

**FACTORS INFLUENCING MODAL CHOICE OF
INTERCITY BUS SERVICE TRANSPORT ON ACCRA-
TAKORADI ROUTE, GHANA**

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Abstract

The study sought to find out factors influencing modal choice on Accra-Takoradi route. This was achieved with the use of methodological triangulation approach not only involving qualitative and quantitative methodology but other sources of data collection such as questionnaire administration, in-depth interviews, and observations. The analysis began with the socio-economic and travel characteristics of respondents as to indicate which of these socio-economic and travel characteristics predominates in the study area. More so, the results of socio-economic, travel characteristics and reasons were cross tabulated with modal choice on the route. The significant relationship between respondents' socio-economic, travel characteristics and reasons with modal choice was ascertained by using Pearson's chi-square test.

Key words: modal choice, intercity bus, passengers, travel behaviour

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Introduction

Researches on travel behaviour is broadly grouped into two (Curtis & Perkins, 2006; Gonzalez & Suarez, 2013): (1) studies on the impact of urban form on travel behaviour and (2) socio-demographic/economic and lifestyle factors that may influence travel behaviour. Some combine elements of the urban form and socio-demographic debate. The important socio-demographic/economic variables that influence travel behaviour include age, gender, household composition, income, gender and car ownership, level of education, occupational status, ability to drive, person travelling with and purpose of travel. However, empirical literature (see Abane 2011; Gonzalez & Suarez, 2013) has tended to focus on intra-urban(short-distance travels within urban systems) with few studies on rural (Curtis & Perkins 2006) and interurban travel behaviour(Aidoo, et al., 2013). Whether intra or inter-urban journeys, passengers have arrays of modal choice to choose from.

Modal choice is derived from a complex process involving objective and subjective determinants stemming from different disciplines and interrelated to a larger or smaller extent (Gonzalez & Suarez, 2013). Modal choice is defined as the decision process to choose between different transport alternatives, which is determined by a combination of individual socio-economic, travel and spatial characteristics, and influenced by socio-psychological factors.

Abane (2011) and Buehler (2011) have conducted studies on modal choice using different number of factors. These studies do not make a clear distinction between short and long distance studies. Long distance trips are shrouded in threshold standard that are intercity or interurban or interregional by design and short distance is intra. Intercity trips involve more time and out-of-pocket cost, so the traveller facing the modal choice decision is in a different situation than a traveller making an intracity trip. Moreover, availability of modals and travel purposes differ. The principal motive for short distance is commuting but intercity trips are for pleasure, business (Gonzalez & Suarez, 2013) causing less frequent trips and the travellers are less familiar with the array of alternatives. Mode choice decision may be affected by similar variables for both short and long distance trips but the impact of the same variables may be different conditional to distance travelled.

Abane(2011) and Gonzalez and Suarez (2013) submitted that socio-demographic characteristics play a significant role in transport choice decision. Literature on this focuses on the modal choice of different modes of transport (Abane, 2009, 2011; Gonzalez & Suarez, 2013).

This study was informed principally by Abane (2011) which sought to examine the travel behaviour of residents in four major metropolitan areas in Ghana. The study like other studies in travel behaviour was intra urban.

It is therefore necessary to elucidate the factors that influence intercity bus modal choice on Accra-Takoradi route in Ghana. Specific objectives are to:

1. Find out the socio-economic, travel characteristics and reasons for modal choice on Accra-Takoradi route;
2. Analyse the relationship between socio-economic, travel characteristics and reasons for modal choice and modal choice on the route; and
3. Assess how individuals perceive the modal choices on the route

This study contributes to the limited number of investigations on modal choice in intercity travels with reference to intercity bus transport. The primacy of certain cities engenders the movements of passengers between them and other neighbouring smaller settlements. These cities offer administrative functions, social, economic, educational, commercial functions. This is reflected by the location of certain facilities and social amenities.

Study area

As indicated in Figure 1, the study area covered travellers on the Accra-Takoradi route. Accra is the administrative and political capital of the Democratic Republic of Ghana covering more than 1000km² of land or about 45% of Greater Accra Region. Accra was also one of the key centres during the struggle for independence. Takoradi (one of the twin city Sekondi-Takoradi) is a city with vibrant port activities. With Sekondi, the twin city covers 200km² of land and a population of about 500,000. It is the most important settlement in the Western Region with primary role in maritime transport since 1928 when the Takoradi Harbour was completed. The opening of the Jubilee field has added another dimension to the prominence accorded the region. The Accra-Takoradi route as indicated in Figure 1 is 162km and with a travel time of 3-4hours depending on the vehicle being used and other endogenous and exogenous variables on the routes.



Figure

1: Map of Ghana showing the study route

Source: GIS Unit, Geography and Regional Planning Department, 2014.

