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Public transport mode preferences of international tourists in Ghana: Implications for transport planning

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ABSTRACT

Generally, most studies on tourism in Ghana have laid emphasis on motivations and experiences of tourists, their preference for accommodation and restaurant facilities, and the quality of services rendered at these facilities ignoring a significant component of tourism, which is transportation. This paper examines public transport mode preferences of international tourists in Ghana. Primary data were collected from 479 out-bound international tourists at the departure hall of the Kotoka International Airport in Ghana between June and August 2015. The analyses of the study were done using frequencies, charts, chi-square statistic and multinomial logistic regression model. The study found that generic dimensions of transport services such as their affordability, accessibility, availability, safety and comfort influence public transport mode choice of international tourists in Ghana. Aside these factors, there were strong relationships between socio-demographic characteristics of tourists and their mode preference. It is therefore recommended that emphasis should be given to accessibility-based transport planning in order to help public transport provide quality services to meet the transport needs of international tourists.

1. Introduction

The most important aspect of tourism is the ability of tourists to travel around various attractions within destination areas (Dickinson and Robbins, 2008). Thus, transport is not only considered as a basic need, but as an essential element that attracts tourists to some destinations. To Akyeampong (2007), transportation is an essential component of tourism and devoid of it, nearly all travel away from home would cease, let alone travelling within destinations. Transportation services are essential to the development of tourism at destinations. However, Akyeampong (2007) noted that tourist exclusive transport is very rare within the industry, thus, most destinations rely on public/local transport services to meet tourists transportation needs. Le-Klahn and Hall (2015: 787) define public transport as "the use of shared, and often state-operated or contracted, bus, ferry, tram and train transport available for use by the general public including tourists to move around an area, excluding transport on city tour buses". Public transportation services over the years have provided tourists with experiences such as providing safe and efficient transport services for them at a given destination, through making available, cost effective modes of movement at the destination (Tran and Kleiner, 2005).

Several studies have been conducted worldwide on tourist travel patterns (Masiero and Zoltan, 2013). These have focused on modelling destination choices, exploring the dimensions of tourists' mobility, as well as determinants of their movement patterns. Besides, the existing studies on transport preferences have focused on countries such as Scotland (Hough and Hassanien, 2010), Oman (Rakesh and Shweta, 2010), India (Randheer et al., 2011), Portugal (Beirao and Sarsfield-Cabral, 2007), Germany and USA (Buehler, 2011; Le-Klahn and Hall, 2015), with studies on tourists' transportation preferences in Africa including Ghana being scanty.

Despite the central role of transportation in holiday experiences of tourists within Ghana, the interface between transportation and tourism in the country has received little research attention. Existing studies including Abane (1993, 2011) and Poku-Boansi (2008) focused on general commuters transport preferences and pricing of urban transport services in Ghana respectively. Specifically, Abane (1993) investigated mode choice to work among formal sector employees; he again examined travel behaviour of commuters in four metropolitan areas in Ghana (Abane, 2011) while Poku-Boansi (2008) investigated pricing of urban transport services in Ghana. Although these studies provide good information on public transportation modes in Ghana, they failed to

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address the transportation modes among tourists in the tourism industry. As a result, very little attention has been paid to public transportation preference of tourists in Ghana. There is therefore a knowledge gap on public transport mode preferences of international tourists in Ghana which this paper intends to fill. The objective of this paper is therefore to examine public transport mode preferences of international tourists in Ghana. In the context of this study 'public transportation preference' refers to the choice between available means of public transportation services at a destination.

Insights gained from this study will shed more light on public transportation preferences among tourists which will aid in planning for efficient and effective transport system to boost the tourism industry in Ghana. The study is also expected to provide tourists with the necessary information about public transport services in Ghana which will guide them in taking informed decisions on transportation services whenever they visit the country.

2. Factors that influence tourists' public transport preference

A number of independent variables (social, economic, cultural and environmental) have significant influence on transportation mode choices (Minal and Ravi, 2014; Thrane, 2015). Travel distance variables, trip-related characteristics, socio-demographics (Thrane, 2015), safety, convenience, affordability and accessibility (Racca and Ratledge, 2004; Stradling et al., 2007; Susilo and Cats, 2014) have been identified as key factors in determining transport mode choice preferences. Travel time, travel cost, waiting time, number and ease of transfers, and comfort are possible regressors which may also affect tourists' transportation mode choices. This study considers socio-demographic and psychographic variables as possible determinants of transport mode choice preferences in Ghana.

