The Quality of Service Perception among Public Transport Users in Metro Manila Considering Dominance of Paratransit Modes

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ABSTRACT

Paratransit (often referred to as 'informal' or even 'illegal' transport) operates on the fringe of the institutional transport system, sometimes even taking over as the main component in the system. Paratransit is generally presented as services that do not fit with the idea of a modern urban public transport system and are partially responsible for problems of traffic congestion, pollution and road accidents in cities where it is particularly widespread. Such is the case of Metro Manila where paratransit modes dominate the public transport system. There is plenty of scope for improving such services but strategies should be informed by a thorough understanding of the needs of public transport users from a quality of service perspective. Moreover, there is a need for urgent reforms in view of declining share of public transport and the drastic increase in private car use as well as the increasing social cost of traffic congestion. A pilot public transport quality survey was conducted covering respondents from University of the Philippines campus. Quality of service measures were developed using exploratory factor analysis and structural equations modelling approaches.

1. Introduction

1.1 Background

Institutional or formal transport includes public transport services often referred to as planned or scheduled transport services. This means public (or private) companies of a formal structure that provide services according to the regulations defined by the relevant urban transport authority. On the other hand, paratransit, often referred to as 'informal' or even 'illegal' transport, operates on the fringe of the institutional transport system, sometimes even taking over as the main component in the system. Paratransit is generally presented as services that do not fit with the idea of a modern urban public transport system and are as partially responsible for problems of traffic congestion, pollution and road accidents in cities where it is particularly widespread. Such is the case of Metro Manila where the public transport system is dominated paratransit modes such as the Public Utility Jeepney, (Garage-to-Terminal) GT Express (i.e. HOV Taxi) and Tricycle-for-Hire.

1.2 Significance

Jaewono and Kubota (2007) emphasized that paratransit which are operated by private companies or individuals are critical in the transport system of developing countries as they are available to everyone. As paratransit are operated without government subsidy, these modes of public transport are provided with no exclusive right-of way, mixing with other road users, with no fixed route within the city's network, and with no fixed schedule. As such, paratransit modes exhibit sub-optimal characteristics including erratic scheduling and service, inadequate investments, inefficient business practices and insurance, and lack of capacity. As such, many small operators crowd along line-haul type corridors and still unable to meet the peak demand.

Cervero and Golub (2007) estimated that 76% of public transport trips in Metro Manila is made using paratransit services. On the other hand, there is plenty of scope for improving paratransit services but well-thought out reform strategies should be informed by a thorough understanding on the needs of the public transport users from a service quality perspective, the attempt of which has never been done before on a metro-wide scale. Tangphaisankun, et al. (2009) demonstrated that commuters' attributes on service quality of paratransit have different effects to mass transit connectivity depending on services measurements and commuter's economic status. The need to understand quality of service perceptions among paratransit users is underscored by the fact that paratransit services in developing countries continue to evolve. Phun and Yai (2016) provided a comprehensive classification scheme for paratransit services and highlighted sustainability issues.

1.3 Objective

The objective of the paper is to explore the quality of service perceptions among paratransit users in Metro Manila. Focusing on paratransit users with more than two transfers from a pilot public transport quality survey conducted at the University of the Philippines Diliman campus, quality of service measures are developed using exploratory factor analysis and structural equations modelling approaches.

2. Quality of Service of Paratransit Services

Service quality is an abstract and elusive construct because of three features unique to services: intangibility, heterogeneity, and inseparability of production and consumption" (Parasuraman et al., 1985, 1988). Researchers have established different definitions of service quality. However, they agreed that service quality should be assessed by using customer perspective. In public transport research, the definition of service quality in the marketing field is also adopted. Perceived quality studies that try to determine the satisfaction levels of public transport users provide a powerful tool to public transport authorities and operators in creating marketing policies aimed at retaining current users (Dell'Olio, et al., 2010, 2011).

An earlier work by Fillone, et al (2005) developed a structural equation modelling where the assessment of the urban traveler was regarded as the endogenous construct. For the captive public transport users, it is the household socio-demographic characteristic as well as the generalized cost of travel that load positively on urban travel assessment. Eboli and Mazulla (2007) formulated a structural equation model to explore the impact of the relationship between global customer satisfaction and service quality attributes. There is a total of 16 service attributes evaluated by the user sample and 2 global service quality indicators (i.e., perceived and expected quality). From the 16 service attributes, factors that were identified by means of an exploratory factor analysis are service planning and reliability (i.e., frequency, reliability, information, promotion, personnel and complaints), comfort and other factors (i.e., bus stop furniture, overcrowding, cost, environmental protection and bus stop maintenance), safety and cleanliness (i.e., cleanliness, safety on board, and personal security), and network design (i.e., bus stop availability and route characteristics). The result revealed that the latent variable with a major effect on global customer satisfaction is service planning and reliability. The network design and the comfort and other factors latent variables also have considerable impacts.

