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Public transport service quality in South Africa: A case study of bus and mini bus services in Johannesburg

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This paper reports on commuters' perceptions of bus and mini bus taxi service using an alternate to the most popular and commonly used service quality (SERVQUAL) instrument, namely The regional estuarine and coastal systems of the Americas (RECSA). From face-to-face interviews using a structured questionnaire to survey a convenience sample of 690 commuters at specifically selected mini-bus taxi and bus ranks using a commuter intercept survey, it was ascertained that overall the perceived quality of public bus transport services exceeded that of minibus taxis, despite the minibus taxis being the dominant mode of public transport. All the RECSA dimensions of transport service quality influenced the respondents' perception of public bus service quality, whereas only three, namely reliability, affordability and extent of the service, influenced their perception of the minibus taxis service quality. To improve public road transport service quality, service providers should among others, implement scheduling systems to improve the punctuality of the service, invest in communication systems, introduce a comfort rating system, improve the arrival times at destinations and reduce journey length. They should also improve the condition of the minibus taxi shelters, increase the frequency of the service on certain routes especially during peak periods on weekdays, take commuters closer to their destination through modal integration and elimination of transfers, improve commuter safety, more especially by changing driver behaviour through focused safety and driver training programmes, and improve affordability and provide value for money service. The findings could also serve to inform public transport policy makers and providers, since a public transportation model and policy based on improving the perceived service dimensions is likely to increase the demand for public bus and minibus taxi transport and, reduce the use of private motor cars, thereby addressing the public road transport conundrum in Johannesburg in particular, and South Africa in general.

Key words: Public transport service, minibus taxi service, public bus service transport service quality.

INTRODUCTION

Several researchers (Javid et al., 2013) argue that the rapid increase in urban population and automobile ownership and usage have resulted in urban transportation problems in developing countries.

According to several South African studies (National Planning Commission, 2011; Mokonyama, 2012), the quality of public transport service in South Africa requires urgent improvement, since it affects mostly poorer members of the community who rely on it for daily commuting. Several studies in developing countries (Pucher and Korattyswaroopam 2004; Ngatia et al., 2010; Mashiri et al., 2010; Finn and Mulley, 2011) confirm that the poorer members of the community are often faced with inadequate transport service, poorly arranged schedules, the absence of facilities – including bus stops and shelters, and the infrequency of services, particularly at off-peak times, which severely compromises the convenience of these services. As was revealed from the national household travel survey (2003) 71% of train users, 55% of taxi users and 54% of bus users were dissatisfied with the level of crowding (Gauteng Province, 2009). In addition, 74% of bus users, 64% of taxi users and 53% of train users were also unhappy with the facilities at stops, ranks and stations. Furthermore, there are excessive delays for public transport with an average waiting time of 40 to 65 minutes (Gauteng Province, 2009). From the aforementioned, it is safe to state that South African commuters are clearly unhappy with public transport service quality, which implies that public passenger transport service organisations (in South Africa) must conduct perception studies on an ongoing basis in order to enable them to meet the needs of passengers, and McKnight et al. (1986) further asserts that the perception studies and results must be used effectively to deliver quality service that meets the needs of passengers.

Despite the fact that transport service quality is an all-pervasive problem affecting both urban as well as rural populations, it is in the urban context that this problem receives the most attention (Dalvi, 1987), partly as a result of the scale of the problem and also because it is in the urban context that controversial issues concerning the appropriate service that meets commuters' needs, choice of inter-modal mix, transport technologies and pricing policies and strategies for transport are hotly debated. However, it is in the context of choosing an appropriate inter-modal mix for urban transport that the poorer countries are currently faced with the greatest dilemma, with the question being asked as to whether they should follow the West and devote a major portion of their development resources to the construction of mass transit systems or whether they should opt for low cost, capital saving options.

In light of the above, this paper reports the response to the following key research questions with respect to bus and mini-bus taxi service, namely: What are the commuters' perceptions of the quality of the service? To what extent would their perceptions of the service influence their future demand for buses and minibus taxis? What is the importance of each service quality dimension in choosing a public transport mode? To what extent do the service quality dimensions influence passenger transport mode choice? What is the importance of the service quality dimensions in choosing a mode of passenger transport?

