Effects of Service Guarantee and Perceived Waiting Experience on Railway Passenger's Repurchase Intentions

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Abstract: In railway transportation, it happens that passengers need to wait due to schedule delay. The unfavorable waiting experience of passengers may cause negative emotion and lower service evaluation. The purpose of this study is to examine the effects of passengers’ perceived waiting experience and service guarantee on their satisfaction and repurchase intentions. This study took the Taiwan Railway Administration as an example and the data were collected via a questionnaire from those passengers who had the waiting experience before. After applying structural equation modeling to test the theoretical model, the research results showed that the effects of perceived waiting time and service guarantee on satisfaction and repurchase intentions were significant. This study proposed some managerial implications and suggestions for future research.

Key Words: Perceived Waiting Experience, Service Guarantee, Repurchase Intentions, Railway

1. INTRODUCTION

In most kinds of services where customers must be present, waiting is inevitable due to uncertain and fluctuating demands (Luo et al., 2004). To realize the customer’s waiting experience is an important topic for service marketers (Cameron et al., 2003). In the rail transportation service, it happens that passengers need to wait due to schedule delay. Although service operators attempt to improve the punctuality of rail schedule, it still would not be economically feasible to completely eliminate waiting (Luo et al., 2004). The rail transportation system operated by the Taiwan Rail Administration (TRA) is the most popular and age-old transportation system between north and south Taiwan. However, there have more and more complaints about delay of train and passengers are not satisfied since their trips may be detained (Taiwan Rail Administration, 2008). It shows that the TRA lacks of the concept of perceived waiting management.

Since it is difficult to obtain a “zero defects” in a service setting, managers has increased interest in managing the perception of waiting experience (Taylor, 1994). The wait for service
can be defined as the time from which a customer is ready to receive the service until the time
the service commences, but it also refers to the state of readiness felt by that customer during
the wait (Casado Diaz and Mas Ruiz, 2002; Taylor, 1994). Customers frequently overestimate
the mount of time they spend waiting for service (Hornik, 1982; Katz et al., 1991) and so do
the train passengers. Generally speaking, waiting for service is a negative experience
(Scotland, 1991) and may cause negative emotion and lower service evaluation. Previous
studies focused on waiting experience have analyzed the effect of perceived waiting time on
the customer evaluations of a service (Luo et al., 2004). Some studies showed that the
customer’s emotional responses of waiting were influenced by perceived waiting time and
punctuality importance (Casado Diaz and Mas Ruiz, 2002). Also those variables have
influences on customer’s satisfaction and behavioral intentions (Bielen and Demoulin, 2007).
However, none of them explores the influences of perceived waiting experience from the
viewpoint of passengers’ perception in the public transportation service industry. In order to
manage the perception of waiting experience of train passengers, it is important to analyze the
effects of passenger's experience of waiting on their satisfaction and behavioral intentions for
rail service.

On the other hand, The TRA has a compensation policy that passengers can ask for a
monetary compensation with over sixty minutes delay. That means passengers cannot get any
guarantee of punctuality because the TRA will pay nothing if the delay time is less than sixty
minutes. Some studies argued that service companies can use service guarantee to attract
customers and build customer loyalty (Wirtz, 1998; Fabien, 2005). Service guarantee can also
help to reduce perceived risk, to encourage dissatisfied customer complain, and to improve
service evaluation after a service recovery (Lidén and Sandén, 2004). Managers need not only
improve the operation process, but also offer an excellent service guarantee which can
recover the service failure and make some compensation to customers (McColl et al., 2005).
Specifically, managers can not only influence the customer’s perceptions through the
variables mentioned above, but also reduce the perception of risk by offering them the service
guarantees. When the customers overestimate the risk, firms can make the commitment of
compensation to reduce the perception of risk or evaluation of the damage, and then to
improve their repurchase intentions.

There is little research to explore the influences of perceived waiting experience and service
guarantee from the viewpoint of passengers’ perception in the public transportation service
industry. The prior studies about the waiting experience had not considered the influence of
service guarantees. And it is exactly the main purpose and contribution of this study. Thus, the
purpose of this study is to examine the effects of passengers’ perceived waiting experience
and service guarantee on their satisfaction and repurchase intentions. This study took the TRA
as an example and the data were collected via a questionnaire survey from those passengers
who had the waiting experience before.