Eboli, et. al (2013) used structural equation model approach to reveal the unobserved latent aspects describing the service and the relationship of these aspects with the Overall Service Quality. In analyzing service quality of public transport, two passengers' statements about the overall service quality were gathered: the first one when passengers have not reflected on the attributes describing the service, and the second one after they have thought about them. Four model were proposed in this study and the model with the most desirable fit structure was selected. From the result, the unobserved latent construct obtaining the highest weight on overall service quality is service, while comfort and personnel have little influence. The passengers' evaluation better explaining the overall service quality is the evaluation made when passengers have reflected on the service.

Mahatma, et al. (2013) developed a model of service quality which is compatible for public land transport services in Indonesia which consists of four dimensions with 18 indicators. The four dimensions are comfort, tangible, personnel, and reliability. Barabino and Di Francesco (2016) presents as simple, practical and holistic framework involving all stakeholders in the characterisation, measurement, and management of the stages of transit quality monitoring.

A more recent work by Han, et. al (2018) considered different influence factors of the passenger's waiting at bus station and established an integrated approach of SEM and Nested Logit to understand how different factors, especially the subjectively perceived latent variables influence travel mode choice behavior. The SEM was used to describe the causal relationship between the latent variables and the corresponding observed variables. The Nested Logit model was used to represent the nonlinear function relationship between the probability of an alternative and the variables that affect the decision. The upper level in the model are the public and private transport where original route bus and alternative route bus are under the public transport and taxi or car-hailing and bicycle sharing are under the private transport. In the SEM, the influence degree of latent variable on overall satisfaction degree can be ranked from highest to lowest as flexibility, safety, convenience, comfort, and economy. Fit accuracy was analyzed using different fit indices. The analysis then suggests that the model has an acceptable fit. The SEM-NL integration model results reveal that gender, monthly income, purpose of the trip, travel distance, safety and convenience service level have a significant effect on the choice of the upper model. Passenger's age, vehicle ownership, and bus ride frequency have great influence on the choice of lower mode.

3. Pilot Public Transport Quality Survey

3.1 UP Diliman Study Area

The University of the Philippines (UP) was founded on June 18, 1908 through Act No. 1870 of the Philippine Assembly and declared as the country's national university[1]. UP Diliman is the fourth oldest constituent university of UP and is the largest constituent university in the UP System in terms of number of degree-granting academic units, student population, faculty, and library resources. There are 27 degree-granting units on campus, accounting for 22,765 students and 1,531 faculty members in 2017[2].

Figure 1 shows the UP Diliman campus map indicating the main arterials providing access to the sprawling campus from the rest of Metro Manila namely, Commonwealth Avenue on the west side and C5/Katipunan Avenue on the east side. UP Diliman is the flagship university as well as the administrative seat of the UP System. The campus has a total land area of 493 hectares (1,220 acres). Majority of areas inside the campus is used for academic and administrative purposes. Some areas of the campus have been allocated for forested areas, student housing, employee and commercial uses. While the housing areas mainly serve the students and University employees, other residents also live inside the campus.

