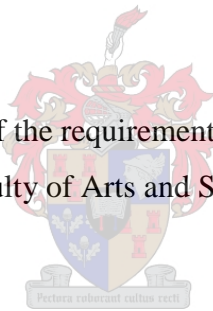


**THE FACTORS INFLUENCING LEARNER TRAVEL TIME TO SCHOOL IN THE
METROPOLITAN MUNICIPALITIES OF GAUTENG PROVINCE**

By PAULOS MATLHOMOLA RAMMUKI

Thesis presented in partial fulfilment of the requirements for the degree Master of Philosophy in
Urban and Regional Science in the Faculty of Arts and Social Sciences at Stellenbosch University



Supervisor: Ms. Lodene Willemse

April 2019

AUTHOR'S DECLARATION

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Date: 20 February 2019

ABSTRACT

The aim of the study is to determine the factors influencing the learner travelling time to school in metropolitan municipalities within Gauteng Province. Descriptive analysis was produced. Correlation, Chi-square and logistic regression analysis were performed on the socio-demographic variables, socio-economic variables and settlement type variables to determine the factors influencing the learner travelling time to school in metropolitan municipalities of Gauteng province. A weak correlation seem to exist between race, income quintile, type of school attended and level of school and mode of transport. As far as other combination of variables, correlation does not exist. Logistic regression output showed that age of a learner indicates that the probability of travelling more than 30 minutes to school, increases as age of the learner increases. Race is not one of the factors that contribute to traveling more than 30 minutes. Transport to and from school seem to be an important factor of travel time. Learners attending secondary, private and furthest school were most likely to travel more than 30 minutes to school compared to learners attending primary schools, public and the nearest school across all metros. It is evident that learner mobility in Gauteng is faced with long travelling time regardless of mode of transport. Challenges are on socio-demographic, socio-economic level and the urban form is also contributing to longer travelling time.

Keywords and phrases: socio-demographic; socio-economic; learner travelling time; correlation; Logistic regression;

OPSOMMING

Die doel van die studie is om die faktore wat die reistyd na skole toe en terug van leerlinge in die metropolitaanse munisipaliteite in die provinsie van Gauteng beïnvloed, te bepaal. 'n Beskrywende analiese is hiervoor aangewend. Die faktore is bepaal deur korrelasie, chi-kwadraatverdeling en logistieke regressie analises op die sosio-demografiese, sosio-ekonomiese en tipe nedersetting veranderlikes uit te voer. Dit blyk uit die bevindinge dat daar 'n swak korrelasie tussen ras, inkomste kwintiel, tipe skool, skool vlak en transport tipes voorkom. Geen korrelasie wat betref ander moontlike kombinasies, kom voor nie. Die logistieke regressie toon dat die ouderdom van 'n leerder 'n goeie aanwyser van die waarskynlikheid tussen 'n leerder en 'n reistyd van 30 minute of langer skool toe, is d.w.s hoe ouer die kind hoe langer die reistyd skool toe. Ras is nie 'n faktor in die bepaling van 'n reistyd van 30 minute of langer nie. Verder blyk dit dat transport na skole toe en terug wel 'n groot invloed op die reistyd het. In vergelyking met leerders wat primêre, publieke en skole in die nabyheid bywoon, is die waarskynlik groter dat leerders wat sekondêre, privaat en verste skole bywoon, langer as 30 minute skool toe reis. Dit is dis duidelik dat leerder mobiliteit in Gauteng kan lang reistye te wagte wees ongeag transport tipes. Die uitdaging kom dis op die sosio-demografiese sowel as die sosio-ekonomiese vlak voor maar stedelike vorm kan ook tot 'n langer reistyd bydra.

Trefwoorde en frases: sosio-demografiese; sosio-ekonomiese; reistyd na skole toe en terug van leerlinge; korrelasie; logistieke regressie;

ACKNOWLEDGEMENTS

I would like to express my sincere appreciation and thanks to the following people:

- Ms. L Willemse for the support, motivation, guidance and supervision she provided during my research. Her skills, knowledge, and patience were key factors for delivering this academic product.
- Centre for Regional and Urban Innovation and Statistical Exploration (CRUISE) led by Professor HS Geyer and Statistics South Africa under the leaderships of Mr R Maluleke, for granting me the opportunity to study an MPhil degree at Stellenbosch University. A big thank you also extends to the CRUISE lecturers for supporting me throughout all the good and tough times of my studies.
- Mrs. Mmapitsi Chuene and Mr. Tirhani Lucky Maringa from Statistics South Africa for support and encouragement throughout the CRUISE programme.
- My beautiful wife Lesang and sons (Karabo and Lesedi) for endless support and encouragement throughout the whole process of obtaining my MPhil degree. It was not easy but you let me continue with studies even when our son was hospitalised and for that I thank you.
- To everyone who contributed directly or indirectly with support, thank you.

CONTENTS

| | Page |
|--|-------------|
| CHAPTER 1: BACKGROUND | 1 |
| 1. INTRODUCTION | 1 |
| 1.1 RESEARCH PROBLEM | 2 |
| 1.2 RESEARCH QUESTIONS | 3 |
| 1.3 THE AIM AND OBJECTIVES | 3 |
| 1.4 OUTLINE OF CHAPTERS | 3 |
| CHAPTER 2: THE FACTORS INFLUENCING THE LEARNER TRAVELLING TIME TO SCHOOLS IN THE METROPOLITAN MUNICIPALITIES OF GAUTENG: EVIDENCE FROM THE LITERATURE | 4 |
| 2. INTRODUCTION | 4 |
| 2.1 SOCIO-DEMOGRAPHIC FACTORS INFLUENCING LEARNER TRAVELLING TIME | 4 |
| 2.2 SOCIO-ECONOMIC FACTORS INFLUENCING LEARNER TRAVELLING TIME | 5 |
| 2.3 SETTLEMENT TYPE | 7 |
| CHAPTER 3: METHODOLOGY | 10 |
| 3. INTRODUCTION | 10 |
| 3.1 STUDY AREA, DATA SOURCES AND VARIABLES | 10 |
| 3.2 SAMPLE SELECTION AND ANALYSIS MODELS | 13 |
| CHAPTER 4: THE RESULTS AND DISCUSSIONS | 14 |
| 4. INTRODUCTION | 14 |
| 4.1 DESCRIPTIVE ANALYSIS | 14 |
| 4.2 CHI-SQUARE ANALYSIS | 21 |
| 4.3 CORRELATION ANALYSIS | 23 |
| 4.4 LOGISTIC REGRESSION | 26 |
| 4.5 INTERPRETATION OF RESULTS | 27 |
| 4.6 RESULTS OF THE SPECIFICATION ERROR TEST | 28 |
| CHAPTER 5: CONCLUSION AND POLICY IMPLICATIONS | 29 |
| 5.1 CONCLUSIONS | 29 |

| | | |
|------------|---|-----------|
| 5.2 | POLICY IMPLICATIONS | 29 |
| 5.3 | LIMITATIONS OF THE STUDY AND RECOMMENDATIONS FOR FUTURE RESEARCH | 30 |
| | REFERENCES | 31 |

TABLES

| | Page |
|--|-------------|
| Table 3.1: Independent and dependent variables. | 11 |
| Table 4.1: Income quintile per race in Eku, CoJ and CoT. | 18 |
| Table 4.2: Relationship between distance to school and dependent variables in Eku, CoJ and CoT. | 21 |
| Table 4.3: Relationship between distance to school and dependent variables in Eku, CoJ and CoT. | 22 |
| Table 4.4: Correlation matrix for Eku metro municipality. | 22 |
| Table 4.5: Correlation matrix for CoJ metro municipality. | 23 |
| Table 4.6: Correlation matrix for CoT metro municipality | 24 |
| Table 4.7: Predictors of learners travelling more than 30 minutes to school in EKH, CoJ and TSH, GHS 2017. | 25 |
| Table 4.8: Results of the specification error test | 27 |

FIGURES

| | Page |
|---|-------------|
| Figure 4.1 show learners in Gauteng metros travelling more than 30 minutes to school. | 14 |
| Figure 4.2: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by age, GHS 2017. | 14 |
| Figure 4.3: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by gender, GHS 2017. | 15 |
| Figure 4.4: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by race, GHS 2017. | 15 |
| Figure 4.5: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by attending primary or secondary schools, GHS 2017. | 16 |
| Figure 4.6: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by attending nearest or not attending nearest school, GHS 2017. | 16 |
| Figure 4.7: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by attending private or public schools, GHS 2017. | 17 |
| Figure 4.8: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by household income quintile, GHS 2017. | 18 |
| Figure 4.9: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by mode of transport, GHS 2017. | 19 |
| Figure 4.10: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by settlement type, GHS 2017. | 20 |

ABBREVIATIONS AND ACRONYMS

The Development Facilitation Act (DFA)

National Development Plan (NDP)

Spatial Planning and Land Use Management Act (SPLUMA)

Department of Basic Education (DBE)

National Household Travel Survey (NHTS)

Department of Transport (DoT)

General Household Survey (GHS)

Ekurhuleni (Eku)

City of Johannesburg (CoJ)

City of Tshwane (CoT)

CHAPTER 1: BACKGROUND

1. INTRODUCTION

Historically under apartheid, the population was classified into four groups, namely: African (black), coloured, white, and Indian. School funding and governing were on the basis of population groups (de Kadt et al., 2018). White schools were better resourced while Black Africans schools were lower standards and underfunded. At the dawn of democratic dispensation, some white schools started allowing admission of Black African learners. African parents started having school choice and those who were economically able, they started sending their children to private, semi-private schools or public school in former white suburbs (Wiener & Ruiters, 2017). In 1995, the Democratic government endorsed an urban spatial reform policy enshrined in the Development Facilitation Act (Act 67 of 1995). The Development Facilitation Act (DFA) was aimed mainly at reducing travel distances between residential and employment areas through the promotion of mixed land use developments. The set of normative spatial principles contained in the DFA (Republic of South Africa 1995). Introduced a legal source to guide the spatial content of planning. The planning commission produced a diagnostic report on the state of South Africa. The most prominent national and provincial policy and legal frameworks, namely the National Development Plan (NDP) 2030, the Spatial Planning and Land Use Management Act, 2013. The Spatial Planning and Land Use Management Act (SPLUMA) (No. 16 of 2013) provides for a single land development process for the country. SPLUMA presents some important opportunities for cities to plan more effectively for transformative outcomes. It is increasingly recognized that travel time reliability is important to travellers, and hence there is an increasing demand to include reliability in the evaluation of transport projects and programs (Aron et al., 2014). The Bill of Rights stipulates that every citizen has a right to basic education regardless of geographic or economic factors (Republic of South Africa, 1996a). The Department of Basic Education (DBE) has through various studies, such as the National Household Travel Survey (NHTS) of 2013, and interactions with affected stakeholders noted that most learners have difficulty in accessing schools in both urban and rural settings. Department of Transport (DoT) together with DBE and other stakeholders developed National Learner Transport Policy which is aimed at addressing the challenges of accessibility and the safety of learners (Department of Transport, 2015). The learner transport policy was developed in line with, and reinforces, other national transport policies and legislative prescripts including White Paper on National Transport 9 policy of 1996; National Land Transport Act of 2009; National Road Traffic Act of 1996 and its supporting regulations. One of the key factors that define accessibility is the travel time between home and school (Hitge et al. 2015). The school choice is mostly influenced by whether or not school quality of education will

improve both anticipated and their children's preparation for the future (de Kadt et al. 2014, Wiener, 2017). The racially defined geographical neighbourhood in which a child resided predetermined which school they could register at. Unfortunately, due to the legacy of apartheid, unbalanced resource allocation, schools in former Black townships seldom offered quality education. This resulted in Black parents seeking quality public education, choosing schools for their children in town or former white suburbs. Learners end up commuting or moving home, of which both options have financial implications (Pienaar & McKay, 2014). South Africa provides a unique platform to study factors influencing learner travelling time to school in the developing World (de Kadt et al. 2014). The purpose of this study is to determine the factors influencing the learner travelling time to school in Gauteng.

