Drivers of Service Satisfaction: Linking Customer Satisfaction to the Service Concept and Customer Characteristics

Shannon Anderson, Lisa Klein Pearo and Sally K. Widener

Journal of Service Research 2008; 10; 365
DOI: 10.1177/1094670508314575

Drivers of Service Satisfaction

Linking Customer Satisfaction to the Service Concept and Customer Characteristics

Shannon Anderson
Rice University and University of Melbourne

Lisa Klein Pearo
Cornell University

Sally K. Widener
Rice University

The "service-dominant logic" focuses on the firm and the customer cocreating value, as defined by the customer. Achieving this orientation requires firms to understand which components of the service concept are most important to different subsets of customers. However, research on the relative importance to customers of core and peripheral service components has produced mixed results. Using data from the U.S. airline industry, the fact that the relative influence on customer satisfaction of core (e.g., operational performance) and peripheral (e.g., service interactions and physical setting) service components is moderated by customer characteristics is demonstrated. Consistent with Vargo and Lusch's premises that "the customer is always a co-creator of value" and that value is "uniquely and phenomenologically determined by the beneficiary," the conclusion that a parsimonious model of customer satisfaction demands consideration of both the service concept and customer characteristics is reached.

Keywords: *customer satisfaction; service-dominant logic; core attributes; individual differences*

INTRODUCTION

Researchers and practitioners are keenly interested in understanding what drives customer satisfaction, in part because studies find that customer satisfaction is an antecedent of increased market share, profitability, positive word of mouth, and customer retention (e.g., Anderson, Fornell, and Lehman 1994). Consistent with early conceptualizations of the "service concept" as a bundle of goods and services, overall satisfaction has

We gratefully acknowledge the KPMG-University of Illinois Urbana Champaign Performance Measurement Program for research funding and our colleagues, Henri Dekker, Utpal Dholakia, and Robert Westbrook for helpful comments on the article. A company that wishes to remain unnamed generously provided access to customer satisfaction data for the U.S. airline industry. Scott Baggett provided helpful research assistance. Correspondence should be addressed to Lisa Klein Pearo, School of Hotel Administration, 545c Statler Hall, Ithaca, NY 14853; e-mail: lisa.pearo@cornell.edu.

Journal of Service Research, Volume 10, No. 4, May 2008 365-381
DOI: 10.1177/1094670508314575

been shown to be well explained by satisfaction with constituent service components (e.g., Athanassopoulos and Iliakopoulos 2003; Mittal, Kumar, and Tsiros 1999; Mittal, Ross, and Baldasare 1998). However, a criticism of these attribute-based models of customer satisfaction is that it is difficult to generalize from them to create robust theories about customer satisfaction (Oliver 1997). Researchers have attempted to address this criticism by using general service typologies to relate characteristics of the service concept to customer satisfaction outcomes with mixed success (e.g., McDougall and Levesque 2000; Ostrom and Iacobucci 1995). In this article, we argue that the service-dominant logic (SDL), a recent advance in service marketing (Vargo and Lusch 2004, 2008), offers a promising avenue for refining the attribute-based model of customer satisfaction for services.

In spite of extensive research on how customer characteristics influence service encounters, Cook, Goh, and Chung (1999) observed that most service typologies focus exclusively on discriminating characteristics of the service concept, ignore customer characteristics and implicitly treat all customers as identical. We find a similar focus on service characteristics in studies relating service typologies to customer satisfaction. Yet SDL holds that the customer is integral to the relational exchange with the firm and cocreates value in use (Lusch and Vargo 2006; Vargo and Lusch, 2004, 2008). In a recent article, Vargo and Lusch (2008) amend their earlier foundational premises on the SDL to recognize that "the customer is always a co-creator of value" (p. 3) and value is "uniquely and phenomenologically determined" (p. 9) by the customer. In this article, we take customer satisfaction as an indicator of "value creation" and examine in the setting of U.S. passenger air travel, whether demographic and situational differences among customers moderate the relative importance of components of the service concept on overall satisfaction. We treat the customer as a unique, endogenous contributor to and evaluator of the value-creation process and demonstrate that incorporating customer characteristics into models that relate the service concept to customer satisfaction produces demonstrably better-fitting models that evidence real differences in what customers value. We posit that the mixed results of previous studies may be due to lack of consideration of unique customer characteristics that may influence the valuation of the cocreated service.

It is well documented that customer characteristics (e.g., gender, age, income) have an important effect on the level of customer satisfaction (Bryant and Cha 1996; Danaher 1998; Johnson and Fornell 1991; Mittal and Kamakura 2001). Moreover, studies show that customer characteristics moderate *outcomes* of customer satisfaction including repurchase intentions (Mittal and Kamakura 2001) and share of wallet (Cooil et al. 2007). Invoking SDL, particularly foundational Premise 10, which maintains that the creation of value is uniquely determined by the customer (Vargo and Lusch 2008), we hypothesize that customer characteristics also moderate the constituent service elements of customer satisfaction, that is, that customer characteristics explain differences in the *composition of overall satisfaction.* Following the approach of prior studies (e.g., Kamakura et al. 2002; McDougall and Levesque 2000), we model overall customer satisfaction as a function of satisfaction with components of the service concept (i.e., attribute-based models of satisfaction) using customer-level data from the U.S. passenger airline industry. We then turn to the central proposition of the article and demonstrate that within the air travel industry, the *composition* of the customer satisfaction model (i.e., what matters to customers) differs significantly across customers with different demographic (e.g., gender, age) and situational characteristics (e.g., class of service). Consistent with prior studies, we find that many individual differences are associated with systematically higher (lower) levels of satisfaction. However, the more interesting and novel contribution of our analysis is showing that individual customer differences moderate the influence of the constituent elements on overall satisfaction. Indeed, in many cases, it is the *composition* of customer satisfaction rather than (or in addition to) the *mean level* of satisfaction that differs between customers. Our findings are consistent with SDL in that the customer uniquely shapes the value creation process, particularly when value is defined as "value in use" as determined by the customer. An important implication of our findings is that managing customer satisfaction requires knowledge of elements of the service concept and customer characteristics to provide a complete picture of the cocreation process that generates customer satisfaction.