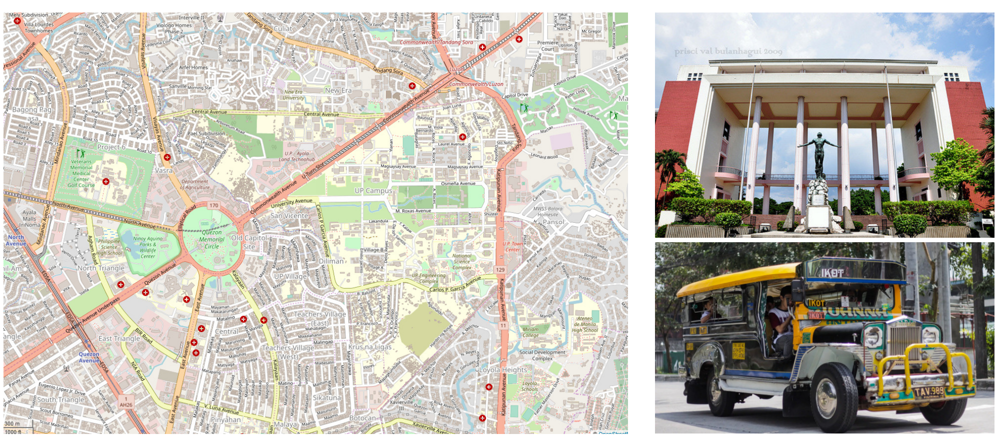
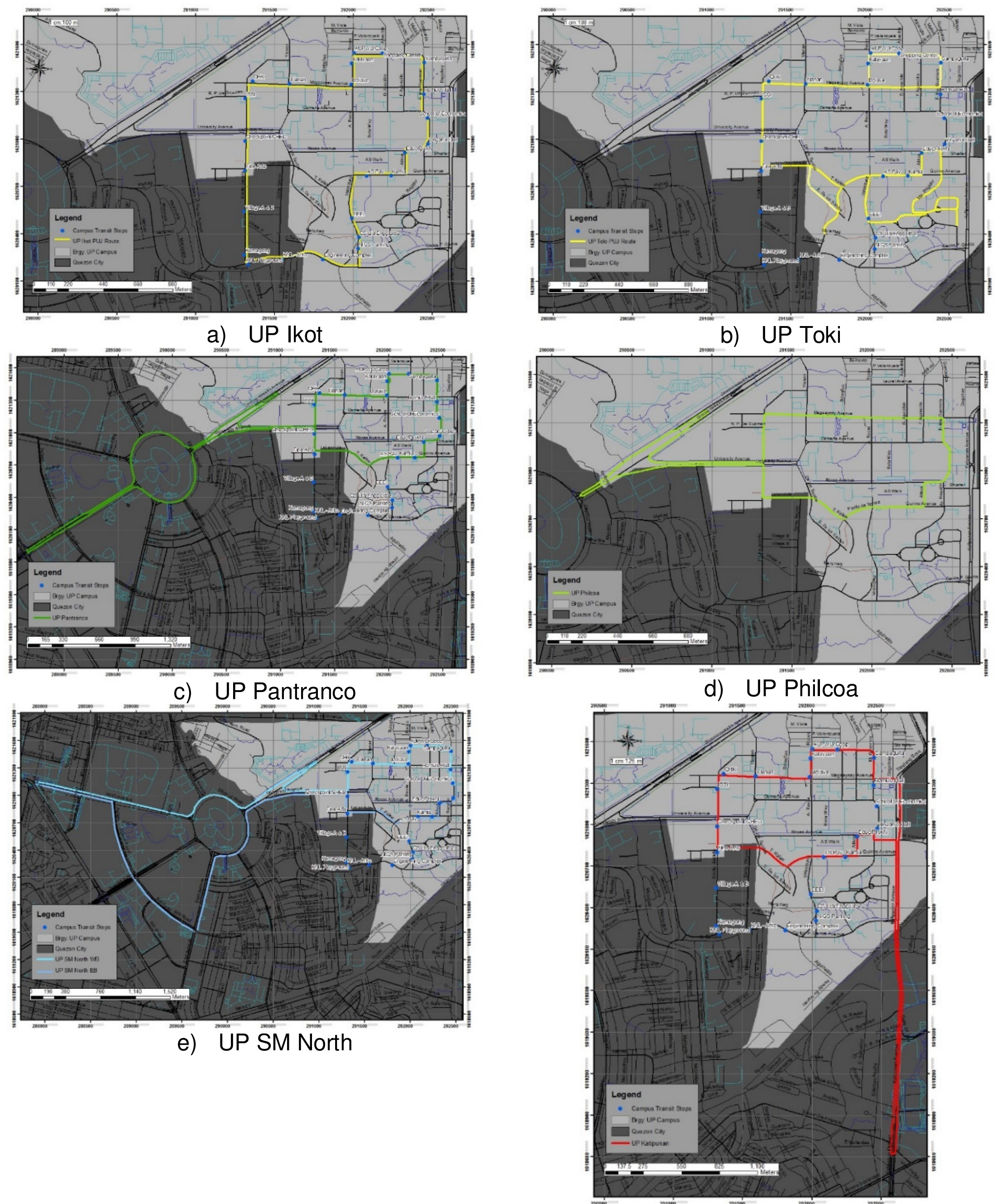