Research methodology

The decision to use quantitative and qualitative methodologies depends on the assumptions concerning the nature of knowledge and reality and how one perceives knowledge and reality and the means of gathering or acquiring knowledge and about the reality. This forms what is often referred to respectively as objectivism, subjectivism and constructivism. Objectivism as an ontological position states that, social phenomena are external facts that are beyond our reach or influence. This is the social phenomena and the categories that we use in everyday discourse that is independent or separate from actors (Bryman& Bell, 2007, p 22). Subjectivisms on the other hand are realities that are symbolically constructed and meaning is observer dependent. More so social reality is ascertained through cognition, organized in memory and is value-laden manner. The knowledge acquired is by observation. Constructivism asserts that social phenomena and their meanings are continually being accompanied by social actors. These realities are

constructed by the social actors (Bryman & Bell, 2007, p 23). This study is approached towards an objectivist-subjectivist and constructivist way of looking at social phenomenon.

Through triangulation the researcher objectively and subjectively sought to attain the objectives and achieve the stated hypothesis. This resulted in the use of both quantitative and qualitative approaches. The qualitative component included in-depth interviews, participant observations and a literature review (Gule, 2009). The quantitative part of the study comprised the standardized responses to a questionnaire.

The researcher through observational studies and informal interviews ascertained all commercial transport companies that ply Accra-Takoradi route. These are GPRTU, ISTC, MMT, Cooperative, Kaneshie Drivers Union, Concerned Drivers Union, PROTOA, VIP, VVIP, DIPLOMAT, FORD, ADB and individuals who operate pick and drop service (Tro-tro). A letter of intent was sent to all the identified transport companies at their head offices/stations with the exception of pick and drop transport operators because they don't have a station. The seven intercity service providers that responded positively to the letter thus partook in the exercise.

Abane (2011), in similar study used 0.03 % of the target population exceeding 1,000,000 passengers. Hence, the sample size for the study is 0.03% of 1,655,657 = 497. In addition to this the researcher identified three forms of passengers -the elderly, the youth and a trader with goods for the in-depth interviews. In all, 42 passengers were interviewed. This study employed both probability and non-probability sampling. Four hundred and ninety seven (497) copies of pre-tested questionnaires were gathered using a four-pronged sampling procedure which included purposive sampling in selecting the service providers offering their on Accra-Takoradi route, quota sampling to ensure the contribution of each service provider to the total sample; accidental sampling to identify buses loading at the various terminals/stations and systematic sampling to select every 3rd or 5th passenger (depending on the seating capacity of the bus loading at the station). In case of refusal, the next passenger is thus selected.

Challenges encountered during the field work

Principally, a researcher must always gain authority before one can start the actual process of obtaining information. Furthermore, this was a difficult group to work with and it required patience to extract the prerequisite information. At the end of the introduction, the managements

of MMT and ISTC offered the researcher a pass to board their buses to and fro Takoradi and Accra for the study. In the course of the field work, there was a change in management of MMT which initially posed as a challenge. But a follow up letter of introduction was addressed to the new Managing Director for his consent. This nonetheless helped in the data collection.

It was difficult to talk some passengers into taking part in the study due to general distrust of researchers (Binge, 2003). Sixty two (62) cases of refusals were reported. In order to get the exact number questionnaires for this study more than 600 questionnaires were administered. This was to take care of unfilled, incorrectly filled and un-submitted questionnaires. Interviewing passengers at the station was a challenge because of the short out-of vehicle waiting time and in-vehicle boarding time. However, with persistence the exercise was carried out with the selected categories of passengers. It was revealed that passengers are relaxed on board a moving vehicle. So they tended to attend to the questions with zeal. Therefore, the passengers' interviews were held mostly on-board for quality.

Data analysis

This section takes into consideration the socio-economic and travel characteristics and the reasons for modal choice. It also looks into the influence of the socio-economic, travel and preferential or psychosocial characteristics on intercity modal choice on Accra-Takoradi route from the analysis of four hundred and ninety seven questionnaires, forty two passenger's in-depth interviews and participant observations on 14 buses operated by the seven service providers.

Socio-economic characteristics of respondents

The socio- economic characteristics discussed were gender, age, educational qualification, occupational status and monthly income. In Table 1 there were 56.7% males and 43.3% females involved in the study. Irfan et al (2012) and Aidoo et al (2013) confirmed that more males make intercity trips than females. Women on the other hand make more intra city or short distance trip (Abane, 2011; Ibrahim-Adedeji, 2011). But Spinney and Millward (2011) asserted that male generally travel more than females irrespective of distance by public transport.

