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Understanding preference for high-speed rail service: a consumer logistics perspective

Abstract

This study uses consumer logistics theory as a framework to identify factors that will help to market high-speed rail (HSR) transportation and critically affect its usage for intercity business travel. Consumer logistics theory essentially reconceptualizes the business distribution literature related to logistics into the context of the consumer market. The resultant consumer logistics functions relate very aptly to consumer deliberation related to transportation decisions. The confirmatory factor analysis function of LISREL is used to develop a measurement model. The measurement model reveals that four consumer logistics functions are critical to U.S. consumers: Safety, Connections, On-Board Amenities, and Information. The structural equations modeling function of LISREL is then used to determine whether the logistics functions ultimately affect usage intentions. The structural model reveals that 1) two of these functions, Safety and Connections, are both positively related to travel effectiveness and efficiency, and 2) effectiveness and efficiency are both positively related to HSR usage intention. The model also shows that it is efficiency of HSR rather than effectiveness that is most strongly related to usage intentions.

Keywords: consumer logistics, services marketing, high-speed rail.

Introduction

The purpose of this study is to reach a fuller understanding of consumers' perceptions of high-speed rail (HSR) service for intercity business travel. HSR typically involves rail a route with limited stops traveling at speeds in excess of 150 miles per hour (de Cerreño, Evans, Permut, 2005). Potential demand for HSR in the U.S. will be driven by concerns about the growing congestion in the nation's air travel network, growing traffic congestion, automobile pollution, petroleum resource conservation, and sustainable urban development (Nash, 2003; Yomiuri Shinbun, 2003). Downward pressure on demand for HSR service in the U.S. resides in a reluctance among many U.S. citizens to embrace public ground transportation (de Cerreño, Evans, Permut, 2005; Nash, 2003).

Consumer logistics theory is used by this research as a framework to provide a better understanding of consumer perceptions and to inform future efforts to develop and market HSR service. Although consumer logistics theory has not been widely cited, it has been used to understand online banking (Gehrt, 2007), grocery shopping (Granzin, 1990) and other consumer phenomena. For intercity business travel, a great deal of the convenience phenomenon resides in the activities involving the location, storage, communication, transportation, and transaction activities. Consumer logistics applies aptly to these activities (O'Brien et al., 2003; Painter and Granzin, 1996). In this study, perceptual data are collected to test a consumer logistics model of HSR travel intention. The results show the manner and the extent to which the logistics of HSR service are likely to lead to customer intentions to use it for inter-city business travel and how HSR service providers, by enhancing their consumer logistics capabilities, can encourage usage.

The consumer logistics framework is used to develop a model that examines the relationship between 1) performance of consumer logistics functions, 2) perceptions of HSR travel value (consisting of travel efficiency and effectiveness), and 3) HSR travel intention for intercity business travelers. Intercity business travel is the focus of the study since, in the interest of relieving the pressure on over burdened air travel networks several potential U.S. corridors, HSR service has come under consideration (Epstein, 2003). The two major questions to be answered by this research are 1) what are the most critical consumer logistics functions related to HSR, and 2) to what extent will they affect perceived value of HSR travel, and, ultimately to what extent will they affect HSR usage intention.

1. Literature review

1.1. Channels, consumer logistics, effciency/effectiveness, usage intention. Logistics relates to the functions that members of a channel of distribution perform in storing and transporting goods to assure that materials and products are available when the customer wants them (Fawcett, Ellram, and Ogden, 2007) and the manner in which performance contributes to customer satisfaction (Tyndall, Gopal, Partsch, Kamauff, 1998). Indeed, making products and services available to the customer in the right form, at the right price, at the right time has been viewed as "a strategic weapon in the battle for market supremacy" (Kudpi and Pati, 1996, p. 16). Fur-

ther, as the responsibilities of channel functions are apt to shift amongst channel members but not be eliminated (Stern, El-Ansary, Coughlin, 1996), in attempts to provide transportation services to the consumer, transportation service providers must either perform all of these functions or shift some or all of them to other channel entities, including the consumer.

