

Factors Influencing Personal Car Ownership Among Households in Benin Metropolis, Nigeria

Festus Amasikomwan Atewe^{1*} & Osagie Joseph Egharevba²

¹Department of Geography and Regional Planning, University of Benin, Benin City, Nigeria

²Department of Social Work, University of Benin, Benin City, Nigeria

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abstract

This study was conducted to identify the socioeconomic and demographic factors influencing personal car ownership in the Benin metropolis, Nigeria. Using a cross-sectional research design, a metropolitan-wide survey data from 630 households collected through questionnaire responses were analysed. The study area was first stratified into three zones (inner, intermediate and outer zones) to facilitate adequate data collection. Thereafter, five communities were randomly selected from each zone for questionnaire administration. Binary logistic regression was used to analyse the hypothesis on the influence of each indicator on personal car ownership. The result revealed that gender, household size, average monthly income and distance to place of work were the leading factors influencing car ownership among households in the study area, and thus presented in their respective order the highest Beta values (1.799, 1.346, 1.210, and 1.101). The study thus, offers support by suggesting policy process for either the strengthening or weakening indicator when the respective desire to encourage or discourage car ownership in planning is a priority. Consequently, the formulation of an appropriate policy that will be useful for strengthening or weakening key parameters is germane for predicting vehicle ownership in the study area.

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Introduction

Many cities of the developing countries are products of unplanned policy of government. Consequently, most of these cities have presented urban structure which in many ways poses challenges to the distribution of social facilities in urban areas. The inaccessibility of public transportation due to inadequate provision of the facility or because of barrier imposed by failing urban structure as well as socioeconomic indicators has led to preferential variation for personal cars in many urban centres. For instance, Adeniji and Adeleke (2018), noted that the poor accessibility of many peri-urban communities along Lagos-Ibadan corridor was attributable to the urban structure of the communities. Accessibility to public transportation is a major problem in many poor countries, but can be very severe among residents of peri-urban and sub-urban areas where the phenomena of sprawl and scatter settlements are the noticeable features.

Litman (2016) defined the term accessibility as the ease of reaching people, freights and services. On his part, Rodrigue (2013) has viewed accessibility as equal to the degree to which a place can be located by various other locations. For the purpose of this paper, accessibility was conceptualized as the sacrifice required to actualize spatial communication. This may include cost, time and effort of overcoming spatial distance. In the transportation literature, accessibility is not only affected by spatial factors such as distance and terrain of the location, but also by non-spatial attributes of the population which may include income characteristics of the population (Clark, Chatterjee and Melia, 2016; Shen, Chen and Pan 2016; Nolan, 2010). Similarly household accessibility to personal cars in the context of this study refers to car ownership status among households which is estimated by households who have their personal means of mobility.

Although the public transportation can be helpful, particularly in areas where the level of service is very high (Ong and Houston, 2002, in Ong and Lee (2007), the public transportation is a distant second to owning a personal vehicle for most households in many urban areas, and this is not surprising as many urban spatial patterns are largely predicated for the automobile (Goldberg, 2001). In Nigeria, this observation has been found to be consistent with many studies conducted on car ownership in the country (National Bureau of Statistics, 2018). However, there is no consistency among these studies regarding factors influencing car ownership from one locality to another. Therefore, the choice for personal car among people has been found to be informed not only by their socioeconomic characteristics, but also by the local peculiarity of the geographical location of the individual. In the Benin Metropolis, the current study area, such observation does not have the backing of research. Therefore, the question is, what factors are responsible for personal car ownership? To what extent do the identified factors influence personal car ownership in Benin Metropolis? This is the gap the study aimed to fill.

Literature Review

Household accessibility to personal cars can usually enhance their daily activities and ability to perform optimally. According to Bourn (2013), access to personal car offers advantage for low-income population and immigrants seeking employment. On the contrary, the lack of access to personal car can be a barrier to taking up available opportunities among young people. A study conducted in 2013 of young low-skilled job seekers in Belfast, the United Kingdom, revealed that individuals without personal means of mobility were found to be more conserved, restricted and limited to a localized area, thus, reducing their chances of meeting opportunities that are spread over space and time (*ibid*). A household is an individual or a group of individuals, who have the accommodation as their only or main residence and for a group, either share at least one meal a day or share the living accommodation. In another way, a household is made up of two or more persons sharing a common apartment either from a single family or from different family background (Haviland, 2003).

* Corresponding author.

E-mail addresses: festus.atewe@uniben.edu (F. Atewe).