1.1 RESEARCH PROBLEM

The ability of learners to access education is hampered by the long distances they have to travel to get to school. The changing education, geography and landscape and the diverse learners which schools attract have become debatable topics specifically because of the distances travelled by learners (Wiener, 2017). There is an ever-increasing learner growth that is being experienced in Gauteng province. The eruption of informal settlements in also results in learners having to travel long distance to access schools. Kennedy, (2008) noted that there is a common trend of families to sacrifice luxurious things so they can afford a better school or a private school education which result in learner having to travel to the school identified as the best. Most developed countries are currently discussing how to raise the quality of education, providing basic education for all, regardless of geographic location or socio-economic background, while developing countries are still struggling to provide access to education (Tansel, 2004). DBE is always striving to address the learner challenges, but there is a continuous challenge of parents enrolling their children in schools that are far from their residence because most of these parents cannot afford housing in the suburbs where they send their kids (Hunter 2010). Gauteng Department of Education introduced the 5 km feeder zone as key criterion for school admissions limits equitable access, in practice feeder zones have not eliminated mobility: 37% of learners access schools beyond the default 5 km feeder zone (de Kadt et al., 2018). General Household Survey (GHS) 2017 also recorded 20.1% of primary school learners who are not attending the nearest schools and a further 22.1 % of secondary school learners who are also not attending the nearest schools during the year 2017 in Gauteng. The purpose of this study was to find out whether the socio-demographic, socio-economic factors, and the settlement type has statistical significance at the travelling time of learners in metropolitan municipalities of Gauteng province.

1.2 RESEARCH QUESTIONS

There are three research questions:

- a. Is there statistically significant socio-demographic factors influencing the learner travelling time to school in Gauteng?
- b. Is there statistically significant socio-economic factors influencing the learner travelling time to school in Gauteng?
- c. Is there statistical significance of settlement type as a factor influencing the learner travelling time to school in Gauteng?

1.3 THE AIM AND OBJECTIVES

The aim of the study is to determine the factors influencing the learner travelling time to school in metropolitan municipalities within Gauteng Province. The aim was achieved through the following objectives:

- a. To determine the statistically significant socio-demographic factors influencing the learner travelling time to school in Gauteng.
- b. To determine the statistically significant socio-economic factors influencing the learner travelling time to school in Gauteng.
- c. To determine the statistically significant of settlement type as a factor influencing the learner travelling time to school in Gauteng

1.4 OUTLINE OF CHAPTERS

Chapter 1 is background begins with an introduction, research problem, research questions, aim and objectives. Chapter 2 provides a synthesis of literature review on learner travelling time, socio-demographic and socio-economic factors influencing learner travel time and settlement type that influence learner travel time to school. Chapters 3 focus on the methodological approach and variables used. Chapter 4 its results and discussions, correlation and regression analysis are performed to determine the factors that are significantly influencing learner travel time to school. Chapter 5 provides conclusions and recommendations of the study based on the findings.

CHAPTER 2: THE FACTORS INFLUENCING THE LEARNER TRAVELLING TIME TO SCHOOLS IN THE METROPOLITAN MUNICIPALITIES OF GAUTENG: EVIDENCE FROM THE LITERATURE

2. INTRODUCTION

Formal education is considered a necessary requirement for all children because of its many socio-economic benefits at both individuals and society's level. Access to school is a basic right in most developed and developing countries, it has evolved quickly, resulting in different systems for providing access to schools (McDonald et al., 2015). Socio-demographic, socio-economic factors, and settlement type are discussed next.

2.1 SOCIO-DEMOGRAPHIC FACTORS INFLUENCING LEARNER TRAVELLING TIME

Socio-demographic factors influencing the learner travelling time to school includes amongst others: age, race, gender of a learner, and the household size. According to United Kingdom's National Travel Survey (2008), children aged 5 to 10 years travel an average distance of 2.6 kilometres to school which increases to 5.5 kilometres at ages 11-16 years. The use of active transport can be encouraged thus increasing physical activity. According to Pauling et al., (2009) younger children in the suburbs of Toronto walked less to school than 11-13 year olds and learners 14-15 year olds walked less but used transit more (44.8% of trips) than students in the suburbs.

Mothers play a key role in the household by making decisions with regard to expenditures and by providing a supportive environment for children. Mothers with low levels of education might not be able to provide support for children in their studies, and will miss out on providing bigger Quantity-Quality trades off. Rural, and poorer households, and households headed by less educated mothers, attend worse public school. Parents cannot help by educating their children at home or by private tutoring (Kugler & Kumar, 2017). Parents who have reached a certain educational level, it is expected that they want their children to reach at least the same level (Breen & Goldthorpe, 1997). The expectation is that higher levels of education of the parents will lead to higher participation levels of their children. Educational participation of girls, is mostly influenced by the mother's level of education (Emerson & Portela Souza, 2007). Mothers who achieved a higher level of education, their experience and how they value education gives confidence to girls to complete higher levels of education. Poor households have limited access to jobs, education and healthcare as they face transport deprivation, hence their children attend nearest public schools. Limited mobility due to household responsibilities and constrained schedules that often does not allow travelling long distance (Titheridge et al, 2014). Anderson (1988) stated that gender-based divisions of labour in both the

production of goods and services and in household-based production, compromise the chances of girls to attend school. Household size refers to the number of household members who are sharing resources in the same household. The number of siblings a child has played an important role while children whose father or mother is missing from the household are more inclined not to be in school, because of limited budget and household chores. In situations where children are required to do household chores or to contribute to the household income, it is possible that if there are adopted or foster children, parents may put those duties more on the shoulders of these children instead of their own children (Fafchamps & Wahba, 2006). Larger family size constrains investments on schooling in Vietnam (Dang & Rogers, 2013). Family size tends to be negatively correlated to educational enrolment, because the available household resources have to be shared amongst all children. This means that parents have to consider all costs associated with schooling and the cheapest option is to enrol children in the nearest public school to avoid travelling costs (Buchmann & Hannum, 2001; Pong, 1997). Parents are the ones making choices of schools according to their preference of what they value important for their children (Schwartz, 2003).

2.2 SOCIO-ECONOMIC FACTORS INFLUENCING LEARNER TRAVELLING TIME

The socio-economic factors of the learner, which will be discussed includes; Household income, level of education of parents, employment status of parents, and mode of transport. Household income is a measure of the combined incomes of all people sharing a particular household or dwelling unit. Poverty influences the demand for schooling not only because it affects the inability of households to pay fees and other costs associated with education, but also because it is associated with a high opportunity cost of schooling for children (Sabates, 2010). Evidence in countries as diverse as Bangladesh, Chile, Ethiopia, and Kenya, indicates that families are involved in school choice, in various forms. Majority is motivated by a desire to provide their children with the best possible opportunities, even when they are faced with financial constraints (Elacqua, 2006; Elacqua, Schneider, and Buckley 2006; Cameron 2011; Weir 2011). Low-income parents do not consider school performance when making decisions on school, while wealthy parents consider school reputation, word of mouth, and school visits as most important sources for school choice (Teske et al., 2007). Better conditions of school facilities enable the teacher to accomplish his/her task and help the learner to learn and achieve effectively. Additionally, the availability and proper use of school facilities can affect the interest of the teacher to teach effectively, in turn, that positively affects student's academic achievement (Buckley et al., 2004). Household wealth determines the ability of a household to invest in the child's education. If the opportunity cost of a child being in school is high for the parents, the chance of dropping out remains high (Abuya, 2013). According to Anderson et al. (2006) there is strong reason to believe that school fees are correlated with school quality in South Africa. Wealthier township families send their children to better schools, while lower socio-economic are left in the poorest performing schools (Pampallis 2003; Fiske & Ladd 2004). Residents are found

to be more sensitive to travel time duration than two distances (Salon, 2009). In most cases, residents prefer the travel mode that has a shorter time duration and lower cost (Qin et al., 2014). O'Fallon et al. (2004) found that some residents tend to choose cars for commuting because they need to transport children to school during their commuting. Trends from North America, Europe, and Australia have shown a decrease in the proportions of learners walking to school and significant increases in proportions learners being driven to school. In the United States, the number of learners being driven to school has increased since 1969 with a decrease in walking (NHTS, 2011). In Britain, the number of 5 to 10year olds being driven to school rose slightly from 38% in 1995/1997 to 42% in 2009 (Mackett, 2013). The decline in walking to Britain's schools is strongly associated with affordability of cars, which increased during a period of rapid economic growth between 1980 and 2005 (Black et al. 2001). In the past 10 years in the United Kingdom the proportion of school journeys made by car has nearly doubled from 16% to 29% so that now one in five cars on urban roads at 8:50 during term time is taking children to school. (SDG 2001). Also high-income residents may be more likely to travel by private cars because they might be faced with higher time, cost and have higher demand for comfort and convenience (Hensher and Rose, 2007; deVasconcellos, 2005). It is a well-established argument that parental education is one of the most powerful determinants of the educational participation of children in many developing countries (UNESCO 2010). In Chile, for example, between one quarter and one third of household income differences can be explained by the level of education of household heads (Ferreira & Litchfield, 1998). Studies show that children from better educated parents more often go to school and remain enrolled (Buchmann & Brakewood, 2000; Colclough, Rose, & Tembon, 2000; Ersado, 2005). Parents who have reached a certain educational level want their children to achieve at least the same level or more than they (Breen & Goldthorpe, 1997). In terms of economic returns, the literature suggests a strong positive relationship between the level of education that individuals attain and their individual earnings, as well as the economic growth of their countries (Cohen & Soto 2007; De la Fuente & Doménech 2006; Gumus & Chuddar 2016; Hanushek & Kimko 2000; Krueger & Lindahl 2001; Psacharopoulos 1994; Psacharopoulos & Patrinos 2002; Tansel 2004). The strongest evidence on the positive returns to education at both individual and societal levels has motivated many governments to invest more in education (Hanushek 2003). The learners who parents are well-educated, with a higher household income, a higher level of car-ownership, and more than one child, are more likely to travel to school by car as parents drop them off on their way to work (McMillan, 2003; Chillón et al., 2014; Mehdizadeh et al., 2016). A learner who walk or cycle to school are active while travelling (Cooper et al., 2003; Sirard et al., 2005) and remain active throughout the school day than those who use passive modes of travel, such as the car, bus, or train (Larouche et al., 2014). In recent years there has been a decrease in walking and cycling and shift towards car travel (Buliung et al., 2009; McDonald, 2007). One

influence may be city design or settlement type: well-connected street grids in urban centres tend to support pedestrian travel, while curvilinear and disconnected street networks commonly found in the suburbs may lend themselves to car travel (Cervero and Kockelman, 1997). In the African context, children, success in school is not only valued by parents, but also by the society; child's education acts as a social protection for the parents. However, there are differentials in parental beliefs which are shaped by their own education attainment. Parents who possess higher levels of education may exhibit different behaviours compared to those with no education. Through this, education plays a clear indirect role in influencing child education attainment and aspiration (Dubow et al., 2009). The presence of uncertainty in regard to paratransit arrival time and the unpunctuality of bus arrival time cause difficulties in determining an exact arrival time. Thus, waiting time is also difficult to determine. Waiting time is not as significant as the riding time in regard to total travel time and thus does not require accurate measurement (Irawan & Sumi, 2012). The minibus taxi is flexible and can adapt to changes in routes and demand quicker and more efficiently than both passenger rail and urban bus transportation. Secondly, the minibus taxi is the most accessible form of public transport (Swanepoel, 2009). Buses and trains spent considerable travel time at the stops and stations. This parameter is directly affected by passengers boarding and alighting time from the bus or train. With increasing time of each passenger boarding the bus, the total travel time increase. Increase in travel time is much more remarkable for the buses with one regular exit door. Average bus speed is a factor that is strongly influenced by other traffic flows. Most effective factor in determining travel time is the time spent statically at the stop, which is directly affected by the demand, passenger boarding and alighting time from the bus. The main problem facing passenger rail is that it suffers from a lack of integration with other modes of transportation within the current spatial trends of the Gauteng province. Consequently, rail commuters travel long distances to access trains, walking up to 30 minutes in some cases (Shaw, 2006). Modernist planning ideology, associated with functionalism, prioritised the private car and the efficiency of municipal service delivery at the cost of pedestrian scale development and the creation of quality public spaces (Behrens & Watson, 1996; Behrens, 1996; Dewar, 2000: 210-211; CSIR, 2000).

