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Behavioral intentions of public transit passengers—The roles of service quality, perceived value, satisfaction and involvement

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ABSTRACT

Understanding the behavioral intentions of public transit passengers is important, because customer loyalty is seen as a prime determinant of long-term financial performance. This study highlights such behavioral intentions and explores the relationships between passenger behavioral intentions and the various factors that affect them. Apart from the factors recognized by past studies, such as service quality, perceived value, and satisfaction, this study addresses the importance of the involvement of public transit services in passenger behavioral intentions. By using passenger survey data from the Kaohsiung Mass Rapid Transit (KMRT), a newly operating public transit system in Taiwan, we apply the structural equation modeling technique to analyze the conceptualized relationship model. The findings reveal that all causal relationships are statistically significant. Managerial implications are discussed.

1. Introduction

Reducing private transport use and increasing that of public transport are two critical but challenging tasks for dealing with the problem of urban transport. Public transport systems need to become more market oriented and competitive, as they tend to be viewed as service products. Along with the trend of the privatization of public transport services over the past decade, the financial performance of private service providers has been a key concern. Understanding the loyalty of public transit passengers is important, because customer loyalty is seen as a prime determinant of a firm's long-term financial performance and is considered a major source of competitive advantage (Lam et al., 2004). For public transit managers, especially for a newly operating public transit system like the Kaohsiung Mass Rapid Transit System (KMRT) studied in this paper, understanding passengers' behavioral intentions after experiencing the public transit services and their associated influential factors is also an essential task. This information can help public transit managers and marketers design effective strategies to meet passengers' needs, and thus retain existing passengers as well as attract new ones from other modes.

Favorable behavioral intentions encompass three dimensions: word-of-mouth, purchase intentions and price insensitivity, and together form the customer loyalty. Satisfaction is generally seen as the main driver of consumer loyalty and behavior (Olsen, 2007). In studies based on the Theory of Planned Behavior (TPB), customer satisfaction has been widely identified as the most important determinant of favorable behavioral intentions. Customer satisfaction is closed linked with perceived service quality and value (Chen, 2008; Jen and Hu, 2003; Petrick, 2004). Travelers who perceive good quality of public transit service are thus more likely to have a higher level of perceived value and satisfaction, and so continue to use this service.

Apart from satisfaction, involvement, a widespread concept in both the marketing domain and behavioral research, describes the strong attitudes that predict or explain behavior (Olsen, 2007). Involvement is defined as the level of interest or importance that an object has for an individual, or the centrality of an object to an individual's ego structure (Zaichkowsky, 1994). The level of involvement influences the level of decision importance in a purchasing process, such as consumers' cognitive and behavioral responses, and customers are likely to display attitudinal loyalty for high-involvement purchases. Surprisingly, involvement has only rarely been applied in the transport service literature.

To address this gap in the current literature, this research aims to develop a relationship model that incorporates the main determinants of public transit passengers' behavioral intentions and explores their effects on behavioral intentions. Specifically, the roles of service attitudes (i.e. service quality, perceived value and satisfaction) and involvement that are involved in the formation of passenger behavioral intentions in the public transit service context are addressed in this study. The remainder of this paper is organized as follows. Section 2 presents the theoretical background and hypotheses of the proposed model. Section 3

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describes the methodology, followed by empirical results reported in Section 4. Finally, a discussion of the results and a conclusion are provided in Section 5.

2. Theoretical background and hypotheses

Behavioral intentions, as an affirmed likelihood to engage in a certain behavior, are important indicators of customers' future behaviors. According to the Theory of Planned Behavior (TPB), behavioral intentions trigger future behaviors (Ajzen and Fishbein, 1980). Favorable behavioral intentions lead to customer loyalty, which is defined as "a deeply held commitment to repurchase or repatronise a preferred product or service in the future" (Oliver, 1997). Behavioral intentions can be viewed as signals that show whether a customer will continue to utilize a company's services or switch to a different provider (Zeithaml et al., 1996). Therefore, by better understanding the passenger behavior marketers and managers of transit systems will be better equipped to develop more appropriate marketing strategies and tailor their products and services to attract new passengers, as well as retain existing ones.

Two behaviors, i.e. repeatedly patronizing the service provider and recommending a service provider to others, are viewed as key manifestations of customer loyalty (Fornell, 1992). Most researchers tend to employ the behavioral-intention measure to represent customer loyalty, since action loyalty is difficult to observe and is often equally difficult to measure (Yang and Peterson, 2004). The current study thus employs the behavioral-intention measure of customer loyalty, which includes repurchase and recommendation intentions.