2.1. Psychographic variables

Psychographic variables include variables such as affordability, accessibility, availability of mode options, length of waiting time, safety/security of mode, comfort/convenience, reliability of modes and many others. These factors even though in varying degrees are interrelated and have influences on tourists' transport mode choice (Anable, 2005; Choo and Mokhtarian, 2004; Johansson et al., 2006) and as such act as key drivers of choice in transportation mode decision making. What this means is that, it is assumed that variations in the choices of tourists in selecting a preferred mode to ride in during their stay could be as a result of these drivers. For instance, tourists are safety conscious (Adam, 2015) and as such would engage in activities that would guarantee their safety. Spears et al. (2013) and Susilo and Cats (2014) noted that safety and security concerns have an important impact on the use of public transport. Research has also revealed that reliability (being on time) have an influence on transport preferences of tourists (Bent and Singa, 2009). According to Mathieson and Wall (1982), tourists stay away from home is temporal and they have limited time to spend at a destination, hence, they would like to complete their itinerary within the available time. For this reason, they are likely to choose means of transport that would guarantee them reliability and also ensure that the departure and arrival of the transport mode is timely. With the establishment of psychographic variables as possible regressors of transport mode choices, the study put forward a hypothesis that certain psychographic variables influence tourists' choices of public transportation modes.

2.2. Socio-demographic variables

A number of studies have considered transport preference as a function of socio-demographic variables (Abane, 2011; Can, 2013; Masiero and Zoltan, 2013; Susilo et al., 2009; Thrane, 2015). These studies have argued that socio-demographic variables cannot be underestimated in the transport decision making continuum. Differences in transport preferences between males and females have been noted (Axhausen et al., 2003; Curtis and Perkins, 2006). Axhausen et al. (2003) have observed that females make fewer and shorter trips and most importantly have preference for transport modes that are stress free (Moriarty and Honnery, 2005). This could be extended to mean that they are likely to choose transport modes which would guarantee them safety, convenience, comfort and reliability. Beirao and Sarsfield-Cabral (2007) also opined that females take into consideration comfort which they conceptualise as transport modes with soft clean seats, having pleasant temperature, being air-conditioned and with less congestion. Although males on the other hand would prefer modes which are safe, convenient, comfortable and reliable, they would not be as critical as their female counterparts in selecting their preferred transport modes (Curtis and Perkins, 2006).

Age is another variable that has a relationship with transport mode preferences (Yavuz and Welch, 2010). Travel patterns have been observed to change with age, from adolescence through adulthood to the aged. Evidence suggests that individuals between 25 and 50 years would travel more frequently than their younger and older counterparts (Axhausen et al., 2003). Also, those above 60 years would prefer modes which are very reliable, comfortable and convenient so as to avoid any stress associated with travel (Buehler, 2011). These findings are laudable due to the fact that the aged are usually not physically strong and might not be able to withstand the stress associated with long travels. Hence they would prefer to opt for modes that would ensure their safety, comfort and convenience.

In terms of occupation, LaMondia et al. (2009) emphasised that students are more likely to use public transport services compared to other available modes since they are less expensive to use. In addition, income level usually tends to influence travel behaviour patterns. It has been argued by Thrane (2016) that since tourism is financed by discretionary income, spending on expensive activities, transportation and accommodation may require additional budget. In scenarios where transport becomes expensive, tourists will opt for cheaper modes since the already constrained budget of the tourists can be worsened leaving them with unsustainable finances which would reduce their planned itinerary (Adongo et al., 2017; Johansson et al., 2006; LaMondia et al., 2009).

Furthermore, the origin of individuals could determine which mode of transport they are familiar with and the likelihood of using the same mode away from home. Hough and Hassanien (2010) in their research on transport choice of Chinese and Australian tourists visiting Scotland found a significant difference among the two countries of origin, suggesting that origin can be an important influencing factor, beside other socio-demographic variables.

3. Theoretical framework

The Alfonzo's (2005) hierarchy of walking needs model was developed based on the Maslow's (1943) hierarchy of needs that suggests that human needs are arranged into a five-level hierarchy comprising physiological, safety, love/belonging, esteem and self-actualisation. On this premise, Alfonzo's theory also arranged factors/needs that influence travel decision-making into a five-level hierarchy consisting of feasibility, accessibility, safety, comfort and pleasurability (Fig. 1) (Alfonzo, 2005).

According to Alfonzo (2005), feasibility is the lowest or most basic need within the hierarchy, which bothers on whether the selection of the required mode is suitable for such a trip/journey. Next to this is the need for accessibility, which pertains to the availability of the preferred mode. The third need is safety, conceptualised as the physical conditions of the mode choice. After safety is the need for comfort which is conceptualised to include; ease, convenience and contentment of the mode of transport. The final need/factor is the pleasurability, which is a higher derivative of comfort and seen as a form of enjoyment of the trip

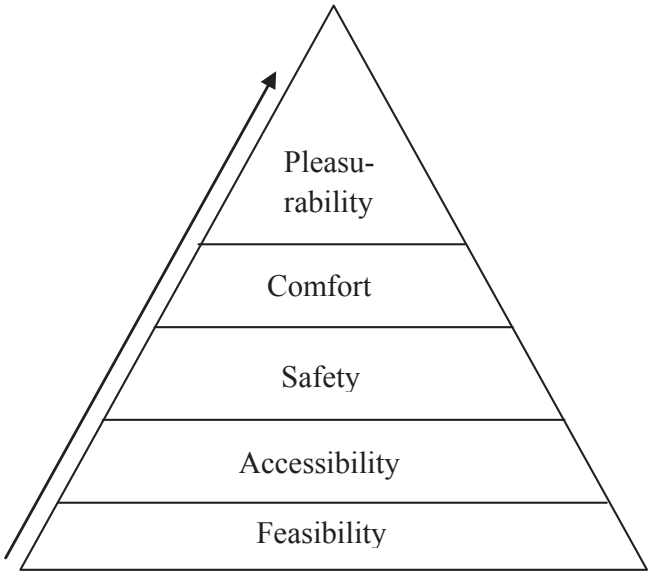

Fig. 1. Hierarchy of Walking Needs Model. *Source*: Adapted from Alfonzo (2005).

