Understanding transantiago users' motivations for paying or evading payment of bus fares

Carolina Busco^{a,*}, Felipe González^a, Yamil Jaqueih^a, Felipe Jiménez^a, Borja Alonso^b

^a Diego Portales University, Santiago de Chile, Chile

^b University of Cantabria, Santander, Spain

ARTICLE INFO

Keywords:

Consumer misbehavior

Fare evasion

Transantiago

Public transport

Factor analysis

Behavioral and social norms

ABSTRACT

Transantiago, the public transport system implemented in Santiago, Chile, remains a controversial subject of public debate due to constantly increasing fare evasion rates throughout its decade-long existence. The research question under consideration in this paper is what motivates individuals to evade or pay bus fares. To answer this question, we developed a multidisciplinary study that combined relevant engineering expertise with a sociological perspective and combined quantitative analyses with qualitative methodologies to include new variables and categories that previous studies on the subject have omitted. We formulated a survey, which was administered to 503 public transport system users. The data we obtained were analyzed using a factor analysis. As a result, six dimensions were identified that explain motivations for fare evasion: (1) behavior and social norms, (2) the public transport service's image, (3) social acceptance of evasion, (4) trip planning, (5) anti-evasion methods, and (6) fear of law enforcement.

Introduction

An important aspect of today's economy and market interaction is *consumer misbehavior*, which can be defined as behavioral acts by consumers that violate the generally accepted norms of conduct in consumption situations, disrupting the social order (Fullerton and Punj, 2004). The literature identifies a wide variety of consumer misbehavior patterns (Mazar et al., 2008; Daunt and Harris, 2011; van Jaarsveld et al. 2015; Cai et al., 2018). This research further explores a specific but widespread example present in Transantiago (renamed Red Metropolitan Mobility Network in March 2019), the public transport system in Santiago, Chile, where avoiding bus fare payment has become normal. This provides the potential for analysis that goes beyond individual decision making to investigating fare payment evasion as a social phenomenon.

Transantiago's 2007 inception was aimed at a complete transformation of the city's method of organizing buses and other public transport services. Some changes involved integrating the bus system with the Santiago Metro service, but the process entailed a variety of other adjustments, including the creation of operating companies to provide trunk and feeder services; the implementation of a fare-payment method by touchless smart card—the so-called Bip! card—to facilitate a swifter process; and, consequently, the imposition of a restricted role for drivers that discharged them from their duties as fare collectors, responsible for ensuring payment from each customer (Muñoz and Gschwender, 2008). The past decade's redefinition of the system has improved its efficiency, as well as user evaluations of the service (Muñoz et al., 2014); nevertheless, Transantiago's

management still lacks social approval (Adimark, 2017) and fare evasion rates continue to increase. According to official data collected by the Metropolitan Public Transport Directory (DTPM), when Transantiago initially launched, the incidence of fare evasion ranged from 11% to 16%. Although these rates have varied over time, the phenomenon has been on the rise, reaching 35% in 2016 and an average of 27% between 2017 and 2019.

To date, the authorities' response to fare evasion has been oriented toward criminalizing the act; they have focused on proposing control measures intended to minimize the associated economic loss. From the public transport users' perspective, the main problem involves service frequency (DTPM 2017). While most users regard evasion as a dishonest act with harmful consequences for other passengers, opinions diverge regarding the extent to which it is acceptable on certain occasions or even constitutes a valid mode of protest.

On one hand, this phenomenon has become more than mere rule-breaking; it has evolved into a problem concerning social order in which individuals no longer perceive the licit act as the only legitimate mode of conduct. In accordance with this diversification of social expectations (Luhmann, 2004), the current research is also aimed at broadening the scope of observation as it affects public transport users; as such, it focuses not only on fare evaders, but also on the perceptions of those who regularly pay for transportation. Consequently, the research question is: What motivations are involved in determining whether users evade or pay bus fares? The assumptions underpinning this question are that evasion within the Transantiago system is a social phenomenon, so the attendant explanation

* Corresponding author.

cannot be limited to an account of individuals' simple economic interests and the incentives and disincentives authorities can impose.

To answer the question raised above, we developed a multidisciplinary study that combined relevant engineering expertise with a sociological perspective, as well as quantitative analysis with qualitative methodologies, to facilitate the inclusion of new variables that previous studies on the subject omitted. Given that our main objective is to identify the motivations that drive the actions of evaders and non-evaders, we first present a framework that identifies the social norms related to evasion and non-evasion, Transantiago's image, travel characteristics, structural aspects, control measures, users' behavior, and sociodemographic characteristics.

Two main contributions can be highlighted in this research. First, the inclusion of non-evaders enables us to better understand the phenomenon and avoid stigmatizing evaders. Although some authors have included non-avoidant users in the analysis (Delbosc and Currie 2016a, Currie and Delbosc, 2017), we enrich their vision by considering non-evaders as part of a social context influenced by acts of protest against inequity, affecting the acceptance of the official rule. In this case, non-evaders perceptions can help us understand why evaders don't resist their misbehavior. Second, we developed a methodology that starts with a qualitative phase to explore new elements that were not considered in previous studies, such as social norms and social acceptance of fare evasion. Although this is a common methodological strategy in scientific research, local authorities and researchers have focused only on the transport system's structural aspects, such as the number of bus doors or the presence of turnstiles, as well as control measures, such as the number of inspectors or fine prices. None of the measures suggested and implemented have diminished Transantiago's fare evasion problem, so decision-makers need new elements to consider in order to reduce economic losses. Finally, both arguments have methodological consequences beyond the classic microeconomic model that has prevailed in the analysis of Transantiago's evasion problem, and both allow the stakeholders involved in the decision-making process to observe the phenomenon from a different perspective.

During the editing process of this paper, a social crisis of great magnitude in Santiago de Chile—and then throughout the country—began with users' reaction to the rise in public transport fare. Riders, organized for years through social networks, called for evading the metro ticket, a transport mode that until then had presented low levels of evasion.

