. Parents who are in possession of private motor vehicle are more likely to convey their wards to school. Table 3 revealed that 30.5% of the pupils' parent or guardian had one motor vehicle while 8.9% had more than one motor vehicle. While 41.6% had no motor vehicle, 36% of the pupils do not know if their parents or guardian had a motor vehicle. The overall analysis revealed that 39.4%

of the pupils' parent and guardian owned a car while about 61% had no vehicles. Hence, less than 40% had access to private transit while 60% will choose from other available mode.

Table 3: Vehicle ownership status of parents

	Frequency	Percent
Yes - one vehicle	58	30.5
Yes - more than one vehicle	17	8.9
No	79	41.6
Not known	36	18.9
Total	190	100.0

Types of vehicle owned by parents/guardian

Vehicle ownership of the parent is further analysed based on their characteristics, Table 4 revealed that 16.8% each had a car or a motorcycle, 4.7% had a bus while 2.1% had a truck. The remaining 60.5% had no vehicle. Parents with a car or motorcycle are more likely to take their children to school than those with a bus or a truck, hence, about 33.6% of the parents with a vehicle are likely to take their children to school. While 6.8% that owned a bus and truck are not likely to take their children to school.

Table 4: Parents' vehicle type

	Frequency	Percent
Motorcycle/tricycle	32	16.8
Car	32	16.8
Bus	9	4.7
Truck	4	2.1
Don't know	113	59.5
Total	190	100.0

Pupils' Family size

Table 5 revealed the size of the pupils family, 11.1% of the pupils are from a family of less than 3 people, 63.7% are from a family size of 3-6 people while 25.6% lived in a family of 7 people and above. By implication, majority of the pupils (63.7%) lived in an average family size of 3-6 people as well as large family of 6 people and above (25.3%). This may implies that parent or guardian had more children to care for, hence, they may concentrate on the much younger ones.

Table 5: Family size

	Frequency	Percent
Less Than 3	21	11.1
3 – 6	121	63.7
6 Above	48	25.3
Total	190	100.0

Occupation of Parents/Guardian

Apart from determining the socio-economic status of people, occupation could also determine availability of a person in the home to perform some family or parental responsibility. Table 6 revealed the occupation of parents and guardians, 40.5% of the pupils' parents or guardians is in

the civil/public service, 14.7% engage in trade or business, 6.3% work in the factories, 25.3% are Technicians in different vocations while 13.2% are in the private paid employment. The data revealed that majority are government workers who must resume almost at the same time the pupils resumed at school. Likewise the factory workers and those in the private paid employment. Less than 40% (Trader & Technician) had independent time of resumption and closing because their working hours/time is flexible.

Table 6: Parents' Occupation

	Frequency	Percent
Civil/public servant	77	40.5
Trader/businessmen	28	14.7
Factory worker	12	6.3
Technician	48	25.3
Private employee	25	13.2
Total	190	100.0

Mode of Transit to School

Five mode of transit were identified by pupils as shown in Table 7. School bus is the most patronised with 34.8%, followed by commercial motorcycle 25.8%, while 18.4% walk to school, 6.8% were taken to school in their parents' private car and 13.2% took public taxi. Despite the fact that school bus had been acknowledged as safest mode of transportation for pupils (ECTRS, 2004; NHTSA, 2014) only 34.8% used school bus while over 60% of the pupils journey to school using modes other than school bus. It means therefore, that pupils are highly exposed to safety and security threats. The low patronage of the school bus may be costly and relatively higher than other transport modes.

Table 7: Pupils' mode of transit to school

	Frequency	Percent
Walking	35	18.4
Motorcycle	49	25.8
Private car	13	6.8
Public taxi	25	13.2
School bus	68	35.8
Total	190	100.0

Further analyses of mode of transit on safety is presented with multinomial logistic regression, which revealed the likelihood ratio test in Table 8. The test was to determine the significant relationship between transit mode and safety of pupils in transit. Results show that at 0.05 level of significant, the chi-square is 96.899, the significance value is .000 and the Negelkerke R-square

Table 8: Likelihood Ratio Tests (Dependent Variable = Safety)

	Model Fitting Criteria	Likelihood Ratio Tests		
Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	11.466[a]	.000	0	.
Transit. Mode	108.365	96.899	4	.000

R-Squared = .573

percentage variation is 573. Thus there is a significant positive relationship between the mode of transport and the safety of pupils. Furthermore, the overall percentage level of vulnerability stood at 83.7% to safety threats (Table 9).