based on the mode of travel. The model also provides background information of individual factors (demographic – age, gender, education and occupation) that affect the fulfilment of these needs. For instance, the income level of a traveller would determine whether he/she can meet the need of comfort and pleasurability which are higher level needs. All these information which are related to the topic under study provide a useful theoretical framework to guide the analysis of the present study.

4. Study area

Ghana is located on the western coast south of the Saharan desert in Africa sharing boundaries with Togo, Cote d'Ivoire, Burkina Faso and the Gulf of Guinea. It lies approximately between latitudes 4.5˚N and 11˚N and longitudes 1˚E and 3˚W (Fig. 2). Ghana is one of the countries that have adopted tourism as an engine of growth in the sub-region especially since the 1980 s. There are a wide array of tourism offerings including castles, forts, beaches, natural rainforests, mountains and festivals. These attributes have, among many factors, attracted a large number of visitors.

The principal mode of transport in Ghana is by road (for freight and passenger). Travelling by train and waterway (predominantly on the Volta Lake, which is the only navigable water body in Ghana) is in a developing stage. It has been estimated that approximately 15 percent of the road users use private cars, and 85 percent travel either using public transport or by foot (Abane, 2011). Public transport modes in Ghana comprise mainly of taxis, *trotros* (a fleet of mini-buses), and commuter buses (for intra and inter-city travels) (Poku-Boansi, 2008). The rail transport system bequeathed to the country by the British before independence has taken a nosedive but is being revamped. Another emerging form of public transport within the rural and urban areas of Ghana is the motorcycle, popularly known as *okada* (a Nigerian jargon for motorcycle taxi).

5. Material and methods

Data for the study were collected from a random sampling of tourists that were leaving the country during the 2015 summer period. After initial questions to ascertain whether respondents were in the country to engage themselves in touristic activities, the field assistants introduced themselves, rationalised the purpose of the research, clarified issues, and the tourists confirmed their willingness to participate

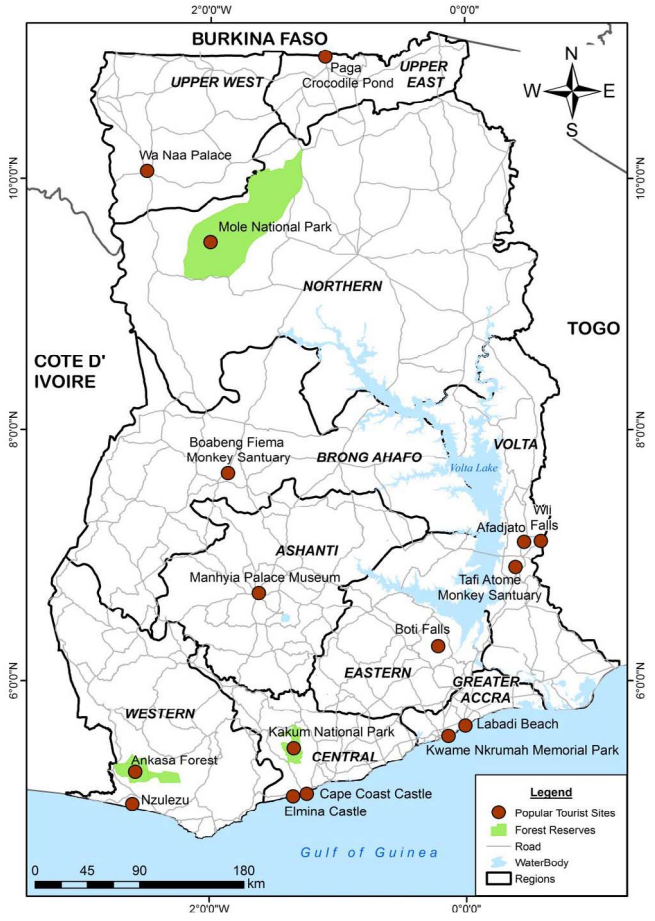

Fig. 2. Map of Ghana showing major tourist centres and transport routes. *Source*: University of Cape Coast (2017).

in the study. The trained field assistants administered the questionnaires at the main exit point being the departure hall of the Kotoka International Airport. The instrument was designed in English and pretested at the Cape Coast Castle, one of the most visited attractions in Ghana, in May 2015. A total of 50 international tourists were purposively selected to participate in the pre-test study. This provided a basis for the instrument to be redesigned to check for accuracy and validity before the actual study. The actual data collection took place between June and August 2015.