Although, efforts are being made to discourage the use of personal vehicles across the world especially in advanced countries where public mass transportation system well advanced, in recent times the use of personal vehicles has been discovered to overshadow public transportation (Ukonze, et.al, 2020; Wards, 2014; and Dargay, 2007). This is most evident in poor countries where public transportation provision is poor and uncoordinated (Aderamo, 2010). In Nigeria for instance, where public transportation provision is almost a makeshift and generally poor (Finn and Mulley, 2011), many people almost entirely depend on personal car for their day-to-day mobility needs. Besides these extreme reasons, the use of personal vehicles has numerous advantages which may not be available in the use of public transportation. According to Bahreini, Reiter and Cools (2022), personal cars offer positive externalities such as accessibility and privacy to their users. However, the use of personal car has been found to differ spatially which may not also be unconnected to different factors that affect different locations differently. According to Tam and Lam (2004), Matas, Raymond and Roig (2009) and Hao and Guo (2019), spatial or land use characteristics as well as demographic and socioeconomic characteristics such as population growth, aging of population, urban form, nearness to public transportation facilities, main routes of public transportation operation and the quality of road infrastructure have been identified by scholars as determinants in personal car ownership from place to place.

In particular, Zagras and Hannan (2012) linked car ownership among households to the influence of demographic, socioeconomic and land-use factors, while Sefriyadi, et al. (2023) attributed strong reason for personal car ownership to the mismatch created by urban sprawl. For instance, in London, people are more likely to own a car if they live in the outer area of the city or

live in an area with poor access to public transport (LTDS, 2011). Similarly, the census data of Great London 1991 and 2001 clearly showed that car ownership rates were higher among residents of outer London than those in the inner London. This has been attributed to the disparity in the connection and quality of transport infrastructure between the inner and the outer London which ranked the outer zone as the lowest in accessibility to public transport facility (Mahmud, 2023). Other indicators highlighted in the literature as influencing personal car usage among individuals or households include rapid urbanisation (Joseph, Eromietse, Emmanuel and Olufunke, 2017), income and previous car ownership (Joseph, et al., 2017; Soltani, 2017; Nolan, 2010 and Potoglou and Kanaroglou, 2008), status of the urban locality (Ong and Lee, 2007), household size (Ritter and Vance, 2013; Wedagama 2009a; Potoglou and Kanaroglou, 2008) and level of educational qualification (Clark, Chatterjee and Melia, 2016 and Flamm, 2009).

Materials and Methods

This study was conducted in the Benin Metropolis, which currently comprises the Benin City, the capital of Edo State and the adjoining sub-urban neighbourhoods. Benin metropolis is the agglomeration of three (3) main local government areas of Egor, Ikpoba-Okha and Oredo and additional portions of Ovia North-East and Uhumwonde local government areas. The Metropolis is located between Latitudes 6°26' 00''N and 6°34'00''N of the Equator and between Longitude 5°35'00''E and 5°4'00''E. of the Greenwich Meridian (Figure 1). In terms of its structure, the different direction of the major arterial roads has led to a spatial growth with almost no definite pattern. Therefore, scholars are divided regarding the actual shape of the city (see Asikhia and Nkeki, 2013; Ogunbodede and Balogun, 2013; Agheyisi, 2008).