Figure 1. UP Diliman Campus and its UP Ikot Jeep

[1] Republic Act 9500 An Act to Strengthen the University of the Philippines as the National University. Retrieved from https://www.lawphil.net/statutes/repacts/ra2008/ra_9500_2008.html.
[2] "Facts at a glance". University of the Philippines Diliman. Retrieved from https://upd.edu.ph/about/facts-at-a-glance/

The Diliman community is sometimes referred to as the Diliman Republic and a "microcosm of the Philippines". As such, it has its own Jeepney public transport system fondly called “Ikot” (or ‘Rotate’) as it provides mobility around the entire campus in a circular route. Another circular route service called “Toki” operates in the reverse direction. In addition to the two circular routes, there are four (4) other routes that enter the campus as shown in Figure 2. Table 1 presents the characteristics of the various jeepney routes serving UP Diliman.



a) UP Ikot
b) UP Toki
c) UP Pantranco
d) UP Philcoa
e) UP SM North
f) UP Katipunan

Figure 2. Jeepney Routes serving UP Diliman

Table 1. Jeepney Routes in UP Diliman

Route	Route Length (in km)	No. of Authorized Units
UP Ikot	5.32	56
UP Toki	8.5	15
UP Pantranco	11.5	90
UP Philcoa	7.11	43
UP SM North	13.8	40
UP Katipunan	8.45	80

3.2 Sampling Frame

Based on the Second Semester enrolment of Academic Year 2018-2019, there are 21,685 enrolled students and 3,377 employees within the campus[3]. Table 1 presents the population size and the target samples for the trip diary and public transport quality survey. A sampling rate of 2.5% of the total UP Diliman Student population was adopted. This rate was adopted from the JICA-assisted 1996-1999 Metro Manila Urban Transportation Integration Study (MMUTIS)[4]. Also, the target samples were distributed to each college/institute/department of UP Diliman in proportion to their share of the student population.

Table 2. Population Size and Target Samples

	Population Size	Target Samples
Registered Students for 2nd Semester AY 2018-2019	21,685	542

3.3 Survey Design

The survey for collecting trip data and perception of public transport quality of service were divided into four (4) sections as follows:

- Section 1 introduces the research objectives, usage of data some introductory questions regarding their travelling behaviours in UP Campus are asked in this part.
- Section 2 asked respondents to recall of their previous trip to UP and to log them in the trip diary. All trips including their trips from their place of residence to UP Campus, within the UP Diliman Campus, and their trip back to their place of residence, was logged. Additional details such as the time of the trips, purpose of the trip, trip mode and fare were also collected.
- Section 3 asked respondents to assess the UP Diliman Jeepneys on their perception of the quality of service. Questions are asked regarding their perception of the quality based on: a) UP Jeepney Vehicles, b) Experience with the Journey, c) Payments, d) Driver, e) General Condition of Stops, f) Accessible Information, g) Reliability and Availability. There is a total of 37 different questions in this survey answerable in a Likert Scale of from Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree.

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[3] Data from UP Diliman Office of the University Registrar (OUR), UP Diliman Human Resources and Development Office (HRDO) and University of the Philippines Office of the Vice-President for Administration (OVPA).
[4] ALMEC Corporation (March 1999). Metro Manila Urban Transportation Integration Study (MMUTIS) Final Report Summary. Retrieved from http://open_jicareport.jica.go.jp/pdf/11580446.pdf

- Section 4 presented the respondents with some basic demographic questions regarding their monthly incomes, daily transportation expenses, age, and household and car ownership information.

3.4 Paratransit Users

Of the 3,857 trips logged during the Trip Diary survey, a total of 1677 trips are made inside UP Diliman Campus, 1,079 are made outside UP Diliman Campus where 536 are inbound trips and 543 are outbound. The rest are trips made outside of the campus. Table 3 presents the distribution of inbound and outbound trips by mode indicating the dominance of jeepney, a major paratransit mode.

Table 3. Distribution of Inbound and Outbound Trips by Mode

Mode	Inbound		Outbound	
	Trips	% share	Trips	% share
Walking	38	7.1%	59	10.9%
Biking	2	0.4%	1	0.2%
Own Car	120	22.4%	114	21.0%
Carpool	25	4.7%	52	9.6%
Tricycle	42	7.8%	19	3.5%
Taxi	12	2.2%	9	1.7%
TNVS	33	6.2%	31	5.7%
Train	2	0.4%	0	0.0%
Own Motorcycle	1	0.2%	1	0.2%
Jeepney	202	37.7%	209	38.5%
UV/FX	25	4.7%	19	3.5%
Bus	33	6.2%	28	5.2%
Other	1	0.2%	1	0.2%
	536	100.0%	543	100.0%

A clear indication of paratransit users in the sample is the magnitude of transfers. Table 4 and Figure 3 below show the frequency distribution of samples by number of transfers. It is quite clear that around half of the samples have 2 or more transfers in going to/out of the campus which is quite typical in Metro Manila.