2.3 SETTLEMENT TYPE

Japan is amongst the countries that located schools closer to residential areas so that nearly all children in the country can walk or use bicycles to go to school (Schoppa, 2012). Northern European countries rely heavily on walking and biking with supplements from transit and autos (McDonald, 2012). North America has developed a different school transport system with nearly one-third of students using school provided transport (Buliung et al., 2009; McDonald et al., 2011). In South Africa the effects

of poor urban planning can still be seen to be embedded in urban infrastructure today. The result is a huge imbalance in access to transportation and a lack of connectivity between various suburbs, townships, cities and regions. As such, Gauteng has a poorly developed transportation network that is unable to effectively cater for both rich and poor Gauteng residents (Simon, 1992). Poor control over urban settlement (both formal and informal). Furthermore, although people can move around freely now, many cannot afford to move house. Thus, for many of Gauteng residents, the daily experience of poverty, overcrowding and unemployment continue to limit their choice of residence and mode of transport (GCRO, 2018). Residential townships for black or coloured people are largely located on the urban fringes, away from job opportunities and economic activities, and little opportunity was granted for the establishment of employment-generating land uses in the townships. Low cost housing settlements have been developing on the urban periphery where land is cheaper and away from economic zones and that there has been developments of single-use office parks separated from residential areas. This has resulted in urban sprawl and most importantly an advancement of apartheid urban spatial structure, which means learners will continue to travel to access schools. The low cost housing developments are mostly not accompanied by school developments (Mubiwa & Annegarn, 2013). According to Culwick et al (2015) commuting distances still reflected those of the apartheid era, with black people travelling longer distance to work than white people. It could implies that the DFA did not achieved its goal. Learners from informal settlements travel the longest because they walk from their homes to the nearest schools and they do not have the choice of mode of transport. Lower socio-economic are left in the poorest performing schools (Pampallis 2003; Fiske and Ladd 2004). Inner city or urban core dwellers in most cities were also found to be making shorter commuting trips than suburbs and villages/rural dwellers. The reason for this could be that urban core has a higher diversity of land use and a good job-housing balance when compared to suburbs and villages/rural areas, which tend to have a higher component of residential than other land uses (Nielson, 2004). Several authors have produced 'indices of Rurality' which list factors such as land-use and/or socio-economic factors, to distinguish rural and non-rural areas (Cloke & Edwards, 1986). The lack of a reliable transport system force populations to spend a significant amount of time in travelling to meet basic needs and increases the transport costs incurred to access these services (Carruthers et al., 2009). As cities grow, they tend to transform from monocentric form, with one employment centre, into a polycentric form with sub-centres of employments that attracts passenger trips from many areas across the city. This results in both random and radial commuting trip patterns and it is the current urban form in Gauteng metropolitan municipalities (Lin et al., 2013). According to Maarman (2006) learners who live in informal settlements share small rooms at home, they do not have tables or desks to do homework on, they share their clothes with siblings, and they do not have the privacy appropriate for their age groups.

This result in learners missing school and ultimately dropping out due to distance to school and lack of resources (Maarman, 2006).

CHAPTER 3: METHODOLOGY

3. INTRODUCTION

The intention of the study is to determine the statistical significance of both socio-demographic, socio-economic and geography type factors influencing the learner travelling time to school in Gauteng metros. The study employs descriptive statistics on quantitative secondary data from Statistics South Africa's General household survey (GHS) 2017. Correlation and logistic regression analysis were performed on the socio-demographic variables, socio-economic variables and geography type variables to determine the factors influencing the learner travelling time to school in metropolitan municipalities of Gauteng province.

3.1 STUDY AREA, DATA SOURCES AND VARIABLES

The study area is Gauteng province's three Metros namely; City of Tshwane, City of Johannesburg and Ekurhuleni Metropolitan municipalities. Data is sourced Statistics South Africa's General Household Survey 2017 (GHS 2017). From GHS 2017 data, there two files which are household file and person file. House household file contains all the information about the household while the person file contains all the information about each person in the household. The first step is to extract only Gauteng province from the two files and inside Gauteng only metros will be extracted. Once the two files are only having the three metros in Gauteng then the data is selected according to variables. Table 3.1 below shows the variables and their categories that were used to perform both correlation and regression analysis. Outcomes will indicate the ones that have significant influence on the learner travelling more than 30 minutes to school.

Table 3.1: Independent and dependent variables

| Dependent variables | Categories | Description | Motivation |
|------------------------------------|----------------------|---|---|
| Learner travel time | 0-30 minutes | Used to determine statistical influence of each independent variable. | The study is about investigating learner travel time in Gauteng Metropolitan area hence learner travel time is included. |
| | more than 30 minutes | | |
| Independent variables | Categories | Description | Motivation |
| Age group of the learner | 5-9 | variable is used to establish if age has an influence on travelling time to school | The variable was included so that the travelling time of learners could be differentiated according to age groups |
| | 10-13 | | |
| | 14-19 | | |
| Race of the learner | Black African | variable is used to establish if race has an influence on travelling time to school | Important to find out what is the race composition of the learners who travel less than 30 minutes and those who travel more than 30 minutes to school. |
| | Coloured | | |
| | Indian/Asian | | |
| | White | | |
| Mode of transport to school | Walking | variable used to indicate percentage per mode of transport used by learners to travel to school | The purpose of this variable is to determine the transport costs incurred by the household using mode |
| | Taxi | | |
| | Bus | | |
| | Train | | |
| | Subsidized transport | | |

| | | | |
|---|----------------------------------|---|---|
| | Transport arranged by parents | | of travel to get to the school (NHTS, 2013). |
| | Parents transport | | |
| Attending public or private school | Attending public school | used to establish the type of schools that learner travel to | To get an indication of the percentages of learners travelling less than 30 minutes and those who travel more than 30 minutes to school. |
| | Attending private school | | |
| Attending nearest or furthest school | Attending nearest school | variable used to find out, if learners travel more than 30 minutes attend local schools or not | The variable is included to help establish if the school attended take learner less than 30 minutes or more than 30 minutes |
| | Not attending the nearest school | | |
| Level of school | Attending primary | Used to establish the school level that learner travel to more than 30 minutes | This variable was included to provide clarity on which level of schooling is travelling the most. |
| | Attending secondary | | |
| Income quintile | Poorest quintile | variable used to indicate the household income level for learners travelling more than 30 minutes to school | Income plays important role in human life hence it was included so we can check if income has impact on learner travelling time in metropolitan municipalities in Gauteng province. |
| | Quintile 2 | | |
| | Quintile 3 | | |
| | Quintile 4 | | |
| | Wealthiest quintile | | |

Source: variables derived using GHS, 2017.

3.2 SAMPLE SELECTION AND ANALYSIS MODELS

The inclusion criteria for being in the sample was learners: between 05 and 19 years of age, currently attending an educational institution and their current grade was between grade R/0 and grade 12. Their highest educational level was less than grade 12 and they had travel time of less than 30 minutes or greater than 30minutes. Geographically they must be residing within one of the three metropolitan municipalities (Eku, CoJ, and CoT) in Gauteng province. Learners with unspecified travel time were excluded. Descriptive statistics used graphs and tables to and percentages to represent the numbers. The correlation was performed to determine the strength of the relationship between independent and dependent variables. Chi-square was used to test relationships between categorical variables. The logistic regression model allows us to establish a relationship between a binary outcome variable and a group of predictor variables.

CHAPTER 4: THE RESULTS AND DISCUSSIONS

4. INTRODUCTION

All variables in the survey data set were binary or categorical variables. Since this research aimed to determine factors influencing learner travelling time to school. Travel time was grouped into two variables, namely: 0-30 minutes and more than 30 minutes. Descriptive analysis, chi-square, correlation, and Binary logistic regression analysis were performed.

4.1 DESCRIPTIVE ANALYSIS

The selection of sample was based on the methodology explained in chapter 3 section 3.2. Descriptive statistics therefore enables us to present the data in a more meaningful way, which allows simpler interpretation of the data (Mendenhall et al., 2008). Based on the descriptive analysis, it is clear that the sampled population vary in sample size per metro, but the sample is representative. Figure 4.1 below shows percentage of learners travelling more than 30 minutes to school in selected Gauteng metros, GHS 2017. Figure 4.1 show that one in every ten learners in Gauteng metros travel more than 30 minutes to school. When comparing the three metros in this study, a slightly higher percentage of learners in CoT (16.9%) indicated travelling more than 30 minutes to school compared to 15.8% and 11.3% in Johannesburg and Eku respectively.

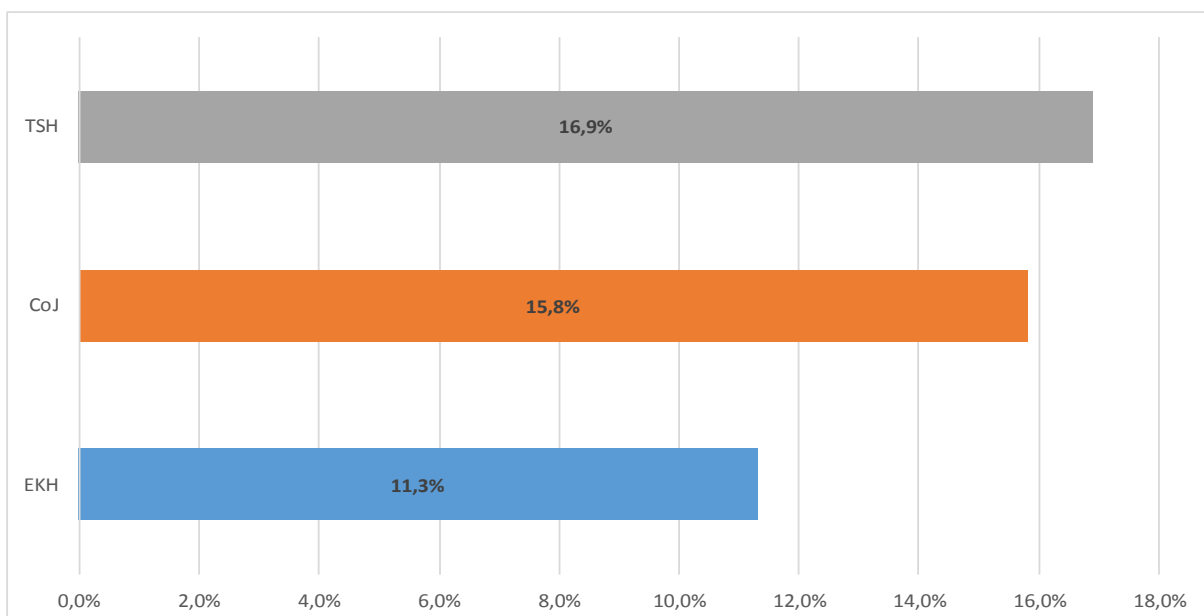


Figure 4.1 show learners in Gauteng metros travelling more than 30 minutes to school.

Figure 4.2 show the age distribution of learners in Gauteng metros that travel more than 30 minutes to school. When comparing the three metros in this study, CoT has a slightly higher percentage of learners in each age group categories as indicated. CoJ having closer but less than city of CoT and Eku having the lowest percentages in all categories compared to the two metros. From figure 4.2 it

clearly indicate that the more learner get older the more they travel longer time and distance. This is in agreement with the study by According to Buliung et al., (2009) together with the UK's NHTS, (2008). This might be due to the fact that younger children (5-9 years) still need to be escorted to school, and at some places they are being escorted to school by domestic workers. If they are escorted to school they will attend the nearest school.