This research aims to understand the different motivations behind the act of paying or not paying the bus fare within the Santiago de Chile public transport system. As a case study, it allows readers to observe a radical evasion phenomenon and witness how—in certain poorly managed circumstances and along with certain social characteristics—evasion can become a complex issue associated with a problem of social legitimacy (Suchman, 1995). This paper demonstrates that given this complexity, the problem will not be resolved by improving specific aspects of the travel experience. Public transport is not an isolated system, but a function imbedded in society that is perceived within a social context. In this specific case, public transportation is associated with elements of protest or contentious actions that are rooted in a feeling of inequity. Although this contextual characteristic is difficult to replicate, this research proposes a more comprehensive approach to a consumer misbehavior problem that any public transport system may face and emphasizes the importance of viewing that problem through a social perspective to unveil its complexity.

Theoretical background

Fare evasion, as an example of consumer misbehavior, afflicts every public transport system worldwide and creates several uniform disadvantages such as loss of income, detrimental impacts on the public transport system's corporate image, damage to the quality of the service provided, and an increased public sense of insecurity (Bonfanti and Wagenknecht, 2010; Reddy et al., 2011).

In the literature, various approaches can be identified to study fare evasion in public transport. According to Delbosc and Currie (2019), three approaches include the conventional transit system perspective, the customer profiling perspective, and the customer motivations perspective. In Barabino et al. (2020), the classification is extended to five main areas: fare evader-oriented, criminological, economic, technological, and operational. None of these develop a social perspective that understands public

transport as part of an overall system such as a city or society, nor question how public transport's function is being fulfilled within this overall system.

Most studies on fare evasion have focused on explanations related to macroeconomic issues and existing infrastructure by estimating econometric models. Their methodologies are usually based on surveys administered to onboard users or historical information about fare evasion, and they explain the phenomenon using variables such as operational factors, bus characteristics, and the presence of barriers (Dauby and Kovacs, 2007; Barabino et al. 2014; Sasaki, 2014; Guarda et al. 2016b; Tirachini and Villanueva, 2016; Troncoso and de Grange, 2017; Cools et al., 2017). In terms of existing infrastructure that favors evasion, studies indicate that more evasion occurs on buses with more doors, higher occupancy rates, and during rush hour (Lee, 2011; Guarda et al. 2016a; Guarda et al. 2016b).

On the other hand, the operators' contract characteristics constitute another relevant factor, revealing that the absence of economic incentives favors evasion (Torres-Montoya, 2014). Payment system design also has a direct impact, as proof-of-payment public transport systems—such as Transantiago—are more vulnerable to fare evasion (Dauby and Kovacs, 2007). Systems with enter barriers—adopted by most metro systems and currently by some bus operators in Santiago—provide fewer opportunities for evasion (Reddy et al., 2011). However, each payment system has an impact on costs that must be considered (Sasaki, 2014; Welde, 2012; Tirachini, 2011).

Another well addressed point in the literature corresponds to the inspection levels necessary to reduce fare evasion rates. In general, higher inspection rates and higher fines discourage evasion (Dauby and Kovacs, 2007; Killias et al., 2009; Tirachini and Villanueva, 2016); however, there are situations where these measures do not have such a clear effect (Clarke et al., 2010; Buehler, Halbherr, and Lechner, 2017). Some researchers have formulated optimization models to determine the most efficient control levels by using information sources such as the probability of an evader being monitored, the monetary value of the fine, and the user's level of risk aversion (Barabino et al., 2013, 2014; Barabino and Salis, 2019; Guarda et al. 2016a). In this same line of research, other investigations have proposed models for optimizing fare inspection strategies in transit networks based on bilevel programming or attacker-defender Stackelberg security games (Correa et al. 2017; Delfau et al., 2018; Delle Fave et al. 2014).

As mentioned in Currie and Delbosc (2017), two assumptions can be identified in most of the aforementioned studies: first, fare evasion includes any circumstance in which the traveler was able to pay but did not do so, and second, such evasion was deliberate. Few studies consider fare evasion as consumer misbehavior. Instead, they focus on identifying categories such as types of evasion, main attributes of evaders, and the reasons why people evade payment (Suquet, 2010; Bucciol et al., 2013; Barabino et al., 2015; Delbosc and Currie 2016a; Delbosc and Currie 2016b; Currie and Delbosc, 2017; Salis et al., 2017; González et al., 2019). Currie and Delbosc (2017) made the most meaningful efforts to understand why people evade, developing two models to explain deliberate and unintentional public transport fare evasion in Melbourne, Australia. They concluded that attributes associated with honesty, ease of evasion, and permissive attitudes toward evasion were key factors that explain deliberate evasion. In the case of unintentional evaders, honesty and permissive attitudes were likewise significant, though "ticketing competence" also affected these evaders.

According to the economic model of human behavior, people pursue dishonest acts consciously and deliberately by making trade-offs between the expected external benefits and the costs of the dishonest act (Becker, 2000; Allingham and Sandmo, 1972). However, fare evasion cannot be explained solely by a cost-benefit analysis. Mazar et al. (2008) concluded that people engage in dishonest behavior to benefit from it, but they want to maintain a positive view of themselves as honest individuals. Likewise, Erat and Gneezy (2011) studied when and why it is important for individuals to choose to lie in the context of an economic and social interaction. They concluded that aversion to lying cannot be explained with the theory of guilt based on monetary consequences. Instead, they showed that a person's beliefs in a given context affect aversion to lying and explain guilt.

Daunt and Harris (2011) found that consumer misbehavior can be explained by personality and sociodemographic factors, but these connections are not direct. Instead, these variables explain future misbehavior indirectly through consumers' past misbehavior. The authors found that past experiences of consumer misbehavior are associated with future misbehavior intentions, and that gender—among other variables—plays an important role in determining individuals' ethical perceptions. Male customers are more likely to have engaged in past consumer misbehavior

than females. This tendency can also be observed in some public transport systems. [Buccioli et al. \(2013\)](#) used survey data from the bus system in Reggio Emilia, Italy, and concluded that there is a greater probability that young non-European men will not carry a valid ticket. A similar analysis performed by [Barabino et al. \(2015\)](#) for the bus system of Cagliari, Italy, found that young men under 26 years of age with low education levels, unemployed or student status, and no alternatives to taking the bus were likelier to evade payment.