LITERATURE REVIEW

The question often arises as to the reason why people prefer one mode of transport to another, and surveys have highlighted the crucial and, sometimes, overwhelming importance of the factors which play a role in this decision, which factors may be grouped under the general heading of the quality of service and, include amongst others speed of delivery, certainty of timing (reliability and scheduling), freedom from interruption (extent of service) and avoidance of damage (safety) (Gubbins, 1988).

Service quality in the public transport sector has remained an elusive and a much neglected area of study. Data regarding the quality and performance indicators of public transportation services are vaguely determined and, in fact, are practically nonexistent (Simona, 2010), and much of the debate has centred around the system itself: spatial designs, systems configurations, city network developments, government policies, and engineering services. Generally, service quality has remained a challenge for the majority of public transport organisations, because of the challenge inherent in measuring service quality (Zeithaml and Bitner, 2000). Furthermore, although a major challenge confronting public transport in general is that of service quality, it (service quality) is a complex area of study and measuring service quality in public transport in particular, is made even more difficult by the subjective nature of service (McKnight et al., 1986; Parasuraman et al., 2000).

In order to get a sense of the challenges facing public transport service quality in general, some reference studies from the developing and developed world is provided. For example, research conducted in Singapore in 2012 revealed that there are four important dimensions that should be considered in public transport service, namely, connections, extent of service, liveable cities, and inclusivity, all of which enhances commuters travelling experience (Land Transport Authority, 2013). A study in Scotland by the department of transport identified more than 30 different service attributes ranging from the punctuality and reliability of the service to the cleanliness of stations. These attributes were considered important to passengers and caused dissatisfaction if not delivered to a satisfactory standard, with public transport organisations deeming it important to try their best to meet passengers' reasonable needs at all times (Samson and Thompson, 2007).

From a European study on public transport conducted

in 2009 (Simona, 2010), it was evident that data regarding quality indicators of public transportation services were vaguely determined and practically non-existent. Furthermore, due to the intangible characteristics of services, defining service quality became an essential issue for some European countries, such as those in the urban area of Oradea, Romania, where quality appeared as an abstract dimension, which led to quality evaluation with specific approaches and instruments. The aforementioned study which used the SERVQUAL (Parasuraman et al., 1988) instrument to gather data and evaluate quality, revealed that the utility of a service encompasses abstract factors, such as security, tangibles, assurance, empathy and sensibility; quality is the outcome of needs, former experiences, and "word of mouth" (Simona, 2010: 471). Additional important service dimensions included, among others, availability, service monitoring, travel times, safety and security, cleanliness of vehicles, and transport capacity (Simona, 2010).

Research conducted in Britain in 2011 (Gazibara, 2010), has shown that service quality is significant to the public transport of the future, and a conclusion drawn from the aforementioned study seemed to suggest that throughout the world, two in three people will live in the cities, an outcome that will bring new opportunities and also challenges – from enormous pressure on resources to congestion on roads, and unsustainable levels of transport-related challenges, including emissions. The important service dimensions that they will focus on are information and communication technology (ICT), service integration, making the poor and their needs a priority, and commuters' behaviour (Gazibara, 2010). The aforementioned findings to a certain extent mirror the state of affairs of public transport services in South Africa. With respect to the developing countries, a study conducted in Kenya in 2010 (British youth council, 2012) showed regulations, improvements in comfort levels (from less overcrowding) and, safety of passengers as important service attributes which led to more attractive public transport. In Lagos Nigeria, the following service quality attributes contributed to improving public transport system: cheaper fares, travel time was reduced, waiting time at bus stops fell during peak and off-peak hours, improved safety and reliability of the new system, reduction of externalities: fuel consumption for vehicles used along the corridor, demonstrating the undeniable advantage of formal public transport (International association of public transport, 2010). As regards the perception of service, only 33.5% of the Nigerian respondents felt that buses in their area were reliable whereas, while a marginal more (35.8%) disagreed (British youth council, 2012: 2).

Some researchers (Beirao and Cabral, 2007; Eboli and Mazulla, 2007) assert that evaluating and measuring transport service quality remains challenging and important, since transport service quality comprises

abstract and intangible constructs such as comfort and safety. Generally, most of the research on service quality has been conducted using the renowned SERVQUAL (Parasuraman et al., 1988) which uses the RATER (responsiveness, assurance, technology, empathy, reliability) dimensions of service quality, or a modification thereof because of inter-alia, features such as the simultaneous measurement of expected and perceived quality and, the ease of interpretation of its results (Barabino et al., 2012). Despite the aforementioned researchers citing and acknowledging that limited studies exist, inter-alia, Too and Earl (2010), where attempts were made to adapt and adopt SERVQUAL to evaluate perceived service quality among rail and bus passengers respectively (Barabino et al., 2010: 241; Randheer et al., 2011), the SERVQUAL instrument has not been without criticism (Buttle, 1995; Lages and Fernandes, 2005). The criticisms included inter-alia, its appropriateness for measuring service quality across service institutions.