Factors such as service quality, consumer satisfaction, and value are frequently viewed as key building blocks of customer loyalty (Chen, 2008). A higher quality of service and levels of satisfaction can result in positive behavioral intentions and ultimately loyalty. Some studies suggest that customer satisfaction should be used in conjunction with perceived value, and perceived value may be a better predictor of repurchase intentions than satisfaction (Cronin et al., 2000; Petrick, 2004; Petrick and Backman, 2002; Woodruff, 1997). Hence, service quality, perceived value, and satisfaction are adopted in this study to examine their influences on behavioral intentions. In addition, this study also hypothesizes that involvement, as mentioned above, is an antecedent of customer loyalty.

2.1. Service quality

Service quality is a measure of how well the service level delivered matches customer expectations, while a firm delivering quality service means conforming to customer expectations on a consistent basis (Joewono and Kubota, 2007; Transportation Research Board, 1999, 2004). Therefore, the extent to which service performance matches customer expectations influences to the degree which customers feel satisfied. The SERVQUAL scale proposed by Parasuraman et al. (1985, 1988) based on the disconfirmation of expectations model (Oliver, 1980) is widely used to measure service quality. This scale contains 22 items under five dimensions including tangibility, reliability, responsiveness, assurance, and empathy. However, these five dimensions and 22 associated items have been challenged as being inappropriate for some service businesses (Cronin and Taylor, 1992). In practice, appropriate modifications are thus generally needed in order to reflect the specific characteristics of the service context being studied.

Hu and Jen (2006) proposed a scale of bus service quality with 20 items under four dimensions – *interactions with passengers*, *tangible service equipment*, *convenience of service*, and *operating management support* – and undertook a survey of bus services in Taipei, Taiwan. *Interaction with passengers* refers to the respect and care passengers feel when interacting with service providers, and how they respond to passengers' problems. *Tangible service equipment* relates to the level of comfort of the facilities and equipment operated by the service providers. *Convenience of service* concerns accessibility, the information provided, and the convenience of the service network. Finally, *operating management support* pertains to elements such as bus schedules, service periods, and the number of staff (Hu and Jen, 2006).

Joewono and Kubota (2007) measured the service quality of Indonesian paratransit systems using nine factors with 54 attributes. The nine factors are as follows: availability, accessibility, reliability, information, customer service, comfort, safety, fare, and environmental impact. They explored user-perceived service quality and overall satisfaction with the paratransit service in order to make forecasts with regard to competition from motor vehicles in Bandung, Indonesia. The results showed that service quality has positive effects on both overall satisfaction and customer loyalty, and overall satisfaction has a positive impact on customer loyalty. In their study on measuring the service quality of Greek public transit systems, Tyrinopoulos and Antonious (2008) used a total of 23 attributes classified into four categories, including general characteristics of the public transport system, terminals & stops, vehicles, and transport points, based on the Handbook for Measuring Customer Satisfaction and Service Quality (Transportation Research Board, 1999). In the current study, the service attributes are mainly based on those in Tyrinopoulos and Antonious (2008), and amended according to the specific service characteristics of the Kaohsiung Mass Rapid Transit System (KMRT).

2.2. Perceived value

Perceived value pertains to a "consumer's overall assessment of the utility of a product (or service) based on perceptions of what is received and what is given" (Zeithaml, 1988). More specifically, perceived value comes from a trade-off between perceived benefits and perceived costs (Lovelock, 2000). Previous studies have suggested that perceived value may be a better predictor of repurchase intentions than either satisfaction or quality (Cronin et al., 2000; Petrick, 2004; Petrick and Backman, 2002; Woodruff, 1997). Perceived value has been identified as an antecedent to satisfaction and behavioral intentions (Chen, 2008, Cronin et al., 2000; Petrick, 2004; Petrick and Backman, 2002). In addition, many studies have concluded that service quality positively affects perceived value (Cronin et al., 2000; Zeithaml, 1988).

In the public transport context, Jen and Hu (2003) established and tested the perceived value model, which they applied to identify factors affecting passengers' repurchase intentions toward public transit services. Their results revealed that passengers' behavioral intentions are significantly affected by perceived value, which is determined by perceived benefits and perceived costs. Moreover, service quality is found to have a positive effect on perceived value.

2.3. Satisfaction

Satisfaction is an overall affective response to a perceived discrepancy between prior expectations and perceived performance after consumption (Oliver, 1980, 1999). There are two general conceptualizations of satisfaction in the literature: transaction-specific satisfaction (individual level) and cumulative

satisfaction (customers' total consumption experience) (Johnson et al., 1995). In practice, service quality and satisfaction are often used interchangeably, but differences between service quality and customer satisfaction are also clarified in the literature. For example, Oliver (1997) suggests that service quality judgments are more specific while customer satisfaction judgments are more holistic. Service quality is also related to cognitive judgments while customer satisfaction is associated with affective judgments.

