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The relationship between young people's transit use and their perceptions of equity concepts in transit service provision

Sigal Kaplan [a,*], João de Abreu e Silva [b], Floridea Di Ciommo [c]

[a] Department of Transport, Technical University of Denmark, Bygningstorvet 116B, 2800 Kgs. Lyngby, Denmark
[b] Instituto Superior Técnico of Lisbon, Portugal
[c] Universidad Politecnica de Madrid-TRANSyT, Spain

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ABSTRACT

This study investigates the effect of price and travel mode fairness and spatial equity in transit provision on the perceived transit service quality, willingness to pay, and habitual frequency of use. Based on the theory of planned behavior, we developed a web-based questionnaire for revealed preferences data collection. The survey was administered among young people in Copenhagen and Lisbon to explore the transit perceptions and use under different economic and transit provision conditions. The survey yielded 499 questionnaires, analyzed by means of structural equation models. Results show that higher perceived fairness relates positively to higher perceived quality of transit service and higher perceived ease of paying for transit use. Higher perceived spatial equity in service provision is associated with higher perceived service quality. Higher perceived service quality relates to higher perceived ease of payment, which links to higher frequency of transit use.

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1. Introduction

Growing numbers of consumers are increasingly concerned about fairness for themselves as well as others through socially responsible consumption (e.g., Arnot et al., 2006; Reinstein and Song, 2012; Webb et al., 2008). Evidence shows that customer loyalty, willingness to pay and purchase intentions are associated with perceived fairness, because consumers are willing to pay higher prices, associate higher quality and switch to products that are linked to social corporate responsibility and fair trade (e.g., Martin et al., 2009; Reinstein and Song, 2012; e.g., Lotz et al., 2013). Moreover, consumers are willing to punish firms for perceived unfair prices (Schein, 2002) and socially irresponsible behavior (Arredondo Trapero et al., 2010). Consumers' consideration of fairness grows stronger in times of economic recession due to increasing frustration over salary erosion and need to face higher prices and shrinkage of products and services (Ferguson, 2014).

Perceived fairness is also highly relevant to the implementation of transport policies. Studies from the last decade show that perceived fairness relates to the acceptability of road pricing schemes and that the findings are replicated across countries in Europe, United States and Asia (Viegas, 2001; Fujii et al., 2004; Cools et al., 2011; Di Ciommo et al., 2013; Kim et al., 2013). A recent study in Scandinavia found fairness relevant to the implementation of safety policy measures (Eriksson and Bjørnskau, 2012). Two studies investigated the role of price fairness in the context of transit: Eriksson et al. (2006) found that fairness relates positively to the acceptability of reduced fair prices in transit in Sweden; Drevs et al. (2014) found that in Germany information about transit subsidies lead to higher willingness to pay.

This study focuses on the effect of perceived fairness (i.e., horizontal equity) and corporate social responsibility in spatial service provision (i.e., spatial equity) on habitual transit use. We address price and travel mode fairness. Price fairness is defined according to Xia et al. (2004) as individual feelings while considering price acceptability and justifiability. Price acceptability results from the individual's internal comparison of a price of a product or service to the reference price of the individual's comparable others (e.g., a reference population group with whom the individual finds similarities, identifies, or compares him/herself). Price justifiability results from the price difference between the price paid by the individual and the reference group. Individuals may have multiple internal reference groups and prices, latent or observed, and these reference groups and prices may vary across individuals. The reference price may be explicit, reflecting an observed price, or implicit, reflecting norms or beliefs (Xia et al., 2004). Within the transport context, travel time is a

* Corresponding author. Tel.: +45.45256559.
E-mail address: siga@transport.dtu.dk (S. Kaplan).

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highly valued resource and hence in this study we suggest to explore travel mode fairness in an analogous manner to price fairness. Travel mode fairness in this study refers to the perceived travel time by transit in comparison with travel time by car between the same origin and destination as the reference travel mode. Corporate social responsibility (CSR) can be defined as the consideration by companies of the effects of their actions on relevant others (e.g., customers, community), their commitment to improving the well-being of their customers, and their actions towards maximizing long-run societal benefits (Webb et al., 2008). As a measure of CSR in the transport sector, we propose spatial equity in service provision to the population of young people across the metropolitan area, because the consideration of social impacts and distributional effects by transit operators fundamentally relates to the quality of life and the social well-being of individuals and communities in urban and peripheral areas (e.g., Geurs et al., 2009; Jones and Lucas, 2012).

We investigated six hypotheses regarding the effect of price fairness, travel mode fairness, and spatial equity in transit provision, on the perception of transit service quality, willingness to pay and habitual frequency of use. Framing the analysis within the theory of planned behavior (TPB), we developed a custom-designed web-based questionnaire for data collection. The questionnaire elicited the frequency of transit use, individual socio-economic characteristics, and latent variables comprising attitudes, subjective norms and perceived difficulties associated with transit use. The attitudes related to the perceived price fairness, travel mode fairness compared to the car, and equity in transit between north and south and between metropolitan core and periphery. The subjective norms referred to car-, transit- and bicycle-oriented behavior of family and friends. The difficulties were associated with service quality (e.g, availability, frequency, operating hours, comfort), lack of personal security, and difficulties associated with the monetary burden of paying for transit.