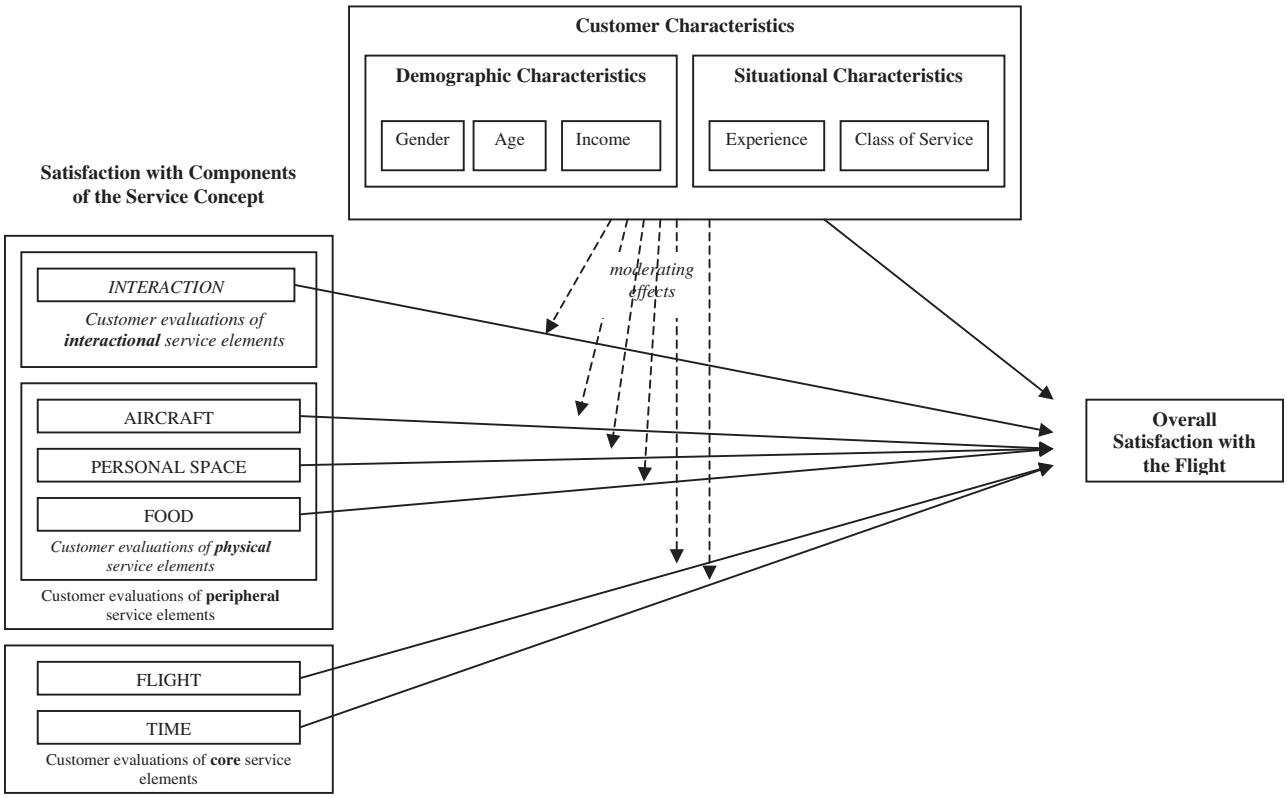
The article is organized as follows. In the next section, we develop hypotheses about the influence of core and peripheral service components on overall satisfaction in air travel and consider research on how customer satisfaction varies with customer characteristics. The third section describes the empirical research setting, the data and variable measures. The fourth section presents results of using structural equation modeling to estimate the attribute-based model and to test hypotheses about the moderating effects on the model of customer characteristics. We conclude with a discussion of managerial implications, limitations, and directions for future research.

LITERATURE REVIEW AND RESEARCH HYPOTHESES

The Association Between Customer Satisfaction and the Service Concept

Sasser, Olsen, and Wyckoff (1978) coined the term "service concept" to describe the bundle of elements packaged for sale to the customer. Service operations and

FIGURE 1
The Structural Relation Between Overall Satisfaction with the Air Travel Experience and Satisfaction with Components of the Service Concept with Direct and Moderating Effects of Customer Characteristics



service marketing studies posit two fundamental types of service attributes: core attributes (what is delivered) and peripheral attributes (how it is delivered; Chase and Stewart 1994; Iacobucci and Ostrom 1993; McDougall and Levesque 2000). Iacobucci and Ostrom define core attributes as "the core of a service is that part of the service we think of when we name the service" (p. 258). Peripheral attributes are then everything else.[1] Peripheral attributes can be subdivided further into physical (Bitner 1990; Chase and Stewart 1994) and interactional (Butcher, Sparks, and O'Callaghan 2003; Chase and Stewart 1994) attributes. Physical attributes include environmental, mechanical, and inanimate components of the service delivery. The interactional attributes include all of the interpersonal encounters involved in the service delivery. Prior research demonstrates that both core and peripheral attributes are positively associated with overall service quality and customer satisfaction (Butcher 2005; Butcher, Sparks, and O'Callaghan 2003; Chase and Stewart 1994; Iacobucci and Ostrom 1993; McDougall and Levesque 2000).[2] Thus, in the empirical analysis that follows we make this prediction:

Hypothesis 1: Overall customer satisfaction is positively related to satisfaction with core and peripheral attributes of passenger air travel.