This study refers service quality to transaction-specific satisfaction, which concerns the (dis)confirmation in the expectance gap of individual attributes, while cumulative satisfaction is conceptualized as overall satisfaction. In other words, overall satisfaction pertains to a holistic evaluation after a service delivery experience, and acts as a consequence of satisfaction with individual attributes (i.e. service quality) (Chen, 2008; Fornell, 1992). Past studies have shown evidence that customer satisfaction significantly affects customer loyalty and behavior intentions in various industries (Anderson and Sullivan, 1993; Cronin and Taylor, 1992; Fornell, 1992; Oliver, 1980; Petrick and Backman, 2002), including public transit services (Joewono and Kubota, 2007; Nathanail, 2008).

2.4. Involvement

The construct of involvement is crucial when considering an individual's purchasing process and is addressed by attitudinal and behavioral theories when tackling the issues of brand loyalty and purchase intentions (Bennett et al., 2005). Involvement is intended to cover an individual's subjective sense of the concern, care, importance, personal relevance, and significance attached to an attitude, a person's motivational state of mind with regard to an object or activity, or the mobilization of behavioral resources for the achievement of relevant goals (Olsen, 2007). Involvement refers to a person's feelings about the relevance or importance of an object based on their inherent needs, values, and interests (Zaichkowsky, 1985).

Since an individual can be involved with advertisements, products, or purchasing decisions, the concept of involvement with these different objects leads to various responses. Involvement with products has been hypothesized to lead to a greater perception of attribute differences, a perception of greater product importance, and a greater commitment to brand choice. Involvement with purchases leads to searches for additional information and more time spent searching for the right selection. For example, involvement with advertising can lead an individual to give more counterarguments to the messages it contains (Zaichkowsky, 1985). Zaichkowsky (1985) argued that a measure of involvement which can be used across various research studies might include three categories: personal (i.e. the inherent interests, values, or needs that motivate an individuals feelings toward the object), physical (i.e. the characteristics of the object that cause differentiation and increase interest), and situational (i.e. factors that temporarily increase or decrease the relevance of or interest in the object). Evidence that these three factors influence a consumer's level of involvement or response to products, advertising, and purchasing decisions has been widely found in the literature. In the public transport context, Lai and Lu (2007) relied on Zaichkowsky (1985) to develop a public transport involvement scale covering personal (e.g. connection with public transport), product (e.g. fare and performance) and situational factors (e.g. time pressure and weather conditions) to measure Taiwanese travelers' involvement in public transport services. Public transit involvement is defined as the level of interest or importance of public transit to a passenger in the current study.

Involvement is found to affect the decision process of a consumer's purchasing behavior, and consumers are more likely to display attitudinal loyalty for high-involvement purchases (Bennett et al., 2005; Chen and Tsai, 2008; Tsiotsou, 2006). Previous studies suggest a positive relationship between product involvement and service/brand loyalty (Beatty et al., 1988; Pritchard et al., 1999). Consumer involvement is also found to have direct effects on perceived product (service) quality (Tsiotsou, 2006), the level of satisfaction (Richins and Bloch, 1991), and therefore perceived value. In other words, the level of involvement that a consumer has with respect to the object of interest works as an important determinant of consumer evaluations and behaviors (Chen and Tsai, 2008).

It is noteworthy that involvement is also suggested to be a moderator variable in many studies of attitude–behavioral relationships and within other aspects of marketing research (Olsen, 2007). Some studies also investigate the moderation effect of involvement on the satisfaction–loyalty relationships (Bloemer and de Ruyter, 1998). In fact, involvement can be changed due to changes in customer attitudes towards services and perceptions of service evaluations, such as perceived value, service quality, and satisfaction. In the above mentioned studies, it is the factor of modified involvement after customers' service experiences that is used as a moderator.

Based on the review of the literature, the current study proposes the conceptual model shown in Fig. 1. The hypotheses are stated as follows:

- H_1: Service quality has a positive effect on perceived value.
- H_2: Service quality has a positive effect on overall satisfaction.
- H_3: Service quality has a positive effect on involvement.
- H_4: Service quality has a positive effect on behavioral intentions.
- H_5: Perceived value has a positive effect on overall satisfaction.
- H_6: Perceived value has a positive effect on involvement.
- H_7: Perceived value has a positive effect on behavioral intentions.
- H_8: Overall satisfaction has a positive effect on involvement.
- H_9: Overall satisfaction has a positive effect on behavioral intentions.
- H_{10}: Involvement has a positive effect on behavioral intentions.