The questionnaires comprised three sections. The first section sought information on respondents' demographics (gender, age, marital status, educational attainment, income levels, occupation and country of origin). The tourists were screened based on their response to the question, "*Are you a Ghanaian departing the country?*" The second section focused on their travel party size, travel companion, and transport mode preferences. The final section probed the generic factors that influenced their travel mode choice decisions.

The questionnaires were distributed to 500 out-bound international tourists. Of these, 479 questionnaires were fully completed and returned, for a response rate of 96%. Statistical Package for Service Solution (SPSS) version 21 was used for analysing the data. Three main statistical tools (frequencies/charts, chi-square (χ^2) and multinomial logistic regression) were employed in the analysis. Chi-square (χ^2) analysis was used to test whether statistically significant relationships (tested at *p-value* of 0.05) existed between tourists' demographic characteristics and travel mode choice. The multinomial logistic regression model was used to investigate the determinants of public transport mode choice. The mode choices as dependent variables were regressed against a set of independent variables to determine which factors better

predict tourists' mode choice.

It is important to note that rental cars were not included in the study. This was due to the fact that they are often seen as formal transport facilities which were not of interest to the paper. Attention was rather giving to informal public transport such as taxis, *trotros*, buses and motorcycles because they are commonly used in Ghana. The neglect of rental cars however, serve as one of the weaknesses of the paper since the overall findings of the paper cannot be generalized to cover those modes of transport.

6. Results

6.1. Sample characteristics

Demographic characteristics of the international tourists point toward a relatively an uneven gender split, with 65 percent of the respondents being males and the remaining 35 percent females. The respondents were aged between 18 and 65 years, with 60 percent of them being less than 30 years. The average age of the tourists was 28 years. Educational levels of the respondents varied between completing high school and attainment of first degrees from universities and other higher degrees. A substantial majority of the respondents (85%) were unmarried. Furthermore, 40 percent of the respondents earn average monthly incomes of more than US$ 2,000.00. Also, one third (33%) of the tourists were students with volunteers being 18 percent of the total respondents. Thirty (30) different nationalities were identified in the study, with the majority (59%) coming from Europe and 25 percent from North America. With respect to length of stay, approximately two-thirds (68.5%) stayed for less than one month. The most frequently used modes during the stay of these international tourists were observed to be taxis (31.5%), *trotros* (mini buses) (29.3%), buses (28.6%) and motorcycles/bicycles (10.6%) (Fig. 3).

6.2. Psychographic factors informing desired transport mode choice options

The study found that tourists have their preference for the above modes of public transport based on several reasons such as being relatively cheaper (21.5%), easily accessible (20.8%) and availability at the point of need (17.1%) (Table 1). Other reasons that affected their choice of modes were safety of mode (9.0%), comfort and convenience (8.6%), reliability (5.4%) and vehicle conditions (2.1%). In extending the argument concerning safety and comfort of these modes, some respondents also noted that they took into consideration seating arrangements before making their preferred choice.

6.3. Public transport preference by socio-demographic variables

A further examination of the relationship between respondents' socio-demographic characteristics and transport preference was carried out to ascertain whether these characteristics have influence on the transport mode choice of the respondents. The literature suggests that the tourists' preference for transport modes is to some extent influenced by their individual characteristics (Hough and Hassanien, 2010; Abane, 2011; Masiero and Zoltan, 2013). Gender, age, marital status, educational level, income, occupation and country of origin were the socio-demographic characteristics considered under this study (Table 2).

Table 1
Factors informing desired transport mode choice options.

Factors	Frequency	Percent (%)
Affordability/pricing	103	21.5
Accessibility	100	20.8
Availability	82	17.1
Length of waiting time	63	13.2
Safety/security	43	9.0
Comfort/convenience	41	8.6
Reliability	26	5.4
Speed limits	21	4.4
Total	479	100.0

Source: Fieldwork, 2015.

The results of the chi-square (χ^2) test presented in Table 2 shows the relationship between tourists' transport mode preferences and their socio-demographic characteristics. With the exception of marital status of the tourists, significant relationships were established with respect to the other six variables examined in the analysis. The χ^2 statistic showed that a significant relationship existed between gender and choice of transport mode in Ghana ($\chi^2 = 13.167$; df = 3; p = .004). This means that gender plays a key role in tourists' selecting their mode of travel. More females than males were found to have used taxis (40%). On the other hand, more male tourists showed preference for *trotro* (31%), bus (29%) and taxi (27%). The use of bus seemed to be the second most popular among both genders (males – 29%, females – 28%).

In the tourism literature, age is noted to have an effect on an individual's transport mode preferences (Yavuz and Welch, 2010; Buehler, 2011). This was confirmed in the study as the analysis showed that a significant relationship existed between age and tourists' choice for Ghanaian public transport modes ($p = .005$) (see Table 2). With respect to the percentage distribution, the younger tourists (< 30 years) prefer to use *trotro* (32%) whilst in contrast the elderly tourists (> 50 years) preferred to use taxi (45%). The middle aged tourists also have preference for taxis (42%). It was further noticed that the tourists' frequent use of bus, *trotro* and motorcycles decreased with age while that of taxi increased with age.