Finally, several studies have shown that climate and ethical culture are important predictors of the frequency of unethical acts within groups and organizational environments ([Loe et al., 2000](#); [Ford and Richardson, 2013](#)). [Gino et al. \(2009\)](#) concluded that people react to others' unethical behavior, and those reactions depend on their own social norms as well as the individual relevance assigned to dishonesty. In addition, they suggested that peer influence is an important factor in the explanation of unethical behavior and observed that, under certain conditions, dishonest behavior can be contagious. In that sense, another consequence of evasion could be that it leads non-evaders to change their behavior, due to this effect on others.

Methodology

This study's research design can be described as exploratory, quantitative–qualitative, transversal, non-probabilistic, and empirical. It is exploratory because it seeks to identify new elements that were not previously referred by the literature. A good way to accomplish this is by using qualitative techniques that are then complemented by a quantitative phase that allows for statistical analysis. It is a transversal, non-probabilistic, and empirical design because the data were collected in a limited period of time (July 18) using a sample based on a strategic selection and therefore cannot allow for a probabilistic analysis. [Fig. 1](#) illustrates the research process and each step's output.

The qualitative phase was developed to identify new elements involved in Transantiago's fare evasion problem. Four focus groups held during May 2018 included 27 university students who were assigned to the following groups: users who never evade fares and consider evasion wrong, users who evade fares occasionally and consider evasion correct in specific cases, individuals who usually evade, and users who always evade fares and justify it. Student selection was conducted through an online questionnaire in which students were asked how they described themselves in terms of fare evasion. Groups were composed of six to seven students from different schools and gender, and conversations lasted between 70 and 90 min. The set of 10 questions were related to three general dimensions: vision of Transantiago and evasion, perception on specific aspects of the travel, and expectations of public transport.

One of the conclusions drawn from this qualitative approach was that the evasion phenomenon encompasses a broad spectrum of behaviors based on the degree of intention to evade, consistent with what [Delbosch and Currie \(2016b\)](#) and [Suquet \(2005\)](#) reported. Although most focus group participants considered fare evasion wrong, many thought it was justifiable for a large segment of the population, such as senior citizens, children, students, and people with low incomes. In some cases, this social justification has ideological and political bases, but in most circumstances, individuals offered a moral justification based on socioeconomic inequities.

Finally, using the information gathered from the focus groups and literature review, we developed a preliminary conceptual map ([Fig. 2](#)) where the seven inner boxes represent the dimension that would explain motivation (social norms; image of public transport system; travel characteristics; structural aspects of the system; control factors; user's behavior; and sociodemographic characteristics), and each dimension is composed of several variables that allow their operationalization (smaller boxes). For example, one dimension that could explain evasion is the perceived image of public transport, which in turn would be influenced by the perception of the safety and quality of public transport, the image that the group closest to the user may have, or the satisfaction that users have with the service. In the same way, the behavior of users could also explain evasion, which in turn would be determined by the attitude toward evasion, the levels of planning before traveling, and the ideology that users may have regarding evasion.

From this conceptual map, a survey was created to collect quantitative data containing 61 items that were further divided into three sets of questions. The first set requested traveler data, including 10 items: age, type of work or activity, type of contract, city district in which the traveler

resides, purpose of the journey, duration of the journey on the current bus, how many days of the week the traveler uses Transantiago buses, whether the traveler also uses the metro during this journey, whether the traveler has an alternative to the bus, and which alternative that is. The second set contained 42 items related to the phenomenon of evasion that could be answered using a Likert scale of four values ranked according to level of agreement (strongly disagree, disagree, agree, strongly agree) and a fifth alternative when items did not apply. A complete list of the questions is included in Appendix Table A1.

The third set of questions encompassed items recorded by observers: bus operator, route, number of bus doors, and presence of a turnstile. In addition, respondents provided observable data about the user such as gender, nationality (Chilean/other), whether the user evaded the fare when boarding the bus, the tactic used to evade (e.g., boarding the bus using the back door, asking for permission but not paying the fare, using a Bip! card that is out of funds), whether the user boarded the bus at a pay zone, and the city district in which the user boarded the bus.

The sample was selected strategically using a simple procedure. First, given that the purpose of this methodological approach was to understand both evasion and non-evasion, official data from DTPM listing the bus routes with the lowest to the highest evasion rates were grouped into quintiles. From the 50 routes selected for the sample, 48% of the buses boarded by the survey team belonged to the routes of the first quintile (lowest evasion rates) and the other 52% belonged to fifth quintile (highest evasion rates). Once on the bus, researchers observed user behavior—fare payment or fare evasion—and after recording the behavior on the questionnaire, approached users over 18 years old to collect the additional information. Since the evasion behavior was observed and not asked of the respondent, evaders did not perceive the questions as judgmental and openly answered them. This methodology allowed for observation-based precision concerning traveler behavior. Therefore, the assumption implied in this methodology is that the individual who was observed not paying the fare is considered an evader, regardless of whether that evasion was circumstantial or not.

The data collection occurred during July 2018, between 9:00 a.m. and 6:00 p.m., and before starting with each questionnaire, subjects were introduced to the study's purpose and asked to sign an informed consent (previously approved by the ethics committee of the Diego Portales University, Santiago, Chile). After the pilot experiment, researchers facilitated the process by providing travelers with the Likert scale answers on a sheet of paper for them to see, while the research team asked each question and recorded the responses. This technique was much faster, allowing survey completion in 12 min. The main difficulty encountered in applying the survey instrument was the duration of the journey. When rides were short, surveys were incomplete and consequently had to be discarded.

A total of 503 valid surveys were obtained, of which 253 were completed by evaders and 250 were completed by non-evaders. The total valid respondents are approximately 75% of the users approached by researchers. [Table 1](#) presents the descriptive summary of the sample.