Thus the empirical model becomes:

$$y = \frac{\ell^{11.466 + 108.365 \text{ transit mode}}}{1 + \ell^{11.466 + 108.365 \text{ transit mode}}} \quad (2)$$

Table 9: Classification (Vulnerability ratio)

	Predicted		
Observed	No	Yes	Percent Correct
No	36	18	66.7%
Yes	13	123	90.4%
Overall Percentage	25.8%	74.2%	83.7%

Table 10 revealed the likelihood ratio of transit mode to security. The test revealed a significant relationship between transit mode and security of pupils in transit, at 0.05 level of significant, the chi-square is 132.028, significant value is .000 and the Negelkerke R-squared percentage variation is .691. This indicated that there is a strong positive relationship between the transit mode and level of security of pupils in transit. Furthermore, Table 11 revealed the overall percentage level of security vulnerability as 82.1%.

Table 10: Likelihood Ratio Tests (Dependent Variable = Security)

	Model Fitting Criteria	Likelihood Ratio Tests		
Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	8.301[a]	.000	0	.
Transit.Mode	140.329	132.028	4	.000

Nagelkerke R-Squared = .691

Thus the empirical model becomes:

$$y = \frac{\ell^{8.301 + 140.329 \text{ transit mode}}}{1 + \ell^{8.301 + 140.329 \text{ transit mode}}} \quad (3)$$

Table 11: Classification (Vulnerability ratio)

	Predicted		
Observed	No	Yes	Percent Correct
No	46	20	69.7%
Yes	14	110	88.7%
Overall Percentage	31.6%	68.4%	82.1%

Discussion

Analysis of the travel pattern revealed that more pupils school outside their zone of residence. In the city centre, only 13 resided within the zone out of 72 pupils that school in the city centre, the remaining 52 pupils came from other zones. Zone A has 7 residing within the zone out of the 31 that school in the zone, 24 pupils came from other zone. For zone B, 5 resided in the zone out of the total of 42 pupils that school in the zone, leaving 37 from other zones. And for zone C and D, 9 and 3 respectively lived in the zone while 32 and 13 respectively school in the zones, the remaining 23 and 10 pupils came from other zones. There is high level of mobility between the zones while the largest number were attached to the city centre 52 follow by zone 'B' (37), zone A and C were almost at the same level (24, 23), while zone D was the less attractive with the least number of pupils (10) that came from other zones. In summary, 153 (80.5%) journeyed to schools outside their home zone while 19.5% school within their neighbourhood. The observed high rate of pupils transit to school could be due to high rate of rent which made many city dwellers to move to the suburb in search of low-cost housing and in addition majority of the parents and guardians are /civil servant who had their place of work within the city centre, likewise the traders, hence, they might prefer a school closer to the workplace.

The background information of parent and guardian revealed that majority of the pupils live with their parents, over 70% had direct parental care either from both parent and single parent while less than 30% were cared for by surrogate parents (guardians). This means that the pupils have adequate parental care because no parent will unnecessarily expose his/her child to threat. Mobility is a function of vehicle ownership, although the type of vehicle owned and the number in the fleet, among other factors, might equally affect the probability of the children been taking to school. This study revealed that 33.6% of the parents with a vehicle are likely to take their children to school, while 6.8% that own a bus and truck are not likely to take their children to school because such vehicles are not passenger vehicle.

Factors such as family size and parent occupation were assessed with a view to identify the possibility of it hindering the level of care a child got from parents, the study revealed range of family size of 3 to 6 people which could mean that parent or guardian has more children to care for, hence, they concentrate on the much younger ones while others were left to go to school unaccompanied. Further to this, majority of the parents worked in a scheduled employment (60%) i.e. civil servants, factories, and private employment whose resumption time is likely to be almost the same with school resumption, hence they let go their children while they also go to work. Only 40% (Trader & Technician) had independent time of resumption and closing because their working hours/time is flexible and subject to their personal schedule.

CONCLUSION AND RECOMMENDATIONS

Findings from the study indicate high mobility of schools pupils across Abeokuta metropolis. This is pointing to the fact that the planning consideration for elementary school as a central neighbourhood facility no longer holds. Hence, a high level of vulnerability of pupils to safety and security risk. It is therefore imperative to recommend strategies to improve safety and security of pupils within the metropolis.

There is need to review planning standards on location of schools, especially along the highways, in the central business district and industrial area where high volume of high capacity vehicle traffic ply. The requirement for planning permission by school proprietors should include traffic impact of the proposed location among others. In addition, restriction of elementary schools to neighbourhood should adequately be enforced by the development control departments and monitored through periodic review and updating of data relating to schools in the metropolis.

Furthermore, planners should incorporate road safety features into land-use, urban planning and transport planning. Emphasis should be placed on development of traffic-calming schemes within the school area to control and alter road users' (drivers') behavior. Measures, such as positioning safety and security operatives around the school corridor with adequate information system will improve the consciousness of school pupils. In the light of prevailing safety and security challenges in the country, safety and security education should be promoted in schools with individual parents complimenting such education by finding time to enlighten their wards about safety and security precautions.

This paper has been able to identify the deviation from the neighbourhood concept in the location of elementary schools and its implications on the safety and security of the pupils. A review of planning standard on location of schools and promotion of safety and security education in schools are recommended.

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