Furthermore, the study found no significant relationship between marital status and preference for public transport within Ghana ($p = .803$). In all, 35 percent of married tourists had preference for taxis. On the other hand, approximately one third (31%) of unmarried tourists used *trotro*. With the exception of *trotro*, the preference for other public transport modes was higher among married tourists than the unmarried. Also, there was no significant relationship between length of stay and mode preference ($p = .931$). However, a relatively high number of tourists

Education is also known to influence individuals' decision-making process or preferences for a service (Abane, 2011). A significant relationship was established between tourists' educational level and their preference for Ghanaian public transports ($p = .032$). Buses were found

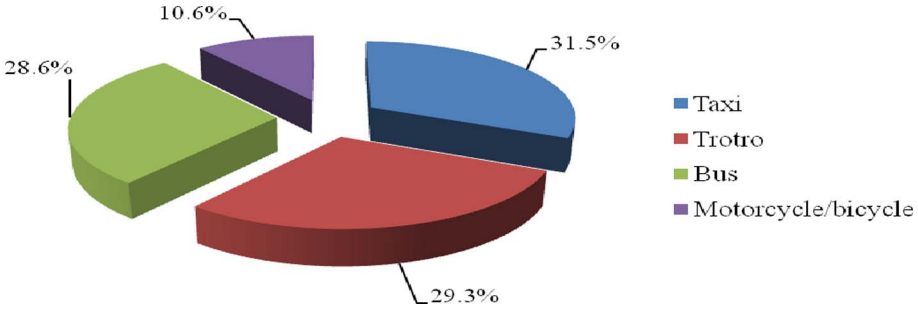

Fig. 3. Public transport mode preferred by tourists. *Source*: Fieldwork, 2015.

Table 2
Public transport preference by socio-demographic characteristics.

Socio-demographic characteristics	Public transport preference				χ^2 Statistic (p-value)
	Bus	Taxi	Mini Bus (*Trotro*)	Motorcycle/ bicycle	
	%	%	%	%	
Gender					
Male	28.6	27.0	30.9	13.5	13.167;
Female	28.0	39.8	26.8	5.4	df = 3
					(0.004)*
Age (years)					
< 30	30.4	25.0	32.3	12.3	18.367;
30–50	23.6	41.5	28.3	6.6	df = 6
> 50	23.0	44.8	21.8	10.4	(0.005)*
Marital status					
Married	31.0	34.7	21.8	12.5	0.993;
Unmarried	29.2	29.5	31.0	10.3	df = 3
					(0.803)
Length of stay					
< 1 month	33.6	35.4	20.0	11.0	1.872;
1–2 months	24.7	33.3	31.2	10.8	df = 6
> 3 months	27.6	29.3	34.5	8.6	(0.931)
Educational level					
High School	16.3	33.7	37.5	12.5	13.779;
University	31.2	28.8	27.8	12.2	df = 6
Post Graduate	32.7	33.9	26.2	7.2	(0.032)*
Income (US $)					
< 1000	30.7	34.1	27.8	7.4	17.448;
1000–2000	31.9	35.4	26.4	6.3	df = 6
					(0.008)*
> 2000	31.5	40.0	23.1	5.4	
Occupation					
Students	32.9	15.8	50.6	0.7	92.987;
Formal	25.0	43.8	22.7	8.5	df = 9
Informal	26.7	36.1	12.4	24.8	(0.000)*
Volunteer	26.7	25.6	32.6	15.1	
Continent					
Africa	21.1	31.6	42.0	5.3	57.507;
Europe	31.1	36.4	28.3	4.2	df = 12
North America	28.9	36.4	20.7	14.0	(0.000)*
Asia	23.0	28.6	38.1	10.3	
Oceania	27.8	34.2	28.6	9.4	

Source: Fieldwork, 2015.
Significance level ≤0.05; df = degree of freedom; * = significant associations (35%) who stayed for less than a month preferred using taxis with almost 9 percent of those staying for more than 3 months opting for motorcycle.

to be the most preferred public transport mode among university graduates (31%) and post graduates (33%), with the latter being the highest. Preference for taxis among high school graduates and post graduates were at par (34%). High school graduates (13%) were found to prefer using motorcycles more than their other colleagues, hence with the exception of the use of bus and taxi which increased with education, *trotro* and motorcycle/bicycle use decreased with education.

Income levels of tourists usually tend to influence their travel behaviour patterns and transport mode choice (Johansson et al., 2006). The analysis presented revealed a significant relationship between income levels and tourists preference for Ghanaian public transport modes (χ^2 = 17.448; df = 6; p = .008). The results further show that tourists with monthly average income of between US$ 1000 and 2000 (32%) preferred to use buses for travelling while in Ghana. Those who earn more than US$ 2000 also preferred using taxis (40%). In addition, tourists with average monthly income of less than US$ 1000 preferred to use *trotro* (28%) and motorcycles (7%). In all, it was observed that preference for buses and taxis increased with income while preference for *trotro* and motorcycles decreased as income increases.