In light of the aforementioned, and due to the complexities of measuring service quality in public transport, this paper reports on a study conducted to explore commuters' perceptions of bus and minibus taxi service in terms of the RECSA service quality dimensions of McKnight et al. (1986).

RESEARCH METHODOLOGY

Research instrument

The previous section alluded to the challenges of using the SERVQUAL instrument to determine commuters' perceptions of public transport service quality, and made reference to RECSA as being more appropriate. Table 1 depicts the five service quality dimensions of both the RATER and RECSA service quality models. It is evident from table 1 (which is self explanatory) that although RECSA incorporates some elements of RATER, it is more appropriate for measuring transport service quality.

A structured questionnaire was developed using the RECSA (table 10 dimensions of transport service quality, and used to survey min-bus taxi and public bus commuters. The same questions were asked of all commuters but 'mini-bus taxi' or 'public buses' were substituted where necessary. A five point Likert scale was used since it is most commonly used when semantic differentials and multiple Likert type questions are included in a questionnaire on a scale (1 to 5) and, in order to determine if the scale is reliable (Nagel, 2007). The questions were divided into five categories, each of which was used to measure the service quality constructs[1], and separate scales were constructed for buses and minibus taxis, respectively based on the five dimensions, namely reliability, comfort, extent of the service, safety and affordability.

The five scales were then combined into a cumulative index which was termed the perception of service quality index (PSQ). Each scale was weighted equally in the index, so that it was possible for index scores to range from 0 to 50. In view of the fact that respondents had been asked their opinions about the importance of each of the five categories, it was also possible to create a cumulative index in which the individual categories were

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[1] In this paper, the terms construct and dimension are used interchangeably when they refer to service quality.

Table 1. Service quality dimensions and attributes

RECSA Service Quality Dimensions	Cluster of Service Attributes	RATER Service quality Dimensions	Service Attributes
Reliability	Arriving on time notification of delays waiting away from home delays en-route	Reliability	The ability to perform the promised service in a dependable and accurate manner
Extent of the service	Total hours of service Service on weekends Service on public holidays Service on weekdays Service in the evening	Assurance	Knowledge and courtesy of employees and their ability to convey trust and confidence
Comfort	Guaranteed seat smooth ride Sheltered waiting areas air conditioning	Tangibility	The physical evidence of the service, eg. the appearance of the personnel and physical facilities, and equipment used to provide the service
Safety	Low probability of accidents Low probability of falling Low probability of assault	Empathy	Caring, individualized attention provided to customers
Affordability	Alternatives –season tickets Cheap fares Value for money	Responsiveness	The readiness and willingness to help customers in providing prompt timely services

Source. Adapted from McKnight et al. (1986); Parasuraman et al. (1988)

weighted according to their perceived importance for each individual. The result was termed the importance-weighted perceptions of service quality index.

Research Design

A descriptive research design was used for collecting data, since several researchers Anastas (1999) and Kirshenblatt-Gimblett (2006), argued that descriptive studies collect a large amount of data for analysis that can yield rich findings and lead to important conclusions and recommendations.

Sample

All (800 000) daily commuters in the City of Johannesburg comprised the population of interest (Johannesburg development agency, 2012), however primary data was collected from commuters who only used public buses and minibus taxis. Geographical sampling was used, in terms of which all the identified bus terminals were grouped into a homogeneous cluster for example, terminals in townships were grouped together to create one cluster, terminals in the suburban areas were grouped together to create another cluster, and terminals in the central business district (CBD) were grouped together to create a final cluster to ensure the homogeneity of the subjects in each of the three clusters (Cooper and Schindler, 2001). All the homogenous clusters were included in the sample.

