



Contents lists available at ScienceDirect

Transportation Research Part A

journal homepage: www.elsevier.com/locate/tra

Modelling service-specific and global transit satisfaction under travel and user heterogeneity

Jaime Allen^{a,*}, Juan Carlos Muñoz^b, Juan de Dios Ortúzar^b^a Department of Transport Engineering and Logistics, Pontificia Universidad Católica de Chile, Vicuña Mackenna 4860, Macul, Santiago 7820436, Chile^b Department of Transport Engineering and Logistics, Centre for Sustainable Urban Development (CEDEUS), Pontificia Universidad Católica de Chile, Vicuña Mackenna 4860, Macul, Santiago 7820436, Chile

ARTICLE INFO

Keywords:

Public transport
Structural equation modelling
MIMIC model
Consumer satisfaction surveys
Perceived service quality
Heterogeneity

ABSTRACT

Service provider administrators need to identify which perceived service quality (PSQ) elements are more relevant for users. By doing this, specific tactical and operational policies can be implemented to retain and attract new customers. In the public transport (PT) arena, few PSQ studies account for both service encounter and global satisfaction. Further, although some studies consider customer heterogeneity, we believe it has not been adequately captured. Regarding the problem of modelling PSQ from a PT service provider, we present a case study from Santiago, Chile. We analyse the PSQ derived from an extensive ($n = 25,094$) urban bus system satisfaction survey using structural equation models (SEM). Explicitly, we incorporate heterogeneity for both travel characteristics and sociodemographic attributes utilising a Multiple Indicator Multiple Cause (MIMIC) approach. We model two simultaneous regression equations regarding satisfaction with the bus-line (service encounter) being used and with the system (global), correcting for heterogeneity in all the satisfaction constructs via the SEM-MIMIC approach. Our main result is that the most critical variable for service encounter satisfaction is frequency/waiting time. For global satisfaction, the most significant attribute is tangibles/image, which includes satisfaction with the allied Metro service, with other users' behaviour, and with information availability. As the perceived waiting time affects all satisfaction constructs negatively, we consider it a critical policy variable to tackle. Our model can serve as a planning tool for any PT administrator. The framework applies to any service setting with independent service-specific and global satisfaction attributes.

1. Introduction

A central objective of any public transport (PT) administrator should be to provide a better level of service for its customers, to retain them and to attract new users, mainly from modes such as the private car. Recent literature has been prolific regarding the quantification of perceived service quality (PSQ) by PT users and attempting to discern which service attributes are more influential in determining global user satisfaction. For example, [de Oña and de Oña \(2015\)](#) summarise different approaches for evaluating service quality in the PT sector. Notwithstanding, we feel that the literature has not adequately captured the heterogeneity of travel conditions and sociodemographic characteristics of PT users. Additionally, very few studies have considered the service-specific satisfaction and the global satisfaction independently.

* Corresponding author.

E-mail address: jallen@uc.cl (J. Allen).

This paper focuses on an application in Santiago, Chile, taking advantage of recent interest by the authorities to improve the service quality delivered by *Transantiago*, the capital's integrated public transport system (Muñoz et al., 2008). Periodic surveys measuring users' satisfaction with its bus system component and information regarding users' type of travel and demographic data are analysed jointly here, to estimate the satisfaction with the specific service (bus-line) used by the respondents, and also their global satisfaction with the system. We use a structural equation multiple cause multiple indicator (SEM-MIMIC) modelling approach. When applied to PT systems, this novel methodology could help the authorities to prioritise resources for improving the system while taking into account users' travel heterogeneity.

Our work allows us to make the following contributions. First, we propose a complete structural equation model including two separate regressions for both *Bus-line Satisfaction* (service encounter) and *System Satisfaction* (global), for the bus component of an integrated public transport system, *Transantiago*. To the best of our knowledge, this is a novel approach that brings marketing concepts into the PT arena and allows for both bus-line and global PT system insights. The ability to correct for heterogeneity is fundamental in the model, which provides valuable information regarding how the different satisfaction latent constructs are perceived. The framework could be generalizable in any service setting where one can separate service transaction-specific and system attributes (Jones and Suh, 2000). In each case, the modeller would need to take into account user's sociodemographic and specific service encounter characteristics, to construct a MIMIC model.