This study also sought to find out whether or not there was a significant relationship between tourists occupational status and their mode of public transport at their destination. To this end, the chi-square test of independence showed a significant relationship between the two variables (p = .000). It is evident from Table 2 that students (51%) and volunteers (33%) preferred using *trotro*, whereas 44 percent of formal sector workers and 36 percent of informal sector workers preferred using taxis. Overall, it was observed that the demand for motorcycles/ bicycles was relatively high among informal sector workers and volunteers. On the other hand, this mode of transport appeared less preferred among students and formal sector employees.

6.4. Differences in preference of transport mode by socio-demographic and psychographic factors

The impact of socio-demographics as a factor in explaining tourists' transport mode preference appears higher relative to the psychographic factors as shown in Model A and Model B (Table 3). However, both models suggest that each of the two set of independent variables significantly explains the variances in international tourists' transport mode choice at the destination. The Model C, however, shows that improved variance is obtained in explaining mode preference as shown by the explanatory power of the model (i.e. Nagelkerke's R-squared) when the factors are jointly modeled. For the sake of scientific evidence, Model C identified the predictors of transport mode preference among tourists (Adongo et al., 2017; Thrane, 2015).

The likelihood of male tourists having less preference for buses and taxis to motorbikes is significantly higher compared to female tourists. Odds of males not inclined to buses and taxis are 0.545 and 0.546 respectively. Level of education also significantly affects tourists' transportation mode preference. Relative to post-graduates, high school levers showed less preference for buses compared with motorbikes, but those with bachelor degrees showed less liking for taxis when at the destination.

Furthermore, income was found as a discriminating factor in mode preference such that strong liking for buses compared to motorcycle, taxi and *trotro* was detected as income surges. Significant variation was also observed in mode preference across nationality with European tourists considerably favouring buses (odds = 17.493) followed by *trotros* (odds = 16.811) and taxis. Similarly, those from North America had significant likelihood of reporting strong liking for buses and *trotros* relative to those with Oceania nationality. The study did not observe significant differences in transportation mode based on stay period as shown in Table 3. Preference for each form of transportation mode appeared similar among the tourists despite variations in their length of stay.

With respect to the psychographic factors, accessibility, comfort/ convenience, affordability and reliability were found as the underlying reasons to differences in tourists' mode preferences. Tourists who indicated strong liking for *trotro* were more probable to attribute it to affordability while those who favoured buses ascribed comfort/convenience, reliability and accessibility reasons. For instance, tourists' were by a factor 1.371 more likely to prefer bus over motorbike due to its reliability.

7. Discussion

International tourists travelling to Ghana for holidays, visiting friends and relatives (VFR) and other purposes were found to patronise different forms of public transport services during their stay. It was deduced that tourists predominantly used public transport modes such as taxis, *trotros,* and to some extent buses for making various journeys. Similar findings came up in studies by Abane (1993, 2011) and Poku-Boansi (2008) who concluded that the two most preferred public transport modes in Ghana were taxis and *trotros*. This finding is not surprising as these two modes have withstood the test of time and are still preferred for intra and inter-city activities.

Issues such as affordability, accessibility and the availability of modes were identified as having an influence on public transport mode

Table 3
Influence of socio-demographic and psychographic factors by preference of transport mode.