2. LITERATURE REVIEWS

2.1 Service Guarantees

Service guarantees are a formalized recovery technique that is used for dealing with service
failures and learning from the experience (Lidén and Sandén, 2004). Wirtz (1998) has
concluded from the prior studies that service guarantee proposed by service providers can be
seem as a promise of service quality. Thus, it can assistant to reduce perceived risk, to improve service evaluation and to have positive influence on repurchase intentions.

Service guarantee is said to have three functions: as a quality tool, a marketing tool, and a customer service tool (Wirtz, 1996). Many studies have advocated service guarantees as a means to improve service quality and satisfaction (Hays and Hill, 2006). Moreover, service providers are forced to increase service quality level by the pressure of implement their commitments stated in the service guarantee (Hays and Hill, 2001).

High service guarantee strength leads to improved service quality, customer satisfaction and loyalty (Berry, 1995; Hart, 1988; Schneider and Bowen, 1996; Hays and Hill, 2006). Most of previous researches support a positive relationship between the presence of a service guarantee and improved service quality (Erevelles, 1993; Ostrom and Iacobucci, 1998; Shimp and Bearden, 1982; Hays and Hill, 2006; McColl et al., 2005).

Moreover, the service provider may “punish” itself via offering some kind of compensation for the service failure (McColl et al., 2005). That is because the compensation represents a kind of cost paid by the service provider. If company offers a higher service guarantee, it will enhance more customers to purchase. Since the higher service guarantee implies the company will offer a high-quality service to avoid paying compensation, the satisfaction with service guarantee is higher than the service without it (Hays and Hill, 2006). For rail transportation, if the company offering a good service guarantee (e.g. delay compensation), the passengers will have high satisfaction. Thus, this study proposes two hypotheses as follows:

H1: Service guarantee has a positive influence on passenger’s satisfaction.
H2: Service guarantee has a positive influence on repurchase intentions.

2.2 Perceived Waiting Experience

The definition of perceived waiting for a service is the period from the time that customer is ready for receiving a service to the time that the service is starting (Taylor, 1994). The perceived waiting time is the perception of the length of time when the customer is waiting for a service. That means the perceived waiting time may not be equal to the real waiting time. Customers often overestimate their waiting time which means they feel longer waiting than the real waiting time (Luo et al., 2004). Most previous studies showed that the perceived waiting time is influenced by the punctuality (Folkes et al., 1987; Katz et al., 1991; Chebat and Filiatrault, 1993; Hui and Tse, 1996; Hui et al., 1998). That means if punctuality is important for a customer, it will produce the time pressure to press him impatient with waiting and have longer perceived waiting time (Casado Diaz and Mas Ruiz, 2002). Thus, this study proposes H3 hypothesis as follows:

H3: Punctuality has a negative influence on perceived waiting time.
Ruiz, 2002; Bielen and Demoulin, 2007). That means the better punctuality of rail schedule makes the better evaluation of service. Thus, this study proposes five hypotheses as follows:

\[ H4 \]: Perceived waiting time has a negative influence on customer satisfaction.
\[ H5 \]: Perceived waiting time has a negative influence on repurchase intentions.
\[ H6 \]: Punctuality has a positive influence on customer satisfaction.
\[ H7 \]: Punctuality has a positive influence on repurchase intentions.

Moreover, satisfaction is considered as an explanation of the likelihood that customers will purchase the service again (Bearden and Teel, 1983). Many past studies in perceived waiting management area have shown that customer satisfaction has positive influence on repurchase intentions of customers (Baker and Cameron, 1996; Szymanski and Henard, 2001; Brady and Robertson, 2001; Casado Diaz and Mas Ruiz, 2002; Kumar, 2005; Bielen and Demoulin, 2007). Following the previous studies stated above, this study proposes a hypothesis as follows:

\[ H8 \]: Customer satisfaction has a positive influence on repurchase intentions.

Based on the literature reviews stated above, this study proposes a research model (as shown in Figure 1). The research model is used to examine the effects of service guarantee, perceived waiting time and punctuality on TRA passenger’s satisfaction and repurchase intentions.

**Figure 1 Research model**

### 3. METHOD

#### 3.1 Measurement

This study employed thirteen manifest variables as multiple indicators for five latent variables in the research model. A Likert five-level scale is applied to all questions to allow subjects to rate each construct variable (1 stands for “strongly disagree” and 5 for “strongly agree”).