Results and discussion

The answers to the 42 items answered with the Likert scale were used for the factor analysis. The database was tested with the Kaiser-Meyer-Olkin measure (KMO) of sampling adequacy and Bartlett's test of sphericity to verify the pertinence of this information reduction technique. Nine items were discarded from the analysis since they presented low communality. KMO shows a value of 0.92, indicating high correlations, and Bartlett's test yielded a significance value less than 0.05.

From the database analysis, the six factors were selected that together explain 58% of the variance in the data, thereby allowing for the construction of a new conceptual map, simplifying the number of variables for further research. The six factors analyzed (including each percentage of explained variance) were: (1) behavior and social norms (30%); (2) the public transport service's image (10%); (3) social acceptance of evasion (6%); (4) trip planning (5%); (5) anti-evasion methods (4%); and (6) fear of law enforcement (3%).

The percentage of explained variance does not appear as relevant in literature for factor selection in an exploratory factor analysis. The main element considered in bibliographical references is Kaiser's rule, which establishes the retention of factors having eigenvalues from the unreduced correlation matrix that are greater than 1 ([Pituch and Stevens, 2016](#); [Yong](#)

Fig. 1. Methodological process.

Fig. 2. Motivation to fare evasion/payment initial conceptual map.

and Pearce, 2013). This is the case for all six factors selected for this study. Another pertinent parameter is the factor loading (the factor loadings matrix is presented in Appendix Table A2), expecting that in social sciences items strongly conform a factor when communalities are between .40 and .70 (Costello and Osborne, 2005), but it is acceptable even from .30 (Pituch and Stevens, 2016). According to the latter, only the trip planning factor would be weak, showing correlations between .30 and .40. Nevertheless, trip planning appears as relevant to the research question (Yong and Pearce, 2013) and conceptually coherent (Pituch and Stevens, 2016), showing important information for policy makers, and enlightening further research.

Table A1 in the Appendix shows the calculation of means and standard deviations for each of the 42 items and differentiates between

evaders and non-evaders. While it is possible to distinguish differences of opinion within each category of users, an aggregate analysis focusing on the proposed dimensions was chosen for this study. The research team also included a mean difference test and developed a boxplot for each item and dimension (see Figs. A1–A6 in the Appendix).

Behavior and social norms

This dimension explains 30% of the variance in the data and meaningfully facilitates an improved understanding of evasion as a social phenomenon that cannot be adequately explained only as an

Table 1
Descriptive Summary of the Sample.

Characteristics	Evaders %	Non-evaders %	Sample %
<i>Gender</i>			100%
Men	57%	43%	51%
Women	44%	56%	49%
<i>Nationality</i>			100%
Chilean	51%	49%	95%
Foreign	42%	58%	5%
<i>Age (years)</i>			100%
< 19	79%	21%	13%
20–29	51%	49%	41%
30–39	51%	49%	20%
40–49	49%	51%	13%
50–59	19%	81%	10%
60–more	25%	75%	3%
<i>Activity</i>			100%
Employee	41%	59%	51%
Unemployed	65%	35%	8%
College student	50%	50%	22%
School student	58%	42%	8%
Housewife	66%	34%	10%
Retired	52%	48%	1%
<i>City District Living</i>			100%
West	61%	39%	34%
South East	48%	52%	25%
North	54%	46%	13%
East	19%	81%	11%
South	54%	46%	10%
Center	44%	56%	7%
<i>Travel Time (minutes)</i>			100%
< 20	50%	50%	40%
20–40	54%	46%	45%
40–60	39%	61%	11%
> 60	40%	60%	3%
<i>Travel Purpose</i>			100%
Work	36%	64%	30%
Study	43%	57%	6%
Other	58%	42%	64%
<i>Use Metro</i>			100%
Yes	33%	67%	37%
No	60%	40%	63%

individual or illegal act. Therefore, evasion can also be understood as a conduct that is subject to evaluation, whether positive or negative, from the perspective of social norms, which are defined as tacit agreements under the control of peers (Luhmann, 1985).

Table 2 shows the items and factor loadings related to this dimension and the percentage of agreement between evaders and non-evaders regarding each item. One of the most enlightening elements relates to values, such as honesty, respect, and responsibility, and items associated with the moral evaluation of a conduct, which go beyond its definition as

legal or illegal acts. This dimension also refers to specific behaviors when using public transport, such as using the Bip! card when boarding a bus or keeping available funds on the card, but focuses on the significance attached to those acts. Beyond an individual definition, this dimension indicates that public transport fare evasion is a social act, as it is observed, evaluated, and approved of or punished by others.

For example, regarding the item that reflects the strongest correlation in this dimension, “Evasion is a dishonest act,” 43% of those who did not pay the fare agreed with that statement, demonstrating a rejection of conceiving of evasion as a dishonest act. By contrast, 90% of those who paid the bus fare agreed with the statement. Regarding the item “Evasion is disrespectful,” 39% of evaders agreed, compared with 85% of non-evaders.

The data presented in Table 2 allow us to infer that, with regard to a normative evaluation of bus fare payment, there were significant differences between users who paid the bus fare and users who did not. This situation can be applied to findings presented by Mazar et al. (2008), who stated that individuals behave dishonestly, but only up to a certain limit. This limit allows them to benefit from a dishonest act, but only when that act is neither bad nor blameworthy enough to change the individual's positive self-concept.

In this context, group definitions assume a critical role in the legitimacy and normality with which evasion is judged. The existence of groups and individuals who publicly defend the practice of evasion, in combination with daily observations of the phenomenon, allows people to avoid conceiving of evasion as something with a negative moral value or experiencing a damaged self-concept when evading bus fares.

The public transport service's image

This dimension explains 10% of the variance in the data and is composed of the items shown in Table 3. Santiago's transport service's image is related to users' expectations and perceptions. Perceptions are the subjective opinions of users and people close to them regarding issues such as quality, safety, and satisfaction.