The survey was conducted during peak periods in the morning and afternoon, over a period of one month, at the following Johannesburg bus and min-bus taxi terminals: Central business

district; Johannesburg suburbs; South of Johannesburg. As a result of the complexities involved in the process of sampling in the public transport context, the choice of a probability sample is always a challenge (McKnight et al., 1986; Cooper and Schindler, 2001), as was demonstrated in the research conducted by the Burbidge city bus company. In the aforementioned study, non-probability sampling techniques were used to select the sample, thus the selection of bus terminals using a map and choosing a sample from the list of bus terminals concerned was deemed to be a realistic and acceptable solution to overcoming the sampling challenge (Cooper and Schindler, 2001).

The sample was selected based on the following: lower costs, greater accuracy of results, greater speed of data collection and availability of population elements (Cooper and Schindler, 2001 and Aaker, et al. 2007). The ultimate test of a sample design is how well it represents the characteristics of the population it purports to embody. In measurement terms, the sample must be valid (Cooper and Schindler, 2001). For the purposes of this study, the sample size of 902 was selected, but 212 questionnaires were excluded from the data analysis due to the high rate of non-responses to many of the important questions in the measurement instrument. As a result, the final sample size of 690 was used in the data analysis.

Data analysis

The statistical package for the social sciences (SPSS) was used to analyze the data (Coakes and Steed, 2003). The Jarque-Bera test was used to assess whether the pediatric sleep questionnaire (PSQ) index data followed a normal distribution. For both buses

and minibus taxis, the null hypothesis of normality was rejected with p-values of 0.000017 and 0.00015 respectively, which meant that it was not possible to use a t-test to compare the mean perceived service quality of buses and that of minibus taxis and therefore a non-parametric test the Mann-Whitney test was used to compare the medians. For the individual service quality dimensions, except Service, as well as the overall index (and weighted index), it was possible to draw a definite conclusion that the perceived quality of bus transport exceeded that of minibus taxis by a significant margin. Generalised linear regression analysis was also used to test if the data fitted the model (Bollen, 1989; Byrne, 2010).

EMPIRICAL FINDINGS

Instrument reliability

The measurement scales were assessed for internal consistency using the Cronbach's alpha which coefficient reflects how closely related a set of items are as a group. The values were all above 0.64, indicating an acceptable level of internal consistency for all the scales (Byrne, 1989).

Sample Characteristics

It became apparent that only 29.8% of the respondents used public buses while the vast majority (70.2%) used minibus taxis as a preferred mode of transportation. A large percentage (30.3%) of public transport users were aged 19 years, and 28.7% were between the ages of 25 and 34 years. Although public buses and minibus taxis were used predominantly by students and scholars, their preferred mode of transport was the minibus taxi. The aforementioned finding reaffirms what has been reported by (Ndebele, 2011).

With regard to service quality, there were significant differences in the respondents' perceptions across age groups, especially respondents in the " under 19 years" , "20 to 24 years" , "25 to 34 years", "35 to 50 years" when these groups were compared with respondents in the "51 years and above" group. In addition, there were significant differences with respect to the overall service quality perceptions among the respondents in the different education and income groups.

Age, gender and level of education were all statistically significant at the 5% level. Age had a negative coefficient, indicating that, on average, younger people have a more favourable perception of the minibus taxis than older people. Gender had a positive coefficient, indicating that on average, women perceived minibus taxis service more favourably than men. On the other hand, educational level had a negative coefficient, indicating that less educated people viewed minibus taxis favourably compared to more highly educated people.

In view of the fact that the indices did not follow a normal distribution according to the Jarque-Bera test, the

non-parametric Spearman's correlation method was used in preference to the Pearson's method. The correlation coefficient between the perceived quality of service index for buses and the perceived quality of service index for minibus taxis (for those who offered opinions on both modes of transport) was 0,068 and not statistically significant (p-value = 0,41). This suggests that the respondents' opinion of bus service quality was independent of their opinion of minibus taxi service.

Colinearity diagnostics

In the multiple linear regression model with the perceived quality of service index for buses and minibus taxis as the dependent variables, and the mode of transport which was used the most often, age, gender, education and income level as the independent variables, the variance inflation factors (VIFs) for the coefficients were all between 1 and 1.9 (1 to 1.9 for busses and 1 to 1.7 for minibus taxis) implying that there was no problem with multi-collinearity as there was no VIF greater than 3.