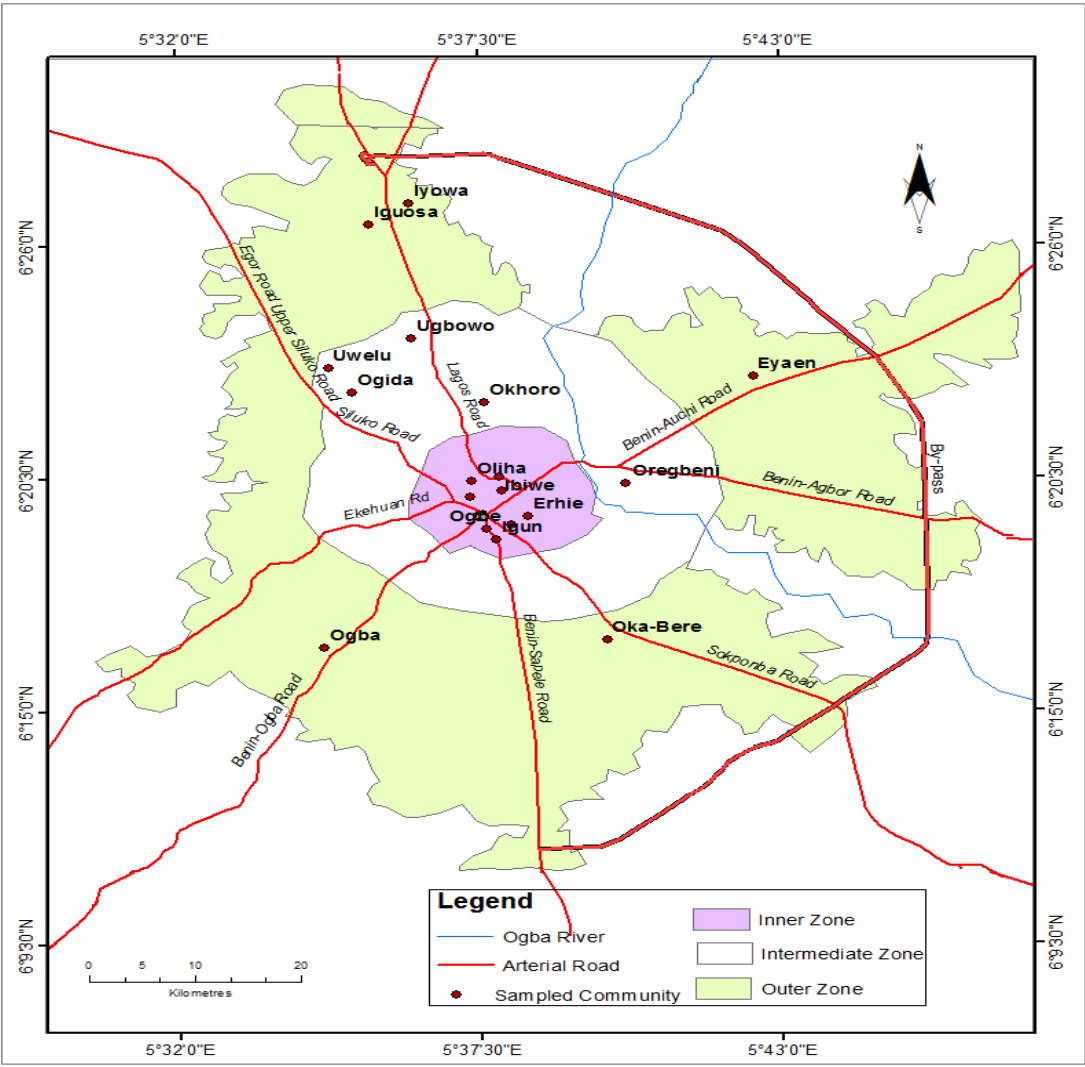


Figure 1: Benin Metropolis Showing the Sampled Communities
Source: Google Map (2023), Modified by Authors.

The transformation of the metropolis from traditional to a modern city and from civil service oriented to industrialized and commercial city has increased the dynamics and functionality of the city and consequently, the mobility demand of the people. Hence, in recent times, Benin City has demonstrated the tendency to generate high volume of traffic, not only because of recent expansion of the population and the urban area, but also because of the potential for individuals to own a personal car.

The study adopted the survey research design, with a mixed method of sampling in arriving at the data for the analysis. The study area was initially stratified into three concentric cluster zones of inner, intermediate and outer zones which was aimed at facilitating data collection. Thereafter, five communities were randomly selected from each cluster making a total of fifteen communities for the survey. This was done through the use of a lucky dip, with 'yes' written on a pieces of papers equivalent to the total number of communities required for the study. All communities in the study area were dip and picking were done without replacement. Consequently, the selected communities were Erhie, Igun, Ogbe, Ibiwe and Oliha (representing the inner zone), Ogida, Okhoro, Uwelu, Oregbeni and Ugbowo (representing the intermediate zone) and Eyaen, Iyowa, Iguosa, Ogba and Oka-Bere (representing sampled communities from the outer zone). In each community, 42 households were systematically selected for the survey.

The data used in the study consist of socioeconomic and demographic factors influencing personal car ownership were collected from primary source. The variables were aggregated cross-sectional data at metropolitan-wide level. These include ownership or non-ownership of a personal car, distance from residence to place of work, distance to other socioeconomic centres, level of education, level of accessibility to public transport and age. The other factors are household size, average monthly income, gender and category of employment. These were mainly collected through the use of a semi-structured questionnaire at the household unit of investigation.