The Moderating Effects of Customer Characteristics on Attributes of Customer Satisfaction

Research has shown that individual customer differences (e.g., gender, age, income) are significant determinants of the mean level of satisfaction as depicted in Figure 1 (e.g., Bryant and Cha 1996; Johnson and Fornell 1991; Söderlund 2002). Subsequent studies have shown that customer characteristics are also associated with *outcomes* of customer satisfaction. For example, Mittal and

Kamakura (2001) explored the moderating role of customer characteristics on the relation between satisfaction and repurchase intentions, and Cooil et al. (2007) investigated the moderating role of customer characteristics on the relation between customer satisfaction and customer loyalty. However, we find no research that explores the moderating role of these variables at the *prior stage of satisfaction evaluation formation.* That is, we find no studies that investigate whether customer characteristics moderate the relation between satisfaction with core and peripheral attributes and overall satisfaction, thereby affecting the *composition* of satisfaction. We find this omission curious in light of current developments in the marketing literature that recognize customers as cocreators of value and the ones who determine the value created (e.g., Vargo and Lusch 2004, 2008).

Early on, Lovelock (1983) recognized that multidimensional service typologies are needed to explain complex managerial phenomena parsimoniously. However, as Cook, Goh, and Chung (1999) observe, most typologies consider only multiple characteristics of the service concept.[3] Customer segmentation strategies are premised on the supposition that customers value service attributes differently (Danaher 1998). As customers take on greater roles as cocreators of value, it seems likely that customer characteristics will interact with the service delivery process and that these interactions may alter the association between individual service components and overall satisfaction. We posit that in the case of customer satisfaction, it is important to jointly consider elements of the service concept and characteristics of customers as cocreators.

Cooil et al. (2007) note that customer characteristics comprise both demographic and situational characteristics and state that it is important to investigate the moderating effects of both types, since prior literature has demonstrated that they both influence customer satisfaction. Demographic variables, such as age, gender, and socioeconomic status, are specific to the customer, while situational characteristics, such as expertise, are specific to the context. A study providing an example of an investigation of the moderating effects of situational characteristics is Wangenheim (2003), who investigated how four situational characteristics—purchase uncertainty, switching costs, duration of customer relationship, and purchase importance—moderated the relation between customer satisfaction and loyalty in a business-to-business setting. Knowledge about both types of characteristics, demographic and situational, is useful and important for creating customer segments for targeted marketing campaigns.

We use those variables identified in Cooil et al. (2007) and Mittal and Kamakura (2001) as a basis for selecting our specific demographic variables of gender, age, and income and our situational variable of experience. Class of service is an important additional situational variable in passenger air travel. All of these variables fit well with Vargo and Lusch's (2008) premise of phenomenological, experiential factors influencing the determination of value that is assigned by the service beneficiary. Our framework is depicted in Figure 1.

Customer Characteristics as Factors in the Evaluation of Satisfaction

In the paragraphs that follow, we develop hypotheses about the moderating effects of demographic characteristics (gender, age, and income) and situational characteristics (experience and class of service) on the relation between satisfaction with service components and overall customer satisfaction. Although we seek to provide specific hypotheses about these characteristics that are grounded in prior research and to support their inclusion in an inquiry of phenomenological elements that influence value evaluations by customers (Vargo and Lusch 2008), we are intentionally parsimonious in our coverage of any single characteristic; our larger aim is to provoke consideration of customer characteristics (perhaps many more than we consider) as indicators of the cocreation process that influences customer satisfaction in services.

Gender. Past research finds that women report greater overall satisfaction than men (e.g., Bryant and Cha 1996; Mittal and Kamakura 2001). One explanation for this finding is that women may be more experienced shoppers with more skill at making attribute comparisons. Experience enables them to identify items that best fit their personal needs and leads to higher overall satisfaction than men (Bryant and Cha 1996). A second explanation is suggested by Mittal and Kamakura (2001), who find that women are less likely to tell the truth about negative experiences than men.

In addition to finding differences in the levels of satisfaction between men and women, past research identifies differences in the relative weights that men and women assign to the service concept components that are often attributable to differences in leadership style (Eagly, Makhijani, and Klonsky 1992) and information-processing style (Meyers-Levy 1991). The findings suggest that women focus more on the interpersonal components of a service interaction (Iacobucci and Ostrom 1993). In fact, with respect to general buying behavior, research has shown that women's purchases are influenced more heavily by their evaluations of the personal interactions (Zeithaml 1985) and sales personnel consultations (Gilbert and Warren 1995) than are men's purchases. As a result, we hypothesize that, on average, women are more satisfied than men, that the composition of the model of customer satisfaction differs between men and women,

and in particular that interactional components influence overall satisfaction more for women than for men.

Hypothesis 2a: Women have a higher mean level of overall satisfaction than men in the model of attribute-level satisfaction.
Hypothesis 2b: The structural model relating attribute satisfaction to overall satisfaction in the passenger air travel industry differs between women and men.
Hypothesis 2c: The interactional component of service satisfaction in the passenger air travel industry will be more important to women than to men.

Passenger age. Elderly people are, on average, slower in encoding new information and in retrieving information stored in memory, thus reducing information-processing capability (John and Cole 1986). Although they may have expertise gained from experience, the benefits of this expertise are not as readily accessible. Mittal and Kamakura (2001) explain that older people may have lower "thresholds of acceptable satisfaction" because information search for a new provider is more costly. However, research also suggests that age-related differences in product or service evaluations may be due to different expectations, driven by differences in society and culture at birth and maturation (Bryant and Cha 1996). In general, past research has found that older people are more satisfied than younger people (Bryant and Cha 1996; Mittal and Kamakura 2001); consequently, we hypothesize the following:

Hypothesis 3a: Older respondents have a higher mean level of overall satisfaction than younger respondents in the model of attribute-level satisfaction.
Hypothesis 3b: The structural model relating attribute satisfaction to overall satisfaction in the passenger air travel industry differs for individuals of different age.