Each of the model constructs is defined as follows:

Behavioral intention: the public transit passenger's judgment about the likelihood of continuing to use public transit or willingness to recommend it to others.

Satisfaction: the extent of overall pleasure or contentment felt by the public transit passenger, resulting from the ability of the

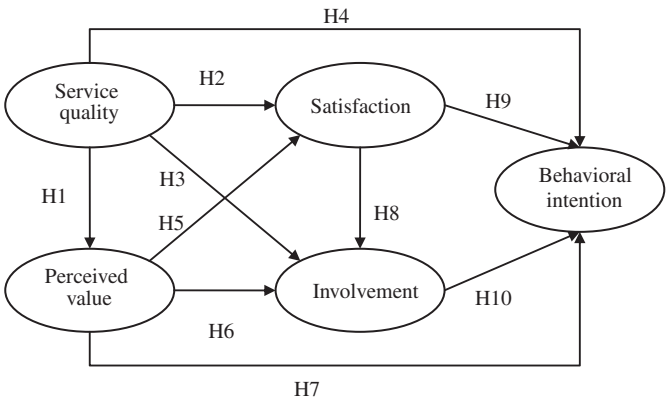

Fig. 1. The conceptual model.

trip experience to fulfill the passenger's relevant desires, expectations, and needs.

Perceived value: the public transit passenger's overall appraisal of the value of the service provided, based on their assessment of what is received (benefits) and what is given (costs or sacrifice).

Service quality: the public transit passenger's assessment of the standard of the service delivered.

Involvement: the level of interest in or importance of public transit to a passenger.

3. Methods

3.1. Kaohsiung Mass Rapid Transit System (KMRT)

Before the introduction of the KMRT, public transport services were poorly provided in Kaohsiung city, and private cars and motorcycles were the main transport modes for the commuters. The KMRT was constructed and is operated by the Kaohsiung Rapid Transit Corporation (KRTC) under a build-operate-transfer (BOT) contract through public and private cooperation, in an approach that is intended to benefit both public and private sectors. The system, offering a network of two lines (see Fig. 2), was developed to increase the quality and coverage ratio of public transportation in Kaohsiung and to minimize noise and air pollution in the urban area. The total length of the current network, i.e. Orange and Red Lines, is 42.7 km with 38 stations, of which 28 are underground, two at ground level, and eight elevated. The Red line (north–south bound) and Orange line (west–east bound) started operating in March and September 2008, respectively. The frequency of train services is every 6 min during peak periods and every 10 min during off-peak ones. Fig. 3 depicts the ridership of the KMRT for the Red and Orange lines. The total ridership was around 141,000 passengers per day at the end of January 2009, which was still far behind the expected ridership of 450,000 passengers per day that

Fig. 2. KMRT network (*Source*: http://mtbu.kcg.gov.tw).

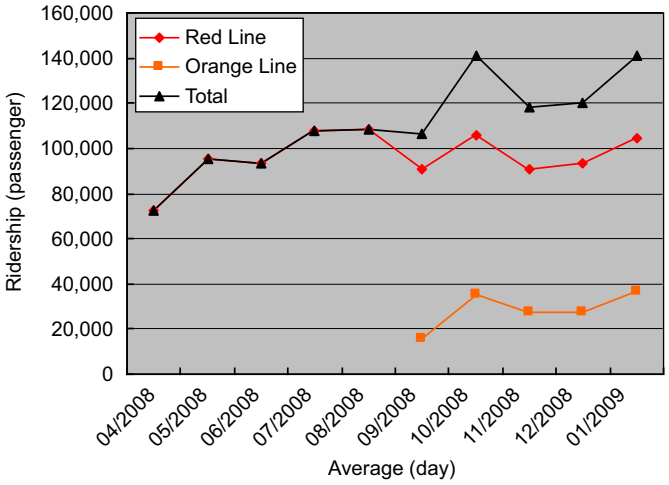

Fig. 3. KMRT ridership.

art need to break-even (Mass Rapid Transit Bureau, 2009). Therefore, marketing and promotion strategies to increase ridership are of concerns for the KMRT.