The decision to change a supply chain in order to better meet the needs and wants of customers and enhance both channel performance and efficiency has long been an interest of channels researchers (Anderson, Lodish, and Weitz, 1987; Anderson and Narus, 1990; Frazier and Rody, 1991; Gupta and Loulou, 1998; Savaskan and Van Wassenhove, 2006). While changes are made in order to increase performance, better serve, or both (Anderson, Day, and Rangan, 1997), there is no guarantee that such changes will materialize, potentially resulting in opportunity costs, loss of customers, and costs associated with refiguring the channel (Christiaanse and Zimmerman, 1999). The marketing literature in general has investigated shifts in functions from the channel to the customer, most notably the growing shift of service from service provider to self-service (Parasuraman, 1996). However, traditional marketing channels research does not often explicitly examine the role the consumer plays in performing logistical functions (O'Brien, Gehrt, Sakano, Ezawa, 2003). Consumer logistics theory, however, focuses on the performance of logistical functions by the consumer (Painter and Granzin, 1996). Bowersox (1978) originally developed a list of the activities that constitute the field of business logistics. Granzin and Bahn (1989) utilize this business logistics framework in the consumer context. The activities include logistical functions performed by the consumer within the household and as well as at the consumer-retailer interface. Thus, consumer logistics extends the research of Etgar (1978) who examined production functions within the household but devoted spare attention to the consumer-retailer interface. Consumer logistics has traditionally accounted for functions including location, transportation, information communication, handling and storage, and inventory and is well suited to helping to explain preferences for alternative means of transportation.

From the consumer's perspective, value has been seen as the trade-off between costs and benefits (Brady et al., 2005). However, attempts to assess value creation empirically suggest that value is specific to the person evaluating (Bolton and Drew, 1991). Channels research shows that value is an important consequence of logistical performance and has been conceptualized as consisting of efficiency and effectiveness (Slater and Narver, 1994). Efficiency relates to reducing the cost of consumer logistics and effectiveness relates to increasing the benefits of consumer logistics. Research also shows that there is a link between consumer value and consumer satisfaction (Tse and Wilson, 1988) and consumer usage intention (Kumar and Grisaffe, 2004). The theoretical components of consumer logistics, value (efficiency and effectiveness), and satisfaction were linked in a study that provided important insight to providers of consumer banking service, a consumer market that has changed as a result of the emergence of online logistics (Gehrt, 2007; O'Brien, Gehrt, Sakano, Ezawa, 2003). Since the notion of HSR service is not the reality in the U.S. that it is in a number of other countries, this research examines HSR usage intentions as an outcome variable.

1.2. High-speed rail. HSR service has spread throughout Europe and Asia where public transport systems are viewed by governments and consumers as an essential public service due to practical considerations such as traffic pollution abatement, travel convenience, and energy conservation (de Cerreño, Evans, Permut, 2005; Schultz, 2007). For Japan's successful Shinkansen, governmental and consumer consideration of these and other issues has resulted in an increasing number of scheduled departures and passenger load increases from 21 million in 1964 to approximately 250 million in 1989 (Japan Travel News, 2006; Taniguchi, 1992; Yomiuri Shinbun, 2003). Shinkansen now offers differing levels of service ranging from Nozomi (Super Fast Express), Hikari (Super Express), and Kodama (Express).

Although frustrated with gridlock on the nation's highways and delays in congested airports, indifference on the part of U.S. lawmakers and negative attitudes toward public rail transportation among consumers have seriously hampered the development of HSR systems in the U.S. (Gimpel, 1998; Nash, 2003; Schultz, 2007). Despite such obstacles, Amtrak introduced its *Metroliner*, a service somewhat slower than HSR, connecting New York to the nation's capital in 1969. In 1985 *Metroliners* surpassed the shuttle operations of several airline companies as the largest single carrier of passengers between New York and Washington. Amtrak has since introduced *Metroliners* between other cities (New York-Boston, Los Angeles-San Diego, etc.). Regardless of these pockets of successful operation, however, it is highly unlikely that Amtrak will singularly take the initiative to build the nation's HSR system since the government has been reluctant to provide adequate support and investment (Epstein, 2003; Vranich, 1991). Further, unfavorable percep-

tions of rail service on the part of the U.S. consumer persist (Lynch, 1998; Schultz, 2007). This study is designed to explain how to effectively overcome unfavorable consumer perceptions and to build upon favorable perceptions based on the framework of consumer Logistics theory.