Regarding the age group in Table 1, the highest number (31.4%) of the respondents was 20-24 years with less than a fifth (18.7%) aged 15-19 years. Normally, passengers aged <15 may

not be allowed to make intercity trips on the own. As it is evident in the participant observations, almost all accosted passengers in the category were with their parents or guardians. Invariably, more than 60% of the respondents were below 40 years of age in similar studies in transport such as Aidoo et al (2013) and Javid et al (2013) regardless of whether intra or intercity trip supported the findings of this study.

With respect to educational level attained, Table 1 revealed that more than two-third (88%) of respondents had acquired one form of education, out of which 56.5% had at least tertiary education. Similarly, Aidoo et al (2013) and Javid et al (2013) in separate studies in Ghana, and Japan respectively corroborated the above assertion for both intra and intercity trips. This is largely higher than the national literacy rate of 21% in Ghana. The location of institutions of learning on the route may have influenced the percentage of schooled respondents.

As per the occupation of the passengers in Table 1, more than a tenth (12.7%) were unemployed, about a fourth (18.9%) were civil/public servants, more than a fourth (23.7%) were self-employed and more than one-fourth (27.4%) were students. Aidoo et al (2013) also indicated that most of their respondents were students. But Javid et al (2013) in Japan noted that majority of respondents were private employees. Irfan et al (2012) reported that almost half of the respondents were into business. With respect to monthly income, about a third (30.3%) earned above Ghc 900, closely followed by 23.9% and 21.9% who earned between Ghc 101-300 and 301-500 Ghc respectively. More than a fifth (20.9%) of the respondents had no income.

Table 1: Socio-economic characteristics by service provider

Socio economic		GPRTU	FORD	MMT	DIPLOMAT	VVIP	VIP	ISTC	Total
Gender	Male	63 (22.3%)	33(11.7%)	47 (16.7%)	20(7.1%)	62(22%)	46(16.3%)	11(3.9%)	282(56.7%)
	Female	55(25.6%)	18(8.4%)	34(15.8%)	14 (6.5%)	51(23.7%)	34(15.8%)	9(4.2%)	215(43.3%)
	p-value	0.400	0.225	0.799	0.799	0.647	0.881	0.873	0.903
Age	<15	7(35%)	2(10%)	5(25%)	3(15%)	1(5%)	1(5%)	1(5.0%)	20(4%)
	15-19	31(33.3%)	11(11.8%)	19(20.4%)	11(11.8%)	12(12.9%)	7(7.5%)	2(2.2%)	93(18.7%)
	20-24	39(25%)	20(12.8%)	20(12.8%)	9(5.8%)	33(21.2%)	31(19.9%)	4(2.6%)	156(31.4%)
	25-29	19(20.4%)	8(8.6%)	15(16.1%)	4(4.3%)	21(22.6%)	19(20.4%)	7(7.5%)	93(18.7%)
	30-34	6(18.8%)	2(6.3%)	2(6.3%)	1(3.1%)	14(43.8%)	7(21.9%)	0	32(6.4%)
	35-39	4(11.4%)	3(8.6%)	5(14.3%)	1(2.9%)	13(37.1%)	6(17.2%)	3(8.6%)	35(7.0%)
	40-44	8(28.6%)	3(10.7%)	6(21.4%)	4(14.3%)	3(10.7%)	3(10.7%)	1(3.6%)	28(5.6%)
	45-49	1(8.3%)	0	1(8.3%)	0	7(58.3%)	3(25%)	0	12(2.4%)
	50 >	3(10.7%)	2(7.1%)	8(28.6%)	1(3.5%)	9(32.1%)	3(10.7%)	2(7.1%)	28(5.6%)
	p-value	0.064	0.859	0.243	0.139	0.000	0.128	0.330	0.003
Education	No Formal	1(8.3%)	1(8.3%)	6(50%)	3(25%)	0	1(8.3%)	0	12(2.4%)
	Basic	5(17.8%)	2(7.1%)	6(21.4%)	2(7.1%)	7(25%)	6(21.4%)	0	28(5.6%)
	Secondary	18(16.8%)	7(6.5%)	14(13.1%)	4(3.7%)	35(32.7%)	21(29.6%)	8(7.4%)	107(21.5%)
	Tertiary	72(25.6%)	32(11.4%)	48(17.1%)	19(6.8%)	59(21%)	43(15.3%)	8(2.8%)	281(56.5%)
	Post Tertiary	22(31.9%)	9(13%)	7(10%)	6(8.7%)	12(17.4%)	9(13%)	4(5.8%)	69(13.9%)
	p-value	0.09	0.572	0.010	0.084	0.024	0.606	0.162	0.006