Table 4. Frequency Distribution of Number of Transfers

Number of Transfers	Frequency	% Total
0	78	14.4%
1	220	40.5%
2	121	22.3%
3	66	12.2%
4	35	6.4%
above 5	23	4.2%
Total	543	100.0%

4. Exploratory Factor Analysis

A total of thirty-five (35) variables were captured in Section 3 of the Pilot Public Transport Survey. Table 5 presents the descriptive statistics.

Table 5. Descriptive Statistics of the Variables

Descriptive Statistics						
	N	Min	Max	Mean	Std. Dev.	Variance
Previous Evaluation (v1)	245	1	5	3.53	0.771	0.594
Seating Condition (v2)	245	1	5	3.5	0.722	0.522
Ease of Entry/Exit (v3)	245	1	5	3.21	0.898	0.807
Personal Space (v4)	245	1	5	2.54	0.921	0.848
Cleanliness (v5)	245	1	5	3.36	0.796	0.634
Emission (v6)	245	1	5	2.73	0.954	0.911
Ambient Noise (v7)	245	1	5	2.67	0.914	0.836
Inside Noise (v8)	245	1	5	2.89	0.916	0.839
Inside Temperature (v9)	245	1	5	2.42	0.983	0.967
Travel Time (v10)	245	1	5	3.08	0.918	0.842
Desirable Route (v11)	245	1	5	3.67	0.811	0.658
Smooth Travel (v12)	245	1	5	3.33	0.914	0.836
Safe Travel (v13)	245	1	5	3.42	0.978	0.957
Easy Payment (v14)	245	1	5	3.84	0.791	0.626
Affordable Fare (v15)	245	1	5	3.98	0.825	0.68
Driver Respects Passengers (v16)	245	2	5	3.62	0.717	0.514
Driver Skills (v17)	245	1	5	3.28	0.927	0.859
Driver Follow Rules (v18)	245	1	5	3.48	0.986	0.972
Driver Respects Others (v19)	245	1	5	3.62	0.872	0.76
Stops Visible (v20)	245	1	5	3.58	0.918	0.843
Stops Safe (v21)	245	1	5	3.24	0.939	0.882
Stops Accessible (v22)	245	1	5	3.76	0.774	0.599
Stops Accessible to PWD (v23)	245	1	5	3.16	0.975	0.951
Stops Known (v24)	245	1	5	3.6	0.925	0.857
Route Information (v25)	245	1	5	3.21	0.994	0.988
Operator Information (v26)	245	1	5	3.87	0.851	0.724
Jeepney Information (v27)	245	1	5	3.9	0.865	0.748
Weekday Availability (v28)	245	1	5	3.82	0.848	0.719
Weekend Availability (v29)	245	1	5	3.2	0.927	0.86
Daytime Availability (v30)	245	1	5	3.89	0.833	0.694
Nighttime Availability (v31)	245	1	5	2.86	1.000	1.000
Short Waiting Time (v32)	245	1	5	2.61	0.967	0.936
Frequent Arrival (v33)	245	1	5	3.06	0.998	0.997
Sufficient Capacity (v34)	245	1	5	3.09	0.958	0.918
Latter Evaluation (v35)	245	1	5	3.29	0.797	0.635
Number of Transfers	245	2	6	2.87	1.079	1.163

4.1 Test for the Suitability of Factor Analysis

To check for the appropriateness of factor analysis in the data, values from the Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of sphericity were obtained as shown in Table 6. The Kaiser-Meyer-Olkin measure of 0.891 indicates that factor analysis is suitable. On the other hand, the Bartlett test of sphericity of 0.00 also indicates that the variables are suitable for factor analysis.

Table 6. KMO and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin measure of sampling adequacy (KMO)		0.891
Bartlett's test of sphericity	Approx. Chi Square	3476.637
	df	528
	p-value	0.00

4.2 Factor Analysis

To identify the number of factors to be included in the study, the method of latent root criterion was used and only factor having eigenvalues greater than 1 is considered. Varimax rotation of factor loadings based on principal components was used to identify the variables associated in each factor and a cut-off value of 0.4 was used in order to extract the variables associated with each factor. Table 7 presents the factor loadings.