3.2. Measures

A self-administered questionnaire survey of KMRT passengers in Kaohsiung City was conducted to collect empirical data for this study. The questionnaire was designed based upon a review of the related literature. To have adequate content validity, the survey instrument was revised and finalized according to feedback from two transport management professors and a pre-test sample of 25 postgraduate students studying a transport management program at a university in southern Taiwan. The questionnaire examined service quality (19 items; example item: "I feel the service frequency of the KMRT is good."), perceived value (three items, example item: "Taking the KMRT is worth it compared with the money I spent"), overall satisfaction (a single item: "Overall, I am satisfied with the service the KMRT provided"), public transit involvement (nine items; example item: "I always pay attention to the information about public transit"), behavioral intentions (two items: "I am willing to recommend the KMRT to others" and "I am willing to keep on taking the KMRT in the future"), and the respondents' demographic and travel behavior information. Apart from respondents' demographic and travel behavior, which were measured by categorical scales, the items of all the other constructs are measured using a five-point Likert scale ranging from 'strongly disagree (1)' to 'strongly agree (5)'.

3.3. Data collection

An on-site survey was conducted at KMRT stations in Kaohsiung City on both weekdays and weekends in October 2008. The convenience sampling technique was employed due to the fact that the population of public transit passengers was not available. Passengers were asked about their willingness to take part in the survey, and if they answered yes then they were asked to complete a pencil and paper questionnaire under the guidance of the data collectors. Eight hundred questionnaires were distributed and 763 usable ones were obtained, and after deleting those with incomplete responses there was an effective response rate of 95.4%. Among the usable samples, 60.8% respondents were female and 39.2% are male. Nearly half of the respondents (47.1%) had a monthly income of less than NT$20,000 (roughly US$600), followed by 32.8% with NT$ 20,001–40,000 (US$601–1200).

Forty-five percent were aged between 25 and 34, and 30.9% were between 15 and 24. Students, housewives, and civil servants accounted for 53.5% of the sample.

3.4. Data analysis

The data analysis was conducted in two stages. First, exploratory factor analyses using principal component with VARIMAX rotation technique were performed to examine construct dimensionalities of both public transport involvement and service quality. In this study, a factor was retained only if it had an eigenvalue, i.e. the amount of variance accounted for a factor, greater than 1.0. The items under each factor were retained only if they had factor loadings greater than 0.5. To assess the reliability of measures, Cronbach's Alpha was calculated to examine the reliability of variables retained in each factor, and coefficients greater than 0.5 were considered acceptable, indicating a good construct reliability (Hair et al., 2006). On that basis, the relationships of involvement, service quality, perceived value, satisfaction, and behavioral intentions were empirically tested using structural equation modeling (SEM) in the second stage by using LISREL 8.0 (Jöreskog and Sörbom, 1996). All analyses were based on the correlation matrix of indicators of interest.

4. Empirical results

4.1. Dimensionality of service quality and involvement

This study employs a multi-attribute approach to measure public transport involvement and service quality. The results from the principal component factor analysis, a uni-dimensional solution with nine involvement items explaining 58.8% of total variance, are shown in Table 1. The involvement factor has an eigenvalue of 5.26 and reliability value (α) of 0.91. A similar procedure is applied to service quality. Two factors with eigenvalues greater than one explain 55.6% of the total variance for the service quality scale (see Table 2). Note that three items are removed from the scale as their factor loadings are less than 0.5. According to the varimax-rotated factor pattern, the first

Table 1
Factor analysis of involvement.

Factor/item	Factor loading	Eigenvalues	Variance explained (%)	Cronbach α
Involvement (INV)		5.29	58.84	0.91
INV5: Taking public transit is important to my daily life	0.83			
INV6: I feel that taking public transit is consistent with my lifestyle	0.83			
INV3: No matter what the trip purpose is, I always prefer taking public transit	0.82			
INV2: Whether the weather is good or bad, I always prefer taking public transit	0.80			
INV7: I like others to know the fact that I take public transit	0.79			
INV1: Whether there is time pressure or not, I always prefer taking public transit	0.76			
INV4: I like the feeling of taking public transit	0.74			
INV8: I always pay attention to the information about public transit	0.73			
INV9: I believe taking public transit will change how people judge me	0.58			
Kaiser–Meyer–Olkin measure of sampling adequacy=0.91.				
Bartlett's test of sphericity=4131.32 (d.f.=36, p=0.000).				
Total variance explained=58.84%.				

Table 2
Factor analysis of service quality.