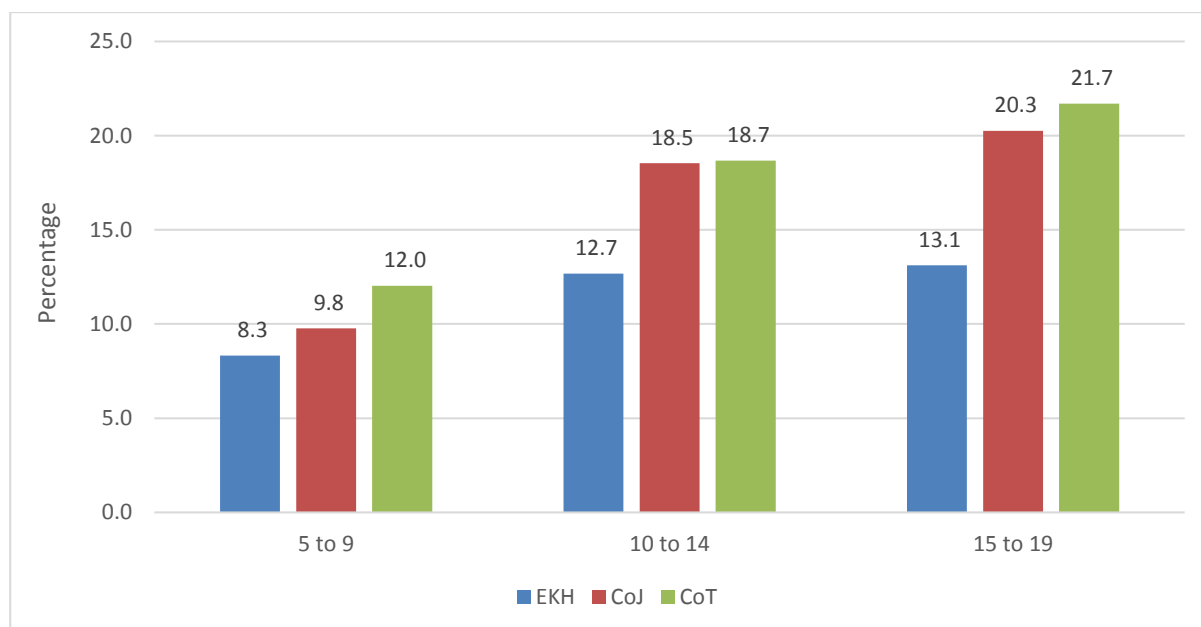


Figure 4.2: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by age, GHS 2017.

Figure 4.3 show Gender of learners in Gauteng metros who travel more than 30 minutes to school. When comparing the three metros in this study, Female learners in the three metros are indicated as majority travelling more than 30 minutes to school. City of CoT female learners (18.9%) compared to 15.1% of male learners. CoJ having 16.3% of female learners and 15.4% of male learners. Lastly Eku with 11.9% of female learners and 10.7% of males respectively. The outcome is in line with the study by Fant, (2008) where he found that girl child in Bunkpurugu/Yunyoo District in Northern Ghana travelled longer to school. In Gauteng the situation might be based on the fact that the two third of the country's population are female. The other reason might be the fact that girls travel longer because of mode of transport they use.

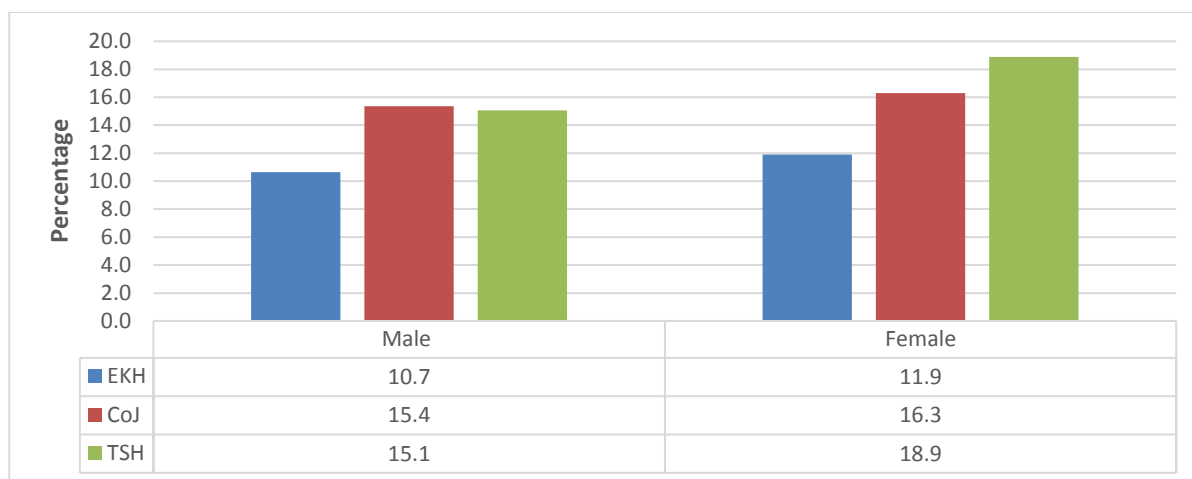


Figure 4.3: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by gender, GHS 2017.

Figure 4.4 show race of learners in Gauteng metros whom travel more than 30 minutes to school. When comparing the three metros in this study, it is revealed that there is no Indian/Asian learners in Eku. Black Africans are represented well across all metros and Coloureds and Whites as indicated in figure 4.4 above. Based on the legacy of apartheid spatial planning it make sense to find that there is lack of Indians/Asian in Ekurhuleni, because they were classified in the same group.

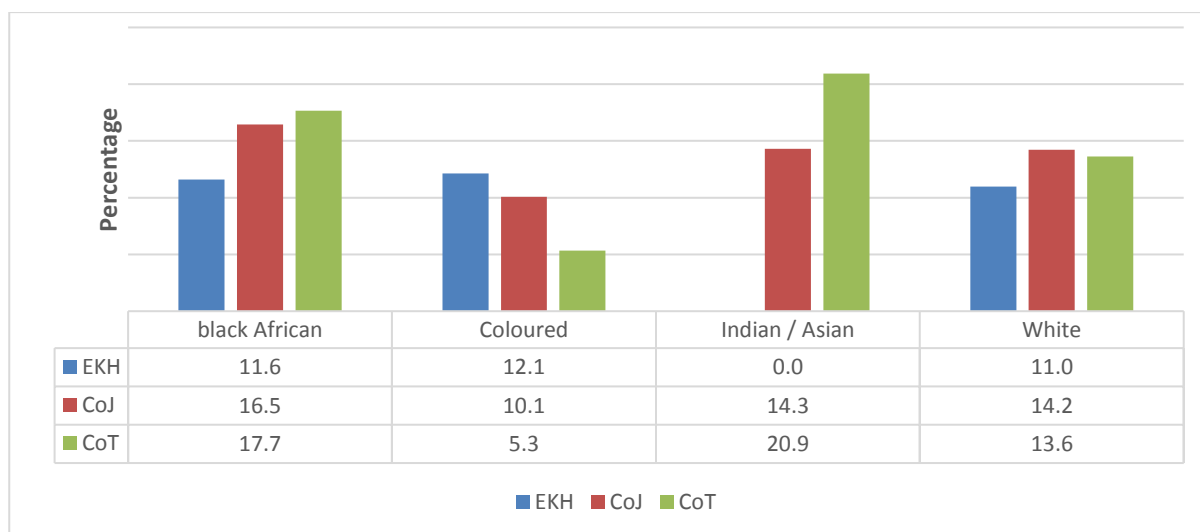


Figure 4.4: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by race, GHS 2017.

Figure 4.5 show learners by level of school they are attending in Gauteng metros whom travel more than 30 minutes to school. Comparison of the three metros in this study, indicates that significantly higher percentages of learners travelling more than 30 minutes are attending secondary school. CoT with 22.4% and CoJ 21.4%. And Eku being the lowest with 14.2% respectively.

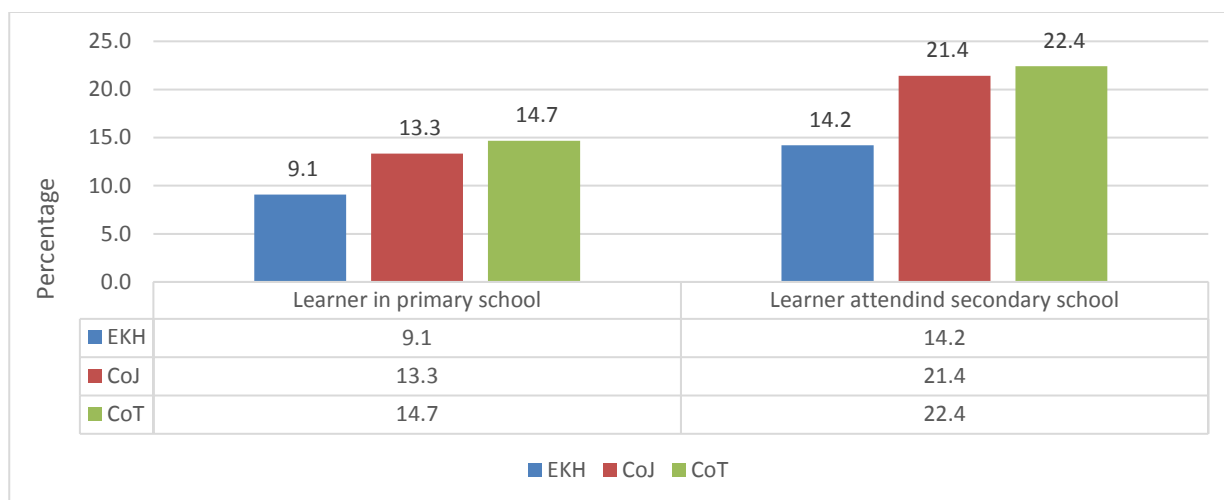


Figure 4.5: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by attending primary or secondary schools, GHS 2017.

Figure 4.6 show learners attending nearest or not attending nearest school in Gauteng metros who travel more than 30 minutes. Higher percentages of learners who travel more than 30 minutes to school they are not attending the nearest school with CoJ 52.2% and CoT 41.5% and Eku 36.4%. Those who attend the nearest school and travelling more than 30 minutes percentages are low. Other studies found that learners from informal settlements travel the longest because they walk from their homes to the nearest schools and they do not have choice of mode of transport. On the other hand because of their lower socio-economic group they are left in the most poorly performing schools (Pampallis 2003; Fiske and Ladd 2004). While Wealthier Township families send their children to better schools. O’Fallon et al. (2004) found that some residents tend to choose cars to travel to work because they need to transport children to school during their travelling to work. Several studies have shown that quite extensive numbers of South African children do travel on a daily basis to schools that are relatively far from their homes (de Kadt et al., 2013).

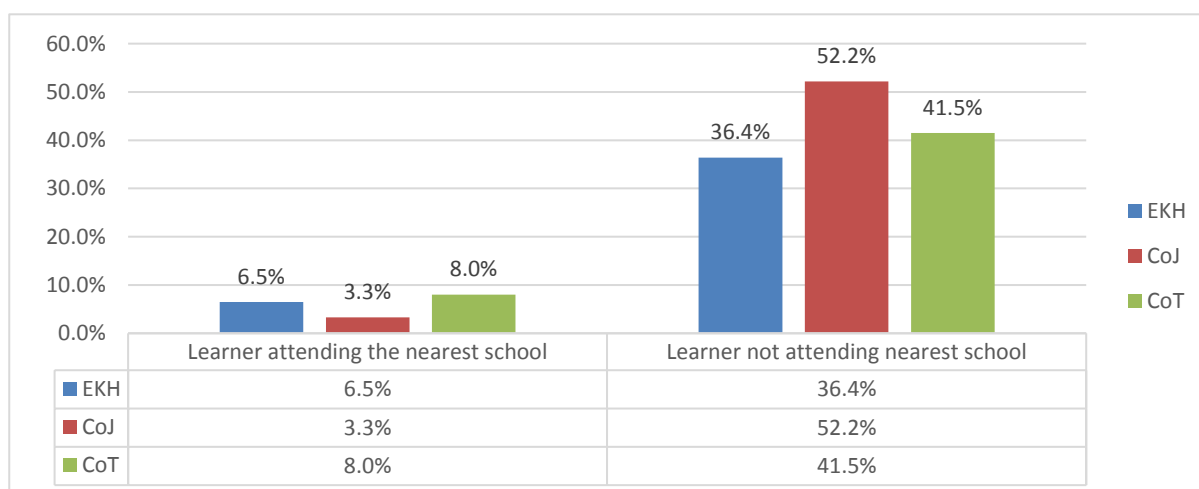


Figure 4.6: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by attending nearest or not attending nearest school, GHS 2017.