Table 7. Varimax Rotation of Factor Loadings

Variable	Factor						
	1	2	3	4	5	6	7
Seating Condition (v2)	0.409						
Ease of Entry/Exit (v3)	0.555						
Personal Space (v4)	0.550						
Cleanliness (v5)	0.497						
Emission (v6)	0.590						
Ambient Noise (v7)	0.673						
Inside Noise (v8)	0.597						
Inside Temperature (v9)	0.526						
Travel Time (v10)							
Desirable Route (v11)							0.553
Smooth Travel (v12)							0.433
Safe Travel (v13)		0.439					
Easy Payment (v14)		0.475					
Affordable Fare (v15)							
Driver Respects Passengers (v16)		0.517					
Driver Skills (v17)		0.655					
Driver Follow Rules (v18)		0.703					
Driver Respects Others (v19)		0.701					
Stops Visible (v20)				0.649			
Stops Safe (v21)				0.442			
Stops Accessible (v22)				0.692			
Stops Accessible to PWD (v23)				0.441			
Stops Known (v24)				0.681			
Route Information (v25)					0.418		
Operator Information (v26)					0.641		
Jeepney Information (v27)					0.641		
Weekday Availability (v28)						0.756	
Weekend Availability (v29)							
Daytime Availability (v30)						0.650	
Nighttime Availability (v31)			0.540				
Short Waiting Time (v32)			0.842				
Frequent Arrival (v33)			0.674				
Sufficient Capacity (v34)			0.444				

Table 8 shows the seven (7) extracted factors. Factor 1 (Vehicle Condition) relates to the overall condition of the jeepney vehicle. Factor 2 (Ride Comfort) captures the overall riding comfort of the travel. Interestingly, this factor lumps variables that measure the journey and payment experience, as well as, the characteristics of the driver. Factor 3 (Service Adequacy) captures the overall service adequacy in terms of nighttime availability, short waiting time, frequency of arrival and vehicle capacity. Factor 4 (Stops Accessibility) relates to the visibility, safety and accessibility of the stops. Factor 5 (Information Provision) captures the level of information provision concerning the route, operator and jeepney. Factor 6 (Service Availability) captures the level of availability of the service during weekday and daytime periods. This factor is expected as the users of the service are students who attend their classes during such periods. Finally, Factor 7 (Route Connectivity) captures the level of connectivity of the route in terms of route desirability and smoothness of travel.

Table 8. Factors Summary

Factor 1	**Vehicle Condition**
	Seating Condition
	Ease of Entry/Exit
	Personal Space
	Cleanliness
	Emission
	Ambient Noise
	Inside Noise
	Inside Temperature
Factor 2	**Ride Comfort**
	Safe Travel
	Easy Payment
	Driver Respects Passengers
	Driver Skills
	Driver Follow Rules
	Driver Respects Others
Factor 3	**Service Adequacy**
	Nighttime Availability
	Short Waiting Time
	Frequent Arrival
	Sufficient Capacity
Factor 4	**Stops Accessibility**
	Stops Visible
	Stops Safe
	Stops Accessible
	Stops Accessible to PWD
	Stops Known
Factor 5	**Information Provision**
	Route Information
	Operator Information
	Jeepney Information
Factor 6	**Service Availability**
	Weekday availability
	Daytime availability
Factor 7	**Route Connectivity**
	Desirable Route
	Smooth Travel

5. Structural Equations Modelling

5.1 Exogenous and Endogenous Constructs

The seven factors obtained from the exploratory factor analysis were all used as the exogenous constructs in the structural equations modelling. The endogenous construct used in the analysis is the overall quality of service where variables Previous Evaluation (v1) and Latter Evaluation (v35) are the observed variables associated in the construct.

The *lavaan*[5] R package was used in tandem with IBM SPSS AMOS to conduct structural equations modelling (SEM). Figure 5 shows the SEM plot. The results from both software packages were found to be very similar.