Employment unemployed	11(17.5%)	4(6.3%)	12(19%)	3(4.8%)	16(25.4%)	15(23.8%)	2(3.2%)	63(12.7%)
Self employed	24(20.3%)	9(7.6%)	20(16.9%)	13(11%)	30(25.4%)	17(14.4%)	5(4.2%)	118(23.7%)
Civil/public	26(27.7%)	10(10.6%)	10(10.6%)	3(3.2%)	25(26.6%)	15(16%)	5(5.3%)	94(18.9%)
Teaching	11(26.8%)	9(22%)	4(9.8%)	1(2.4%)	5(12.2%)	8(19.6%)	3(7.3%)	41(8.2%)
Business	6(17.6%)	0	7(20.6%)	2(5.9%)	8(23.5%)	9(26.5%)	2(5.9%)	34(6.8%)
Students	40 (29.4%)	18(13.2%)	25(18.4%)	12(8.8%)	23(16.9%)	15(11%)	3(2%)	136(27.4%)
Private	0	1(11.1%)	1(11.1%)	0	6(66.7%)	1(11.1%)	0	9(1.8%)
Pensioner	0	0	2(100%)	0	0	0	0	2(0.4%)
P-value	0.208	0.062	0.033	0.286	0.016	0.237	0.822	0.014
Monthly income <100	4(21.1%)	1(5.2%)	4(21.1%)	3(15.8%)	3(15.8%)	4(21.1%)	0	19(4.8%)
101-300	23(24.5%)	5(5.3%)	22(23.4%)	5(5.3%)	25(26.6%)	12(12.8%)	2(2.1%)	94(23.9%)
301-500	23(26.7%)	8(9.3%)	18(20.9%)	7(8.3%)	20(23.3%)	9(10.5%)	1(1.2 %)	86(21.9%)
501-700	14(26.9%)	5(9.6%)	6(11.5%)	2(3.8%)	13(25%)	9(17.3%)	3(5.6%)	52(13.2%)
701-900	6(26.1%)	4(17.3%)	1(4.3%)	0	8(34.6%)	1(4.3%)	3(13%)	23(5.9%)
>900	27(22.7%)	14(11.8%)	13(10.9%)	10(8.4%)	23(19.3%)	26(21.8%)	6(5%)	119(30.3%)
Missing								104 (20.9)
p-value	0.09	0.451	0.052	0.325	0.551	0.125	0.091	0.124

Source: Fieldwork, 2014.

*P-value is based on Pearson's chi test

Table 2: Travel characteristics and service providers

Travel Characteristics		GPRTU	FORD	MMT	DIPLOMAT	VVIP	VIP	ISTC	Total
Ownership of car	No	102(23.4%)	41(9.4%)	75(17.2%)	30(6.9%)	100(23%)	70(16.1%)	17(3.9%)	435
	Yes	16(26.2%)	10(16.4%)	6(9.8%)	4(6.6%)	13(21.3%)	10(16.4%)	2(3.3%)	62
p-value		0.763	0.230	0.309	0.959	0.827	0.907	0.000	0.005
Purpose of travel									
	Educational	29(22.8%)	10(7.8%)	21(16.5%)	9(7.1%)	29(22.8%)	23(18.1%)	6(4.7%)	127
	Recreational/social	11(21.2%)	4(7.7%)	8(15.4%)	0	13(25%)	9(17.3%)	7(13.5%)	52
	Religious	7(26.9%)	5(19.2%)	3(11.5%)	2(7.7%)	4(15.4%)	4(15.4%)	1(3.8%)	26
	Official	26(20%)	13(10%)	12(9.2%)	8(6.2%)	43(33.1%)	24(18.5%)	4(3.1%)	130
	Business	23(25.8%)	10(11.2%)	22(24.7%)	8(9.0%)	12(13.5%)	13(14.6%)	1(1.1%)	89
	Family reunion	22(31.4%)	9(12.9%)	14(20%)	6(8.6%)	11(15.7%)	7(10%)	1(1.4%)	70
	Health	0	0	1(50%)	0	1(50%)	0	0	2
p-value		0.607	0.641	0.580	0.521	0.014	0.752	0.016	0.037
Frequency of travel									
	Once a week	13(25.5%)	5(9.8%)	9(17.6%)	5(9.8%)	13(25.5%)	5(9.8%)	1(2%)	51
	More than once a week	12(20.7%)	6(10.3%)	6(10.3%)	3(5.2%)	15(25.9%)	14(24.1%)	2(3.4%)	58
	Fortnightly	20(32.8%)	8(13.1%)	10(16.4%)	7(11.5%)	9(14.8%)	7(11.5%)	0	61
	Monthly	20(19.4%)	8(7.8%)	23(22.3%)	4(3.9%)	23(22.3%)	21(20.4%)	4(3.9%)	103
	Occasionally	46(23.2%)	19(9.6%)	26(13.1%)	13 (6.6)	51(25.8%)	32(16.2%)	11(5.6%)	198
	First timer	7(28%)	5(20%)	6(24%)	2(8.1%)	2(8.0%)	1(4%)	2(8%)	25
p-value		0.483	0.562	0.227	0.481	0.230	0.096	0.370	0.235
Person travelling with									
	Family	12(15.8%)	7(9.2%)	15(18.4%)	3(3.9%)	21(27.6%)	11(14.5%)	8(10.5%)	
	Friends	20(33.9%)	5(8.5%)	4(6.8%)	1(1.7%)	15(25.4%)	10(16.9%)	4(6.8%)	
	Alone	118(23.7)	51(10.3%)	81(16.3%)	30(8.3%)	77(21.3%)	59(16.3%)	8(2.2%)	
p-value		0.097	0.913	0.023	0.191	0.577	0.943	0.006	0.024
Arrival at the station									