We make no predictions about the relative influence of core versus peripheral attributes on overall satisfaction for passengers of different ages.

Income. Income is often used as a proxy for education and, thus, as an indicator of the potential for in-depth information processing (Homburg and Giering 2001). Past research has explored the direct effects of income on satisfaction. Bryant and Cha (1996) found that satisfaction declines as income rises. Although quality rises as more expensive goods are purchased, expectations also rise. Mittal and Kamakura (2001) propose that those with lower levels of education, much like elderly people, accept lower levels of satisfaction because the search for alternatives is more costly. Although the interaction effects of income and attribute weighting on satisfaction have not been studied before, we predict that, as a result of more efficient information processing and a greater understanding of the attribution of responsibility (Folkes 1988), consumers with higher income levels weight more heavily those components of the service that are under the airline's control. Thus, we expect that those with higher income put less emphasis on core components and weight the peripheral (interactional and physical) components most heavily. As a result of high expectations, we also predict that satisfaction will decline as income rises.

Hypothesis 4a: Higher income individuals have a lower mean level of overall satisfaction than do lower income individuals in the model of attribute-level satisfaction.
Hypothesis 4b: The structural model relating attribute satisfaction to overall satisfaction in the passenger air travel industry differs for individuals of different income levels.
Hypothesis 4c: Evaluations of core components of service satisfaction will be less influential on overall satisfaction evaluations for higher income respondents than for lower income respondents.

Experience. Although expertise has been studied extensively in the context of information search and processing (e.g., Alba and Hutchinson 1987), there is mixed evidence on its effects on service evaluations. Given that repeated encounters with a service provider are largely driven by self-selection of a product's loyal customers, we might expect that overall satisfaction is *higher* for experts than novices (Johnson and Fornell 1991). However, researchers have put forth contrasting theories, such as Reinartz and Kumar (2002), who argue that loyal customers are more demanding as a result of their higher expectations. Similarly, Zeithaml and Bitner (2002) suggest that a broader range of past experience may increase the individual's ideal level of service. Since previous research provides no unambiguous prediction about the effect of experience on the *level* of satisfaction, we make no hypothesis about whether experience is associated with increased or decreased satisfaction; however, our model specification does allow for a mean difference in satisfaction between experts and novices.

In comparing the importance customers of different levels of expertise assign to core versus peripheral service performance, Butcher (2005) finds, in a restaurant setting, that the more experience a customer has with a service provider, the more important the core service attributes are in satisfaction evaluations. The author hypothesizes that consumers begin to take the interpersonal components for granted over time as they continuously demonstrate satisfactory levels. However, unique circumstances of the airline industry are suggestive of how expertise may affect passengers' ability to differentiate core versus peripheral drivers. Specifically, given

that variation in core performance–flight smoothness and on-time arrival is often attributed to external circumstances beyond the airlines' control (e.g., weather-related turbulence and delays), we expect that experts will be better able to correctly attribute blame and thus weight the elements within the airlines control more heavily (Folkes 1988). The peripheral drivers—both physical and interactional—are generally viewed as within the airline company's control (Folkes 1988). In sum, experienced travelers are expected to have greater product-level expertise, to be more involved in the purchase, to have both higher and more specific expectations of performance, and to be a more accurate judge of relative quality due to experience with different airlines and aircrafts. Moreover, as opposed to the Butcher (2005) study, our data include service providers that differ substantively on the interpersonal service dimension. Consequently, we hypothesize the following:

Hypothesis 5a: The structural model relating attribute satisfaction to overall satisfaction in the passenger air travel industry differs for individuals with different experience levels.

Hypothesis 5b: Evaluations of core components of service satisfaction will be less influential on overall satisfaction evaluations for more experienced travelers than for less experienced travelers.

Class of service. One might argue that class of service (first or business class vs. economy class) would mimic the effects of income, as described above. However, class of service may also differentially affect expectations as well as perceptions of performance if the service is viewed as fundamentally different between first and economy class. Thus, we consider it to be a situational characteristic as used by Cooil et al. (2007). Because expectations of service quality will be higher in first class than in economy or coach class, satisfaction is often lower than might be anticipated based on the merits of the service provided alone (Bryant and Cha 1996). Although the interaction effects of class of service and attribute weighting on satisfaction have not been studied before, we predict that, as a result of higher expectations and a greater understanding of the attribution of responsibility (Folkes 1988), consumers in first class will weight those components of the service more heavily that are under the airlines control. That is, passengers in first class will expect the airline to transport them to their destination in a timely fashion, but they will place more emphasis on their seat comfort and interactions with the first-class airline crew. Thus, we expect that those in first class will put less emphasis on core components and weight the peripheral (interactional and physical) components most heavily. As a result of higher expectations, we also predict that satisfaction will decline as class of service increases.

Hypothesis 6a: Passengers in a higher class of service have a lower mean level of overall satisfaction than do lower class of service individuals in the model of attribute-level satisfaction.

Hypothesis 6b: The structural model relating attribute satisfaction to overall satisfaction in the passenger air travel industry differs for individuals of different class of services.

Hypothesis 6c: Evaluations of core components of service satisfaction will be less influential on overall satisfaction evaluations for higher classes of service respondents than for lower classes of service respondents.