Factor/item	Factor loading	Eigenvalue	Variance explained (%)	Cronbach α
Core service (CS)		8.17	28.12	0.89
SQ4: general information provision	0.73			
SQ3: network coverage	0.73			
SQ2: service provision hours	0.69			
SQ5: prices of tickets	0.67			
SQ1: service frequency	0.64			
SQ8: complaint dealing	0.64			
SQ6: ticket selling network	0.59			
SQ9: train information provision	0.58			
SQ7: personnel behavior	0.52			
Psychical environment (PE)		1.29	27.48	0.88
SQ13: facility cleanliness	0.75			
SQ15: vehicle cleanliness	0.75			
SQ18: vehicle safety	0.74			
SQ14: safety at terminals and stops	0.73			
SQ19: vehicle stability	0.71			
SQ12: conditions at terminals and stops	0.65			
SQ17: onboard information provision	0.65			
Kaiser–Meyer–Olkin measure of sampling adequacy=0.952.				
Bartlett's test of sphericity=6588.309 (d.f.=136, p=0.000).				
Total variance explained=55.60%.				

Note: SQ10, SQ11, and SQ16 are removed due to their factor loadings are less than 0.5.

factor concerns "core service" (nine items, $\alpha=0.89$) while the second relates to "physical environment" (seven items, $\alpha=0.88$). The factors, including involvement and service quality, are measured through a single index by averaging the item scores for each factor for subsequent analyses.

4.2. Measurement model

The measurement model fit is assessed by a confirmatory factor analysis (CFA), with the results shown in Table 1. Six common measures are used to estimate the model fit, namely the ratio of the chi-square value to degrees of freedom (χ^2/d.f.), goodness-of-fit index (GFI), root mean square error of approximation (RMSEA), normed fit index (NFI), non-normed fit index (NNFI), and the comparative fit index (CFI). A GFI, a NFI, a NNFI, and a CFI above 0.90 indicate a close fit of the model to the data. Moreover, an RMSEA of 0.08 or less also indicates a good fit (Hair et al., 2006). As shown in Table 3, the chi-square statistic ($\chi^2=88.20$, d.f.$=18$) is significant, however, the ratio of the chi-square value to degrees of freedom (χ^2/d.f.$=4.9$) is less than 5. Other fit indices – namely, GFI (0.97), CFI (0.99), NFI (0.99), NNFI (0.98), and RMSEA (0.07) – exceed their respective common acceptance levels, as mentioned above. Therefore, the measurement model has a good fit with the data collected.

Item reliability, construct reliability, and average variance extracted are all examined with regard to the convergent validity of CFA (Hair et al., 2006). Item reliability indicates the amount of variance in an item due to the underlying construct. *t*-Values for all the standardized factor loadings of items are found to be significant ($p<0.05$), and all loadings are larger than 0.5, assuring item reliability (see Table 3). Construct reliability estimates range from 0.84 to 0.87, greater than 0.6, which is the threshold value of acceptable reliability. The average variance extracted (AVE) measure reflects the overall amount of variance in the indicators accounted for by the latent construct. The average variances extracted of all constructs range from 0.69 to 0.74, above the cut-off value of 0.5, indicating all constructs are satisfactory. The convergent validity of the measurement model appears to be adequate.

In addition, discriminant validity is assessed by comparing the average variance extracted (AVE) of each individual construct with shared variances between this individual construct and all the other constructs. A higher AVE of the individual construct than shared variances suggests discriminant validity. As shown in Table 4, comparing the square root of the AVE with the correlations among the constructs indicates that each construct is more closely related to its own measures than to those of other constructs, implying adequate discriminant validity (Fornell and Larcker, 1981).

4.3. Structural model

Having established a reliable and valid measurement model, a structural model is used to test the predictive relationships between constructs of the proposed conceptual model. The simultaneous maximum-likelihood-estimation procedures are used to examine the hypothesized relationships among service quality, perceived value, overall satisfaction, involvement, and behavioral intentions. The goodness-of-fit indices of the final estimated structural model after the model modification process include χ^2/d.f. (83.52/18$=$4.65), GFI (0.97), AGFI (0.94), CFI (0.99), NFI (0.99), and RMSEA (0.07), indicating that the structural model has a reasonable explanation of the observed covariance among the constructs of interest. Fig. 4 depicts the results of the estimated structural model.

4.3.1. Hypotheses testing

Regarding the hypothesis tests, as shown in Table 3 and Fig. 4, all structural path estimates are statistically significant ($p<0.01$). Service quality has a significantly positive effect on perceived

Table 4
Correlation matrix of constructs.

Construct	Mean	S.D.	IN	SQ	PV	SAT	BI
IN	3.77	0.66	–				
SQ	3.92	0.52	0.62	0.86			
PV	3.81	0.70	0.69	0.66	0.83		
SAT	4.14	0.68	0.56	0.63	0.58	–	
BI	3.97	0.73	0.64	0.60	0.60	0.63	0.85

Note: The values on the diagonal are square roots of average variance extracted.