5-10 minutes ago	23(17.3%)	10(7.5%)	17(12.8%)	2(1.5%)	49(36.8%)	31(23.3%)	1(0.8%)	133
10-20 minutes ago	50(30.9%)	23(14.2%)	25(16%)	12(7.4%)	24(14.8%)	17(10.5%)	10(6.2%)	162
20-30 minutes	16(19.1%)	14(14.9%)	14(14.9%)	7(7.4%)	20(21.3%)	19(20.2%)	2(2.1%)	94
Above 30 minutes	27(25.5%)	4(3.8%)	23(21.7%)	13(12.3%)	19(17.9%)	13(12.3%)	7(6.6%)	105
P-value	0.032	0.013	0.304	0.012	0.000	0.011	0.040	0.000
Time of obtaining tickets								
5-10 minutes ago	37(18.5%)	15(7.5%)	22(11.0%)	7(3.5%)	69(34.5%)	40(20%)	10(5%)	200
10-20 minutes	68(32.1%)	29(13.7%)	38(17.9%)	22(10.4%)	26(12.3%)	27(12.7%)	2(0.9%)	212
20-30 minutes	10(25.0%)	6(15.0%)	5(12.5%)	0	7(17.5%)	9(22.5%)	3(7.5%)	40
Above 30	3(7.9%)	1(2.6%)	15(39.5%)	5(13.2%)	7(18.4%)	2(5.3%)	5(13.2%)	38
p-value	0.005	0.163	0.001	0.023	0.000	0.108	0.010	0.000
In-vehicle waiting time								
5-10 minutes ago	38(22.8%)	27(16.2%)	32(19.2%)	18(10.8%)	27(16.2%)	22(13.2%)	3(1.8%)	167
10-20 minutes	44(33.1%)	9(6.8%)	12(9.0%)	6(4.5%)	34(25.6%)	22(16.5%)	6(4.5%)	133
20-30 minutes	17(23.0%)	5(6.8%)	10(13.5%)	3(4.1%)	20(27%)	22(13.2%)	3(1.8%)	167
Above 30	19(17%)	5(6.8%)	10(13.5%)	7(6.5%)	27(24.1%)	22(16.5%)	6(4.5%)	133
p-value	0.067	0.060	0.064	0.199	0.060	0.544	0.401	0.016
Arrival at the destination								
5-10 minutes ago	8(20.5%)	1(2.6%)	7(17.9%)	0	14(35.9%)	6(15.4%)	3(7.7%)	39
10-20 minutes	17(24.6%)	13(18.8%)	3(4.3%)	2(2.9%)	24(34.8%)	8(11.6%)	2(2.9%)	69
20-30 minutes	15(25%)	2(3.3%)	6(10%)	2(3.3%)	12(20%)	19(31.7%)	4(6.7%)	60
Above 30	32(18.2%)	15(8.5%)	30(17%)	14(8%)	43(24.4%)	32(18.2%)	10(5.7%)	176
Missing system								
p-value	0.576	0.006	0.042	0.113	0.124	0.027	0.701	0.003

Source: Fieldwork, 2014.