Second, we introduce a three-step MIMIC model, including a measurement model, a MIMIC structural model, and a Mediation Analysis (MacKinnon et al., 2007) for PT satisfaction. We introduce the MIMIC model into the PT satisfaction paradigm to take into account various travel and user heterogeneities. A novelty, since current literature has not captured these elements adequately. We only found one previous study which used the MIMIC approach for modelling PSQ (Guirao et al., 2016). Our framework leads the way for future research studies to include heterogeneity into MIMIC models when utilising the SEM approach. The Mediation Analysis permits acquiring information on how primary policy variables affect *System Satisfaction*. Finally, we present the first SEM-MIMIC-Satisfaction application reported in the literature for a Latin American PT system.

The rest of the paper is organised as follows. Section 2 summarises the results of several literature reviews. First, we present an analysis of the theoretical framework of PSQ and user satisfaction in the service setting. Then, we offer a summary of contemporary research approaches regarding the search for relevant factors explaining users' satisfaction with PT systems, focusing on previous attempts to take into account heterogeneity. Last, we present a review of other essential aspects concerning satisfaction with PT, such as attitudes towards PT, growing mass transit markets. Section 3 offers a methodological review, briefly describing structural equation models, the MIMIC (Bollen, 1989) approach, and Mediation Analysis. In Section 4 we introduce our Case Study, we describe the Santiago case, specifically the *Transantiago* bus system, provide details about the sample, and the survey. In Section 5 we present the Model structure and results. Finally, in Section 6 we present the discussion, and in Section 7 we conclude with our most important findings, alongside key policy recommendations for the *Transantiago* administration.

2. Literature reviews

There are two different perspectives when modelling service quality and user satisfaction: *perceived quality* based on users' experience, and *expected quality*, which determines the users' expectations from a PT system (Bordagaray et al., 2014). In the marketing science literature, Miller (1977) found that when asked about expectations, customers elicited several different types of expectations, including expectations of ideal, minimum, predicted and normative performance. Therefore, depending on the type of expectation measured, different strengths of relationships with other constructs were found. Henceforth, in this research, we base our focus on perceived service quality (PSQ), which is also the most commonly used framework in the PT literature.

PSQ has been found to be one of the most important constructs in recent marketing literature (Laroche et al., 2004). It is a significant variable that correlates well both with customer satisfaction and value. PSQ indirectly measures how well the service delivery matches or exceeds customer's expectations. Hensher et al. (2003) note that as passengers may view specific aspects of service quality as positive or negative, the overall level of passenger satisfaction is best measured by how individuals evaluate the total package of services offered. The satisfaction level is an aggregate measure of perceived users' satisfaction with different aspects of the transport system (del Castillo and Benitez, 2012). Customer satisfaction is regularly measured using satisfaction surveys. In marketing, satisfaction ratings are considered means to strategic ends, such as repurchase behaviour and customer retention, that directly affect a firm's overall performance (Mittal and Kamakura, 2001). Customers' evaluations of service quality and their ratings of satisfaction offer critical inputs for developing marketing strategies (Ofir and Simonson, 2001).

Regarding service quality, Parasuraman et al. (1985) state three essential features: intangibility, heterogeneity and inseparability. Services are *intangible* because they involve performance rather than object creation. They are *heterogeneous* because their performance often varies from producer to producer, from customer to customer, and from day to day. Finally, the production and consumption of many services are indeed *inseparable*. Additionally, in PT systems, users are subject to natural perturbations in passenger flows and congestion, which vary by the hour, causing additional variability in the services provided.

PSQ is the degree and direction of discrepancy between consumers' perceptions and expectations. In their exploratory work with focus groups for different scenarios, Parasuraman et al. (1988) produced a multiple-item scale instrument (SERVQUAL) to assess PSQ under different service settings. They reported five main dimensions: tangibles, reliability, responsiveness, assurance, and empathy. The objective of their instrument was to determine the relative importance of these dimensions in influencing customers' overall quality perceptions. When the original SERVQUAL experiment took place, "a striking result" reported by the authors was that *reliability* was consistently the most critical dimension and *assurance* the second.

We frame our application on the relationships between the concepts of sacrifice, PSQ, service value, and satisfaction. Cronin et al.

Download English Version:

<https://daneshyari.com/en/article/6780205>

Download Persian Version:

<https://daneshyari.com/article/6780205>

[Daneshyari.com](https://daneshyari.com)