Figure 4.7 show learners by attending private or public schools in Gauteng metros who travel more than 30 minutes to school. Comparison of the two variables; private school and public school, the data suggest that majority of learner travelling more than 30 minutes to school they attend private schools. Other studies also found that learners who parents are well-educated, with a higher household income, a higher level of car-ownership, and more than one child, are more likely to travel to school by car as parents drop them off on their way to work (McMillan, 2003; Chillón et al., 2014; Mehdizadeh et al., 2016).

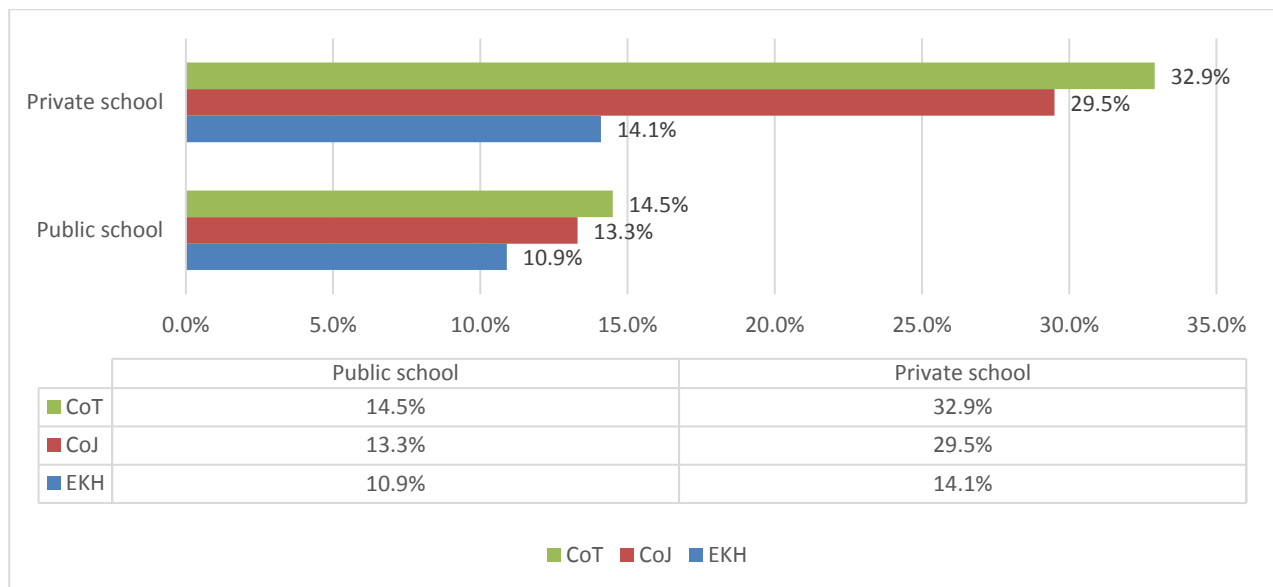


Figure 4.7: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by attending private or public schools, GHS 2017.

Figure 4.8 illustrates students travelling more than 30 minutes to school per capita household income. The quintiles were calculated by dividing monthly household income by household size. This is important for measuring expected household income per person as size of the household affect expenditure pattern. The results show that in the selected metros, children living in the wealthiest households were taking longer to school compared to children living in the poorest quintiles. The results agree with literature that; wealthy township families send their children to better schools, while lower socio-economic are left in the most poorly performing schools (Pampallis 2003; Fiske & Ladd 2004). Table 4.1 below shows the income quintiles distribution per race.

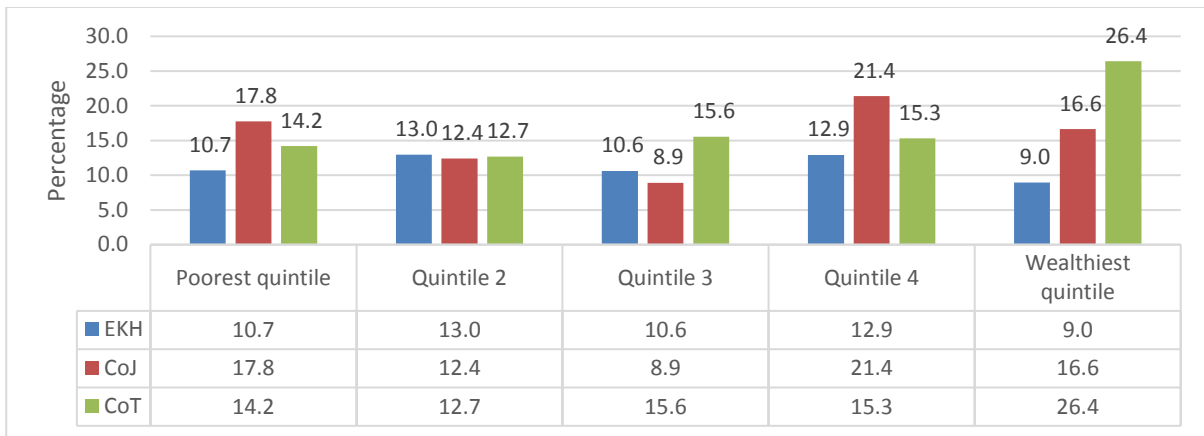


Figure 4.8: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by household income quintile, GHS 2017.

Table 4.1: Income quintile per race in Eku, CoJ and CoT.

| Quintile | Eku | | | | CoJ | | | | CoT | | | |
|---------------------|---------------|----------|----------------|---------|---------------|----------|----------------|---------|---------------|----------|----------------|---------|
| | black African | Coloured | Indian / Asian | White | black African | Coloured | Indian / Asian | White | black African | Coloured | Indian / Asian | White |
| Poorest quintile | 59.44 | 69.58 | 72.83 | 60.98 | 60.49 | 63.71 | 72.47 | 59.68 | 66.38 | 87.54 | 67.75 | 56.43 |
| Quintile 2 | 13.25 | 5.38 | 0.00 | 0.00 | 9.67 | 2.45 | 0.00 | 0.00 | 10.22 | 0.00 | 0.00 | 0.00 |
| Quintile 3 | 12.59 | 7.30 | 0.00 | 0.00 | 12.04 | 14.95 | 0.00 | 0.00 | 6.75 | 0.00 | 9.62 | 0.00 |
| Quintile 4 | 8.72 | 5.98 | 4.37 | 15.78 | 11.12 | 5.03 | 3.56 | 10.24 | 6.59 | 4.04 | 0.00 | 3.83 |
| Wealthiest quintile | 6.01 | 11.77 | 22.80 | 23.24 | 6.68 | 13.85 | 23.97 | 30.08 | 10.06 | 8.42 | 22.63 | 39.74 |
| Total | 570454 | 27114.2 | 17893.6 | 84579.9 | 768014 | 52017.4 | 44072.8 | 71680.1 | 582757 | 15707.1 | 9162.64 | 84907.3 |

Source: Own Calculation.

Table 4.1 indicate that in Eku there is low percentage of black African who are wealthiest (6%), CoJ (7%) and black Africans living in CoT are contributing around 10%. For whites there is an interesting patterns across all selected metros, they only exist in poorest quantile group, quantile 4 and wealthiest quantile respectively. Figure 4.9 shows learners by mode of transport used to travel to school, immediately the use of train was confirmed to be the mode of transport that it is guaranteed that learners will travel more than 30 minutes. This is supported by the literature by Shaw, (2006) which state that problem facing passenger rail is that it suffers from a lack of integration with other modes of transportation within the current spatial trends of the Gauteng province. Therefore, rail commuters travel long distances to access trains, walking up to 30 minutes in some cases. Residents mostly like to use mode of transport that has shorter travelling time and it is cheaper (Qin et al., 2014). Else residents tend to use cars for travelling, because they need to transport children to school during their travelling (O’Fallon et al., 2004). This is indicated and dominate in CoJ (19.7%) with CoT being second with nearly 16% of private care use.

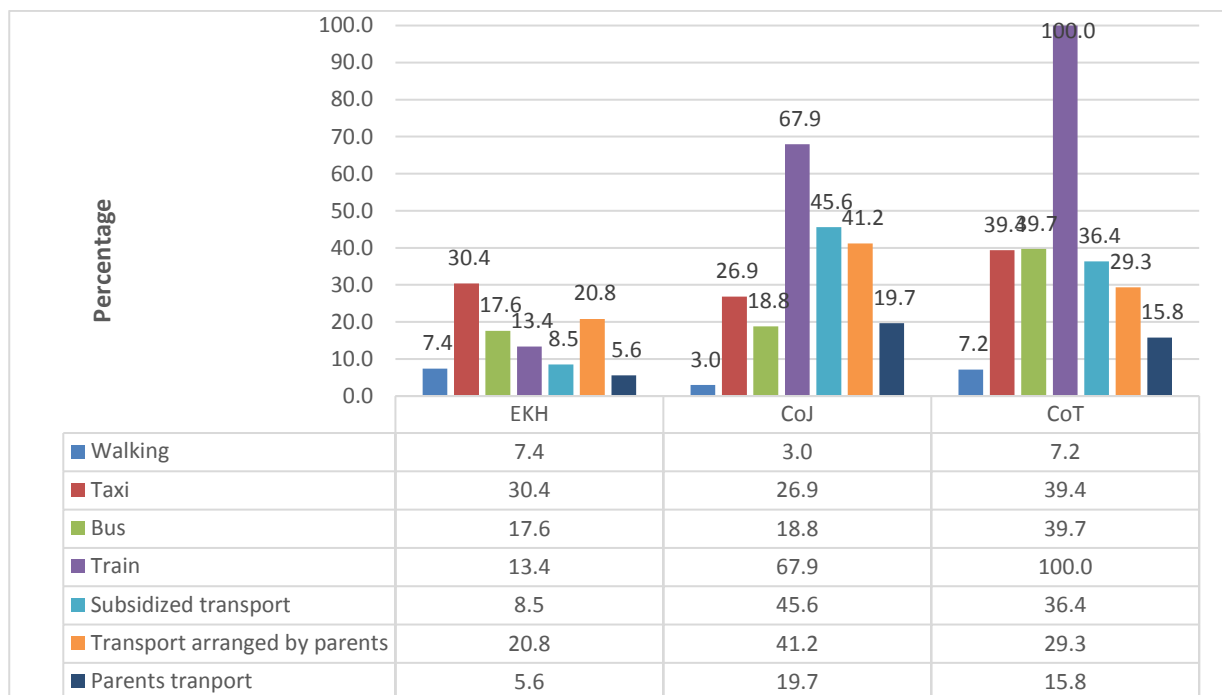


Figure 4.9: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by mode of transport, GHS 2017.

Figure 4.10: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by settlement type. These variable has demonstrated that the three metros has difference wherein Eku and CoJ do not have traditional settlement. As indicated majority travelling more than 30 minutes to school in City of CoT resides in traditional settlement (26.3%), urban 16%, and farms 17%. On contrary CoJ 15.8% residing on urban settlement while Eku also have 11.4% of urban dwellers. The results confirms that urban dwellers in most cities are found to be making shorter commuting trips than suburbs and villages/rural dwellers which in our case the rural are traditional settlement. The reason for this could be that urban core has higher diversity of land use and a good job-housing balance when compared to suburban and villages/rural areas, which is mostly dominated by residential than other land uses (Nielson, 2004).

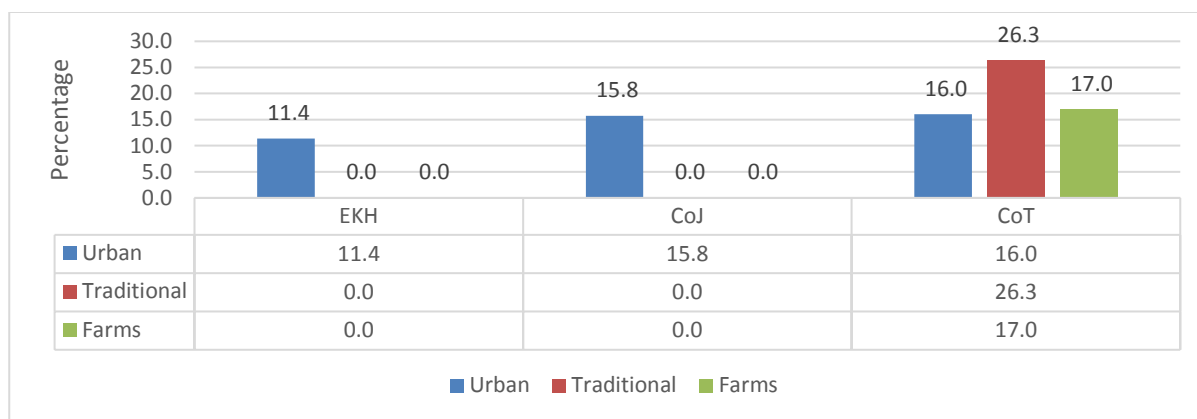


Figure 4.10: Percentage of learners travelling more than 30 minutes to school in selected Gauteng metros by settlement type, GHS 2017.