*P-value is based on Pearson chi test

Table 3: Reasons for modal choice of intercity bus transport service

Variables	Service Providers							Total
	GPRTU	FORD	METRO	DIPLOMAT	VVIP	VIP	ISTC	
Distance to the bus station	19(35.2%)	5(9.3%)	7(13%)	4(7.4%)	8(14.8%)	8(14.8%)	3(5.6%)	54
P-value	0.091	0.163	0.091	0.430	0.169	0.210	0.312	0.066
Frequency	55(33.5%)	18(11%)	29(17.7%)	18(10.9%)	22(13.4%)	20(12.2%)	2(1.2%)	164
P-value	0.000	0.713	0.557	0.010	0.001	0.097	0.026	0.000
Reliability	84(26.2%)	38(11.9%)	49(15.3%)	26(8.1%)	66(20.6%)	47(14.7%)	10(3.1%)	320
p-value	0.077	0.111	0.424	0.127	0.131	0.250	0.170	0.061
Bus stop facilities	6(22.2%)	1(3.7%)	1(3.7%)	2(7.4%)	7(25.9%)	7(25.9%)	3(11.1%)	27
p-value	0.769	0.230	0.061	0.948	0.448	0.187	0.064	0.146
Time table	3(17.6%)	1(5.9%)	1(5.9%)	2(11.8%)	2(11.8%)	2(11.8%)	8(47.1%)	17
p-value	0.633	0.169	0.073	0.924	0.321	0.691	0.000	0.000
Cleanliness	24(16.2%)	11(7.4%)	6(4.1%)	10(6.8%)	57(38.5%)	35(23.6%)	5(3.4%)	148
p-value	0.010	0.176	0.000	0.961	0.000	0.003	0.633	0.000
Fare	65(38.7%)	1(0.6%)	41(24.4%)	21(12.5%)	17(10.1%)	16(9.5%)	8(4.8%)	168
p-value	0.000	0.000	0.001	0.000	0.000	0.004	0.563	0.000
Employees attitude	4(13.3%)	3(10%)	6(20%)	5(16.7%)	5(16.7%)	4(13.3%)	2(6.7%)	30
p-value	0.167	0.961	0.282	0.028	0.712	0.349	0.447	0.215

Space for luggage	10(15.4%)	0	4(6.2%)	4(6.2%)	26(40%)	14(21.5%)	7(10.8%)	65
p-value	0.089	0.003	0.018	0.814	0.000	0.200	0.003	0.000
Purpose of travel	19(28.4%)	11(16.4%)	12(17.9%)	8(11.9%)	7(10.4%)	5(7.5%)	4(6%)	67
p-value	0.301	0.666	0.656	0.068	0.012	0.043	0.366	0.012
Comfort	29(15.2%)	23(12%)	8(4.2%)	9(4.7%)	64(33.5%)	44(23%)	13(6.8%)	191
p-value	0.000	0.301	0.000	0.137	0.000	0.001	0.013	0.000
Safety/security	26(13.5%)	11(5.7%)	23(11.9%)	7(3.6%)	68(35.2%)	44(22.8%)	11(5.7%)	193
p-value	0.000	0.008	0.035	0.024	0.000	0.001	0.004	0.000
Speed	14(16.5%)	30(35.3%)	5(5.9%)	7(8.2%)	17(20%)	11(12.9%)	2()	85
p-value	0.074	0.000	0.004	0.600	0.470	0.359	0.378	0.000

Source: Fieldwork, 2014. * multiple response

*p-value is based on Pearson's chi square test

Socio-economic characteristics of respondents and modal choice

Various studies have been conducted on the demand for public transport (Chee&Fernandez, 2013) and socio-economic variables such as age, gender, educational qualification and income (Diaz, 2011) were found significant in many of them. There were more male respondents on this route than females (see Table 1). GPRTU recorded the highest number of male respondents, followed by VVIP with ISTC having the least. Similarly, out of 43.3% of the female respondents on the route 25.6%, 8.4%, 15.8%, 6.5%, 23.7%, 15.8% and 4.2% were on GPRTU, FORD, MMT, DIPLOMAT, VVIP, VIP, and ISTC respectively. In the same vein, GPRTU had the highest number of females followed by VVIP with ISTC having the least.

Gender was found to influence a modal shift in demand (Abane, 2011; Arasan&Vedagiri, 2011). Limtanakool et al (2006) estimated binary Logit models distinguishing between private car and train found out that women are more likely to use train than men. In this study more males than female respondents chose GPRTU more than any other service provider on the route. Age was also found to be significant as well as a positive relationship between age and the use of public transport (Nurdden et al., 2007). Limtanakool et al (2006) results indicated that older commuters have a higher propensity to use private car more than middle age and young travellers.

According to Table 1 more than 80% of respondents were below 40 years and could be termed a youthful category. For all the age categories, <15 (35%), 15-19 (33.3%), 20-24 (25%) and 40-44 (28.6%) years old respondents chose GPRTU more than any other service provider. The remaining 25-29 (22.6%), 30-34 (43.8%), 35-39 (37.1%), 45-49 (58.3%) and 50> (32.1%) years old respondents chose VVIP more.

Limtanakool et al (2006) found out that education has an impact on modal choice of long distance models as an explanatory variable. They found out that high educated commuters usually tend to use public transport more. According to Table 1, half of the respondents with no formal education chose MMT more than any service provider on the route. Respondents with basic (25%) and secondary education (32.7%) chose VVIP. GPRTU was the modal choice for respondents with tertiary (25.6%) and post tertiary education (31.9%).