A service guarantee is an explicit commitment to the customer concerning all or part of the service process (Fabien, 2005). This study referred to the content of Bitner (1990), Bitner et
al. (1990), Hart (1988), Wirtz (1998) and Fabien (2005) and devised six questions, including “There is no limitation of the service guarantee”, “The description is clear and realizable”, “The service guarantee is meaningful for passengers”, “The service guarantee is proposed by TRA actively”, “All passengers are qualified to obtain this service guarantee”, and “The service guarantee is reliable”.

For perceived waiting time, perceived waiting time means the customer’s perception of time length during the period of waiting for a service (Bielen and Demoulin, 2007; Taylor and Fullerton, 2000). This study referred to theories proposed by Taylor (1994), Bielen and Demoulin (2007) and Taylor and Fullerton (2000) and designed three questions, including “expectation for delay time”, “prediction of delay time” and “perception of delay time”.

The definition of punctuality is an evaluation of promptness or adherence to a specific time (Folkes et al., 1987; Taylor, 1994). Moreover, the punctuality refers to an evaluation of the punctuality of rail schedule. This study defined the single question for measuring the punctuality for specific trip according to Folkes et al. (1987) and Taylor (1994).

The satisfaction with service is defined as an affective reaction to an incident during the dispensing of a service based on experience (Bielen and Demoulin, 2007; Casado Diaz and Mas Ruiz, 2002; Cronin and Taylor, 1992). This research took the viewpoints of the aforementioned scholars and used the single question to measure the whole satisfaction of passengers Toward TRA.

Basically, repurchase intention refers to the willingness of purchase again (Bielen and Demoulin, 2007). It also reflected by the inclination to complain or recommend to the service provider (Casado Diaz and Mas Ruiz, 2002). This study referred to theories proposed by Bielen and Demoulin (2007) and Casado Diaz and Mas Ruiz (2002) and designed two questions, including “probability of repurchase” and “recommend to others”.

3.2 Data Collection

A survey of the passengers of TRA has been conducted with a questionnaire in this research. Since there have many passengers within north Taiwan, the survey was conducting at Taipei and Taoyuan stations which are two major stations in north Taiwan. Questionnaires were distributed at the train stations. The researchers first asked the passengers weather they have the experience about waiting for a delay train. If the passenger’s answer is positive, then he was selected to be our respondent. The respondent then continued to fill the questionnaire and returned it to the researcher after they filled out the questionnaire.

The survey period were across three weeks including week day and weekend. The survey time was started from 7 am to 8 pm. However, the questionnaire of this study was designed based on the respondents’ previous experience not the current trip while filling the questionnaire. Since the waiting experience might happen for a long time ago and it was not easy to remind the detail of trip information, the trip period was not collected in this study.

This study applied structural equation modeling (SEM) to test the hypotheses and our research model. In general, the sample size should be large than 200 in order to reduce the sampling error (Hatcher, 1998). This study dispatched total 400 copies at Taipei and Taoyuan train stations (each station has 200 copies) in order for meet the basic requirements for SEM
to be valid.

3.3 Analysis

The paths in the research model were analyzed using structural equation modeling (SEM). Analysis followed a two-step procedure based partly on the approach recommended by Anderson and Gerbing (1988). The first step applied confirmatory factor analysis (CFA) to develop a measurement model that has an acceptable fit to data. The second step then tests the theoretical model (or structural model) via path analysis to ensure that the structural model is meaningful and statistically acceptable.

Technically, the chi-square test may be statistically insignificant for a better fitness in SEM analysis. However, in practice, the chi-square test is extremely sensitive to sample size and departures from multivariate normality, frequently resulting in rejection of a well-fit model (Hoyle, 1995). Therefore, chi-square/degree-of-freedom ($df$) ratio can be used as an index of goodness-of-fit (James et al., 1982; Jöreskog and Sörbom, 1993). The acceptable chi-square/$df$ ratio is <5 (<3 is better) (Jöreskog and Sörbom, 1993; Hatcher, 1998). Many fitness indices exist, such as Bentler's comparative fit index (CFI), goodness of fit index (GFI), GFI adjusted for degrees of freedom (AGFI), normed-fit index (NFI), non-normed-fit index (NNFI); all of which should exceed or be close to 0.9. Notably, root mean square residual (RMR) should be <0.05, and root mean square error of approximation (RMSEA) should be <0.08 (<0.05 is better) (Hatcher, 1998).