The survey was administered among university students in Copenhagen and Lisbon to explore the transit perceptions and use by young people under various economic and transit provision conditions. In Portugal, the on-going recession is imposing a significant economic burden on young people in their twenties, who are among the most affected people by the economic crisis with high unemployment. Transit prices have increased dramatically in the last two years, the concessionary fares for teenagers and elderly have been canceled, and the supply has suffered significant reductions in frequencies and operating hours, in particular in the evening and early morning. Combined with high unemployment rates and reductions in the households' available income, this has resulted in heavy transit patronage in the Lisbon Metropolitan Area decreasing by 15% in the first trimester of 2013, continuing a trend from 2011. In Denmark, the economic crisis had a lesser effect on young people, concessionary fares are available for elderly and adolescents, and the transit provision is relatively equitable in terms of connectivity across the metropolitan area (Kaplan et al., 2014). Nevertheless, transit prices are relatively high, some areas where students reside suffer from connectivity gaps (Kaplan et al., 2014), and re-organization processes have led to a reduction of direct bus services in peripheral areas. According to national statistics, about 25% of the young Danes in their twenties travel to work by transit (Sigurdardottir et al., 2013).

The current study is free from the limitations of its predecessors. Firstly, the two aforementioned studies on fairness in transit provision investigated stated preferences in reaction to hypothetical scenarios describing a favorable policy, which are susceptible to incentive compatibility bias and strategic response bias (Wang et al., 2007). Instead, we elicited revealed preference of actual transit use frequency and perceived burden associated with actual transit expenditure, which are bias free. Secondly, previous studies disregarded the comparative nature of fairness, which refers to consumers' feelings as the result of a price comparison to explicit reference price of comparable others or to implicit price reflecting norms or beliefs (Xia et al., 2004). This study acknowledges the comparative nature of fairness in the design of the questionnaire items as comparative statements referring to reference population groups and transport modes. Thirdly, previous studies disregarded also the difference between fairness to oneself and for others, both translating into consumption patterns and preferences, as consumers begin to consider the public consequences of their actions and their ability to induce social change through their purchasing power (Xia et al., 2004; Webb et al., 2008). This study addresses price and travel mode fairness to one self, as well as equity in spatial transit provision for others. Last, previous studies considered only the monetary dimension, while this study accounts for the multiple dimensions influencing transit choices including prices, travel time, service quality and personal security.

The remainder of the paper is organized as follows. Section 2 focuses on methodological issues, namely the conceptual framework, the research hypotheses and the model estimation. Section 3 concentrates on data issues, including survey design, administration and sample characteristics. Section 4 describes the empirical results of the model estimation and Section 5 draws the conclusions.

2. Methodology

2.1. Research hypotheses

The behavioral framework to explore the research hypotheses on the relationship between perceived equity and transit use by young adults is loosely built upon the TPB (Ajzen, 1991), due to its established behavioral support in a wide variety of behaviors (e.g., Armitage and Conner, 2001). According to the TPB, favorable attitudes, perceptions and subjective norms, as well as greater perceived behavioral control (ease) of conducting the behavior, lead to stronger intentions to perform the behavior. These intentions will eventually transform into observed behavior, provided the availability of resources and the ability to choose one's own behavior. The TPB has been previously confirmed applicable for describing transit use intentions (e.g., Farag and Lyons, 2010; Chen and Chao, 2011). In this study, the TPB's attitudinal constructs comprise fairness (i.e., perceptions of horizontal equity) and CSR (i.e. perceptions of spatial equity), the perceived behavioral control consists of perceived service quality, personal security, and payment ease, the subjective norms include both pro-car and pro-bicycle norms, and transit use frequency serves as an indicator for habitual transit use behavior.

This study postulates that two equity concepts may have an impact on the decision to use transit. These concepts are fairness and corporate social responsibility (CSR), known to influence consumer satisfaction and purchase intentions of products in other industrial sectors (Xia et al., 2004; Webb et al., 2008). Previous empirical findings from other industrial sectors show that fairness perceptions explain consumer satisfaction, favorable attitudes towards the supplier (e.g., Webb et al., 2008), willingness to pay for goods or services (e.g., Chung et al., 2011), and eventually purchase intentions (e.g., Schein, 2002). Accordingly, we postulate three hypotheses about the linkage between fairness and transit use:

*H*1: Higher perceived price/travel mode fairness positively relates to higher perceived quality of transit service.
*H*2: Higher perceived price/travel mode fairness positively correlates higher perceived ease of monetary expenditure on transit use.

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