4.2 CHI-SQUARE ANALYSIS

Chi-square test was performed between independent variable and dependent variables to find out statistical significance of variables. The outcomes suggest that mode of transport is significance in all the metros. At 95% confidence interval. Attending public or private school is only showing significance in two metros, namely: CoJ and CoT. Attending nearest or furthers school is showing level of significance in all metros. While attending primary or secondary is also showing significance in all metros. Income quantile is only significant in CoT. This is in agreement with Titheridge et al, (2014) Poor households have limited access to jobs, education and healthcare as they face transport deprivation, and hence their children attend nearest public schools. Limited mobility due to household responsibilities and constrained schedules that often does not allow travelling long distance. Table 4.2 below shows variable with level of significance.

Table 4.2: Relationship between distance to school and dependent variables in Eku, CoJ and CoT.

| | EKH | | CoJ | | Tshwane | |
|---------------------------------------|------------------|-------------|------------------|-------------|------------------|-------------|
| | Chi-Square value | Probability | Chi-Square value | Probability | Chi-Square value | Probability |
| AGE | 4,819 | 0,125 | 0,878 | 0,000* | 8,849 | 0,014* |
| Gender | 0,392 | 0,553 | 16,044 | 0,741 | 2,008 | 0,144 |
| Race | 1,901 | 0,925 | 2,7841 | 0,741 | 2,784 | 0,741 |
| Mode of transport | 45,05 | 0,000* | 190,464 | 0,000* | 117,2 | 0,000* |
| Attending public or private school | 1,18 | 0,367 | 27,332 | 0,001* | 21,76 | 0,000* |
| Attending nearest or furthest school | 120,675 | 0,000* | 346,545 | 0,000* | 121,144 | 0,000* |
| Attending primary or secondary school | 6,056 | 0,022* | 10,973 | 0,002* | 6,942 | 0,023* |
| Income quintile | 1,903 | 0,915 | 12,474 | 0,119 | 14,654 | 0,054* |

*= values significant at 5 percent level of significance.

Table 4.2 shows relationship between independent and dependent variables. Age, race, attending public or private school, attending the nearest or furthest school and attending primary school or secondary school was found to be related to the distance to school. These variables will be included in building of the model. Table 4.3 shows relationship between independent and dependent variable's. Age, mode of transport, race, attending public or private school, attending the nearest or furthest school and attending primary school is associated to the distance to school. These variables will be included in the model.

Table 4.3: Relationship between distance to school and dependent variables in Eku, Coj and CoT

| | EKH | | CoJ | | Tshwane | |
|---------------------------------------|------------------|-------------|------------------|-------------|------------------|-------------|
| | Chi-Square value | Probability | Chi-Square value | Probability | Chi-Square value | Probability |
| AGE | 4,819 | 0,125 | 0,878 | 0,000* | 8,849 | 0,014* |
| Gender | 0,392 | 0,553 | 16,044 | 0,741 | 2,008 | 0,144 |
| Race | 1,901 | 0,925 | 2,7841 | 0,741 | 2,784 | 0,741 |
| Mode of transport | 45,05 | 0,000* | 190,464 | 0,000* | 117,2 | 0,000* |
| Attending public or private school | 1,18 | 0,367 | 27,332 | 0,001* | 21,76 | 0,000* |
| Attending nearest or furthest school | 120,675 | 0,000* | 346,545 | 0,000* | 121,144 | 0,000* |
| Attending primary or secondary school | 6,056 | 0,022* | 10,973 | 0,002* | 6,942 | 0,023* |
| Income quintile | 1,903 | 0,915 | 12,474 | 0,119 | 14,654 | 0,054* |

*= values significant at 5 percent level of significance.

4.3 CORRELATION ANALYSIS

Correlation analysis is a method of statistical evaluation used to study the strength of a relationship between two, numerically measured, continuous variables. Correlation of variables was performed per each selected metro

Table 4.4: Correlation matrix for Eku metro municipality

| | Age | Gender | Mode of transport | Attending public or private school | Attending nearest or furthest school | Attending primary or secondary school | Income quintile | Household size | Race |
|--------------------------------------|--------|--------|-------------------|------------------------------------|--------------------------------------|---------------------------------------|-----------------|----------------|---------|
| Age | 1,000 | 0,009 | -0,112 | -0,050 | -0,066 | 0,777* | -0,109 | -0,033 | 0,094 |
| Gender | 0,009 | 1,000 | 0,031 | -0,005 | 0,022 | 0,002 | -0,040 | 0,023 | 0,010 |
| Mode of transport | -0,112 | 0,031 | 1,000 | 0,365* | 0,280 | -0,080 | 0,294 | -0,064 | 0,442** |
| Attending public or private school | -0,050 | -0,005 | 0,365** | 1,000 | 0,079 | -0,036 | 0,242 | -0,051 | 0,311* |
| Attending nearest or furthest school | -0,066 | 0,022 | 0,280 | 0,079 | 1,000 | -0,041 | 0,060 | -0,020 | 0,004 |

| | | | | | | | | | |
|---------------------------------------|--------|--------|---------|--------|--------|--------|--------|--------|--------|
| Attending primary or secondary school | 0,777* | 0,002 | -0,080 | -0,036 | -0,041 | 1,000 | -0,091 | -0,044 | 0,093 |
| Income quintile | -0,109 | -0,040 | 0,294 | 0,242 | 0,060 | -0,091 | 1,000 | -0,115 | 0,168 |
| Household size | -0,033 | 0,023 | -0,064 | -0,051 | -0,020 | -0,044 | -0,115 | 1,000 | -0,091 |
| Race | 0,094 | 0,010 | 0,442** | 0,311* | 0,004 | 0,093 | 0,168 | -0,091 | 1,000 |

* Strong correlations between two variables

** Weak correlation exist between two variable

Table 4.5: Correlation matrix for CoJ metro municipality

| | Age | Gender | Mode of transport | Attending public or private school | Attending nearest or furthest school | Attending primary or secondary school | Income quintile | Household size | Race |
|---------------------------------------|--------|--------|-------------------|------------------------------------|--------------------------------------|---------------------------------------|-----------------|----------------|---------|
| Age | 1,000 | -0,058 | -0,003 | 0,012 | 0,103 | 0,727* | -0,004 | -0,023 | 0,057 |
| Gender | -0,058 | 1,000 | -0,002 | -0,043 | 0,029 | -0,032 | -0,022 | 0,026 | -0,057 |
| Mode of transport | -0,003 | -0,002 | 1,000 | 0,427** | 0,504* | -0,021 | 0,241 | 0,003 | 0,367** |
| Attending public or private school | 0,012 | -0,043 | 0,427** | 1,000 | 0,205 | -0,023 | 0,097 | -0,062 | 0,344** |
| Attending nearest or furthest school | 0,103 | 0,029 | 0,504* | 0,205 | 1,000 | 0,035 | 0,044 | -0,047 | -0,049 |
| Attending primary or secondary school | 0,727* | -0,032 | -0,021 | -0,023 | 0,035 | 1,000 | 0,041 | 0,004 | 0,031 |
| Income quintile | -0,004 | -0,022 | 0,241 | 0,097 | 0,044 | 0,041 | 1,000 | -0,175 | 0,157 |
| Household size | -0,023 | 0,026 | 0,003 | -0,062 | -0,047 | 0,004 | -0,175 | 1,000 | -0,046 |
| Race | 0,057 | -0,057 | 0,367** | 0,344** | -0,049 | 0,031 | 0,157 | -0,046 | 1,000 |

* Strong correlations between two variables

** Weak correlation exist between two variable

Table 4.6: Correlation matrix for CoT metro municipality

| | Age | Gender | Mode of transport | Attending public or private school | Attending nearest or furthest school | Attending primary or secondary school | Income quintile | Household size | Race |
|------------------------------------|--------|--------|-------------------|------------------------------------|--------------------------------------|---------------------------------------|-----------------|----------------|---------|
| Age | 1,000 | 0,018 | -0,132 | 0,005 | -0,042 | 0,774* | -0,028 | -0,035 | 0,001 |
| Gender | 0,018 | 1,000 | 0,010 | 0,003 | 0,027 | 0,035 | 0,018 | 0,041 | -0,011 |
| Mode of transport | -0,132 | 0,010 | 1,000 | 0,346** | 0,341** | -0,147 | 0,371 | -0,147 | 0,354** |
| Attending public or private school | 0,005 | 0,003 | 0,346** | 1,000 | 0,223 | -0,016 | 0,238 | -0,024 | 0,140 |
| Attending nearest or | -0,042 | 0,027 | 0,341** | 0,223 | 1,000 | -0,018 | 0,164 | 0,058 | 0,026 |

| | | | | | | | | | |
|---------------------------------------|--------|--------|---------|--------|--------|--------|--------|--------|--------|
| furthest school | | | | | | | | | |
| Attending primary or secondary school | 0,774* | 0,035 | -0,147 | -0,016 | -0,018 | 1,000 | -0,009 | 0,009 | -0,005 |
| Income quintile | -0,028 | 0,018 | 0,371** | 0,238 | 0,164 | -0,009 | 1,000 | -0,041 | 0,243 |
| Household size | -0,035 | 0,041 | -0,147 | -0,024 | 0,058 | 0,009 | -0,041 | 1,000 | -0,122 |
| Race | 0,001 | -0,011 | 0,354** | 0,140 | 0,026 | -0,005 | 0,243 | -0,122 | 1,000 |

* Strong correlations between two variables

** Weak correlation exist between two variable

According to tables 4.4, 4.5, and 4.6, there seem to be a strong correlation between the age of the learner and whether the learner attends primary or secondary school. This is in line with government policy that learners of certain age (i.e. 7 to 13 should be in primary and 14-19 ideally should be in secondary school). The researcher, however, acknowledges that there is possibility of some over laps. A weak correlation seem to exist between race, income quintile, type of school attended and level of school and mode of transport. As far as other combination of variables, correlation does not exist. It is important to mention that this cut across all the three metros.