The data analysis was done using cross-tabulation and other descriptive techniques while the binary logistic regression (equation 1) was employed to determine the influence of socioeconomic and demographic factors on personal car ownership among households. In the operationalization of the

model, the dependent variable (Y) was car ownership status, whereas the independent variables ($X_1, X_2, X_3, \dots, X_n$) were represented by the different socioeconomic and demographic indicators of car ownership. The formula for the logistic regression model as used in the study is given as.

$$\text{Logit}(y) = \left(\frac{P(Y=1)}{1-P(Y=1)} \right) = a + X\beta, \dots \dots \dots \text{Equation 1,}$$

Where:

$P(Y=1)$ describes the probability of a household owing a personal car, while $[1-P(Y=1)]$ is the probability of a household not owing a personal car. This probability falls between 0 and 1 ($0 \leq P \leq 1$) for all the possible independent variables. Also, a and β represent the intercept and a vector of slope coefficients respectively, while X is a vector of the explanatory variables.

Results and Discussion

A. Demographic Attributes of the Study Population

This study examined the key socioeconomic and demographic components of the respondents which may influence the decision of their means of transportation. These include gender, education, age, marital status and occupation. Others include household size and level of income and means of movement (Table 1).

The survey showed that more males were interviewed compared to females. In terms of education, the study showed that most of the people (94.6) were educated to at least the secondary school level, which may not be unexpected from urban population. Similarly, the marital status indicated that 87.1% were married which stood for the modal proportion. In the employment categories, those in the self-employed constituted the highest number, and were followed by private employees. Also, the information on the means of movement in the study area revealed that public transport was the dominant means of transportation and 47.8% of the respondents attested that they used the public transport for their daily mobility.

Table 1: Demographic Attributes of the Study Population

Gender of Respondents	Frequency	Percentage (%)	Cumulative Percentage (%)
Male	417	66.2	66.2
Female	213	33.8	100.0
Total	630	100	
Age of Respondents	Frequency	Percentage (%)	Cumulative Percentage (%)
≤ 25	6	1.0	1.0
26 - 35	193	30.6	31.6
36 - 45	308	48.9	80.5
46 - 55	108	17.1	97.6
56 and above	15	2.4	100.0
Total	630	100.0	
Education Qualification of Respondents	Frequency	Percentage (%)	Cumulative Percentage (%)
No Formal Education	07	1.1	1.1
Primary Education	26	4.1	5.2
Secondary Education	296	46.9	52.1
Tertiary Education	301	47.7	100.0
Total	630	100.0	
Marital Status of Respondents	Frequency	Percentage (%)	Cumulative Percentage (%)
Single	47	7.5	7.5
Married	549	87.1	94.6
Widow/Widower	13	2.1	9.7
Separated	21	3.3	100.0
Employment Category of Respondents	Frequency	Percentage (%)	Cumulative Percentage (%)
Private Employees	213	33.7	33.3
Civil/Public Servants	124	19.7	53.0
Self-Employed	294	46.6	100.0
Means of Movement	Frequency	Percentage (%)	Cumulative Percentage (%)
Personal Car	175	27.8	27.8
Public Transport	301	47.8	75.6
Personal Car and Public Transport	154	24.4	100.0

Source: Authors' Field Survey, 2023

B. Determinants of Personal Car Ownership in Benin Metropolis

According to Sefriyadi, et al. (2023), the desire to own a personal car by an individual stems from a number of intrinsic variables operating within the human mind. This may include socio-economic, perception and attitudinal factors, as well as spatial factors ranging from distance between a person’s home of residence and places of socioeconomic activities. This may also include unavailability of alternative means of transportation and the current transport infrastructure gap. Intriguing, this study has revealed case close identities to many of the reasons raised in the literature which are responsible for car ownership among individuals and households, although with its peculiarity in the pattern in which the identified factors exert their influence. For instance, two extreme positions of opinion for agreement and disagreement to previous studies relating to the rating and ranking of the various underlying indicators were identified. On the one hand, the finding is in consonance with Wedagama (2009a), whose study in Denpasar in Indonesia City of Bali showed a strong correlation between household size and motorcycle ownership rate. It is however, at variance with the findings of Nolan (2010), which identified level of income and previous car ownership status as the strongest determinants of car ownership among households. But the fact that many other previous studies also disagreed on the rating of the factors was a respite to the current study. The output statistics in Figure 2 showcased the weighted multiple indicator rating of the factors influencing car ownership in the Benin metropolis. Visual interpretation of the output result indicated that gender, household size, average monthly income, distance to

place of work, employment category and age were in that order, the leading causes of car ownership in the study area with respective percentage rating of 20.90%, 18.40%, 14.60%, 11.30%, 10.30% and 8.50%.