	Model A			*Model B*			*Model C*		
Explanatory variables	Bus[a]	Taxi[a]	*Trotro*[a]	Bus[a]	Taxi[a]	*Trotro*[a]	Bus[a]	Taxi[a]	*Trotro*[a]
	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)	Odds Ratio (SE)
Gender (Ref. female)									
Male	−0.283 (0.512)*	−0.165 (0.514)**	−0.342 (0.504)*				−0.289 (0.545)*	−0.192 (0.546)**	−0.415 (0.538)
Age	1.244 (0.802)	1.593 (0.847)	0.741 (0.796)				1.092 (0.866)	1.888 (0.913)	−0.675 (0.863)
Marital Status (Ref. unmarried)									
Married	−0.681 (0.567)	1.132 (0.559)	−0.756 (0.537)				−0.667 (0.613)	1.151 (0.611)	−0.684 (0.584)
Educational Level (Ref. post graduate)									
High School	−0.211 (0.570)**	−0.410 (0.549)	−0.728 (0.519)				−0.196 (0.622)**	−0.380 (0.600)	−0.742 (0.566)
University	−0.459 (0.467)	−0.368 (0.475)*	−0.485 (0.457)				−0.494 (0.516)	− 0.358 (0.523)*	−0.454 (0.506)
Income	−0.282 (0.516)*	−0.412 (0.514)	−0.662 (0.487)				1.325 (0.555)*	−0.494 (0.555)	−0.709 (0.520)
Occupation (Ref. volunteer)									
Students	22.304 (1.113)**	33.363 (1.102)**	13.417 (1.115)*				17.990 (1.130)**	27.504 (1.120)**	11.452 (1.139)*
Formal	1.624 (0.581)	0.973 (0.569)	2.537 (0.559)				1.432 (0.640)	−0.923 (0.632)	2.360 (0.631)
Informal	−0.782 (0.562)	−0.264 (0.584)*	1.001 (0.533)				1.190 (0.630)	−0.391 (0.652)	1.618 (0.609)
Continent (Ref. Oceania)									
Africa	−0.262 (1.266)	1.164 (0.852)	1.569 (0.915)				−0.255 (1.362)	1.482 (0.964)	1.981 (1.011)
Europe	14.637 (0.673)**	9.994 (0.654)**	16.267 (0.706)**				17.493 (0.774)**	9.450 (0.759)**	16.811 (0.816)**
North America	4.276 (0.692)*	1.665 (0.684)	7.207 (0.713)**				6.021 (0.787)*	2.248 (0.784)	9.410 (0.816)**
Asia	−0.774 (0.891)	−0.341 (0.952)	2.600 (0.830)				1.209 (0.991)	−0.550 (1.045)	4.473 (0.941)
Length of stay	1.405 (0.652)	1.287 (0.659)	−0.812 (0.621)				1.780 (0.708)	1.684 (0.721)	1.050 (0.689)
Psychographics (Ref. speed limits)									
Affordability/pricing				1.733 (1.451)	8.750 (1.509)	41.000 (1.739)*	−0.703 (1.594)	3.282 (1.628)	23.815 (1.824)*
Accessibility				−0.077 (1.077)*	−0.275 (1.160)	1.750 (1.442)	1.239 (0.043)*	0.158 (1.289)	0.948 (1.523)
Availability				−0.500 (1.162)	2.688 (1.234)	1.250 (1.565)	−0.177 (1.362)	−0.880 (1.406)	−0.601 (1.678)
Length of waiting time				−0.400 (1.165)	−0.813 (1.256)	5.500 (1.515)	−0.182 (1.331)	−0.403 (1.394)	2.294 (1.606)
Safety/security				−0.667 (1.472)	3.250 (1.525)	−0.191 (1.747)**	−0.275 (1.625)	1.832 (1.659)	−0.657 (1.848)
Comfort/convenience				−0.053 (1.232)*	1.000 (1.225)	2.400 (1.511)	1.023 (0.023)*	−0.558 (1.388)	−0.844 (1.612)
Reliability				−0.018 (1.176)**	−0.017 (1.522)*	−0.400 (1.494)	1.371 (0.030)*	−0.046 (1.665)	−0.384 (1.601)
Constant	1.328	1.520	0.735	2.708	1.386	1.000	2.869	1.472	−0.517
Nagelkerke's R-squared	0.394*			0.288*			0.511*		
McFadden's R-squared	0.173*			0.118*			0.244*		
Cox & Snell's R-squared	0.366*			0.267*			0.474*		

NB: [a] Motorcycle = Base category; ** $p < .01$; * $p < .05$.

preferences. This situation is so because, within the country, taxis and *trotros* are readily available everyday within urban areas for use. Also their unions and city authorities have provided them with terminals that can easily be accessed. In addition, some operators who do not belong to unions provide 'roaming' services making them as well easy to access. However, anecdotal evidence suggests that these modes are not readily available and accessible for use in visiting the countryside attractions and that they have to be chattered or pre-arranged. This notwithstanding, their tariffs are regulated by their respective unions to ensure affordable services for all. This, according to Tyrinopoulos and Aifadopoulou (2008), makes taxis and *trotros* less expensive than other available transport services (rental cars). The choice of public transport modes of international tourists was also influenced by factors such as safety, comfort/convenience and reliability. This finding supports the view of Anable (2005) who argued that travellers take into consideration convenience and comfort in selecting their choice of mode.

A significant relationship was established between socio-demographics (gender, age, income, education, occupation and continent of

origin) and tourists' choice of public transport modes. This relationship points toward the multifaceted interconnections between individual socio-demographics and their mode preferences. This result buttresses the views held by researchers that many factors come to play to affect the choice of transport mode of individuals (Abane, 2011; Hough and Hassanien, 2010; LaMondia et al., 2009; Masiero and Zoltan, 2013) and also to a large extent define their travel behaviour patterns. Specifically, the study revealed that as the income levels of tourists increase, their preference for taxis also increases. This could be attributed to the fact that higher income earners are seen to have stronger preference for public transport modes which are convenient and flexible to use (Choo and Mokhtarian, 2004; Johansson et al., 2006). Also, the relationship established between gender and tourists' preference for specific modes attest to the fact that gender plays a key role in the mode choice decision-making process (Curtis and Perkins, 2006). The observation that females prefer taxis more than their male counterparts was found to be influenced by both their biological structure and general perception for such mode of transport. For examples, their biological structure of being soft and flexible makes them not to take risks and often prefer convenient and comfortable transport such as taxis as observed by Axhausen et al. (2003) and Moriarty and Honnery (2005). Concerning their general perception of taxi, Abane (2011) found females to generally perceive taxis as good mode of transport in Ghana due to their availability and reliability.