4.4 LOGISTIC REGRESSION

Table 4.7: Predictors of learners travelling more than 30 minutes to school in EKH, CoJ and TSH, GHS 2017

| | | EKH | | CoJ | | CoT | |
|--------------------------------------|----------------------------------|------------|---------|------------|---------|------------|---------|
| | | Odds Ratio | P-Value | Odds Ratio | P-Value | Odds Ratio | P-Value |
| | Intercept | 2,9 | 0,0001 | -4,1 | 0,0001 | -3,1 | 0,0001 |
| | N | 1 014 | | 1 026 | | 777 | |
| Age group of the learner | 5-9 @ | | | | | | |
| | 10-14 | 0,562 | 0,245 | 1,142 | 0,801 | 0,699 | 0,477 |
| | 14-19 | 1,238 | 0,57 | 1,716 | 0,183 | 1,158 | 0,74 |
| Race of the learner | Black African @ | | | | | | |
| | Coloured | 1,404 | 0,602 | 0,611 | 0,55 | 0,135 | 0,116 |
| | Indian/Asian | *** | *** | 0,337 | 0,211 | 1,346 | 0,805 |
| | White | 5,32 | 0,065 | 0,705 | 0,619 | 0,614 | 0,535 |
| Mode of transport to school | Walking @ | | | | | | |
| | Taxi | 2,519 | 0,11 | 1,419 | 0,635 | 1,632 | 0,438 |
| | Bus | 1,379 | 0,615 | 1,114 | 0,897 | 3,8 | 0,026 |
| | Train | *** | *** | *** | *** | *** | *** |
| | Subsidized transport | 0,646 | 0,568 | 18,656 | 0,036* | 3,675 | 0,051* |
| | Transport arranged by parents | 1,736 | 0,216 | 2,998 | 0,025* | 2,285 | 0,114 |
| | Parents transport | 0,171 | 0,102 | 2,724 | 0,142 | 1,745 | 0,328 |
| Attending public or private school | Attending public school @ | | | | | | |
| | Attending private school | 1,572 | 0,271 | 1,171 | 0,736 | 1,266 | 0,532 |
| Attending nearest or furthest school | Attending nearest school @ | | | | | | |
| | Not attending the nearest school | 6,475 | 0,0001* | 23,01 | 0,0001* | 8,128 | 0,0001* |
| Level of school | Attending primary @ | | | | | | |
| | Attending secondary | 1,573 | 0,249 | 2,474 | 0,045* | 2,254 | 0,040* |
| Income quintile | Poorest quintile @ | | | | | | |
| | Quintile 2 | 1,323 | 0,508 | 0,529 | 0,162 | 0,872 | 0,747 |
| | Quintile 3 | 0,979 | 0,967 | 0,408 | 0,066 | 1,004 | 0,994 |
| | Quintile 4 | 0,929 | 0,9 | 0,831 | 0,678 | 0,456 | 0,144 |
| | Wealthiest quintile | 0,492 | 0,144 | 0,553 | 0,237 | 1,285 | 0,577 |

*=insignificant at 0, 05 level

*** Values too small to provide reliable estimates

@ Reference category

4.5 INTERPRETATION OF RESULTS

Age of the learner indicates that the probability of travelling more than 30 minutes to school increases as the age of the learner increases. It is important to note that the odds of learners aged 15 to 19 were 1.2; 1.7 and 1.2 more than the odds of learners aged 5 to 9 to travel more than 30 minutes to school in Eku, CoJ and CoT respectively. In Belgian children, walkable distances of 1.5 km and 2 km for 11 to 12 year olds and 17–18 year olds, respectively. An Irish study reported an acceptable walking distance of 2.4 km for 15 to 17 year olds (Nelson et al., 2008). United Kingdom's National Travel Survey (2008) found that children aged 5 to 10 years travel an average distance of 2.6 kilometres to school which increases to 5.5 kilometres at ages 11 to 16 years. This seems to agree that the older the learner gets, the more their travel time and distance increases. Race of the learner is not one of the factors that contribute to travelling more than 30 minutes, however, it is vital to note that the difference is insignificant. Learner mobility has decreased racial segregation of schools, but influenced the increase of socio-economic segregation, with implications for access to education and equality. This is resulted from costs associated with learner travelling to be more costly, meaning that it is more likely to be shaped primarily by socio-economic status, rather than race (de Kadt, 2013). Mode of transport to and from school seem to be an important factor of travel time. Due to the fact that learners who walk to school were most likely to attend the nearest school, it seems as if they are most likely to take shorter time in school than learners using motorized transport. Schools are considered too far if they are over 30 minutes away from a child's home when walking (de Kadt, 2013). There is many variations in terms of subsidized transport, transport, arrange by parents for learners and parents who take their children to school. Learners in CoJ were 20 times more likely to travel more than 30 minutes to school whilst comparative figures suggest that the opposite was true in Eku. The results support the findings by de Kadt, (2013). Type of school attended is expected that learners attending secondary, private and furthest school were most likely to travel more than 30 minutes to school than learners attending primary, public and the nearest school across all metros. It is important to note that that the difference was significant for all the metros for attending the nearest or furthest school as well as for attending primary or secondary school, which was only insignificant in Eku.

Income levels, according to the study is found that household level of income does not determine whether the learner will travel more or less than 30 minutes to school. This confirms studies by Pampallis (2003) that learners from informal settlements travel the longest because they walk from their homes to the nearest schools and they do not have the choice of mode of transport. On the other hand the lack of a reliable transport system force populations to spend a significant amount of time in travelling to meet basic needs and increases the transport costs incurred to access these services (Carruthers et al., 2009).

4.6 RESULTS OF THE SPECIFICATION ERROR TEST

Table 4.8: Results of the specification error test

| | EKH | CoJ | TSH |
|-----------|-------|------|-------|
| Somers' D | 0,574 | 0'82 | 0,632 |
| c | 79% | 91% | 82% |

Model fit was examined using Sommers' D and c. The c should range from 0.5 to 1. With 0.5 meaning the model is not working at all whilst higher values for Somers' D indicate better predictive performance. Table 4.8 show that the model fitted the data well. The variables were good predictors of travelling more than 30 minutes in CoJ (91%), CoT (82%) and Eku (79%).

CHAPTER 5: CONCLUSION AND POLICY IMPLICATIONS

The purpose of this study was to find out whether socio-demographic, socio-economic factors, and the settlement type has statistical significance in the learners travelling time to school in metropolitan municipalities of Gauteng province. The main focus of the study was to determine factors influencing learner travelling time, with learner who travel less than 30 minutes being the control group of the study.

5.1 CONCLUSIONS

According to tables 4.4, 4.5, and 4.6, there seems to be a strong correlation between the age of the learner and whether the learner attends primary or secondary school. This is in line with government policy that learners of a certain age (i.e. 7 to 13 should be in primary and 14 to 19 ideally should be in secondary school). A weak correlation seems to exist between race, income quintile, type of school attended and level of school and mode of transport. As far as other combination of variables, correlation does not exist. Logistic regression output showed that the age of a learner indicates that the probability of travelling more than 30 minutes to school, increases as the age of the learner increases. Race is not one of the factors that contribute to travelling more than 30 minutes. Transport to and from school seem to be an important factor of travel time. Learners attending secondary, private and furthest school were most likely to travel more than 30 minutes to school compared to learners attending primary schools, public and the nearest school across all metros. It is evident that learner mobility in Gauteng is faced with long travelling time regardless of mode of transport. Urban form is also contributing to learner travelling time because studies still indicate low cost housing taking place on the urban periphery, meaning learner from those development still have to travel to access school. Challenges are on socio-demographic, socio-economic level and the urban form is also contributing to longer travelling time.

5.2 POLICY IMPLICATIONS

The Development Facilitation Act (DFA) was aimed mainly at reducing travel distances between residential and employment areas through the promotion of mixed land use developments which from the study it is clear that the policy did not transform Gauteng metropolitan municipalities much because there is still learner travelling more than 30 minutes to school and also the development of low cost housing is still taking place on urban edges.

The National Development Plan (NDP) 2030, the Spatial Planning and Land Use Management Act (SPLUMA) (No. 16 of 2013) provides for a single land development process for the country. SPLUMA presents some important opportunities for cities to plan more effectively for transformative

outcomes but with the current settings it will take time for sustainable human settlement as described by NDP 2030 to be mostly developed or to upgrade the existing human settlements. Until then learners will still be faced by long travelling time to schools. Recently the Gauteng provincial legislature changed the 5km radius for feeder zone for 2019, preference will be given to learners with guardians whose home or work address is in the feeder zone. This implies that there will be continuous number of learner travelling more than 30 minutes to school, because majority of black African reside far away from their work place. Policy makers and town planners they need to address the employment and residential area of people without isolating the need to build better schools closer. The learner transport also need to be assessed because there are learners who still take longer on the road while collecting other, as a result they get fatigue of being on the road longer. The learner transport policy was implemented, but it produces the same outcomes as other policies because learners are being provided with transport, the same transport collect learner at their home meaning that they end up reaching school tired due to spending more time in the transport. Learners travelling with learner transport do not have the same experience even, though they use the same vehicle, simply because the first child to be collected spend more time in the car while the last one collected experience short travelling time. No dedicated roads for learner transport.

5.3 LIMITATIONS OF THE STUDY AND RECOMMENDATIONS FOR FUTURE RESEARCH

The limitation of this study is the fact that survey is households based and its main objective is to capture household's activities, questions relating to education have some limitations. One such limitation is that the survey captured only few learners who used train to school and could not make estimates based on this. Recommendation from the study is that further research be conducted on learner travelling time with the use of census data wherein everyone will be covered and there will be more variables to analyse. DBE to share with stakeholders the registration address of learners at sub place level so that the full learner mobility can be studied and the implications can be identified to inform policy formulation.

REFERENCES

- Anderson 1988. Improving access to schooling in the third world: A review. BRIDGE Research Report
- Aron M & Bhourri N 2014. Isolating Different Factors Affecting Travel Time Reliability in an Observational Before/After Study. Sevilla, Spain.
- Behrens R 1996. From Red to Green, Green to Amber, and Back to Red: A Critique of South African Layout Planning. *Town and Regional Planning* 40: 6-17.
- Behrens R & Watson V 1996. Making urban places: Principles and guidelines for lay-out planning. Cape Town: UCT Press.
- Breheeny M 1996. Centrists, Decentrists and Compromisers: Views on the Future of Urban Form. In: Jenks.
- Breen R & Goldthorpe JH 1997. Explaining educational differentials: Towards a formal rational action theory. *Rationality and Society* 9, 3: 275–305.
- Buckley J, Schneider M & Shang Y 2004. Effects of school facility, quality on teacher retention in urban school district. National clearing house for educational facilities. Washington Dc.
- Buchmann C & Brakewood D 2000. Labor structure and school enrollments in developing societies: Thailand and Kenya compared. *Comparative Education Review* 44, 2: 175–204
- Buliung RN, Mitra R & Faulkner G 2009. Active school transportation in the greater Toronto area, Canada: an exploration of trends in space and time (1986–2006).
- Buliung RN, Mitra R & Faulkner G 2009. Active school transportation in the Greater Toronto Area, Canada: an exploration of trends in space and time (1986–2006). <https://www.ncbi.nlm.nih.gov/pubmed/19272403> [Accessed: 03 September 2018] Prev.
- Cameron S 2011. “Whether and Where to Enrol?” Choosing a Primary School in the Slums of Urban Dhaka, Bangladesh.” *International Journal of Educational Development* 31,4: 357–366.
- Carruthers R, Krishnamani RR & Murray S 2009. Improving Connectivity: Investing in Transport Infrastructure in Sub-Saharan Africa. Washington DC: World Bank.

Available: http://www.infrastructureafrica.org/aicd/system/files/BP7_Transport_maintxt.pdf.

[Accessed 17 July 2018.]

Cervero R & Kockelman K 1997. Travel demand and the 3Ds: density, diversity, and design. *Transp. Res. D.-TR. E.* 2, 199–219. <https://www.sciencedirect.com/science/article/pii/S1361920997000096>

[Accessed: 26 July 2018]

Chillón P, Hales D, Vaughn A, Gizlice Z, Ni A & Ward DS 2014. A cross-sectional study of demographic, environmental and parental barriers to active school travel among children in the United States. *Int. J. Behav. Nutr.* <https://www.ncbi.nlm.nih.gov/pubmed/24885862> [Accessed: 11 August 2018]

Cloke P & Edwards G 1986. Rurality in England and Wales 1981: A replication of the 1971 index. *Regional Studies* 20(4).

Cohen D & Soto M 2007. "Growth and Human Capital: Good Data, Good Results." *Journal of Economic Growth* 12, 1: 51–76.

Colclough CH, Rose P & Tembon M 2000. Gender inequalities in primary schooling: The roles of poverty and adverse cultural practice. *International Journal of Educational Development* 20.

Cooper AR, Page AS, Foster LJ & Qahwaji D 2003. Commuting to school: are children who walk more physically active? *Am. J. Prev. Med.* 25, 273–276. [http://dx.doi.org/10.1016/S0749-3797\(03\)00205-8](http://dx.doi.org/10.1016/S0749-3797(03)00205-8). [Accessed 3 September 2018.]

COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH (CSIR). 2000. Guidelines for Human Settlement Planning and Design. Pretoria: CSIR. Boutek Report No. BOU/E2001.

Culwick, C., Gotz G., Katumba, S., Trangos, G. and Wray C. 2015. Mobility in Gauteng city region. *Regional Studies, Regional Science* 2 (1).

Dang H & Rogers H 2013. "The Decision to Invest in Child Quality over Quantity: Household Size and Household Investment in Education in Vietnam." Policy Research Working Paper 6487. The World Bank.