Behind age in that order of magnitude, the study showed that distance to other centres of socioeconomic activities (with percentage rating of 6.70) and education (with percentage rating of 4.00), were other less indicators of car ownership in the study area. Although, this outputs result (Figure 2) did not offer the research opportunity to understand the real influence and direction of each indicator on car ownership, it helped in highlighting the relevant indicators for model validation (see Table 8).

C. Simple Indicator Rating of Factors of Car Ownership in Benin Metropolis

(I). Car Ownership Rate in Relation to Household Size of Respondents

The cross-tabulation between household size and ownership of personal car is shown in Table 2. The output result indicated that a total of 319 respondents own a personal car which was distributed across different age groups. From the result, it is evident that, a progressive increase in household size was also corroborated with an increase in personal cars. Consequently, households with larger number were observed to own a personal car than households with smaller size (Table 2). This implies that, the tendency to own a personal car tends to increase with an expansion of the size of a household.

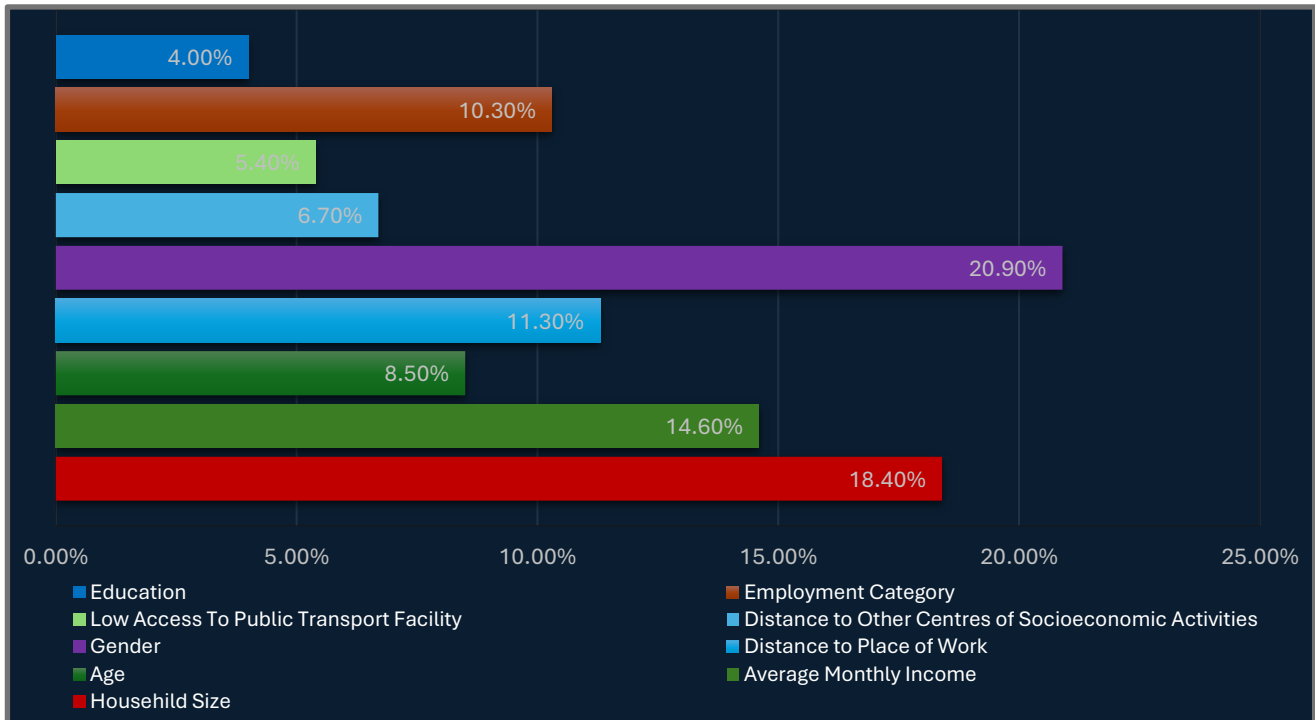


Figure 2: Multiple Indicator Rating of Factors of Car Ownership in the Study Area
Source: Authors’ Field Survey, 2023.