RESEARCH SETTING, DATA, AND VARIABLE MEASURES

The Research Setting

The airline industry is a rich setting in which to study customer satisfaction. The service involves multiple customer encounters or "transaction points," which begin with the purchase of the ticket and end with baggage delivery, encompassing interactions with numerous individuals and physical spaces (Athanassopoulos and Iliakopoulos 2003). Thus, the service concept is amenable to decomposition in the manner of the attribute-based models of customer satisfaction. Second, although customers differ in important respects, information is widely available to all customers on different aspects of service quality. Government agencies (e.g., U.S. Department of Transportation) collect and publicize standardized data on operational performance (e.g., on-time departure, denied boardings, lost or mishandled baggage), and third-party marketing firms (e.g., J.D. Power, American Customer Satisfaction Index) collect and publicize data on customer satisfaction. Finally, although airlines differ somewhat in their operational strategies, all airlines perform the same basic functions using the same technology.

Description of the Data

A major vendor of customer satisfaction data to the airline industry provided the data for this study. We test our hypotheses using survey responses from over 20,000 passengers of the 10 major carriers in the U.S. domestic market during the fourth quarter of 2000[4] and use a hold-out sample of responses from 12,000 passengers during the third quarter of 2000 to identify attributes of air travel. The survey—a self-addressed, postage-paid, one-page instrument—is distributed in airports to a random sample of passengers on randomly selected flights.

TABLE 1
Summary Statistics for Satisfaction Survey Items and Related Latent Constructs

Latent Construct	*Item Response* (N)	*Raw Item Skewness*	*Raw Item Kurtosis*	*Raw Item* M[a]	*Raw Item* SD	*Imputed Item* M[b]	*Imputed Item* SD[b]	*Raw Item Cronbach's Alpha*
Peripheral dimensions of service								
INTERACTION								.82
HLPKN: Helpfulness/courtesy of check-in personnel	19,298	–1.719	3.191	6.00	1.29	6.00	1.29	
CHKIN: Wait to check in	19,169	–1.197	0.802	5.54	1.60	5.53	1.59	
BRDING: Efficiency of boarding aircraft	19,301	–1.178	1.234	5.55	1.42	5.54	1.41	
PRBGDL: Promptness of baggage delivery	10,573	–1.158	–0.599	5.45	1.67	5.27	1.56	
TAOB: Timely/accurate information onboard	18,879	–1.567	2.385	5.83	1.41	5.81	1.40	
RSPFLT: Responsiveness of flight attendants	18,415	–1.290	1.643	5.79	1.31	5.77	1.30	
AICFA: Clarity of in-flight announcements	17,361	–0.868	0.159	5.20	1.56	5.18	1.54	
AIRCRAFT								.92
CLNINT: Cleanliness of aircraft interior	19,599	–1.059	1.290	5.68	1.21	5.67	1.21	
CBAPP: Cabin appearance	19,611	–0.938	–.952	5.62	1.21	5.62	1.21	
CONDAC: Condition of aircraft interior	19,536	–1.007	1.119	5.64	1.21	5.63	1.21	
PERSONAL SPACE								.90
ARMSH: Arm and shoulder room	19,593	–0.425	–0.732	4.54	1.77	4.53	1.77	
LEGRM: Legroom	19,561	–0.379	–0.918	4.50	1.88	4.49	1.87	
STCMFT: Seating comfort	19,445	–0.541	–0.567	4.78	1.74	4.78	1.73	
FOOD								.86
AMTFD: Amount of food	12,899	–0.529	–0.677	4.68	1.79	4.59	1.72	
FDQLT: Quality of food	13,096	–0.343	–0.731	4.38	1.72	4.32	1.66	
Core dimensions of service								
TIME								.89
OTARR: On-time arrival	18,040	–1.198	0.135	5.44	1.97	5.40	1.94	
OTDEP: On-time departure	19,047	–0.858	–0.668	5.08	2.11	5.05	2.10	
FLIGHT								.88
AQTKOF: Aircraft quietness during takeoff	19,325	–0.832	0.500	5.23	1.38	5.22	1.38	
ACQFLT: Aircraft quietness during flight	19,309	–0.909	0.756	5.34	1.34	5.33	1.34	
SMHFLT: Smoothness of flight	19,119	–1.101	1.322	5.63	1.24	5.62	1.24	
AIRQLT: Air quality	19,335	–0.786	0.247	5.20	1.44	5.19	1.43	
Overall satisfaction								
CUSTSAT								.81
OVFGT: Overall experience of flight	19,335	–1.252	1.084	5.52	1.56	5.51	1.56	
OVARCF: Overall rating of aircraft	19,237	–0.889	0.574	5.37	1.38	5.36	1.37	
OOBRD: Overall on-board services	19,143	–0.955	0.519	5.42	1.46	5.40	1.45	

a. All questions use a 7-point Likert scale from 1 (*very poor*) to 7 (*excellent*). The full range of responses is exhibited for all items.
b. We use the Markov Chain Monte Carlo method to impute arbitrarily missing values and employ the EM algorithm to find maximum likelihood estimates of the parameters for the incomplete data (Schafer 1997). The total sample size for the complete imputed sample is 20,046.

The main body of the survey is devoted to assessing satisfaction with a large number of components of the air travel experience. Passengers are asked to rate their satisfaction for the specific flight or leg of a flight on which they are currently traveling. For each attribute and for overall satisfaction with the flight, passengers rate their satisfaction on a common 7-point Likert scale, anchored at each end by the responses *very poor* and *excellent*. Descriptive statistics for the survey items are provided in Table 1. Although satisfaction levels are generally high, all items exhibit the full range of response and adequate variation with good distributional properties. Although negative skewness is often an issue with customer satisfaction data, the levels of skewness and kurtosis exhibited by our data are below those (3.0 and 8.0-10.0, respectively) that Kline (1998) specifies as problematic for maximum likelihood estimation of structural equations models.