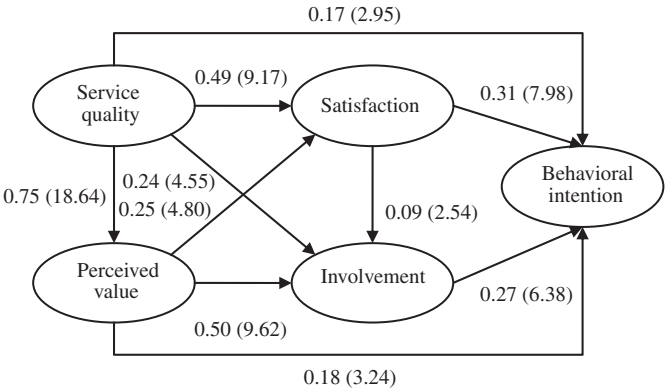

Fig. 4. The estimated model.

Table 3
CFA for the measurement model.

Constructs	Items	Item reliability				Construct reliability	Average variance extracted
		Factor loading	Standard errors	Error variance	*t*-value		
Involvement (IN)	INV	1.00	0.02	0.00	39.04	–	–
Service quality (SQ)	CS	0.90	0.03	0.19	29.14	0.85	0.74
	PE	0.82	0.03	0.33	26.48		
Perceived value (PV)	PV1	0.80	0.03	0.35	23.80	0.87	0.69
	PV2	0.80	0.03	0.35	25.34		
	PV3	0.89	0.03	0.21	28.50		
Satisfaction (SAT)	OSAT	1.00	0.02	0.00	39.04	–	–
Behavioral intention (BI)	BI1	0.88	0.03	0.22	28.82	0.84	0.72
	BI2	0.82	0.03	0.33	25.47		

Table 5
Direct, indirect, and total effects of behavior intention.

Path	Effect	Estimates	*t*-value
Involvement → Behavioral intentions	Direct effect	0.27	6.30**
	Indirect effect	0.42	10.86**
	Total effect	0.69	18.97**
Service quality → Behavioral intentions	Direct effect	0.17	2.95**
	Indirect effect	0.25	7.17**
	Total effect	0.42	9.09**
Perceived value → Behavioral intentions	Direct effect	0.18	3.24**
	Indirect effect	0.06	3.17**
	Total effect	0.24	4.06**
Satisfaction → Behavioral intentions	Direct effect	0.31	7.98**
	Indirect effect	–	–
	Total effect	0.31	7.98**

** Denotes $p < 0.01$.

value ($\gamma_1 = 0.75$, t-value = 18.64), overall satisfaction ($\gamma_2 = 0.49$, t-value = 9.17), involvement ($\gamma_3 = 0.24$, t-value = 4.55), and behavioral intentions ($\gamma_4 = 0.17$, t-value = 2.95), and thus H_1, H_2, H_3, and H_4 are supported. The results show that service quality plays a significant role in passenger evaluations of public transit services, involvement, and behavioral intentions.

The effects of perceived value on overall satisfaction ($\gamma_5 = 0.25$, t-value = 4.81), involvement ($\gamma_6 = 0.50$, t-value = 9.62), and behavioral intentions ($\gamma_7 = 0.18$, t-value = 3.24) are significantly positive, indicating that H_5, H_6, and H_7 are supported. Overall satisfaction has a significantly positive effect on both involvement ($\gamma_8 = 0.09$, t-value = 2.54) and behavioral intentions ($\gamma_9 = 0.31$, t-value = 7.98), suggesting support for H_8 and H_9. Finally, involvement is also found to have a significantly positive effect on behavioral intentions ($\gamma_{10} = 0.27$, t-value = 6.38), and thus H_{10} is supported.

4.3.2. Indirect, direct, and total effects on behavioural intentions

Table 5 reports the effects (i.e. direct, indirect, and total) of various determinants on passengers' behavioral intentions. According to the estimated model, apart from satisfaction with mere direct effects, all antecedents have both direct and indirect effects on behavioral intentions. The total effect is estimated as the sum of direct and indirect effects. In terms of total effects, involvement (0.69) appears to have the largest effect on behavioral intentions followed by service quality (0.42), satisfaction (0.31), and perceived value (0.24) in order. With respect to direct effects, involvement (0.27) also has a considerably large effect on behavioral intentions while satisfaction (0.31) has the largest direct effect. Moreover, the indirect effect of involvement (0.42) on behavioral intentions mediated by service quality, perceived value, and satisfaction is also the largest among various antecedents. These results suggest that the role of involvement influencing passengers' behavioral intentions, either toward re-using public transit services or recommending the public transit services to others, should not be negligible. Furthermore, how to increase passengers' level of involvement deserves careful consideration in the marketing and promotion strategies of public transit companies.