Table 2. Cross-Tabulation of the Influence of Household Size on Ownership of Personal Cars

Ownership Status of Personal	Household size								Total
	1	2	3	4	5	6	7	8	
Owner	0 0.00%	11 3.4%	18 5.6%	26 18.2%	60 18.8%	64 20.1%	66 20.7%	74 23.2%	319 100.0%
Non-Owner	78 25.1%	71 22.8%	62 19.9%	41 13.2%	26 8.4%	17 5.5%	15 4.8%	1 0.3%	311 100.0%
Total	78 12.4%	82 13.0%	80 12.7%	67 10.6%	86 13.7%	81 12.9%	81 12.9%	75 12.0%	630 100.0%

Source: Authors’ Field Survey, 2023.

(II). Car Ownership Rate in Relation to Distance to Work of Respondents

Distance is a serious barrier to communication and overcoming this requires mobility enhancement which may be available through public transport or personal car. The survey of the influence of distance barrier on personal car ownership revealed that most of the people with personal means of mobility travelled long distances to their places of work. From the result, we observed that households who have to cover longer distances travelling from their homes to places of work have more desire to own their personal car. From Table 3, it is discovered that car ownership rate collapses with reduction in distances to work places as clearly indicated by the percentage of households with personal cars in each distance category.

Further analysis for establishing strong theoretical basis on this relationship involved the point biserial correlation. In the application of the correlation equation, the data analysis was treated in the two dichotomous sets: those whose distance to work influenced their desire to own a car (represented by 1) and those whose distance to work did not influence their desire for a personal car (represented by 0). The output result (Table 4) shows that as one move from zero (0) to one (1), there is a statistically significant change in travel distance. This implies that those who own a personal car have longer distances coverage to places of work. The finding therefore revealed that distance is one of the basic prerequisites that most people would normally consider in deciding to own a personal car. To substantiate this finding and to determine the level of its significance, the t test analysis was further performed to

ascertain whether the mean different of the two sub-groups is statistically significant in their distance to work. The result showed that there is difference in the mean of the two groups with respect to distance to work (Table 4).

(III). Car Ownership Rate in Relation to Income and Age of Respondents

Although the information in Table 5 explained an incremental trend in the proportion of households with personal car in relation to increase in income, this cannot be totally held to mean that an increase in income (especially marginal increase) will always lead to a corresponding increase in the number of households with personal car. This is evident from the output result (Table 5) where in some instances households' sub-group with relatively lower income (50,001-70,000) own more personal cars than those with higher income class (70,001-90,000), and even when there was an increase in car ownership rate due to income, the proportion was marginal. The implication is that, while the relationship between income size and desire to own personal car cannot be shielded, this can also be affected by other factors such as the value system of individuals.

Similarly, the information on age revealed that ownership of personal car was influenced by age. From the result, it is clear that preference for personal cars was particularly high among some specific age brackets. Thus, car ownership rate was discovered to be more among middle aged group (36 – 55 years) with more active people while ownership rate tends to decline among younger and older people (Table 5).

Table 3: Influence of Distance on Personal Car Ownership

Distance in Metres	Private Car Ownership Status			
	Own Private Car	No Private Car	Total	Percentage With Personal Car
<= 100	15	131	146	10.27
101 - 3600	36	81	117	30.76
3601 - 7100	68	47	115	59.13
7101 - 10600	89	33	122	72.95
10601 - 14100	111	19	130	85.38
Total	319	311	630	

Source: Authors' Field Survey, 2023

Table 4: Point Biserial Correlation

Distance to Work	Distance to Work		Car Owned
	Pearson Correlation		
		1	.67*
	Sig. (2-tailed)		.015
	N	630	630
Car Owned	Car Owned		Distance to Work
	Pearson Correlation		
		.67*	
	Sig. (2-tailed)	.015	
	N	630	630

Source: Authors's Field Survey, 2023

Table 5: Influence of Income and Age on Car Ownership

Ownership of Personal Car	Average Monthly Income (₦)								Total	
	<= 10000	10001 - 30000	30001 - 50000	50001 - 70000	70001 - 90000	90001 - 110000	110001 - 130000	130001 - 150000		
No	Count	0	1	3	68	11	70	105	58	316
	% within	0.0%	0.3%	0.9%	21.5%	3.5%	22.2%	33.2%	18.4%	100.0%
Yes	Count	2	3	6	53	44	60	72	74	314
	% within	0.6%	1.0%	1.9%	16.9%	14.0%	19.1%	23.0%	23.6%	100.0%
Total	Count	2	4	9	121	55	130	177	132	630
	% within	0.6%	1.3%	2.8%	38.4%	17.5%	41.3%	55.2%	42.0%	100.0%
Ownership of Personal Car	Age of Respondent							Total		
	<= 25	26 - 35	36 - 45	46 - 55	56 - 65					
No	Count	2	107	149	41	8	307			
	% within	0.7%	34.9%	48.5%	13.4%	2.6%	100.0%			
Yes	Count	4	86	159	67	7	323			
	% within	1.2%	26.6%	49.2%	20.7%	2.2%	100.0%			
Total	Count	6	193	308	108	15	630			
	% within	1.0%	30.6%	48.9%	17.1%	2.4%	100.0%			

Source: Authors' Field Survey, 2023.