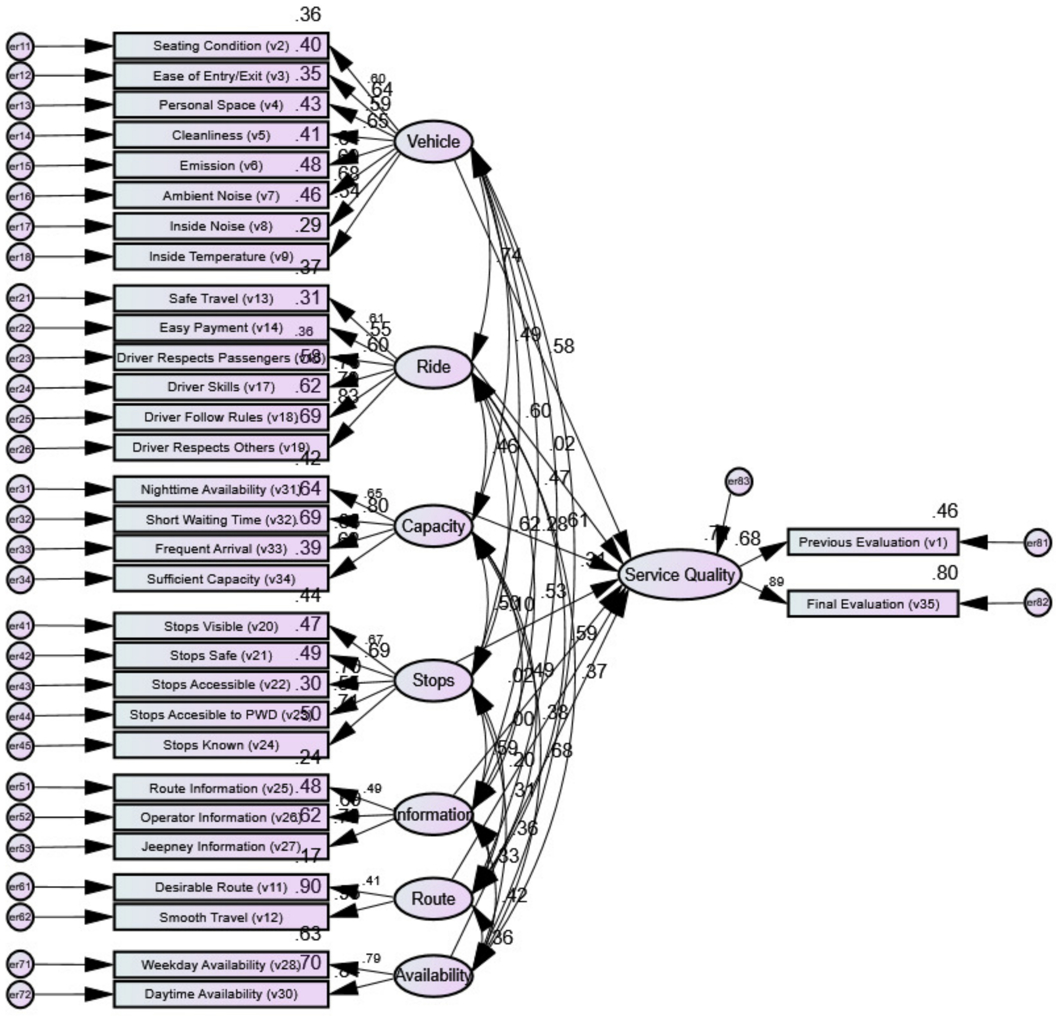

Figure 5. SEM plot

5.2 Goodness-of-Fit Tests

To assess the goodness of fit of the overall model, some measures were identified. Goodness of fit measures can be divided into absolute fit indices, incremental fit indices, and parsimonious fit indices. Absolute fit indices are a direct measure of how well the model specified by the researchers reproduces the observed data. In this analysis, measures that

[5] Yves Rosseel (2012). lavaan: An R Package for Structural Equation Modeling. Journal of Statistical Software, 48(2), 1-36.

were used are the Normed Chi-Square (Chi-square/df), Goodness of Fit Index (GFI), and the Root Mean Square Error of Approximation (RMSEA). The acceptable value for the normed chi-square should not be greater than 3 while the acceptable value for the RMSEA should not be greater than 0.08. Goodness of fit index ranges from 0 to 1 where values that are closer to 1 are more desirable. Incremental fit indices differ from the absolute fit indices in that they assess how well the estimated model fits relative to some alternative baseline model which is most commonly referred to as a null model. In this analysis, Normed Fit Index (NFI), Tucker-Lewis Index (TLI), and the Comparative Fit Index (CFI) are the measures that were used. Similar as with the goodness of fit index, the values of these indices range from 0 to 1 where values that are closer to 1 are more desirable. Parsimony fit indices is designed to provide information about which model among a set of competing models is best, considering its fit relative to its complexity. In this analysis, measures that were used are adjusted goodness of fit index and the parsimony normed fit index. Similar as with the previous indices mentioned, these indices range from 0 to 1 were values that are closer to 1 are more desirable. Table 9 presents the Goodness-of-Fit measures.