5. Discussion and conclusion

This study investigated public transit passengers' behaviors by constructing a comprehensive model considering public transit involvement, service quality, perceived value, satisfaction, and behavioral intentions. In particular, different from previous studies, the role of involvement is addressed in the process of passenger experience while taking public transit services. The relationship model was tested using data obtained from a passenger questionnaire survey of the KMRT system in Taiwan.

The results of the relationships between service quality, perceived value, satisfaction, and behavioral intentions suggest important implications for public transit companies. Passenger behavioral intentions or loyalty significantly rely on passenger satisfaction. To enhance passenger satisfaction, two antecedents, i.e. service quality and perceived value, must be addressed. Service quality is measured as passenger evaluations of the service attributes of public transit services, such as the general characteristics of the public transport system, terminals and stops, vehicles, and transport points (Tyrinopoulos and Antonious, 2008). Quality improvement and management, such as identifying those specific attributes about which passengers are most concerned and endeavoring to offer quality services, are prerequisites to obtaining passenger satisfaction. According to our results, service attributes such as vehicle safety, facility cleanliness, and complaint handing have significant influences on passenger behavioral intentions.[1] These findings can provide useful information for the KMRT in its efforts to prioritize the important service attributes and ensure its service quality meets or exceeds passenger expectations. However, offering better service quality is always costly, and such costs are frequently shifted to passengers through higher ticket prices, and these might offset any benefits thus obtained.

In other words, passenger satisfaction is not guaranteed if the quality of the services that public transit delivers do not result in increased passenger perceptions of value in relation to the fares paid. Therefore, providing passenger-value-oriented quality services is crucial for public transit companies if they are to satisfy their passengers and thus increase re-patronage/word-of-mouth behavior, and consequently customer loyalty. Currie and Wallis (2008) provided a synthesis of the evidence with respect to effective ways to grow urban bus markets in Europe, North America, and Australia. They focused on service improvement measures, including network structure and service level, bus priority measures, vehicles and stop infrastructure, fare and ticketing systems, passenger information and marketing, personal safety and security, and synergy effects of measures. In addition, the effects of psychological factors such as service quality, satisfaction and perceived value on passenger behaviors have also been addressed in the field of transportation research (Hu and Jen, 2006; Jen and Hu, 2003; Joewono and Kubota, 2007; Tyrinopoulos and Antonious, 2008).

While offering quality transit services is essential, increasing passengers' involvement with, by the use of advertisements, for example, can be employed as a pull-strategy to develop the transit market. Another contribution of this study is to explore the role and effect of passengers' involvement in public transit on passenger behavioral intentions. Our results show that involvement has a positive and significant effect on passenger behavioral intentions. In the public transit context, passengers with higher public transit involvement are those who have higher needs, values, and interest with regard to public transit. Therefore, it is rational that higher public transit involvement is positively related to higher behavioral intentions and other antecedents.

Given the importance of involvement with regard to passenger behavioral intentions, activities aim at increasing passenger involvement could be used to design effective marketing strategies in the public transit context. Marketers of public transit services should seek various ways, such as eye-catching advertisements and celebrity endorsements, to increase passengers'

[1] Due to limited space, the details of the regression results are not reported in this paper. However, they are available upon request from the authors.

involvement with such services. Increasing ridership is extremely important for a public transit system like the KMRT, which is a recent BOT transit system start-up with current ridership far below its expected break-even point. Therefore, in addition to retaining existing passengers, more importance should be attached to attracting new passengers. A more marketing-oriented approach rather than the traditional supply-oriented approach is thus believed to be more appropriate for the KMRT.

Several limitations of this study provide research direction for future studies. First, given the importance of involvement, the development of a comprehensive and valid involvement scale which can apply to general public transport services is recommended. Second, how to design and implement effective marketing strategies incorporating involvement to attract more passengers also need further investigation. Third, involvement is only specified as one of the determinants of passenger behavioral intentions in this study. However, as frequently discussed in the behavioral and marketing literature, involvement might act as a mediator or moderator in the attitude–behavioral relationships (Kokkinaki and Lunt, 1997). In this study, involvement is affected by customer evaluations of services, such as perceived value, service quality, and satisfaction. When people are satisfied with the public transport, their involvement toward it will increase. Increased involvement might play a role as a moderator in the relationship between service evaluations and behavioral intentions. Although the potential moderating role of involvement is not explored in this study, it deserves further investigation in the public transit context.

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