Regression modelling

The generalised linear regression model was also considered, since it caters for categorical and continuous explanatory variables and a response variable that may or may not necessarily be normally distributed. Since, the average of several variables was taken to calculate the overall service quality, it is a well-established fact that the response variable will be normally distributed. The fitted model for public buses was:

Overall service quality $= \beta_0 + \beta_1$ *age$+ \beta_2$*gender$+ \beta_3$*occupation$+ \beta_4$*education$+ \beta_5$*income$+\varepsilon$

The type III test results showed that age, education and income were all significant (at the 5% level) in influencing the overall service quality provided by the busses, since their p-values are all less than 0.05. However, gender and occupation were not significant in influencing the respondents' perception of the overall service quality provided by the bus. There were however differences at the 5% level of significance, among the education groups when comparing all the respondents in the group with some form of education and their perception of the overall service quality, since the p-values were less than 0.05.

It further became evident that there were significant differences at the 5% level (since the p-values were less than 0.05) in the education group between respondents with less than matric, matric and matric plus a tertiary qualification groups when comparing all those groups to respondents in the group with some other form of

Table 2. Total variance explained – public buses.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of S quared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	26.80	70.52	70.52	26.80	70.52	70.52	12.34	32.47	32.47
2	1.93	5.07	75.60	1.93	5.07	75.60	9.63	25.34	57.82
3	1.26	3.33	78.94	1.26	3.33	78.94	8.02	21.12	78.94
4	.95	2.51	81.45						

education, with respect to the overall service quality. There were also differences in those who were in the "0-R1000" and "R5001-R6000" income bracket, when comparing to these groups of respondents to those that were in the "Above R6000" group, with respect to their perception of the overall service quality provided by public busses. The generalized linear model fitted for mini-bus taxis was:

service quality=β_0+ β_1 *age+ β_2*gender+ β_3*occupation+ β_4*education+ β_5*income+ε

The type III test results showed that age, education and occupation are all significant at the 5% level in influencing the overall service quality provided by the minibus taxis, since their p-values are all less than 0.05. However, similar to busses, gender and income were not significant in influencing the overall service quality provided by the minibus taxis.

It was also evident that there were significant differences at the 5% level, (since the p-values were less than 0.05) in the age between respondents in the "under 19yrs", "20 to 24 yrs", "25 to 34 yrs", "35 to 50 yrs" when comparing all these groups to respondents in the "51 yrs and above" group with respect to their perception of the overall service quality provided by mini-bus taxis. There were also differences in those who were in the "0-R1000" income group when comparing this group to those that are in the "above R6000" income group with respect to the overall service quality.

Factor analysis

Factor analysis was run separately for the questions related to buses and minibus taxis using the principal component analysis (PCA) method of estimation with varimax rotation. Sezhian et al., (2011: 63) cite Hair et al. (2006) who argue that even though the objective of PCA is to reduce the number of variables of a dataset, it retains most of the original variability in the data, with the first principal component accounting for as much of the data variability as possible and succeeding components accounting for as much of the remaining variability as possible.

With regard to public buses, the summarized results depicted in table 2 reveal that three factors, explained the cumulative variance among the factors, since all of these factors have Eigen values which exceed 1.These factors validate the factors responsible for the service quality of bus transport. Factor 1 loaded on the importance of the service quality dimensions and using public bus transport in the future as regards to safety, availability, comfort and affordability, Factor 2 loaded on the combination of comfort and timely arrival at destination, and Factor 3 loaded on the extent of service (or availability).

With regard to minibus taxi transport service, it is evident from the summary results reflected in table 3, that four factors accounted for approximately 75% of the variation among the factors, and these factors are responsible for mini-bus taxi service quality. The four factors were punctuality, timetables, timely arrival at destination, and reasons for failure to arrive at destination on time. Factor 1 denoted the friendliness of drivers, driver skills and rules of the road, safety, comfort and extent of service; factor 2 represented the importance of the dimensions as regards choosing public transport; factor 3 denotes the availability of service, factor 4 denotes affordability and the rate of accidents.

Perceptions of service quality

The correlation coefficient between the perceived quality of service index for buses and the perceived quality of service index for minibus taxis (for those who offered opinions on both modes of transport) was 0.068 and not statistically significant (p-value = 0.41). This suggested that the respondents' opinion of buses was independent of their opinion of minibus taxis.