2. Methodology

2.1. Questionnaire development. Two focus group interviews were conducted as part of the effort to adapt extant consumer logistics items and develop additional consumer logistics items for this study. The first focus group of ten individuals was conducted in Tokyo, Japan. Tokyo was chosen because it is the epicenter of Japan's successful HSR network. Medium to heavy users of HSR for business travel were recruited. The second focus group of ten individuals was conducted in the San Francisco metropolitan area. Medium to heavy users of air travel between San Francisco and Los Angeles were recruited since these individuals are good prospects for HSR should it become available. Furthermore, it is a high-profile corridor for HSR development (Epstein, 2003). The Tokyo focus group was done first since it helped to inform the agenda of the U.S. focus group where consumers are not as well acquainted with HSR.

Before the full survey was undertaken, the questionnaire was pretested. A pretest sample of approximately 194 responses was collected. Respondents were drawn from three MBA programs in the San Francisco area. These individuals tended to travel regularly for business purposes with 55 percent of them commuting between San Francisco and Los Angeles via air in the past year. Descriptive statistics were run as a means of identifying instrument irregularities. Pretest respondents were also queried regarding question ambiguity as they returned their responses. Only minor modifications to the questionnaire were necessary.

The cover of the final questionnaire provided respondents with basic information such as the likely cost and duration of HSR service between San Francisco and Los Angeles. A colored photo of the exterior and the interior of an HSR train was also included. This information was intended to establish the frame-of-mind for the response setting and to make it relatively more tangible. The questionnaire itself consisted of 64 items to measure perceptions of consumer logistics issues, 4 items each to measure travel efficiency and travel effectiveness, and 3 items to measure usage intention. All of the data were collected using a 5-point Likert type scale.

2.2. Data collection. Final data collection took place at a major air terminal in the San Francisco metropolitan area. A total of 398 questionnaires were collected. Questionnaires were collected at departure gates for flights with any of the major Los Angeles metro area airports as the destination. Arrival areas of flights with a Los Angeles origination were utilized only in the beginning of the data collection process since arrival passengers were not seem to give the questionnaire the same level of attention as passengers awaiting departure. Passengers at the departure gates, however, with a known amount of time before their departure, devoted a great deal of care to their responses. Of those who completed questionnaires at the San Francisco air terminal, 43 percent resided in the San Francisco area, 23 percent in Los Angeles, 16 percent in San Diego, 5 percent in other California locations, and 13 percent in areas outside of California. Because San Francisco respondents exceeded respondents from other areas, the consumer logistics factor scores of the 1) San Francisco and Los Angeles, and 2) San Francisco and other areas were compared. There were, however, no significant differences between the groups.

Since the focus of this study was business travel, responses were drawn during the week since airport administrators verified that these were the days with the heaviest business travel. Potential respondents were screened by asking them whether they were traveling for business or leisure and whether their final destination was Los Angeles. If they were business travelers, they were informed that a study was being conducted about HSR service in the San Francisco-Los Angeles corridor and that the researchers were interested in their perceptions of such a service. The data collector indicated that respondents would be provided with a $10 cash incentive for completing the questionnaire. This procedure resulted in an 87 percent response rate.

3. Data analysis

There were two phases of data analysis. In the first phase, exploratory factor analysis was used to provide preliminary information about the consumer logistics related perceptions of HSR service. The matrix of consumer logistics factors was saved and correlation analysis (analysis of variance for categorical independent variables) was utilized to help understand how various demographic groups and groups defined by air travel usage frequency perceive the logistical aspects of HSR service.

In the second phase of data analysis, LISREL (Joreskog and Sorbom, 2004) was used to perform confirmatory factor analysis and structural equation modeling, adhering to the two-step convention of Anderson and Gerbing (1988). In the first step, the confirmatory factor analysis function of LISREL was used to develop the measurement model. This ensures that the critical consumer logistics function

is identified and retained for the subsequent structural equations modeling procedure. In the second step, the structural equations modeling function of LISREL was used to develop the structural model. The structural model clarifies the relationship between the performance of consumer logistics functions, HSR travel effectiveness and efficiency, and HSR usage intention.