Unlike behavior and social norms, this dimension is characterized by a less pronounced difference between the perceptions of evaders and non-evaders. For example, regarding the item “The bus service reflects concerns about users' well-being,” only 15% of evaders agreed and a similar proportion (17%) of non-evaders agreed. In the same way, the items referencing that Transantiago's buses are safe, clean, and regularly serviced and maintained showed virtually no difference in perception between the groups.

On the other hand, comparing the general perception of Transantiago's bus service with the perception of the specific bus on which the user was traveling at the time of the survey reveals interesting distinctions. There is a significant increase in the percentage of agreement, from 21% to 44% in evaders and from 33% to 59% in non-evaders. As a result, it can be argued that Transantiago's image is a complex social construct and that it does not necessarily show a strict correlation with individual experiences. Therefore, improving specific aspects of the travel

Table 2
Items and Factor Loadings Related to Behavior and Social Norms.

Item	Factor Loadings	Agree + Strongly Agree		Mean Difference Test-t
		Evaders	Non-evaders	
Evasion is a dishonest act	.796	43%	90%	12.68 ^a
Evasion is disrespectful	.779	39%	85%	12.45 ^a
Evasion damages other passengers	.698	37%	81%	11.41 ^a
All public transport users should validate their Bip! cards upon boarding a bus	.693	63%	95%	11.66 ^a
It is annoying when those who evade payment find a place to sit	.662	35%	80%	11.75 ^a
Evasion is an irresponsible act	.658	42%	82%	9.98 ^a
It is right to pay the bus fare	.657	70%	97%	11.15 ^a
Not paying the bus fare is an illicit act	.597	41%	83%	10.52 ^a
With more places in which to charge the Bip! card, there is no excuse to evade	.580	57%	82%	7.35 ^a
My family values influence my behavior about paying bus fares	.576	45%	87%	12.04 ^a
Evasion produces a feeling of guilt	.566	35%	68%	7.95 ^a
Evasion is an acceptable action in some cases	.564	81%	47%	9.07 ^a
I am afraid of sanctions for the act of evading payment	.526	52%	81%	6.21 ^a
It is evasion when a Bip! card is not validated after being used on the metro	.507	38%	78%	10.22 ^a

^a The mean difference is statistically significant at the 95% confidence level.

Table 3

Items and Factor Loadings Related to the Public Transport Service's Image.

Item	Factor Loadings	Agree + Strongly Agree		Mean Difference Test-t
		Evaders	Non-evaders	
I am satisfied with Transantiago's bus service	.724	21%	33%	3.73 ^a
The bus service reflects concerns about users' well-being	.639	15%	17%	1.59
I am satisfied with this bus's service	.599	44%	59%	3.01 ^a
People close to me are satisfied with Transantiago's buses	.594	13%	19%	3.28 ^a
Transantiago's buses are safe	.583	18%	20%	0.05
Transantiago's buses are clean	.568	16%	15%	0.67
Transantiago's buses are regularly serviced and maintained	.534	13%	18%	1.15
Ticket fare is cheap	.458	6%	15%	3.37 ^a
The frequency of bus service suits my needs	.425	33%	42%	2.89 ^a

^a The mean difference is statistically significant at the 95% confidence level.**Table 4**

Items and Factor Loadings Related to Social Acceptance of Evasion.

Item	Factor Loadings	Agree + Strongly Agree		Mean Difference Test-t
		Evaders	Non-evaders	
If I lose my Bip! card, it is acceptable for me to evade payment	-0.623	75%	29%	10.51 ^a
It is acceptable to evade payment if my card is out of funds	-0.601	80%	48%	8.73 ^a
Evasion is a valid way of protesting	-0.455	68%	37%	8.77 ^a
In general, evasion has become an acceptable act	-0.429	74%	66%	1.47

^a The mean difference is statistically significant at the 95% confidence level.**Table 5**

Items and Factor Loadings Related to Trip Planning.

Item	Factor Loadings	Agree + Strongly Agree		Mean Difference Test-t
		Evaders	Non-evaders	
I am concerned about keeping funds on my Bip! card	.708	48%	84%	18.48 ^a
I am concerned about remembering to bring my Bip! card with me when I plan to take the bus	.694	57%	90%	15.63 ^a

^a The mean difference is statistically significant at the 95% confidence level.**Table 6**

Items and Factor Loadings Related to Ineffective Anti-evasion Methods.

Item	Factor Loadings	Agree + Strongly Agree		Mean Difference Test-t
		Evaders	Non-evaders	
The turnstile is a useful method for reducing evasion	.624	42%	46%	0.58
The fine stops evasion	.584	31%	35%	0.06

Table 7

Items and Factor Loadings Related to Fear of Law Enforcement.

Item	Factor Loadings	Agree + Strongly Agree		Mean Difference Test-t
		Evaders	Non-evaders	
It is frightening to evade when there is a Bip! card inspector	.301	75%	86%	3.50 ^a
If the penalty fee were higher, I would think twice before evading	.339	64%	85%	6.52 ^a

^a The mean difference is statistically significant at the 95% confidence level.

experience is not sufficient to change users' collective impression of Transantiago. Caution should likely be exercised in investing in advertising campaigns, expecting to promote payment based on a quality improvement.

Finally, although both evaders and non-evaders have a negative perception regarding Transantiago, the image factor remains relevant. The qualitative phase shows that this bad image is the main argument used to justify evasion and accept it in others, motivating evaders to elude payment and giving non-evaders a reason to accept this conduct.

Social acceptance of evasion

This dimension explains 6% of the variance in the data, and the items reflect various situations in which evasion becomes acceptable (Table 4). It is important to note that acceptable norms do not necessarily square with the law. Legal regulations have been selected from a larger group of norms and legitimized through a politically valid procedure by the state, which is thereby able to enforce such regulatory norms via organizations established for that purpose (Luhmann, 1985).

Fig. 3. Motivation for fare evasion and payment - final conceptual map.

Contradictory norms can therefore coexist within a society where only those norms established as legitimate by the state are regarded as legal.