(IV). Car Ownership Rate in Relation to Employment Category and Educational Qualification

The influence of education on personal car ownership is displayed in Table 6. It is observed that out of a total of 26 respondents who had primary education, 11 of them had no personal cars while 15 had personal cars. Also, out of a total of 96 sampled respondents with secondary education, 56 had no personal car while 40 of them had personal car, and while from the total of 508 of the sampled respondents, 240 have no personal means of mobility while 268 had means of mobility (Table 6). Though the information seems to show that those with higher educational level tends to have means of mobility than those who had secondary and primary educational qualification, the number of the respondents that own cars and do not own car tends to be relatively the same (307 and 323 respectively for those who do not own and those who own). This brings to bear the need to fully understand factors that could possibly influence the need to own personal means of mobility. Similarly, the variation in the number of households with personal car in relation to category of employment is shown in Table 6. From a total of 323 respondents who were assessed to owned personal car, 19.5% were private business owners, 23.2% were civil servants and 57.3% were self-employed. Obviously, larger percentage of those that own personal car were self-employed. Meanwhile, out of 307 respondents who did not have a personal car, 17.9% were owners of private business, 16.0% civil servants and 66.1% self-employed (Table 6).

D. Model Validation

Table 7 revealed the result of the binary logistic regression performed to explain the real impact of socioeconomic and demographic characteristics on personal car ownership in the Benin Metropolis. The indicators selected include gender, age, category of employment, average monthly income, household size, distance to place of work, low level of public transport accessibility, distance to other centres of socioeconomic activities and education qualification (see Figure 1). Although, the descriptive statistics has been brought to bear in addressing the behaviour of the population to the identified indicators of car ownership in the study area, the use of descriptive statistics did not explore the real impact nor did it indicate the direction of the relationship. Therefore, the introduction of binary logistic regression was to explain the relationship between the various indicators on car ownership in the study area as well as the degree to which each indicator influenced car ownership. The result of the model as a whole explained 10.2% (Cox and Snell R Square) and 13.9% (Nagelkerke R Square) of the variance in the dependent variables (personal car ownership status). The R square may appear low, but this is not unexpected from a behavioural study as also noticed by Erimona (2013) and Hills et al. (2011).

From the result of the analysis, four out of the nine selected indicators were found to make significant contribution to the model. These are gender, household size, distance to place of work and education (Table 8). However, the greatest impact factor on personal car ownership was gender, with a positive odd ratio of 1.799 of the study population answering yes to be influenced to buying a car if their gender was male. Thus, the probability of owning a personal car is likely to increase by an odd ratio of 1.799 with a unit increase in male gender or by a unit change from female gender to male gender. This indicated that more males are likely to own a personal car in relation to females. This was followed by household size with a positive odd ratio of 1.346 of the study population answering yes to be influenced to buying a car with increasing household size. The implication of this is that, households with larger size are more likely to have a personal car than households with smaller size. This finding was in consonance with Wedagama (2009a), which submitted that, a household's preference for personal car was not likely to be unconnected to the household size. Similarly, this was followed in that order by average monthly income, distance to place of work, category of employment, age, distance to other centres of socioeconomic activities, low level of public transport access and educational qualification. The output result revealed that car ownership rate responds directly to the dynamics of a household's monthly income even though this was not significant. Consequently, the elasticity of the demand for personal car among households is likely to increase by an odd ratio of 1.210 for every unit increase in average monthly income. This indicates that, when income increases, people will tend to be motivated to own a personal car, thereby increasing the stock of vehicles. The indication is that income is a major factor that contributes to the phenomenal increase in vehicle ownership among households. This finding was consistent with Ukonze et.al. (2020) and Tsang, Daley, and Milthorpe (2011) which found that income had a significant effect on vehicle ownership in their respective studies. Distance to place of work has a significant positive odd ratio of 1.101. This indicates that the probability of owing a personal car increases by an odd ratio of 1.101, for every unit increase in the distance barrier between place of residence and place of work. In analyzing the influence of employment category on personal car ownership, the data were collapsed into two groups of self-employment and paid employment with paid employment used as reference for the analysis. The result returned a positive odd ratio of 1.081. This clearly showed that the probability of owning a personal car increases with change in the proportion of household from paid employment category to self-employment category. This means that there are more people in self-employment with a personal car than those in paid employment (Table 8).