According to Table 1, it can be deduced that unemployed (25.4%), self-employed (25.4%), and private employee (66.7%) respondents' modal choice was VVIP bus. Whereas civil/public servant (27.7%), students (29.4%) and teacher/lecturer (26.85) respondents' modal

choice was GPRTU. Business men and women (26.5%) respondents' modal choice was VIP and pensioners (100%) respondents' modal choice was MMT bus. It can also be deduced that respondents earning <100 Ghc modal choice were on MMT (21.1%), GPRTU (21.1%) and VIP (21.1%), whereas respondents earning 101-300 Ghc modal choice was VVIP (26.6%) and the rest chose GPRTU more than other service providers on the route.

Travel characteristics of Respondents

Table 2 indicates that more than a fourth (25.6% and 26.2%) of the respondents were travelling for educational and official purpose respectively and 0.6% travelled for health purpose. In Arintono (2010), 54% of the respondents made it for social visits. But Gonzalez & Suarez (2013) noted that leisure and business trips form the bulk of long distance trips. Table 2 further indicated that more than 72.6% respondents travelled alone, 11.9% travelled with friends and the remaining with family members. More than three-fourth (87.5%) did not own a personal car which is evident in developing countries. Almost a third (32.6%) arrived at the station 10-20 minutes ago, with more than a fourth (26.2%) arriving 5-10minutes ago.

More than a third (33.6%) spent 5-10 minute, more than a fourth (26.8%) spent 10-20minute and less than a fourth (21.9) spent above 30 minutes in-vehicle waiting time. In Roza et al (2013) commuter bus as feeder access mode in Kuala Lumpur normally has long waiting time interval (around 30 minutes). Al-Sahili&Sadeq (2004) observed that majority of intercity bus riders in the West Bank had a problem with the waiting time. Time while waiting, either initially or during a transfer, is perceived by travellers to be worse than while riding.

More than a third (35.4%) arrived at the destination 20-30minutes late, with more than a fourth (30.8%) arriving above 30 minutes late. This is against the perception that it takes 3hr: 30minutes-5 hours to travel in-between the two cities. More than a third (39.8%), less than a fourth (20.7%) and 5.2% travelled by the current service provider on Accra-Takoradi route occasionally, monthly or first timer respectively. In Arintono (2010), the majority of respondents use the intercity travel service on a non-regular basis (50%) and about 36% travel between the origin and destination points regularly once or twice a month. It is very rare to encounter passengers that travel every day on the route as in intra city studies such as Abane (2011) and Babarino and Deiana (2012) where the majority of passengers are daily users.

The purpose of travel of the majority number of the respondents was official (26.2%). In Babarino and Deiana (2012), most of the travellers' reason for embarking on the journey was educational. Most of the respondents (72.6%) travelled alone. Majority of the respondents (87.5%) did not own personal vehicle and are otherwise called captive users. Most of the respondents (32.6%) arrived at the station 10-20 minutes ago. Most of them obtained tickets 10-20 minutes after getting to the station.

Travel Characteristics and modal choice

The cross tabulation of travel characteristics and service provider as indicated in Table 2 shows that more than a fourth (26.2%) of respondents on board GPRTU buses, 16.4% on FORD and VIP buses and 21.3% on VVIP buses owned private cars. More than a fourth (25.5%) travelled by GPRTU and VVIP apiece once a week. More than a fourth (25.9%) and more than a fifth (20.7%) travelled by VVIP and GPRTU respectively more than once a week. Almost a third (32.8%) travelled by GPRTU, 16.4% by MMT, 11.5% by DIPLOMAT and VIP fortnightly. About a fifth (19.4%) and more than a fifth (22.3%) travelled by GPRTU and MMT respectively monthly.

Barely a fourth (22.8%) of respondents who travelled for educational purpose was on board GPRTU and VVIP buses. A fourth (25%) and more than a tenth (13.5%) of respondents who travelled for recreational/social purpose were on board VVIP and ISTC buses respectively with none from DIPLOMAT buses. More than a fourth (26.9%) and less than a fifth (19.2%) of respondents who travelled for religious purpose were on board GPRTU, VVIP buses respectively.

More than a third (33.1%) and a fifth (20%) of respondents who travelled for official purpose were on board VVIP and GPRTU buses respectively. More than a fourth (25.8%) and 24.7% of the respondents who travelled for business purpose boarded GPRTU and MMT buses respectively. About a third (31.4%) and a fifth (20%) of respondents who travelled for family reunion boarded GPRTU and MMT buses respectively. Half (50%) of the respondents who travelled for health reasons boarded MMT and VVIP buses apiece.