Evasion, when considered an illegal act that consists of nonpayment of public transport fares, lies within a gray area concerning the empiric definition of such conduct. Although evasion is illegal, individuals' disapproval of the behavior seems relative, given the apparent existence of certain conditions in which evasion is considered acceptable and the fact that this acceptance has increased among users.

This dimension is also defined by a strong difference of opinion between evaders and non-evaders, which permits a more precise characterization of each group. Nevertheless, even though non-evaders disagree more strenuously with the statements presented in Table 4 than evaders do, certain circumstances seem more acceptable to non-evaders, especially when they find themselves with insufficient funds on their Bip! cards. This raises the possibility of an extant subgroup of non-evaders who pay the fare and reject evasion as legitimate conduct but sometimes do evade. This may happen because they feel supported by the sense that such conduct is socially accepted and because, given that the situation is exceptional, they experience no subsequent harm to their self-concept. This situation is related to the ethical culture and conditions in which dishonest behavior can be contagious (Gino et al., 2009), changing the behavior of some non-evaders.

Trip Planning

Table 5 lists items, factor loadings, and agreements related to trip planning. The differences between the groups regain importance and reflect a level of dissimilarity related to this dimension. The qualitative step showed that one deficiency associated with Transantiago is that, at certain hours of the day (usually early in the morning or late at night), it can be difficult to find a location where users can add money to Bip!

cards and ensure that sufficient funds are available for the trip (Bucknell et al. 2016). In this context, individuals who have forgotten to do this are forced to board the bus without paying the fare. Something similar happens to those who reside in areas where they must walk significant distances to charge their Bip! cards. This can be a meaningful obstacle for women, children, and elderly people.

These situations require a more rigorous temporal perspective when planning trips, which is especially relevant for those who do not recognize evasion as legitimate conduct in any circumstances, but less relevant for those who regard occasional evasion as permissible—and know that the behavior will meet with general social acceptance within their environment. Finally, the possibility of charging the Bip! card monthly requires users to have a significant sum of money on hand on a given day, which is not viable for students and individuals with low incomes.

Currently the system offers a loan through Bip! cards for those who do not have sufficient funds to complete an additional trip. Bucknell et al. (2016) show that fare evasion could also be reduced by extending the time window of a loan.

Ineffective anti-evasion methods

This dimension explains 4% of data variance, reveals strong correlations, and is theoretically relevant because it includes information related to the efficiency of measures pursued by public authorities to stop evasion. Table 6.

Qualitative data revealed that fines are ineffective due to a lack of enforcement; people know that they probably won't have to pay it. This perception is stimulated by police officers, inspectors, and local judges who understand Transantiago's lack of social approval and the payment difficulties due to social inequities. Therefore, authorities select those who may be "forgiven" and omit or reduce the fine if needed. On the

other hand, although turnstiles seem to be more effective, skipping the turnstile is easy and there is no shame associated with this behavior; several public lists on social media show ways of doing this. Consequently, given the agreement percentages and qualitative data mentioned, these control measures can be considered ineffective.

Fear of law enforcement

Although the relevance of fear of law enforcement seems low (it explains a mere 3% of the variance) and reflects weaker correlations, its analysis is useful for comparison with the anti-evasion methods dimension. Analyzing both distinguishes elements that might explain the anti-evasion methods to date.

Turnstiles and fines seem ineffective (as shown by the anti-evasion methods factor), possibly because they fail to trigger adequate fear in users. As Table 7 illustrates, the presence of an inspector appears to be the most effective dissuasion measure—and always reflects a more substantial influence on the behavior of non-evaders than on that of evaders. This could explain the collective efforts emerging on social networks and mobile apps to collaboratively avoid encounters with inspectors.

While higher fines also make people reflect on the risks associated with evasion, when considering the qualitative step and the semantics related to this dimension, increasing fines is not an optimal solution. If, as some studies have established, evasion is significantly associated with unemployment and a lack of economic resources, at some point, individuals simply cannot afford the penalty fee (Troncoso and de Grange, 2017; Guarda et al. 2016b). Considering Bijleveld (2007), a better solution should be employing inspectors who require payment and charge a small fee if they observe evasion. This procedure seems more effective than prosecuting evaders later through the judicial system, as is done in Chile.

Conceptual map

The six dimensions discussed produce a more precise methodology for future research. Fig. 3 shows a proposed conceptual map, which can contribute to a better understanding of evasion among Transantiago users by graphing the main variables that determine each of the proposed dimensions from the factor analysis. For example, behavior and social norms explain part of the evasion phenomenon and are related to variables such as users' norms and personal values, the perception of whether evasion is an illegal act or not, planning levels before the trip, and the existence of charging points, among others. Most of the variables are expressed in the questionnaire by several items. Items related to "fine" and "ideology" were co-related by the factor analysis in different dimensions. That is why these two variables are not exclusive of one dimension.

Conclusions

This research has identified that motivation to pay or evade the bus fare is mainly explained by social dimensions, such as social norms, Transantiago's image, users' behavior, and users' sociodemographic characteristics. Consequently, the transport system's structural aspects and control measures—where the authorities and researchers have been focused

Appendix

See Appendix Table A1 and Table A2.

until now—have less or no impact on users. Based on this study's factor analysis, a dimension related to structural aspects could not be constructed to explain data variance, and control measures seem to be ineffective.

This study was based on several assumptions, which are better supported in light of the results presented here. First, the assumption was made that to achieve a deeper understanding of fare evasion on Transantiago from the perspective of consumer misbehavior, it was relevant to also include the opinions of those who do not evade. The results show that in some dimensions, differences in opinion regarding each item can be significant and can therefore be identified and characterized in distinctive groups. Doing so allowed identification of specific risks and challenges for each, meaning that massive measures may not be adequate to stop evasion (González et al., 2019). Additionally, the data uncovered the relevance of social acceptance of evasion, revealing that in some conditions, evasion is considered acceptable and this acceptance has affected more users.

