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We consider the problem of modelling perceived service quality and satisfaction in bus rapid transit (BRT)-type public transport systems. Our analysis is based on data derived from a benchmark BRT consumer satisfaction survey performed in eight different Latin-American cities in four countries (Brazil, Chile, Colombia, and Mexico), between 2013 and 2015. The main objective is to develop a structural equation model (SEM) to establish which attributes affect more significantly users satisfaction with the system. A secondary objective is to assess whether including more complex models such as latent class models (finite mixture models), yield more precise results. A tertiary objective is to compare the resulting latent class models across the cities, for differences that could result in different public policy recommendations.

Firstly, we review the state of the art in modelling perceived service quality and satisfaction of public transport systems. We highlight those studies that attempt to compare different cities with a single survey instrument to establish which are the most relevant attributes for explaining satisfaction, across cities. We also highlight studies that perform specific clustering of homogeneous groups within a heterogeneous population, particularly those using the SEM framework.

The benchmark survey instrument evaluated herein consists of specific items, such as satisfaction with accessibility, availability (frequency and location), reliability, easiness to transfer, comfort, customer service, user information, safety against theft and traffic accidents, ease to pay and, finally, a global satisfaction rating. The satisfaction ratings are given on a Likert-type scale from 1 to 5. Additionally, information is obtained from users regarding their socio-demographics and travel patterns, and also items regarding their attitudes towards the specific bus system, given also on a Likert-type scale.

Using a SEM approach, we regress the general satisfaction with the systems in each city with the specific attribute satisfaction items. We follow a three-step approach: (i) we regress the general satisfaction with the system for each city to determine which are the most important attributes in each city and across cities; (ii) for four of the eight cities, we have large enough sample sizes enabling us to model with a latent class approach. This allows us to classify subpopulations according to heterogeneity between groups regarding their specific response pattern (satisfaction decision). Afterwards, group membership can be attributed to differences in socio-demographic data and travel characteristics (e.g., gender, income, travel patterns, bus system characteristics, etc.), yielding more effective public policy-type information; (iii) for the resulting latent class models, across cities, we compare for differences amongst the different homogenous groups regarding their satisfaction decision rules and their specific group membership characteristics. This allows for comparison within each city and across cities regarding specific public policy recommendations.

In summary: we model the satisfaction with BRT-type systems, using two econometric techniques: SEM and latent class models. This allows us to establish which attributes are most relevant for users regarding their total satisfaction, in each city and across cities, generating a benchmark. Additionally, specific subpopulations are...
identified in each city regarding their satisfaction decision behaviour: the models incorporate socio-demographic and travel heterogeneity for specific group membership.

From the results, we can gain insight into how different BRT-type systems manage to fulfill user expectations (satisfaction) and provide policy recommendations regarding specific attributes to improve in each city, and across cities. Additional insights are explored regarding specific under-satisfied groups in each city, which can be used for providing specific public policy recommendations. Finally, we identify benefits from using the latent class models for modelling satisfaction with public transport.

**KEY REFERENCES**