Table 4 presents the summary statistics in respect of the importance attached to each of the five dimensions of quality of service, on a scale of 1 (less important) to 5 (very important). Table 4 reveals that all five dimensions

Table 3. Total variance explained – Minibus taxis.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	21.80	57.38	57.38	21.80	57.38	57.38	15.32	40.32	40.32
2	3.56	9.36	66.75	3.56	9.36	66.75	5.19	13.65	53.98
3	1.86	4.90	71.65	1.86	4.90	71.65	4.67	12.29	66.27
4	1.19	3.14	74.79	1.19	3.14	74.79	3.23	8.52	74.79
5	.99	2.61	77.41						

Table 4. Importance of service quality dimensions

	Buses		Minibus Taxis	
	Mean	Median	Mean	Median
Reliability	4,3	5,0	4,4	5,0
Comfort	4,4	5,0	4,2	5,0
Service	4,3	5,0	4,3	5,0
Safety	4,3	5,0	4,3	5,0
Affordability	4,4	5,0	4,3	5,0

were considered very important, and equally so. Buses were perceived as being more reliable than minibus taxis, and those who used public buses more often tended to have a higher opinion of the quality of the bus transport service, while those who used minibus taxis as their primary mode of transport did not do so because they had a high opinion of the quality of the minibus taxi experience, since the coefficient for the mode of transport used the most often was not significant.

Therefore, it can be concluded that those who use minibus taxis tended to do so for reasons other than their opinion of this mode of transport, for example, they may use the minibus taxis for the convenience of this mode of transport as opposed to safety and reliability. Punctuality was also an important factor which influenced the respondents' perception of the overall service quality, while communication was not as important. Despite the study findings, communication is likely to influence the overall service quality, since some literature (Mashiri et al., 2010) revealed the importance of information and communications technology systems to improve communication with passengers. It also became evident that timetables were important for both bus and minibus taxi commuters, which finding is also supported by the literature which showed that timetables were important to the scheduling process, because the dissemination of information to passengers is critical to the successful operation of public transport services, and in maintaining and stimulating demand (Mashiri et al., 2010).

Timely arrival at the destination (Reliability) is an important factor influencing passengers' perception of the transport service. Furthermore, the time taken to arrive at the destination is important in explaining the utilisation of minibus taxi service. However, contrary to what is reported in the literature, adherence to routes did not emerge as an important factor influencing the commuters' perception of either bus or minibus taxi transport service. For example, some researchers (Shaibani, 2005) maintained that adherence to the route is important because it improves the predictability of public transport while enabling passengers to plan effectively.

The extent of service was one of the top five important factors that correlated positively with the perception of service on the part of both bus and minibus commuters, and taking passengers to their exact destination was shown as being an important factor in influencing passengers' perceptions of the service. Public transport accessibility and availability were also perceived as being important factors in commuters' perception of public transport service. Availability of the service in the evenings and on public holidays influenced the respondents' service quality perceptions. Driver friendliness also emerged as one of the important factors that correlated highly with the respondents' perception of service of the both bus and minibus taxi commuters.

With regard to the comfort of service, buses were perceived as being more comfortable than minibus taxis. Furthermore, seat availability emerged as an important factor for evaluating the service of both bus and minibus taxis, while the condition of the bus shelters was less of a factor for the bus commuters than for the minibus taxi commuters. Regarding the Safety of service, it emerged that buses were perceived as being safer than minibus taxis. The safety of the service also emerged as an important factor in the commuters' perceptions of the service offered by both the buses and minibus taxis.

Finally, buses were perceived as being more affordable than minibus taxis, and the affordability of service emerged as being an important factor influencing the respondents' perceptions of the service offered by both bus and minibus taxis. In summary, for each individual scale (RECSA) and mode of transport (buses and

minibus taxis), the perceived quality of the mode of transport is strongly associated with the intention to continue using the mode of transport in the future, thus impacting the demand for the public transport.

CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY

Generally, age, education and income were all significant in influencing the perceptions of the overall service quality provided by the bus and the minibus taxis. Furthermore, gender and occupation were not significant in influencing the perceptions of the overall service quality provided by the bus and minibus taxis. Generally, younger respondents have a more favourable perception of minibus taxis services, females perceive minibus taxis more favourably than men, and the less educated respondents viewed minibus taxis favourably compared with the more highly educated. Therefore, age, gender and education status are likely to influence the choice and the utilisation of the mode of public transport.