Table 6: Proportion of Car Ownership in Relation to Employment Category and Educational Qualification

Means of Mobility	Employment Category			
	Private Business	Civil Servant	Self Employed	Total
Do Not Own	55 17.9%	49 16.0%	203 66.1%	307 100.0%
Own	63 19.5%	75 23.2%	185 57.3%	323 100.0%
Total	118 18.7%	124 19.7%	388 61.6%	630 100.0%
Ownership of Personal Car	Educational Qualification			
	Primary	Secondary	Tertiary	Total
Do Not Own	18 5.7%	56 17.8%	240 76.4%	314 100.0%
Own	8 2.5%	40 12.7%	268 84.8%	316 100.0%
Total	26 4.1%	96 15.2%	508 80.6%	630

Source: Authors' Field Survey, 2023.

Table 7: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	802.387 ^a	.104	.139

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 8 Variables in the Equation

Variables	B	S.E.	Wald	df	Significant Level	Exp(B)	Comment
Gender (1)	.587	.183	10.241	1	.001	1.799	Significant
Age	.010	.014	.001	1	.981	1.055	Not Significant
Employment Category (1)	.078	.303	.067	1	.796	1.081	Not Significant
Average Monthly Income	.232	.038	.251	1	.617	1.210	Not Significant
Household Size	.297	.069	18.390	1	.000	1.346	Significant
Distance to Place of Work	.113	.026	24.975	1	.000	1.101	Significant
Low Level of Access to Public Transport	-.259	.175	2.193	1	.139	.774	Not Significant
Distance to Other Centres of Socioeconomic Activities	.002	.047	.002	1	.962	1.002	Not Significant
Education Qualification (Tertiary)			4.879	2	.087		Significant
Education Qualification (Primary1)	-.074	.427	.030	1	.862	.772	Not Significant
Education Qualification (Secondary2)	-.529	.243	4.719	1	.030	.589	Significant
Constant	-2.279	.615	13.723	1	.000	1.02	Significant

a. Variable(s) entered on step 1: Gender, Age, Employment Category, Average Monthly Income, Household Size, Distance to Place of Work, Low Level of Access to Public Transport, Distance to Other Centres of Socioeconomic Activities and Education Qualification.

In addition, the analysis for education qualification was categorized into primary, secondary and tertiary sub-groups with the tertiary sub-group used as a reference. Consequently, the out result returned a respective negative odd ratio of .772 and .589 for primary and secondary education levels. This means that the probability of owing a personal car decreases by an odd ratio of .772 for every change in tertiary education category to primary education category and by an odd ratio of .589 for a change in tertiary education category to secondary education category. Thus, the finding showed that there were more personal car owners among people with tertiary education qualification than those with secondary education qualification, just as it was established that there were more car owners among secondary education qualification than primary school holders. The odd ratio for age, distance to other centres of socioeconomic activities and low level of public transport accessibility were respectively 1.055, 1.002 and 0.774. This implies that while the probability of owning a personal car is likely to increase by a respective odd ratio of 1.055 and 1.002 for any unit change in age and distance to other centres of socioeconomic activities, the likelihood of owing a personal car will decrease by an odd ratio of 0.774 for any unit change in the level of inaccessibility to public transport facility (see Table 8).

Conclusion and Recommendation

This study, adopting the survey design was carried out to determine factors influencing personal car ownership among households in the Benin metropolis. The result revealed that four out of the nine selected indicators used in the model were found to make significant contribution to the study.

These are gender, household size, distance to place of work and education. However, the greatest impact factor on personal car ownership was gender, followed by household size, then distance to place of work and finally education with the lowest significant impact. Overall, from the nine indicators used in the model, seven of them made positive impact. These are: gender, age, employment category, average monthly income, household size, distance to place of work and distance to other places of socioeconomic activities. While the remaining two made negative impact on personal car ownership (see Table 8). The study thus, reveals the influence of a thinkable policy process that can be designed to either enhance or hinder an indicator when the desire to encourage or discourage car ownership among individual households is a priority. Consequently, the formulation of appropriate policy that will be useful in strengthening or weakening the key parameters is germane for predicting vehicle ownership in the country.

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Declaration of Interest

The authors declare that they have no known competing financial, material or personal interests or relationships that could have turned out to influence the outcome of findings reported in this paper.

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