Table 9. Goodness-of-Fit Measures

Absolute Fit Indices	
Chi-square/df	1.736
Goodness of fit index (GFI)	0.825
Root mean square error of approximation (RMSEA)	0.055
Incremental Fit Indices	
Normed Fit Index (NFI)	0.772
Tucker-Lewis Index (TLI)	0.873
Comparative Fit Index (CFI)	0.887
Parsimony Fit Indices	
Adjusted goodness of fit index (AGFI)	0.793
Parsimony Normed Fit index (PNFI)	0.690

Table 10 shows the standardized factor loading of the constructs. From the seven factors that were identified, vehicle condition has the most effect on the overall quality of service followed by service adequacy.

Table 10. Standardized Factor Loading of the Constructs

Constructs	Standardized Factor Loadings
Vehicle Condition	0.581
Ride Comfort	0.022
Service Adequacy	0.282
Stops Accessibility	-0.097
Information Provision	0.021
Service Availability	0.197
Route Connectivity	-0.005

Table 11 shows the standardized factor loading of the construct items. From the factor that has the most effect on the overall quality of service which is vehicle condition, the variables that best explain this construct are ambient noise produced, inside vehicle noise, internal cleanliness and ease of entry/exit. For the ride comfort, the variables that best explains this construct is are related to the driver characteristics such as being respectful of other on the road, following traffic rules and regulations and having the necessary skills. For the service adequacy construct, the variables that best explain this are frequent arrival and short waiting time. For the stops accessibility construct, it is important that stops are known and visible at the same time. For the information provision construct, jeepney information is very important. In the local context, this is significant since commuters are always wary that the jeepney is operating legally. The service availability construct is explained by both daytime and weekday availability. The route connectivity construct is strongly explained by the smoothness of travel. Finally, the respondent's evaluation better explaining the overall quality of service is the latter evaluation where the respondents have already reflected on the service.

Table 11. Standardized Factor Loadings of the Construct Items

Constructs	Standardized Factor Loadings
Vehicle Condition	
Seating Condition	0.596
Ease of Entry/Exit	0.635
Personal Space	0.593
Cleanliness	0.653
Emission	0.643
Ambient Noise	0.690
Inside Noise	0.682
Inside Temperature	0.542
Ride Comfort	
Safe Travel	0.607
Easy Payment	0.553
Driver Respects Passengers	0.596
Driver Skills	0.763
Driver Follow Rules	0.788
Driver Respects Others	0.831
Service Adequacy	
Nighttime Availability	0.648
Short Waiting Time	0.800
Frequent Arrival	0.833
Sufficient Capacity	0.622
Stops Accessibility	
Stops Visible	0.666
Stops Safe	0.686
Stops Accessible	0.701
Stops Accessible to PWD	0.550
Stops Known	0.709
Information Provision	
Route Information	0.490
Operator Information	0.690
Jeepney Information	0.785
Service Availability	
Weekday availability	0.794
Daytime availability	0.837
Route Connectivity	
Desirable Route	0.411
Smooth Travel	0.951
Overall Service Quality	
Previous Evaluation	0.675
Latter Evaluation	0.895

6. Discussion

The conduct of exploratory factor analysis and structural equations modelling on the pilot survey data from UP Diliman produced acceptable models for evaluating the quality of service perceptions among paratransit users. A total of seven (7) exogenous constructs were identified and measured that explain the commuters' perception of paratransit quality of service. The findings of this study reflects the quality of service perception among paratransit users among UP Diliman respondents but this reflects that perception of typical commuters in Metro Manila. The insights generated can therefore be generalized to a larger area and provide practical implications to public transport planning and policy for the greater metropolitan area.

The foregoing work provides a good starting point for more innovative work in analysing quality of service evaluation among paratransit users. For one, further work on developing a quality of service index specifically for paratransit services will be pursued. Discrete choice modelling of preferences among paratransit users will also be explored. In the long term, there is a need to establish a paratransit quality of service indicator that takes into account the local context from both the users' and operators' perspective.

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