4. Results

For the first phase of analysis, exploratory factor analysis using principal components factor analysis with varimax rotation on the 64 consumer logistics statements identified 15 factors with an eigenvalue exceeding 1.00. Examination of reliability coefficient alphas, the scree diagram (percentage of variance explained), the number of statements loading on each factor at > .50, and the interpretability of each factor were criteria used to decide on the number of consumer logistics factors to retain. Seven factors were retained: 1) Information, 2) Safety, 3) On-Board Amenities, 4) Transportation Connections, 5) Station Arrival and Departure, 6) Computer Connections, and 7) Station Amenities (see Table 1). The factor labels result from interpretation of the statements that load on each consumer logistics factor

Table 1. Exploratory factor analysis

	Info	Safety/ cleanlinesss	On-board amenities	Transport connection	Station in & out	Computer connect	Station amenitis
% of variance explained	11.2	6.4	6.2	5.7	5.0	4.7	4.4
Reliability	.92	.87	.81	.80	.85	.83	.77
Items							
Boarding info	.749						
Fare info	.739						
Station access info	.736						
Depart./arriv. station info	.730						
Connection info	.727						
Simple ticket purchase	.725						
Train schedule info	.705						
Convenient ticket purch	.670						
Special deals info	.620						
Local transp. mode info	.596						
Walk depart gate safe		.850					
Walk arrival gate safe		.850					
Station safety		.644					
Station cleanliness		.542					
Boarding platform safety		.526					
Signage		.492					
On-board vending			.745				
On-board shops			.652				
On-board service person			.574				
On-board food/beverage			.566				
On-board entertainment			.552				
On-board TV, entertain			.549				
Multiple class tickets			.526				
Wide aisles			.497				
Frequent transp. connect				.860			
Good transp. connections				.846			

Table 1 (continued). Exploratory factor analysis

	Info	Safety/ cleanlinesss	On-board amenities	Transport connection	Station in & out	Computer connect	Station amenitis
Home-station connection				.842			
Multiple mode tickets				.626			
Easy drop-off					.808		
Easy pick-up					.793		
Easy boarding					.716		
Easy de-boarding					.628		
Computer services						.786	
Electrical outlets						.764	
Telecom signal						.761	
Station shops							.774
Station restaurants							.750
Station ATM, etc.							.669
Station business support							.629

Notes: Extraction method: Principal Component Analysis. Rotation method: Varimax with Kaiser Normalization. KMO = .906. Bartlett's test = .000 (sig).

In terms of consumer logistics, all of these factors except On-Board Amenities and Computer Connectivity resemble factors from past consumer logistics research and are likely to affect HSR usage intention indirectly via their direct affect on travel efficiency and effectiveness. On-Board Amenities and Computer Connectivity do not appear to be logistics-related but may, nonetheless, affect HSR usage intention directly (rather than indirectly via efficiency and effectiveness). For each factor, Table 1 shows the constituent statements and their loadings (> .50), the percentage of variance explained, and the reliability coefficient. For statement loadings, the .50 cutoff is conservative since a loading at the .30 level is considered acceptable. For reliability, the .70 level is the cutoff that is consistent with statistical convention.

A simplified structure of consumer logistics emerged in the two-step, second phase of the analysis which utilized LISREL. In the first step which uses confirmatory factor analysis to develop the measurement model, four endogenous factors emerge rather than seven. This is because greater demand is put on the data since the covariance matrix is reconciled to the exogenous variables (consumer logistics factors) as well as the endogenous variables. Further, this study examines not one but two levels of endogenous variables (efficiency/effectiveness and usage intention). The exogenous factors that emerge are 1) Information, 2) Safety/Cleanliness, 3) On-Board Amenities, and 4) Transportation Connections (see Table 2). The decision of which factors to retain is based on a combination of considerations. For the overall model, the RMSEA statistic (< .80 cutoff), fit-statistics (i.e., GFI, CFI, IFI) (> .90 cutoff), and chi-square/degrees of freedom ratio (< 3.00 cutoff) are strong. For each factor, composite reliability (> .70 cutoff) and average variance explained (> .50 cutoff) are all very strong. There is some variability in the individual statements which ideally should load at > .70 but consideration of all statistics suggests a strong measurement model.