Passengers provide general demographic information (e.g., gender, income level) as well as descriptive information about the particular flight for which they are being surveyed (e.g., class of service). The top panel of Table 2 provides descriptive statistics on the customer's self-reported age, annual income, and the number of flights taken in the previous year. Understandably, income suffers from nonresponse. The middle panel of Table 2 provides descriptive data for groups of customers

TABLE 2
Profile of Survey Respondents

	Panel A: Full-Sample Descriptive Statistics					
	N	*Min*	M	*Median*	SD	*Max*
Annual income (in thousands)	15,491	0.00	96.57	80.00	82.37	999.00
Age	19,661	12.00	50.26	50.00	14.07	99.00
No. of trips in past year	20,315	0.00	12.08	6.00	15.77	198.00

	Panel B: Descriptive Statistics for Subgroups	
Partitioning Variable	*M Partitioning Variable*	*Group Size* (N)
Age (years)		
Low	38.9	9,912
High	61.8	9,749
Income		
Low	$51,302	8,041
High	$145,424	7,450
No. trips in past year		
Low	3.18	10,700
High	21.99	9,615
Class of service		
Economy	NA	17,385
First	NA	2,699
Gender		
Male	NA	10,498

	Panel C: Correlation Matrix				
	Gender	*Expertise*	*Income*	*Class*	*Age*
Expertise	–.252*				
Income	–.180*	.364*			
Class	.134*	–.246*	–.180*		
Age	.000	–.178*	–.010	.010	

NOTE: For Panel C, gender: 1 = *male*, 2 = *female*; expertise: 1 = *low expertise*, 2 = *high expertise*; income: 1 = *low income*, 2 = *high income*; class: 1 = *first*, 2 = *economy*; age: 1 = *young*; 2 = *old*.
*$p < .01$ (two-tailed).

who are used to assess the effects of various continuous (e.g., age) and categorical variables (e.g., gender, class of services) on the level and composition of overall satisfaction. For continuous variables, the groups are formed by dividing the full sample at the median value of the hypothesized interaction variable, with "ties" assigned to a single group. The last panel of Table 2 provides correlations between measures that indicate membership in the different groups, an indication of overlap in group membership. Although the correlations are typically statistically significant, in most cases they are small, indicating that partitioning the data in these different ways provides unique insights on individual differences that may be associated with customer satisfaction.

The descriptive statistics of Tables 1 and 2 broadly mirror data from similar surveys at different times, so it is unlikely that our results are affected by our choice of survey and time period.[5]

Variable Measures

The independent variables—latent variables representing satisfaction with core and peripheral attributes of air travel service—are identified by using exploratory factor analysis on a holdout sample of approximately 12,000 customer satisfaction surveys from the third quarter of 2000. Factor analysis helps to reduce the dimensionality of survey responses related to all aspects of the service encounter that are covered by a sufficient number of respondents.[6] An oblique rotation of the factor solution is used to enhance interpretation of the factors. The factor solution contained six factors with eigenvalues greater than 1.0.[7] To further refine the measures, we dropped survey items with a maximum loading of less than .30 or with significant cross-loadings on two or more factors (Verbeke and Bagozzi 2002). These criteria caused us to drop 4 questions, leaving 21 survey questions that

together yielded six distinct factors. Table 1 organizes the survey items in groups according to the factor structure identified in the analysis of the holdout sample. Cronbach's alpha measures ranging from 0.81 to 0.92 indicate a high level of coherence for each latent construct in the research sample. Figure 1 depicts the conceptual model relating attribute-level satisfaction with overall customer satisfaction in air travel that we estimate in relation to the variables described below.

We interpret the factors as attributes of air travel service: INTERACTION, AIRCRAFT, PERSONAL SPACE, FOOD, FLIGHT, AND TIMELINESS. The first factor, INTERACTION, represents the subcategory of peripheral drivers that relate to interaction with airline personnel in all aspects of the service encounter. It includes courtesy of those who check in the passenger (HLPCKN), the wait to check in (CHKIN), efficiency of the boarding process (BRDING), the timeliness and clarity of information provided at the onboard (TAOB and AICFA, respectively), the responsiveness of flight attendants (RSPFLT), and the promptness of baggage delivery (PRBGDL). The second factor, AIRCRAFT, includes three assessments of the appearance of the aircraft: the cleanliness (CLININT) and condition (CONDAC) of the aircraft interior and the general appearance of the cabin (CBAPP). The third factor, PERSONAL SPACE, describes the passenger's satisfaction with the seating space (STCMFT), arm room (ARMSH), and leg room (LEGRM). The fourth factor, FOOD, includes an assessment of the quantity (AMTFD) and quality (FDQLT) of food served during the flight. Together, these four factors—INTERACTION, PERSONAL SPACE, AIRCRAFT, and FOOD—identify peripheral drivers of overall satisfaction with air travel. The latent variables PERSONAL SPACE, AIRCRAFT, and FOOD represent the physical components of the peripheral drivers, while INTERACTION represents the peripheral components associated with customer-employee interactions.

The two remaining factors, TIME and FLIGHT, represent evaluations of core dimensions of service. TIME measures satisfaction with the timeliness of the flight departure (OTARR) and arrival (OTDEP). FLIGHT measures satisfaction with the flight environment, including noise during takeoff (AQTKOF) and in flight (ACQFLT), air quality (AIRQLT), and the smoothness (e.g., absence of turbulence) (SMHFLT) of the flight.

The latent dependent variable—overall satisfaction (CUSTSAT) with a specific air travel experience—is measured by three items: satisfaction with overall experience of the flight (OVFGT), satisfaction with overall rating of the aircraft (OVARCF), and satisfaction with overall onboard services (OOBRD). A variety of similar global evaluation measures have been used in the past, such as overall service quality (Bolton and Drew 1994) and overall satisfaction (Anderson and Mittal 2000).

Variables that are hypothesized to affect the level of overall satisfaction as well as the composition of the attribute-based model of satisfaction include demographic and situational characteristics of the passenger (Hypotheses 2-6). We use self-reported income, age, gender, and the class of service flown to measure these variables. Following previous research that finds familiarity to be a reliable indicator of expertise (Söderlund 2002), we use the passenger's estimate of the number of flights flown in the last 12 months as a proxy for expertise in air travel.