More specifically, with respect to the RECSA service model, the respondents' perceptions of the bus service were more positive compared with that of minibus taxis in terms of reliability, comfort, safety and affordability of service. In addition, those commuters who used buses more often than minibus taxis as their primary mode of transport, tended to have a higher opinion of the quality of bus transport service, whereas, those commuters who used minibus taxis as their primary mode of transport did not do so because they had a high opinion of the quality of the minibus taxi experience. This means that passengers may be using the minibus taxi service for other reasons, such as the availability and possibly the convenience of the service and. not because it is a safe mode of public transport, as emerged in this study.

It is therefore essential that people should be moved from their point of departure to their destinations, safely, economically and in accordance with the pre-determined and proposed times according to what is published in a timetable. This does not, however, mean at the fastest possible speed but in a way which is consistent with both the fare demanded and the quality of service offered. Since South Africa's public transport service is dominated by minibus taxis, a public transport model that is perceived to intentionally or unintentionally exclude the minibus taxi industry is, not likely to be sustainable in the long-term in achieving public transport integration and optimisation. Furthermore, it is well acknowledged that in order to improve and manage a service, one has to first be able to measure it (Dhingra, 2011). The aforementioned researcher further argues that 'in order to make public transport services attractive, they need to be measured and monitored on a continual basis," (Dhingra, 2011: 1).

Public transport must be differentiated from other modes of transport, such as private vehicles, by providing a better, superior service than that offered by the other modes of transport, and by making the commuters aware of the service being provided without compromising convenience, comfort or safety. The marketing and repositioning strategy of public transport in Johannesburg, and the country at large, should focus on the RECSA dimensions as being the most important service quality dimensions which influence passengers' perception of the service and future service utilisation.

Public transport organisations and policy makers should place more emphasis on the punctuality of the service by implementing scheduling systems in order to improve the punctuality of service by implementing service planning software, such as, amongst others, Microbus and mentor streets schedule software suites, which have been successfully implemented in other countries. Timetables should be implemented, since they are used as a point of reference by passengers, and are important and relevant to the overall service quality.

Since commuters will utilise public transport provided if it arrives at their destination timely, public transport organisations should seek methods to improve the timely arrival at the destination, such as increasing the frequency of service on each route, and during weekends, evenings and on public holidays. The minimization or even elimination of transfers and the proper integration of the public transport services should be the focus of public transport policy makers because such a strategy would completely overhaul the public transport service and, as a consequence, increase the utilisation and the demand for public transport. Public transport authorities should create an environment that would:

1. Encourage competition on routes, increase operational efficiencies, expand or contract services based on demand and supply,
2. reduce the pressure to operate unprofitable routes without sufficient compensation,
3. promote the self-regulating capacity of free markets as a better co-ordinating mechanism, stimulate the public transport industry by encouraging the private provision of transport services,
4. fast-track the deregulation of the public transport industry, thus creating space for competition in order to improve the quality of service, specifically, in instances where regulations are having a harmful effect, particularly, on the bus and minibus taxi industries,
5. prioritise public transport network improvements, improve the integration of the modes of public transport in order to eliminate passengers transfers,
6. balance the needs of the commuters with those of the providers of public transport, and
7. fast track the efficient integration of the minibus taxis into the bus rapid transit (BRT) systems, as well as the

integration of the infrastructure for both buses and minibus taxis, including rail.

Public transport drivers should also be compelled to attend customer service training, and quarterly assessments on the impact of the training on customer service should be conducted. In addition, they should be thoroughly screened prior to being employed, a qualification in customer service, experience in driving, a clean criminal and traffic offences record, and knowledge of the rules of the road should be introduced as the minimum requirements for a professional driver's permit.

A National task team (NTT) on public transport safety should be established to focus on improving public transport safety; and provincial structures reporting to the NTT should also be established to implement safety programmes throughout the year, instead of only focussing on the busy seasons of the year, such as during the festive periods, especially Christmas. Journey length is often the leading cause of dissatisfaction on the part of the commuters, and the findings reveal that time taken to arrive at the destination is important for the all commuters. Research on journey length will be valuable to both academic and professionals of passenger transport.

In terms of the limitations of the study, it should be noted that the data was only collected from commuters in Johannesburg, and not throughout South Africa. Although data collection can be costly, it is often even more costly to make erroneous decisions or arrive at conclusions and generalizations based on inadequate information, weak data, insufficient data (sample too small for use in extrapolation), all of which could result in the research losing credibility. Thus, for greater generalizability data from a larger sample selected from across all provinces in South Africa could shed more light on the commuters' perceptions across the country.

Conflict of Interests

The author(s) have not declared any conflict of interests.

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