As a case study, this paper approaches an extreme example of fare evasion that has been on the rise for the last 13 years, contextualized by the emergence of groups that publicly approve of and defend this conduct. As such, the results cannot account for generalizations, but as demonstrated with this research, the high levels of evasion in Santiago de Chile may not be completely explained by a cost-benefit model based on concrete individual incentives. Instead, this research observed evasion as a social phenomenon, revealing that public transport is a complex system embedded in society where it fulfills several expectations that are not being met by Transantiago.

Other public transport systems experiencing consumer misbehavior may benefit from incorporating a multidisciplinary perspective and a social approach to better understand the misbehavior, propose more holistic solutions (not centered only on the individual's decision making process), and complement structural aspects that, although easy to identify and measure, may not provide sufficient information to solve the problem.

This study demonstrated that evaders and non-evaders agree that not paying fares is not necessarily evasion in certain situations. This suggests the normative perspective from which people judge this conduct should be reconsidered. When facing the need to reevaluate transportation-related public policy, it is advisable to propose free passes for certain user groups, which would also help redefine and assert Transantiago's image. As the results show, disapproval of Transantiago's overall service is higher than disapproval of the service used during the survey. When a collective image is a stronger determinant of perceptions than experience is, the issue is a social problem that will not be solved by improving specific aspects of traveling.

Finally, the findings have also reoriented our future research on this topic. Keeping up with the multidisciplinary perspective, we are now questioning the role of public transport both on social inequality and social exclusion/inclusion, which will surely be a useful approach for policy makers and will reveal new issues to consider.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Table A1
42 Items of the Survey Answerable Using a Likert Scale.

Question	Dimension	Evaders			Non-evaders			Mean Difference	
		Mean	Stand. Dev.	N	Mean	Stand. Dev.	N	Test-t	
Evasion is a dishonest act	Behavior and Social Norms	2.45	0.57	253	3.29	0.52	250	12.68 *	
Evasion is disrespectful	Behavior and Social Norms	2.40	0.59	252	3.24	0.54	250	12.45 *	
Evasion damages other passengers	Behavior and Social Norms	2.28	0.57	253	3.09	0.70	250	11.41 *	
All public transport users should validate their Bip! cards upon boarding a bus	Behavior and Social Norms	2.66	0.61	253	3.41	0.44	250	11.66 *	
It is annoying when those who evade payment find a place to sit	Behavior and Social Norms	2.26	0.61	252	3.14	0.79	249	11.75 *	
Evasion is an irresponsible act	Behavior and Social Norms	2.43	0.57	251	3.12	0.62	250	9.98 *	
It is right to pay the bus fare	Behavior and Social Norms	2.77	0.58	253	3.44	0.32	250	11.15 *	
Not paying the bus fare is an illicit act	Behavior and Social Norms	2.39	0.54	250	3.11	0.62	249	10.52 *	
With more places in which to charge the Bip! card, there is no excuse to evade	Behavior and Social Norms	2.65	0.64	252	3.19	0.69	250	7.35 *	
My family values influence my behavior about paying bus fares	Behavior and Social Norms	2.32	0.91	252	3.30	0.74	250	12.04 *	
Evasion produces a feeling of guilt	Behavior and Social Norms	2.20	0.75	253	2.85	0.92	249	7.95 *	
Evasion is an acceptable action in some cases	Behavior and Social Norms	3.00	0.63	253	2.32	0.80	250	9.07 *	
I am afraid of sanctions for the act of evading payment	Behavior and Social Norms	2.64	0.73	253	3.10	0.66	250	6.21 *	
It is evasion when a Bip! card is not validated after being used on the metro	Behavior and Social Norms	2.34	0.53	253	3.03	0.61	248	10.22 *	
I am satisfied with Transantiago's bus service	Public transport service's image	2.24	0.73	252	2.54	0.82	250	3.73 *	
Bus service reflects concerned with the well-being of users	Public transport service's image	1.78	0.50	253	1.88	0.49	248	1.59	
I am satisfied with this bus's service	Public transport service's image	1.92	0.55	253	2.12	0.63	250	3.01 *	
People close to me are satisfied with Transantiago's buses	Public transport service's image	1.66	0.58	253	1.89	0.66	248	3.28 *	
Transantiago's buses are safe	Public transport service's image	1.95	0.51	253	1.96	0.56	250	0.05	
Transantiago's buses are regularly serviced and maintained	Public transport service's image	1.90	0.48	253	1.86	0.47	250	0.67	
Ticket fare is cheap	Public transport service's image	1.92	0.36	246	1.85	0.56	243	1.15	
The frequency of bus service suits my needs	Public transport service's image	1.45	0.41	253	1.68	0.67	250	3.37 *	
If I lose my Bip! card, it is OK for me to evade payment	Public transport service's image	2.17	0.57	253	2.37	0.62	249	2.89 *	
It is acceptable to evade payment if my card is out of funds	Social acceptance of evasion	2.89	0.63	253	2.14	0.64	250	10.51 *	
Evasion is a valid way of protesting	Social acceptance of evasion	3.04	0.57	253	2.43	0.65	250	8.73 *	
In general, evasion has become an acceptable act	Social acceptance of evasion	2.91	0.77	253	2.22	0.76	247	8.77 *	
I am concerned about remembering to bring my Bip! card with me when I plan to take the bus	Social acceptance of evasion	2.88	0.50	253	2.78	0.68	250	1.47	
The turnstile is useful method for reducing evasion	Trip planning	2.53	0.92	253	3.79	0.26	250	18.48 *	
The penalty fee stops evasion	Trip planning	2.75	1.22	253	3.89	0.13	250	15.63 *	
It is frightening to evade when there is a Bip! card inspector	Ineffective anti-evasion measures	2.30	0.71	250	2.34	0.88	248	0.58	
If the penalty fee were higher, I would think twice before evading	Ineffective anti-evasion measures	2.23	0.48	253	2.22	0.75	249	0.06	
The experience of being inspected affects my trip negatively	Fear of law enforcement	2.93	0.62	252	3.18	0.61	245	3.50 *	
The bus business only benefits companies that own buses	Fear of law enforcement	2.78	0.70	253	3.28	0.73	245	6.52 *	
I would prefer to have another way to charge the Bip! card	Not considered in the factor analysis	2.74	0.73	253	2.39	0.81	249	4.39 *	
People only evade payment to save money	Not considered in the factor analysis	3.41	0.54	250	3.16	0.71	240	3.42 *	
The bus fare is too high for me, given my income	Not considered in the factor analysis	2.98	0.69	250	3.39	0.55	248	5.71 *	
The pay zone helps to reduce evasion	Not considered in the factor analysis	2.87	0.60	252	2.56	0.85	248	4.05 *	
Paying in cash is preferable to using the Bip! card	Not considered in the factor analysis	3.34	0.67	253	3.12	0.80	250	2.77 *	
In general, evasion has become a daily act	Not considered in the factor analysis	2.66	0.60	250	3.00	0.59	250	4.93 *	
Paying the bus fare is more important than paying for bread	Not considered in the factor analysis	2.18	0.64	247	2.00	0.62	249	2.54 *	
	Not considered in the factor analysis	3.25	0.46	253	3.38	0.40	250	2.38 *	
	Not considered in the factor analysis	1.44	0.34	253	1.95	0.74	249	7.74 *	