Table 2. Measurement model

Indicator**	Standardized loading*	Std. error	*t*	Composite reliability	Average variance extracted
Information				0.91	0.67
45**	0.62	0.06	11.80		
49	0.83	0.08	16.13		
50	0.85	0.07	16.59		
51	0.81	0.07	15.67		
52	0.76**	-	-		
Safe/clean				0.87	0.70

Table 2 (continued). Measurement model

Indicator**	Standardized loading*	Std. error	*t*	Composite reliability	Average variance extracted
16	0.74	0.09	13.43		
17	0.86	0.09	14.72		
25	0.77**	-	-		
On-board amenities				0.74	0.37
36	0.67	0.14	8.89		
38	0.64	0.12	8.62		
40	0.63	0.13	8.56		
41	0.61	0.14	8.41		
42	0.58**	-	-		
Connectivity				0.88	0.71
8	0.88	0.05	21.25		
9	0.91	0.05	22.15		
10	0.85**	-	-		
Efficiency				0.85	0.59
65	0.70	0.05	15.35		
66	0.68	0.06	14.71		
67	0.73	0.05	16.38		
68	0.88**	-	-		
Effectiveness				0.95	0.83
69	0.90	0.04	25.01		
70	0.89	0.04	24.73		
71	0.93	0.04	26.88		
72	0.88**	-	-		
Intention to buy HSR				0.90	0.76
76	0.76	0.04	18.42	Chi-square = 571.99	GFI = 0.90
77	0.92	0.04	25.71	df = 303	CFI = 0.96
78	0.91**	-	-	p = 0.0	RMSEA = 0.049
				Chi-square/df = 1.89	IFI = 0.96

Notes: * P's significant at .01. ** Unstandardized loading fixed at 1.00 to set the metric for multiple item constructs. ** See Appendix A for item description.

The selection of consumer logistics factors retained was further reduced when the structural model was tested in the second step of this phase. This involved testing of a hypothesized model and, based on those results, a final model. The hypothesized model is shown in Figure 1. As explained in the Phase One section, On-Board Amenities was not treated as a consumer logistics factor directly affecting efficiency and effectiveness but it was used in the analysis, recognizing its possible direct link to usage intention. The results of testing the hypothesized model are shown in Table 3.

Although the statistics for the overall model are satisfactory, the statistics for some of the individual relationships are very weak. Statistical significance at the .05 level for a two-tailed t-test is 1.65. Examination of Table 3 shows that Information is very weakly related to efficiency and effectiveness and On-Board Amenities is very weakly related to HSR usage intention. Consequently, an alternative model was tested (see Figure 2).

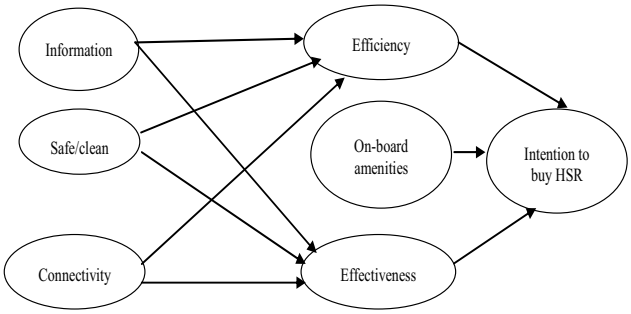

Fig. 1. Hypothesized HSR service model

Based on the results for the hypothesized model, the final model tested is shown in Figure 2. The results for the final model are shown in Table 4. Overall model statistics including RMSEA, fit statistics, and the chi-square/degrees of freedom ration are strong. Furthermore, all of the individual relationships are

statistically significant at the .05 level. What remains in the structural model are the variables that ultimately will drive usage of HSR service. That model shows the consumer logistics factors of Safety/Cleanliness and Transportation Connections each having a positive influence on perceptions of the travel efficiency and travel effectiveness that HSR travel is likely to provide for business travel. Further, the model shows that efficiency and effectiveness are both positively related to HSR usage intentions. Although phase one of data analysis suggests that there are up to seven consumer logistics factors that may come into play, phase two shows that, where a model of HSR usage intention is concerned, the definitive consumer logistics factors are Safety/Cleanliness and Transportation Connections.