In an attempt to model the extent of influence that socio-demographic and psychographic variables have on public transport mode choice preference, the Multinomial Logistic Regression was used. It could be established that Model A and B had influences on mode choice preference. However, the best predictor of transport mode choice preference could be seen as a function of socio-demographic and psychographic variables (Spears et al., 2013; Stradling et al., 2007; Susilo and Cats, 2014). Thrane (2015) in his study concludes that mode choice options is best studied when varying independent variables (trip-related, distance-related and socio-demographics) are combined. Within the context of this study, income was established as a significant predictor within Model C with respect to bus. With respect to Alfonzo's theory, comfort which is a higher order need of transport consumers is a function of income, thus, as tourist income increases there is a likelihood of them seeking modes that guarantees comfort. Affordability, another significant predictor was found to have favoured *trotro*. Taking cue from Dayour (2013) and Adongo et al. (2017) it has been established that Ghana is a destination preferred by gap year students. This category of tourists with backpackers dominating, operate on low budgets (Adongo et al., 2017; Aguilo et al., 2017) and as such are not in the position to spend extra on transport preference, hence will opt for any mode which is affordable. The study also found that tourists who preferred bus, did so because they are reliable compared to other means. Drawing from the evidence adduced by Dayour (2013) and Adongo et al. (2017) that gap year students are the dominant category of tourists that visit Ghana, and coupled with the fact that they operate on low budget (Thrane, 2016), it is expected that transport mode options that are reliable and would easily facilitate their itinerary would be preferred.

In situating the findings in the context of the Alfonzo's model which hinges on the hierarchy of travel needs, it was observed that affordability, accessibility, and availability of public transport serve as a significant predictor of mode choice. This supports studies by Abane (2011), Hough and Hassanien (2010), LaMondia et al. (2009) and Masiero and Zoltan (2013) which found similar factors to influence the transport mode choice decisions of individuals. Apart from the above factors, the study found that taxis and *trotros* are the most affordable means of transport for intra-city travels, whereas buses also have the same characteristic when used for inter-city travel. When these are met, the tourists then consider the safety, reliability, comfort and vehicle conditions (Anable, 2005; Choo and Mokhtarian, 2004; Johansson et al., 2006) before making a final preference. In the same vein socio-demographic variables which were also found to be significant in determining mode preference could also be explained by the hierarchy model. The age, educational and income levels of tourists certainly determine which transport mode they would prefer.

8. Implications for transport planning

The findings of the study have some implications for transport planning. First they suggest that there should be a shift of emphasis from mobility-based transport planning (which focuses predominantly on expanding transport networks to ease movement) that dominates Ghana's transport planning system to accessibility-based transport planning. This form of transport planning gives attention to multiplicity of factors such as mobility, accessibility, affordability, reliability, comfort, and safety of vehicles that makes it easy for one to travel from one place to the other (Venter, 2016). Taxis being the preferred transport mode followed by *trotros* and buses as indicated by the study require provision of quality services by these modes to continually attract tourist patronage. These quality services as captured under accessibility-based transport planning as "quality mobility" could be achieved by transport unions, Driver and Vehicle Licensing Authority (DVLA), and National Road Safety Commission (NRSC) intensifying their activities to ensure that the above transport modes are always in good condition on roads and drivers applying the road traffic codes of Ghana in their daily activities. In addition to this, the quality and performance of transport networks could be enhanced by way of the Ministry of Transport, Metropolitan Municipal and District Assemblies (MMDAs), Department of Urban Roads, and Department of Feeder Roads collaborating to ensure sufficient road network connectivity to various tourist attractions, improve the level of services on roads and control congestions which may cause traffic to slowdown vehicular movements. These when achieved will encourage accessible, reliable, affordable and safer transport services by taxis, *trotros* and buses to meet the transport needs of international tourists.

Secondly, significant relationships/differences observed between the socio-demographic and psychographic variables and tourists' preference for public transport signify that socio-demographic variables can be used to segregate Ghana's tourism transport market. It was evident from the model that European, American and Asian tourists had high preference for bus and *trotro*, thus, socio-demographic factors could be used as a basis to segment Ghana's tourism market with respect to transport. This segmentation, according to Amuquandoh and Asafo-Adjei (2013), would aim at reducing large groups of people into smaller groups for easy marketing of products. In general, the result from the study buttresses the conception that socio-demographic variables are important in segmenting the international tourism markets for various tourism related products.

9. Conclusion

Based on the main findings, the following conclusions were drawn. In examining the preference of international tourists with regards to their transportation needs in Ghana, taxis, *trotros* and buses are their most preferred modes of public transport. The study generally conforms to the Alfonso's hierarchy of walking needs model by revealing that generic dimensions of transport services such as their affordability, accessibility, availability, safety and comfort influence public transport mode choice of international tourists in Ghana. Aside these factors, there are strong relationships between socio-demographic characteristics of tourists and their mode preference. Specifically, multinomial logistic model observed that mode choice is a function of socio-demographic and psychographic variables. Hence, to provide quality public transport services to attract enough tourist patronage in future there is a need to prioritise accessibility-based transport planning system in Ghana to address most of the transport needs raised by international tourists.

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