RESULTS

Research Methods

We estimate the attribute-based model of airline passenger satisfaction that is depicted in Figure 1 using LISREL 8.5 structural equation modeling software and full information maximum likelihood estimation methods. We explicitly model measurement error of the latent constructs as well as covariance among the core and peripheral attributes. For larger samples, the full information maximum likelihood method provides efficient estimators when data deviate from normality or are based on ordinal scales and is preferable when records include missing data to either data imputation or the use of listwise deletion (Kline 1998).[8]

To test the effects of variables that are hypothesized to affect the level and composition of satisfaction (Hypotheses 2-6), we employ the multisample approach (Kline 1998) in which the attribute-based model of satisfaction is estimated simultaneously for groups that represent different levels of the hypothesized interaction variable (e.g., age, gender).[9] We test for a group difference in the mean level of satisfaction (Hypotheses 2a, 3a, 4a, and 6a) by fixing the measurement model to be common across groups, arbitrarily setting the mean of the latent variable for overall satisfaction to zero for one group, and estimating a contrast for the second group (Jöreskog and Sörbom 1993, pp. 66-84). We test the joint significance of the interaction variable on the full model (Hypotheses 2b, 3b, 4b, 5a, and 6b), by comparing the restricted model, where all structural parameters for the latent attribute satisfactions (i.e., INTERACTION, AIRCRAFT, PERSONAL SPACE, FOOD, TIME, and FLIGHT) are restricted to be equal across groups, to an unrestricted model (Hu and Bentler 1999). These are nested models, so we use the chi-square difference to test whether the moderator variable has a significant effect on the composition of overall satisfaction. Similarly, to test

hypotheses about the relative size of a specific coefficient for the two groups (Hypotheses 2c, 4c, 5b, and 6c), we estimate models with and without a restriction on coefficient equality and examine the significance of the difference in model chi-square statistics. To facilitate comparisons across groups, we tabulate the common metric completely standardized coefficients.

Basic Attribute Model Results

Table 3 presents the completely standardized coefficients for the measurement model, and Table 4 presents the structural model for the full sample of surveys. The scale of the latent variables is determined by fixing the loading of the indicator with the highest factor loading in the exploratory factor analysis at a value of one. This "reference indicator" is identified in Table 3 by an asterisk. All of the subsequent models have a common measurement model, and as we discuss later, tests of measurement model differences between groups of customers do not indicate meaningful differences. Consequently, for the sake of parsimony, Table 3 is provided as a representative measurement model and we do not tabulate measurement models for subsequent analyses. As Table 4 demonstrates, the recommended model fit statistics indicate good fit of the data to the hypothesized model (Hu and Bentler 1999). Thus the model provides a good basis for testing our hypotheses. In Table 4 we find strong support for Hypothesis 1, that satisfaction with core and peripheral attributes of air travel is positively associated with overall satisfaction. With the exception of FLIGHT, all of the attributes are significantly ($p < .01$) associated with increased overall satisfaction.

Direct and Moderating Effects of Customer Characteristics

In order to test Hypotheses 2 through 6, we jointly estimate the basic model, allowing some or all of the structural equation model coefficients to vary between two groups. We then compare the model chi-square for the restricted and unrestricted models to determine whether the hypotheses are supported. We constrain the measurement model to be identical for each pair of groups and focus our discussion exclusively on group differences in the structural model (Hu and Bentler 1999).[10] Table 5 reports results of testing Hypotheses 2 through 6.

We first consider Hypothesis 2, which examines the role of GENDER on the evaluation of overall satisfaction. In contrast to prior studies, we find no mean difference in overall satisfaction associated with gender (Hypothesis 2a) after attribute satisfaction is taken into account. However, we do find strong evidence that the composition of the model relating attribute satisfaction to overall satisfaction differs between men and women (Hypothesis 2b) as evidenced by the significant differences of model chi-square statistics for the unrestricted and restricted models. As the middle portion of the table reports, the unrestricted model yields a significantly better fit ($p < .01$). Moreover, visual inspection of the common metric fully standardized coefficients reveals differences in how men and women value employee interactions and food. Turning to Hypothesis 2c, we examine formally the proposition that women place substantially more weight on interpersonal attributes than do men. In the lower portion of the table, we formally test the proposition that these coefficients are identical while restricting all remaining coefficients to be identical and find that Hypothesis 3c is supported ($p < .01$). In sum, Hypotheses 2b and 2c are supported, while Hypothesis 2a is not supported; consequently we conclude that gender differences are related to women and men having a different compositional model of customer satisfaction rather than different levels of satisfaction.

Hypothesis 3 considers the role of passenger age on overall satisfaction. The results indicate a significant ($p < .01$) mean difference (Hypothesis 3a) associated with age. As in Bryant and Cha (1996), older people are more satisfied than younger people after attribute satisfaction is considered. Further, the model relating attribute satisfaction to overall satisfaction differs significantly ($p < .01$) between older and younger passengers (Hypothesis 3b). Theory and past research provided no basis for specific hypothesized differences in the weights that older and younger passengers placed on specific attributes; however, casual inspection of the common metric fully standardized coefficients suggests that older people weight INTERACTION, FOOD, and FLIGHT more than do younger people, who weight AIRCRAFT and PERSONAL SPACE more. Both groups attach similar value to flight timeliness. In sum, Hypotheses 3a and 3b are supported, and age both directly effects overall customer satisfaction and moderates the relation between attribute satisfaction and overall satisfaction.