4. RESULTS

4.1 Sample and Reliability Analysis

A total of 400 questionnaires were distributed for the research and 354 copies were recovered and valid. The effective sample recovery rate was 88.5%. Among them, the numbers of valid questionnaire collected in Taipei and Taoyuan station were both 177. The sample structure is shown in Table 1. The ages of the respondents were under 25 years old (42.94%), and half were female. Students and office workers represented 39.83% and 24.58% respectively. Most respondents graduated from senior high school (48.31%). The samples in this study exhibited similar demographic characteristics to those involved in other investigation in TRA.

With regards to the test of reliability, we have chosen Cronbach’s $\alpha$ reliability coefficient for the analysis in this study. However, there are only service guarantee and perceived waiting time since only these two construct variables have more than two questions. The reliability coefficients for service guarantee and perceived waiting time presented in the questionnaire were 0.869 and 0.845 which were greater than 0.8. Thus, this means all dimensions adopted in this research are highly reliable.

<table>
<thead>
<tr>
<th>Table 1 Sample</th>
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<tr>
<td>Sex</td>
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<tr>
<td>Male</td>
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</table>
4.2 Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) is primarily used to validate or confirm the attribute of parameters in the factor analysis or the number of factors involved. There are three latent variables present in the model presented in this research: service guarantee, perceived waiting time and repurchase intentions. Since the satisfaction and the punctuality both only have one measurable variable, they are not suitable included in the measurement model (Hatcher, 1999). Results of measurement model fitness indices prior to adjustment are shown in Table 2.

| Table 2 Result of measurement model fitness indices prior to adjustment |
|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                          | Chi-square | df     | Chi-square/df | GFI     | AGFI    | RMR    | NFI    | NNFI    | CFI    |
| M₀                      | 351.878     | 67      | 5.252           | 0.874   | 0.802   | 0.079  | 0.837  | 0.812   | 0.862  |
| M₁                      | 221.872     | 55      | 4.034           | 0.909   | 0.849   | 0.075  | 0.878  | 0.864   | 0.904  |
| M₂                      | 137.811     | 44      | 3.132           | 0.939   | 0.891   | 0.067  | 0.913  | 0.907   | 0.938  |

Note: M₀ is the initial model; M₁ is the M₀ model removed V5; M₂ is the M₁ model removed V2.

M₀ is the initial model and the fitness indices are not good enough for CFA. In the measurement model, each indicator variable is predicted to load just one factor; that is, none of the indicators are complex variables (measuring multiple latent variables) (Hatcher, 1998). According to the Lagrange multiplier test, V5 should be the measurable variable of service guarantee. However, V5 also had relationship with other construct variables, that means V5 is a complex variables (measuring multiple latent variables) and should be removed from the measurement model (Hatcher, 1998). After removed V5, the fitness of the 1st revised measurement model (M₁) was still not good enough and V2 was found to be a complex variable with the same situation of V5. With removed two complex variables, the value of Chi-square for the 2nd revised measurement model (M₂) was dropped to 137.811 with p<0.001. The ratio of Chi-square/df was smaller than 5 after the adjustment. In addition, this study could also see from the table above that the value of GFI, AGFI, NFI, NNFI and CFI have exceeded or closed to 0.9. The RMR has fallen below 0.067. Overall speaking, the indices show the acceptable fitness of measurement model.
The result of measurement model characteristic analysis is shown in Table 3. From the \( t \)-value in the table, it is evident that the standardized factor loadings for all indices have reached the significance level. In addition, the standardized factor loadings for all indices have exceeded 0.5. This showed that all indices have sufficient convergent validity (Anderson and Gerbing, 1988). Furthermore, All constructs have shown excellent composite reliability (>0.7) (Fornell and Larker, 1981). The variance extracted estimate for each construct variable is greater than 0.5. Thus, the measurement model has the both reliability and validity.