Reasons for modal choice and modal choice

Several studies such as Abane (2011) in transport studies have indicated the prominence reliability factor plays in modal choice making. From the analysis on Table 3, 35.2% of respondents chose GPRTU because it was reliable as against MMT (13%). ISTC was least to be patronised in terms of reliability. This is because the company only offers once a day trips on the route unlike other service providers making up 8-20 trips daily.

Safety/security garnered the second highest responses for all the service providers. This factor entails the safety/security of passengers and their luggage. VVIP was chosen by most passengers because of this attribute, closely followed by VIP. DIPLOMAT attracted least number of passengers based on this factor. Wen et al (2005) in Taiwan noted that a certain number of passengers had switched from one carrier to others with better safety record. A 40 years old man on board a GPRTU bus remarked:

“I don't feel safe in GPRTU unlike when I am on board VVIP, VIP and DIPLOMAT buses. These buses are well grounded when on the road unlike smaller buses”

The third reason on the log is comfortability of the bus which gives a picture similar to that of safest/security. Most VVIP passengers choose the company based on this factor, followed by VIP. The least went to MMT buses because the bus is always crowded, it is always very hot without the fans working and the aisles are always filled with goods. A passenger may have to scale the goods when going down.

The fourth factor is the fare being charged by the service providers. Fares are fundamentals to the operations of public transport since they form a major source of income to operators. According to Table 3 most respondents boarded GPRTU buses because of the fares, followed by MMT buses which have more seating capacity than all the other service providers in the study area which compensates for the low fares being charged.

The fifth factor is the frequency at which the service providers offer their services on this route. The size of GPRTU buses selected for this exercise attracted most respondents. Four buses belonging to GPRTU would have departed before a VVIP or MMT bus departs. The sixth factor on the log is interior and exterior cleanliness of the bus. VVIP and VIP respondents were mostly attracted based on this factor. MMT and ISTC attracted least respondents based on this factor. A 24 years old female passenger on a GPRTU bus on this factor observed:

“The first thing I check when I get to the station is the exterior of the bus and I will also go on to see if the vehicle is in good shape. Otherwise I will not board the bus”.

In Ghana, only ISTC offers scheduled trips on all their routes as against the norm for other service providers on the route. Hence it attracted most of its passengers by this virtue.

Aside this, the maximum in-vehicle waiting time is 10minutes whether the bus is fully occupied or not. MMT is beginning to offer modified form scheduled bus transport. The station managers do not necessarily require the tickets sellers to exhaust all the seats in the bus. If the passengers have been in the bus for about 39-45 minutes then the driver may be asked to take off provided the number of passengers is more than half of the capacity. More so, this depends on the availability of buses at one terminal than the other.

Hypothesis testing

1. *Passengers’ socio-economic, travel characteristics and preferential attributes do influence modal choice on the route.*

The Pearson’s chi-square was used to test whether the yes and no for each modal choice and the socio-economic, travel characteristics and reasons for modal choice of the passengers in a cross tabulation are independent, investigating each modal choice outcome separately as indicated in Tables 1, 2 and 3. Pearson’s chi square test analyses in Tables 1, 2 and 3 showed that the following factors (age, educational qualification and employment status, frequency, time table, cleanliness, fare, employee’s attitude, space for luggage, purpose of travel, ownership of car, purpose of travel, person traveling with, arrival at the station, time of obtaining tickets, in-vehicle waiting time and arrival at the destination, comfort, safety/security and speed) were found to be statistically significant relationship ($p < 0.05$) with modal choice.

Spinney and Millward (2011) used the characteristics of children, school types and neighbourhood to organize the results from the examination of travel modes choices (bus, car and walk) for children’s journeys between home and school with Pearson chi square test. The study revealed that there is a roughly proportional distribution among the three mode choices. The distance to school appears especially strong for both walking and bus choices while preference for automobile appears prominent in the two intermediate distance categories.

Conclusion and recommendation

Factors influencing modal choice in inter urban travel behaviour studies may not be significantly from what obtains in intra urban studies as espoused in the study. One underlying issue is the frequency of intra-urban travel behaviour as against intercity. Passengers are more knowledgeable about the modes more than the intercity travellers.

Factors influencing intercity bus modal choice are age, educational qualification and employment status, frequency, time table, cleanliness, fare, employee's attitude, space for luggage, purpose of travel, ownership of car, purpose of travel, person traveling with, arrival at the station, time of obtaining tickets, in-vehicle waiting time and arrival at the destination, comfort, safety/security and speed.

There is a need to ascertain factors influencing intercity bus modal choice on certain routes like, Accra-kumasi, Accra-Aflao, Kumasi- Tamale and so on. When these researches are carried out, it can offer a wholistic view on factors influencing intercity bus modal choice in Ghana.

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