- De la Fuente A & Doménech R 2006. "Human Capital in Growth Regressions: How Much Difference Does Data Quality Make?" *Journal of the European Economic Association* 4, 1: 1–36.
- De Kadt J, Shane A, Norris, Fleisch B, Richter L & Alvanides S 2014. Children's daily travel to school in Johannesburg-Soweto, South Africa: geography and school choice in the Birth to Twenty cohort study, *Children's Geographies*.
- Department of Transport (1996). *White Paper on National Transport Policy*, Government Printers, Pretoria.
- Department of Transport (2000). *National Land Transport Act, Act 05 of 2009*. Government Printers, Pretoria
- deVasconcellos EA 2005. Urban change, mobility and transport in Sao Paulo: three decades, three cities. *Transp. Policy* 12, 2:91–104.
- DEWARD 2000. The Relevance of the Compact City Approach: The Management of Urban Growth in South African Cities. In: Jenks, M., Burton, E. & Williams, K. (eds.). *The Compact City: A Sustainable Urban Form?* London: E & FN Spon, p. 209-218.
- Dubow EF, Boxer P & Huesmann L R. 2009. Long-term effects of parents' education on children's educational and occupational success: Mediation by family interactions, child aggression, and teenage aspirations. *Merrill-Palmer Quarterly* 55: 224–249.
- Elacqua G 2006. Enrollment Practices in Response to Vouchers: Evidence From Chile. http://ncspe.org/publications_files/OP125.pdf
- Elacqua G, Schneider M & Buckley J 2006. "School Choice in Chile: Is it Class or the Classroom?" *Journal of Policy Analysis and Management* 25, 3: 577–601.
- Emerson PM & Portela Souza A. 2007. Child Labor, School Attendance, and Intrahousehold Gender Bias in Brazil. *The World Bank Economic Review* 21, 2: 301-316.
- Ersado L 2005. Child labor and schooling decisions in urban and rural areas: Comparative evidence from Nepal, Peru and Zimbabwe. *World Development* 33, 3: 455–480.
- Fafchamps M & Wahba J 2006. Child labor, urban proximity, and household composition. *Journal of Development Economics* 79: 374–397.
- Ferreira FHG & Litchfield JA 1998. Calm after the storms: income distribution in Chile, 1987-1994. *World Bank Policy Research Working Paper* 1960. Washington, D.C.: World Bank.

Retrieved from: www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/1998/11/17/000178830_98111703530642/Rendered/PDF/multi_page.pdf. [Accessed 3 September 2018.]

Fiske E & Ladd H 2004. *Elusive Equity: Education Reform in Post-Apartheid South Africa*. Washington, DC: Brookings Institute.

Ginsburg C, Norris SA, Richter LM & Coplan DB, 2009. Patterns of residential mobility amongst children in Greater Johannesburg-Soweto, South Africa: observations from the Birth to Twenty cohort. *Urban Forum*.

Ginsburg C, Norris SA & Richter LM 2011. An analysis of associations between residential and school mobility and educational outcomes in South African urban children: The Birth to Twenty cohort.

Gumus S & Chudgar A 2016. Factors affecting school participation in Turkey: an analysis of regional differences. *A Journal of Comparative and International Education* 46, 6: 929-951.

Fant, EK, 2008. Education and girl-child empowerment: the case of Bunkpurugu/Yunyoo district in Northern Ghana. Available: <https://munin.uit.no/handle/10037/1541>[Accessed:12 November 2018]

Hanushek EA & Kimko DD 2000. "Schooling, Labor-force Quality, and the Growth of Nations." *American Economic Review* 90, 5: 1184–1208.

Hanushek EA 2003. "The Failure of Input Based Schooling Policies." *The Economic Journal* 113, 485: F64–F98

Hensher DA & Rose JM 2007. Development of commuter and non-commuter mode choice models for the assessment of new public transport infrastructure projects: a case study. *Transp. Res. Part A-Policy Pract* 41, 5: 428–443.

Hitge G & Vanderschuren M 2015. Comparison of travel time between private car and public transport in Cape Town. *35J. S. Afr. Inst. Civ. Eng* 57, 3.

- Hunter M 2010. Racial desegregation and schooling in South Africa: contested geographies of class formation. *Environment and planning. A*, 42(11), 2640.
- Irawan MZ & Sumi T 2012. Motorcycle-based adolescents' travel behaviour during the school morning commute and the effect of intra-household interaction on departure time and mode choice, *Transportation Planning and Technology* 35, 3: 263-279.
- Johansson MV, Heldt T & Johansson P 2006. The effects of attitudes and personality traits on mode choice. *Transp. Res. Part A-Policy Pract* 40, 6: 507–525.
- Kennedy R 2008. Are private schools elitist? From www.privateschool.about.com.
- O'Fallon C, Sullivan C & Hensher DA 2004. Constraints affecting mode choices by morning car commuters. *Transp. Policy* 11: 17–29.
- Krueger AB & Lindahl M 2001. "Education for Growth: Why and for Whom." *Journal of Economic Literature* 39, 4: 1101–1136.
- Kugler AD & Kumar S 2017. "Preference for Boys, Family Size and Educational Attainment in India." *Demography* 54: 835–859.
- Larouche R, Saunders TJ, Faulkner G, Colley R & Tremblay M 2014. Associations between active school transport and physical activity, body composition, and cardiovascular fitness: a systematic review of 68 studies. *J. Phys.* <https://pdfs.semanticscholar.org/7f76/0f1b1a24adf913401121b331d32547a412de.pdf> [Accessed: 06 September 2018]
- Lin, D., Allan, A. and Cui, J. Does Polycentric Urban Spatial Development Lead to Less Commuting: A perspective of Jobs-Housing Balance. 2013. Polycentric city and urban commuting. 49th ISOCARP Congress (2013). 1-10.
- Maarman RFA 2006. Poverty as determinant in educational provision: Exploration of life context for funding policy. Paper presented at the British Association for International and Comparative Education. Education and Development, Belfast, Northern Ireland, September.

- Mubiwa, B. and Annegam, H. (2013). Historical Spatial Change in the Gauteng City Region. University of Johannesburg, Department of Geography, Environmental Management and Energy Studies. Gauteng City-Region Observatory.
- McDonald NC, Brown AL, Marchetti LM & Pedroso MS 2011. U.S school travel 2009: an assessment of trends. *Am. J. Prev. Med.* 41, 2: 146–151.
- McDonald NC 2007. Active transportation to school: trends among U.S. schoolchildren, 1969–2001. *Am. J. Prev. Med.* 32, 509–516. <https://www.ncbi.nlm.nih.gov/pubmed/17533067>. [Accessed: 19 August 2018]
- McMillan T 2003. Walking and Urban Form: Modeling and Testing Parental Decisions about Children's Travel. Doctoral dissertation, University of California, California.
- Mehdizadeh M, Nordfjaern T & Mamdoohi A 2016. The role of socio-economic, built environment and psychological factors in parental mode choice for their children in an Iranian setting. *Transportation* 1–21. doi: 10.1007/s11116-016-9737-z
- Mendenhall W, Beaver RJ & Beaver BM 2012. *Introduction to Probability and Statistics*. 14th ed. Boston: Cengage Learning.
- Miedema H 2007. Adverse effects of traffic noise, in T. Görling & L. Steg (Eds.), *Threats to the quality of urban life from car traffic: problems, causes, and solutions*, Elsevier, Amsterdam.
- Morfoulaki M, Kotoula K, Mirovali G & Aifantopoulou G 2015. School transportation: Determination and Analysis of User Needs in the use of Technological Equipment which Increases the Security Levels. 6th Hellenic Congress on Road Safety, Athens, Greece 2015.
- Nielsen T 2004. Impact of urban structure on personal transportation in the context of a large Danish provincial city. Association of European Transport.
- Pampallis J 2003. “Education Reform and School Choice in South Africa.” In *Choosing Choice: School Choice in International Perspective*, edited by D. Plank and G. Sykes, 143–163. New York: Teachers College Press, Columbia University.

- Psacharopoulos G 1994. "Returns to Investment in Education: A Global Update." *World Development* 22, 9: 1325–1343.
- Psacharopoulos G & Patrinos HA 2002. "Returns to Investment in Education: A Further Update." *The World Bank Policy Research Working Paper* 2881.
- Pucher J & Buehler R 2008. Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany', *Transport Reviews*, vol. 28, no. 4, pp. 495-528.
- Qin P, Chen Y, Cu J & Wang L 2014. Travel behavior analysis for the residents in Beijing: value of time and travel demand elasticity estimates. *Econ. Geogr.* 34, 11: 17–22.
- Republic of South Africa, 1996a. *The Constitution of the Republic of South Africa*, Pretoria: Government Printers.
- Republic of South Africa (RSA). 1996b. *National Education Policy Act 27 of 1996*. Government Gazette. Pretoria.
- Republic of South Africa (RSA). 2010. *National Development Plan, 2030*
- Rothengatter T, Transport and traffic safety, in T. Görling & L. Steg (Eds.), 2007. *Threats to the quality of urban life from car traffic: problems, causes, and solutions*, Elsevier, Amsterdam.
- Sabates RS, Akyeampong K, Westbrook J & Hunt F 2010. School drop: out patterns, Causes, Changes and Policies. Essex. Retrieved from <http://unesdoc.unesco>. [Accessed 24 July 2018.]
- Salon D 2009. Neighborhoods, cars, and commuting in New York City: a discrete choice approach. *Transp. Res. Part A: Policy Pract.* 43: 180–196.
- Schoppa L 2012. Residential mobility and local civic engagement in Japan and the United States divergent paths to school. *Compar. Pol. Studies* 46, 9: 1058–1081.
- Shaw A 2006: Achieving a pro-public transport agenda in South Africa- the challenge for middle income countries, *WIT Transactions on the Built Environment* 89: 805-815.
- Simon D 1992. Reform in South Africa and modernisation of the Apartheid City, In D.W. Drakakis-Smith, ed. *Urban and regional change in southern Africa*. London: Routledge. Pp33-67.

- Sirard JR, Riner WF Jr, McIver KL & Pate RR 2005. Physical activity and active commuting to elementary school. *Med. Sci. Sports Exerc.* 37, 2062–2069 (doi: 00005768-200512000-00007 [pii]).
- Swanepoel I 2009. A proposed system-based subsidy approach for integrated public transport systems in South African metropolitan areas, Cape Town: Stellenbosch University, <http://scholar.sun.ac.za/bitstream/handle/10019../2266/swanepoel,%20l.pdf?sequence=1> [Accessed 17 August 2018.]
- Statistics South Africa, 2013. General Household Survey Database, Pretoria: Statistics South Africa.
- Statistics South Africa, 2017. General Household Survey 2016, Statistical Release P0318, Pretoria: Statistics South Africa.
- Tansel A 2002. “Determinants of School Attainment of Boys and Girls in Turkey: Individual, Household and Community Factors.” *Economics of Education Review* 21, 5: 455–470.
- Tansel A 2004. “Education and Labor Market Outcomes in Turkey.” *World Bank Report: Background Papers and Studies for Turkey.*
- Teske P, Fitzpatrick J & Kaplan G 2007. *Opening doors: How low-income parents search for the right school.* Seattle, WA: Center on Reinventing Public Education. Available: <http://www.crpe.org/cs/crpe>. [Accessed 21 July 2018.]
- Titheridge H, Christie N, Mackett R, Hernandez DD & Ye R 2014. *Transport and Poverty: A review of the evidence.* UCL.
- Tomul E 2007. “The Change in Educational Inequality in Turkey: A Comparison by Regions.” *Educational Planning* 16, 3: 16–24.
- UNESCO. 2010. *Education for All Global Monitoring Report 2010: Reaching the Marginalized.* Paris: UNESCO.
- Van Wee B 2007. Environmental effects of urban traffic, in T. Görling & L. Steg (Eds.), *Threats to the quality of urban life from car traffic: problems, causes, and solutions*, Elsevier, Amsterdam.

Weir S 2011. "Parental Attitudes and Demand for Schooling in Ethiopia." *Journal of African Economies* 20, 1: 90–110.

Wiener V & Ruiters G 2017. Experiences and Perceptions of Learner Migrants of Commuting to and from School: A case study of Learners at two Schools in Cape Town, 2013-2015.