*The mean difference is statistically significant at the 95% confidence level.

Table A2
Factor Loadings Matrix.

Question	Factor					
	1	2	3	4	5	6
Evasion is a dishonest act	.796	.106	.156	.076	.066	-0.092
Evasion is disrespectful	.779	.213	.184	.053	.084	-0.045
Evasion damages other passengers	.698	.098	.131	.038	.082	-0.210
All public transport users should validate their Bip! cards upon boarding a bus	.693	.108	.105	.181	-0.012	.051
It is annoying when those who evade payment find a place to sit	.662	.067	.067	.127	.094	-0.174
Evasion is an irresponsible act	.658	.148	.209	.037	.026	-0.073
It is right to pay the bus fare	.657	.206	.131	.200	-0.058	.110
Not paying the bus fare is an illicit act	.597	.151	.182	.140	.022	.177
With more places in which to charge the Bip! card, there is no excuse to evade	.580	.029	.047	.121	-0.018	.052
My family values influence my behavior about paying bus fares	.576	.014	-0.029	.322	.098	.080
Evasion produces a feeling of guilt	.566	.139	.179	.005	.121	.068
Evasion is an acceptable action in some cases	-0.564	-0.055	-0.427	.001	.012	.026
I am afraid of sanctions for the act of evading payment	.526	.168	.022	-0.056	.124	.269
It is frightening to evade when there is a Bip! card inspector	.518	.110	-0.132	-0.048	.106	.301
It is evasion when a Bip! card is not validated after being used on the metro	.507	.006	.165	.100	-0.079	.095
If the penalty fee were higher, I would think twice before evading	.488	-0.019	.059	.183	.234	.339
I am satisfied with Transantiago's bus service	.130	.724	.164	.037	.049	.121
Bus service reflects concerned with the well-being of users	.053	.639	.080	-0.004	.042	.030
I am satisfied with this bus's service	.242	.599	-0.022	.060	-0.108	.032
People close to me are satisfied with Transantiago's buses	.128	.594	.296	.064	.051	.084
Transantiago's buses are safe	.047	.583	.014	.098	.141	-0.061
Transantiago's buses are clean	.083	.568	-0.197	.009	.129	-0.139
Transantiago's buses are regularly serviced and maintained	.033	.534	-0.197	-0.095	.098	-0.056
Ticket fare is cheap	.085	.458	.292	-0.071	.011	.062
The frequency of bus service is suits my needs	.076	.425	.263	-0.041	.185	.062
If I lose my Bip! card, it is OK for me to evade payment	-0.378	.001	-0.623	-0.159	.049	.033
It is acceptable to evade payment if my card is out of funds	-0.380	-0.028	-0.601	-0.082	-0.113	.088
Evasion is a valid way of protesting	-0.432	-0.171	-0.455	-0.097	.045	.017
In general, evasion has become an acceptable act	-0.015	-0.124	-0.429	-0.018	-0.302	-0.097
I am concerned about keeping funds on my Bip! card	.506	.044	.175	.708	.023	-0.041
I am concerned about remembering to bring my Bip! card with me when I plan to take the bus	.522	-0.004	.128	.694	.046	.041
The turnstile is useful method for reducing evasion	.022	.099	.057	.075	.624	.019
The penalty fee stops evasion	.133	.188	.039	-0.048	.584	.007

See Appendix Figs A1–A6.

Fig. A1. Boxplot of behavior and social norms.

Fig. A2. Boxplot of public transport service's image.

Fig. A3. Boxplot of social acceptance of evasion.

Fig. A4. Boxplot of trip planning.

Fig. A5. Boxplot of anti-evasion ineffective measures.

Fig. A6. Boxplot of fear of law enforcement.

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- Carolina Busco** (carolina.busco@mail.udp.cl) is a sociologist from Pontifical Catholic University of Chile who holds a PhD in political and social sciences from the University of Macerata, Italy. She conducts academic research on various social problems, such as evasion in Transantiago and the social legitimacy of megaprojects.
- Felipe González** (felipe.gonzalezr@udp.cl) is an associated professor at the School of Industrial Engineering of the Faculty of Engineering at Diego Portales University. His research interests include modeling travel behavior, transport networks, and urban planning.
- Yamil Jaquith** graduated from the School of Industrial Engineering of the Faculty of Engineering at Diego Portales University.
- Felipe Jimenez** graduated from the School of Industrial Engineering of the Faculty of Engineering at Diego Portales University.
- Borja Alonso** (alonsobo@unican.es) is an assistant professor of transport planning at the University of Cantabria (Spain). He has been a member of the Transport Systems Research Group since 2007 and his research focuses on transit operations and planning, transport modeling, and traffic engineering.