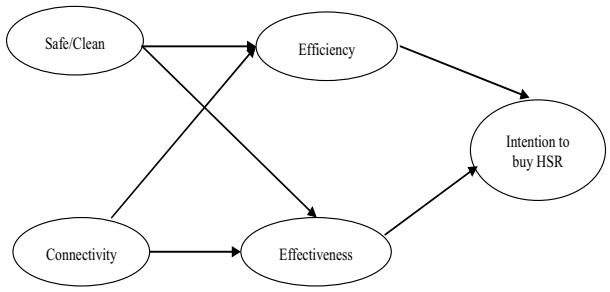

Fig. 2. Final HSR service model

5. Discussion

The combinational Safety/Cleanliness factor may be somewhat surprising. In today's world, with somewhat recent bombings in Madrid and London, it is not surprising that Safety is judged to be a factor of substantial gravity (Boyes, 2006) while Cleanliness is probably judged to be a factor of less gravity. Cleanliness, however, may be one of the faces of Safety (Kumar Grisaffe, 2004). Obviously, to encourage potential passengers to travel by HSR, security procedures and equipment can be put into place. Ample security cameras, the presence of police, security announcements, and other measures have visible or palpable manifestations and readily demonstrate Safety to passengers. Less obviously, Cleanliness, although in many ways unrelated to Safety, may nonetheless communicate Safety to passengers. The consumer mindset may be that a transportation service provider, who cannot keep their vehicles and stations clean, will not be up to the more formidable task of keeping their stations and vehicles safe. Even care in station design, creating a logistically functional but also an environment that is pleasing to the eye may provide a level of assurance to the HSR user and potential user. There is no question that threats of terrorism in addition to everyday concerns about crime have elevated the importance of Safety and Cleanliness.

The Transportation Connections factor is relatively straightforward. U.S. business travelers can be encouraged to use HSR by providing good access to HSR stations via public transportation modes. Constituent statements for the Transportation Connections factor suggest that home-to-station connections are important and that frequency of connections is a key issue. This will be a challenge in the U.S. where public transportation lags behind many cities in Europe and Asia. With fewer public transportation options to link with HSR, the alternatives here are limited. Although installation of intra-city train and subway systems may not be an option, municipal bus service could certainly add routes and increase route frequency. More novel approaches such as subsidizing taxi cab discounts for HSR users traveling to and from the station could also be considered.

Table 3. Hypothesized structural model

Latent variable	Efficiency (η1)	Effectiveness (η2)	Intention to buy HSR (η3)
Information (ε1)	0.09[a] (1.22)[b]	0.00 (0.06)	-
Safe/clean (ε2)	0.28 (4.05)	0.29 (4.42)	-
On-board amenities (ε3)	-	-	0.04 (0.82)
Connectivity (ε4)	0.27 (4.66)	0.31 (5.51)	-
Efficiency (η1)	-	-	0.25 (4.83)
Effectiveness (η2)	-	-	0.49 (10.11)
Goodness of fit measures			
Chi-square = 783.17	GFI = 0.86		
df = 356	CFI = 0.91		
P = 0.0	RMSEA = 0.057		
Chi-square/df = 2.20	IFI = 0.91		

Notes: a. Completely standardized solution. b. Numbers in parentheses are t values (two-tailed).

It is also important to discuss the paths of influence between the variables. The relationship between the exogenous variables (Safety/Cleanliness and Transportation Connections) and the first level of endogenous variables (efficiency and effectiveness) is very strong. To the extent that the Safety/Cleanliness and Transportation Connections elements of consumer logistics can be provided by HSR, consumers' travel efficiency and travel effectiveness will be substantially enhanced. This evidence suggests that there is substantial leverage for funds spent on Safety/Cleanliness and Transportation Connection concerns.

Table 4. Final structural model

Latent Variable	Efficiency (η1)	Effectiveness (η2)	Intention to buy HSR (η3)
Information (ε1)	-	-	-
Safe/clean (ε2)	0.33 (5.76)	0.30 (5.52)	-
On-board amenities (ε3)	-	-	-
Connectivity (ε4)	0.29 (5.33)	0.31 (5.86)	-
Efficiency (η1)	-	-	0.26 (5.09)
Efectiveness (η2)	-	-	0.49 (10.17)
Goodness of Fit Measures			
Chi-square = 787.02	GFI = 0.86		
df = 359	CFI = 0.91		
P = 0.0	RMSEA= 0.057		
Chi-square/df = 2.19	IFI = 0.91		

Note: All paths are significant at 0.05, directionally.