<table>
<thead>
<tr>
<th>Service Guarantee</th>
<th>Standardized factor loading</th>
<th>( t )-value</th>
<th>Composite reliability</th>
<th>Variance extracted estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>0.764</td>
<td>15.854*</td>
<td>0.810</td>
<td>0.522</td>
</tr>
<tr>
<td>V3</td>
<td>0.900</td>
<td>19.757*</td>
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<td>0.711</td>
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<tr>
<td>V4</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>V6</td>
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<th>Perceived Waiting Time</th>
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Note: *indicates \( t \)-test has reached the significance level of \( p<0.001 \)

### 4.3 Path Analysis

The next portion involved path analysis of the research model. The value of Chi-square for the model came to 104.550. The ratio of Chi-square/df was 2.681 (104.550/39) and smaller than 3. Besides, CFI = 0.955, GFI = 0.949, AGFI = 0.914, NFI = 0.931 and NNFI = 0.936. They all have exceeded 0.9. Results for RMR = 0.063 within the accepted range. This proves that the results of fitness obtained from this structural model turned were ideal and met the required standards.

The number of path coefficients amongst the latent variables is shown in Table 4 and Figure 2. Overall speaking, the positive and negative signs for all path coefficients have been consistent with the hypotheses we have presented in this study. The service guarantee, punctuality and satisfaction have all showed significant positive influence on repurchase intentions. The perceived waiting time has significant negative influence on repurchase intentions. Out of these dimensions, satisfaction has exhibited the most significant influence (0.442). These results have validated hypotheses H1, H2 H5, H7 and H8 presented in this study. In addition, the effects of service guarantee, perceived waiting time and punctuality on satisfaction has also been proven in this study, thus validating H4 and H6. Finally, the punctuality has a significant negative influence on perceived waiting time. That means passengers perceived longer waiting while the rail schedule is unpunctuality.

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5. CONCLUDING REMARKS

In conclusion, the model structure presented in this research has been faithfully tested. The data supports the relationships among the five variables through the causal paths of eight hypotheses. According to the research results, perceived waiting time will negative influence customer satisfaction and repurchase intentions. This is consistent with previous studies at other service industries. Managers should focus on managing the perceived waiting experience of train passengers. People feel boring, uneasiness and anxiety while they experience uncertainty waiting (Maister, 1985). Improving servicescape, offering waiting information, entertainment media (e.g. music, TV news, etc.) has been viewed as an enhancement to the waiting environment design based on the previous studies (Areni and Kim, 1993). These factors can also affect the evaluation of customers’ overall experience (Cameron et al., 2003).

Moreover, perceived waiting time will increase while the passenger needs to be the destination on time. Passengers often have intentions to use TRA service when they need to
be the destination on time, since the rail transportation usually can offer a train schedule and will not be disturbed by road traffic congestion. However, people may still feel longer waiting time and negative affective action while the punctuality of the trip is bad. Waiting for a train at commuter time (e.g. go to work or school) will makes passengers unsatisfied and not accepted. Offering interesting information or additional service may attract their attentions, and make them not focus on the waiting experience. Anyhow, the delay waiting should be avoided especially at commuter time.

The results also show that service guarantee and customer satisfaction can positive influence repurchase intentions. The influence of customer satisfaction is greater than service guarantee. The content of service guarantee should be designed from the viewpoint of passengers. It also needs to offer a service recovery system to support the service guarantee while the promise in guarantee cannot be achieved. Managers should have a well-defined service guarantee in order to increase passenger perceptions of satisfaction and repurchase intentions.

With regards to suggestions for future research, due to the constraints of research budgets and time limitations, we were unable to exercise greater control over subjects and samples collected. It is suggested that follow-up researches expand the selection of samples for different customer groups such as various travel purposes, frequency, and waiting period (e.g. peak period or off-peak period). Second, researchers interested in conducting follow-up studies may consider expanding the scope of research to include the influences of other competitive modes. In addition, the availability of real time transit information may also influence the passengers’ perception of waiting time. Future study can explore the relationship between passengers’ perceived waiting time and the availability of real time transit information. Finally, this study confirmed the effects of service guarantee and perceived waiting experience on repurchase intentions. Researchers should also explore other antecedents of perceived waiting experience, such as service encounter types or servicescape in order to generate a theoretical model that is more complete and integrated than the proposed model.

ACKNOWLEDGEMENTS

The paper is part of the results of the research project of National Science Council (NSC-952416H424001) of Taiwan. The authors would like to thank the NSC for financially supporting this research.

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