The relationship between the first (efficiency and effectiveness) and second (usage intentions) level endogenous variables is also very strong. Issues of business travel efficiency and effectiveness have important bearing on HSR usage intentions. Effectiveness generally relates to results while efficiency generally relates to the costs. What is surprising about the findings is that business travelers' intentions to use HSR are affected more strongly by the effectiveness of HSR than by its efficiency. Many would believe that the major advantage of HSR over air travel in the San Francisco-Los Angeles corridor is primarily in terms of minimization of monetary costs. The analysis suggests otherwise. Since actual time in transit via air travel is less than HSR, business travelers are apparently including the home-to-station and intra-station logistics in their travel calculus as well as the rail or air transit time. Thus, potential HSR business travelers expect that the home-to-station and intra-station pitfalls encountered by today's domestic air traveler will be averted by HSR service. Consequently, HSR service must absolutely be designed and promoted to assuage these concerns.

In more general terms, the results provide empirical support for the applicability of consumer logistics theory in the services context. This is an important finding since the intangibility of services might be expected to diminish the applicability of consumer logistics (Gehrt, 2007; O'Brien et al., 2003). Thus the findings suggest new theoretical and methodological avenues of inquiry for services marketing.

Limitations and future research

Since this study tests consumer responses to a service that does not yet exist in the U.S., some precaution must be taken in interpreting the findings. Nonetheless, questionnaire design including illustrations, scenario-setting introductory remarks, and phrasing of questionnaire items was tempered by the effort to reify HSR service in the respondent's mind to the fullest extent possible.

From a geographic perspective, the findings may be limited by the regional nature of the sample. Data collected from a national sample, however, would be undermined by noise caused by the manner in which the role of HSR will vary from region to region. Thus, future studies in multiple regional sites are likely to be more useful than a national study.

From a passenger perspective, the findings may be limited by the business travel focus. This choice was made, however, due to the fact that HSR plans often focus on business travel (Gimpel, 1998; Yomiuri Shinbun, 2003). Nonetheless, future studies of leisure use of HSR are called for, particularly for corridors in which leisure travelers may represent the mainstay of fares. The Florida-feeder corridor, for instance, has received attention as a corridor in which HSR may someday provide an alternative means of conveyance for east coast vacationers (Eastham, 1998).

The results of this research could also be leveraged by benchmarking its results with the results of similar research conducted in proven HSR corridors. This could provide useful points of reference if compared with successful HSR systems such as in Japan, France, and Spain.

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Appendix A. Measures

Variable name	Alpha	Label	Item
Information	.880	45	The availability of information about train schedules is important.
		49	The availability of information about station access is important.
		50	Provision of information about departure and destination facilities is important.
		51	Provision of boarding information details is important.
		52	Provision of information about connections is important.
Safe/clean	.814	16	Station safety is an important concern.
		17	Station cleanliness is an important concern.
		25	Boarding platforms should be clean and safe.
On-board amenities	.762	36	Compartments should have on-board news and TV entertainment facilities.
		38	HSR aisles should be wide to increase the comfort of passengers who want to stretch their legs.
		40	Entertainment facilities (personal video screen, headphone jack, electrical outlet, etc.) should be available for each seat.
		41	An on-board shop should be available (i.e., magazines, snacks, souvenirs).
		42	On-board service personnel should be available.
Connectivity	.907	8	For home-to-station travel, public transportation options are important.
		9	The frequency of public transportation routes to an HSR station is important.
		10	Public transportation should have good connections to HSR stations.
Efficiency	.832	65	HSR will allow me to minimize the amount of time I spend traveling from S.F. to L.A.
		66	By using HSR for S.F.-L.A. travel, I will minimize the amount of running around I must do.
		67	HSR travel between S.F. and L.A. will allow me to minimize my travel costs.
		68	HSR travel between S.F. and L.A. will allow me to travel more efficiently.
Effectiveness	.942	69	HSR travel between S.F. and L.A. will provide me with desired travel benefits.
		70	HSR travel between S.F. and L.A. will ensure that I satisfy my travel needs.
		71	HSR travel between S.F. and L.A. will allow me to achieve optimal travel results.
		72	HSR travel between S.F. and L.A. will allow me to travel more effectively.
Behavioral intention	.900	76	There is a good probability that I would use HSR for S.F.-L.A. business travel.
		77	My preference for business travel between S.F.-L.A. would be HSR.
		78	For business travel between S.F.-L.A., HSR would be my consistent choice.