Turning to Hypothesis 4, we examine the role of INCOME on the evaluation of overall satisfaction. Consistent with prior research we find evidence of a negative effect of income (Hypothesis 4a) on the mean level of customer satisfaction after attribute satisfactions are taken into consideration. Further, we find significant differences in the composition of the model of overall satisfaction (Hypothesis 4b); however, inspection of the common metric fully standardized coefficients suggests that the differences are concentrated in the variable PERSONAL SPACE, which plays a greater role in the

TABLE 3
An Attribute-Level Model of Customer Satisfaction in U.S. Domestic Air Travel: Measurement Model

	Peripheral Drivers				*Core Drivers*		*Overall Satisfaction*
Survey Item[a]	*INTERACTION*	*AIRCRAFT*	*PERSONAL SPACE*	*FOOD*	*TIME*	*FLIGHT*	*CUSTSAT*
HLPCKN	.61						
CHKIN	.52						
BRDING	.73						
PRBGDL	.56						
TAOB[b]	.75						
RSPFLT	.69						
AICFA	.48						
CLNINT		.91					
CBAPP		.85					
CONDAC[b]		.94					
ARMSH			.90				
LEGRM[b]			.88				
STCMFT			.81				
AMTFD				.83			
FDQLT[b]				.88			
OTARR					.89		
OTDEP[b]					.90		
AQTKOF[b]						.92	
ACQFLT						.92	
SMHFLT						.68	
AIRQLT						.70	
OVFGT[b]							.74
OVARCF							.79
OOBRD							.77

NOTE: These are the results of maximum likelihood estimation of the structural relation between overall satisfaction and satisfaction with core and peripheral dimensions of air travel (N = 20,046). Completely standardized coefficients for the items were used to measure each latent variable. All loadings are significant at $p < .01$ (two-tailed test) for unstandardized coefficients.
a. See Table 1 for survey item descriptions and summary statistics.
b. Referent indicators that define the scale of the latent variables.

satisfaction of high-income passengers. Although tests of Hypothesis 4c indicate a statistical difference in the coefficients for the core attributes, TIME and FLIGHT, these differences do not appear to be material.

Hypothesis 5a posits that the model of customer satisfaction differs for passengers with different levels of expertise, represented by a measure of travel experience. In the middle of Table 5, test results indicate that the unrestricted model is superior to the restricted model ($p < .01$), confirming that compositional differences based on expertise do exist. Turning to the specific test of Hypothesis 5b, both on-time arrival and departure (TIME) and satisfaction with the smoothness and quietness of the flight (FLIGHT) are less important components of satisfaction for experts than novices. Examining the general pattern of the common metric fully standardized coefficients, we see that the coefficient for INTERACTION is lower for experts than novices, while the coefficients for the physical peripheral components—AIRCRAFT, PERSONAL SPACE, and FOOD—are all higher. Taken together this suggests that experts place more emphasis on the physical amenities associated with air travel as compared to core service performance or interactions with service personnel. We do not hypothesize mean differences in satisfaction between experts and novices due to conflicting theories about the direction of difference. However, our analysis reveals that more experienced travelers have a significantly lower level of satisfaction than their less experienced counterparts. Thus, theories related to experts having higher expectations than novices may be more characteristic of airline passengers than alternative theories.

Finally, we turn to Hypothesis 6 and examine the moderating influence of class of service on the composition of customer satisfaction. We find that first-class customers are significantly less satisfied than their economy-class counterparts (Hypothesis 6a), and we find strong evidence of model differences (Hypothesis 6b). Comparing the coefficients of each group, first-class customers place less weight on the core attributes of TIME

TABLE 4
An Attribute-Level Model of Customer Satisfaction in U.S. Domestic Air Travel: Structural Model

Latent Variable	*Standardized Coefficient*
Peripheral dimensions	
INTERACTION	.48***
AIRCRAFT	.16***
PERSONAL SPACE	.26***
FOOD	.09***
Core dimensions	
TIME	.13***
FLIGHT	.01
R^2 of overall customer satisfaction	.87
Model fit statistics	
RMSEA	.076
NNFI	.90
CFI	.92

NOTE: This table reports the results of estimating the attribute model of customer satisfaction in Figure 1 and provides evidence on Hypothesis 1. The completely standardized coefficients are presented to allow comparison of the relative impact of satisfaction with each attribute on the evaluation of overall satisfaction with the flight experience. INTERACTION = the passenger's satisfaction with interaction with flight and airline personnel; TIME = the passenger's satisfaction with the arrival and departure time of the flight; FLIGHT = the passenger's satisfaction with the flight while in the process; AIRCRAFT = the passenger's satisfaction with the aircraft used in the flight; PERSONAL SPACE = the passenger's satisfaction with personal space in the aircraft; FOOD = the passenger's satisfaction with the food served on the flight; CUSTSAT = the passenger's overall satisfaction with the air travel experience; RMSEA = root mean square error of approximation; NNFI = non-normed fit index; CFI = comparative fit index.
***$p < .10$ (two-tailed test; for unstandardized coefficients).

and FLIGHT than their economy-class counterparts (Hypothesis 6c). However, in this analysis the results are indicative of both statistical and meaningful differences in the relative weight attached to these core dimensions of service. Comparing the results of the high-income (low-income) groups with those of the first-class (economy-class) groups, it seems that income, a demographic characteristic, plays a relatively small role in the process of evaluating overall satisfaction, while class of service, a situational characteristic, is associated with significant differences in evaluating overall satisfaction. These results raise interesting questions about past findings about the relation between income and satisfaction. Specifically, when income is correlated with the purchase of subtly different services (e.g., first-class vs. economy-class travel), we may inappropriately attribute differences in the satisfaction process to demographic characteristics rather than to situational characteristics.

Table 6 summarizes the results of testing Hypotheses 2 through 6, effects of individual differences on overall customer satisfaction. The key finding is that while we have tended to find support for prior research that reports mean differences in the level of satisfaction for certain customer groups, we have also contributed new evidence that in many cases there are also important *compositional* differences in what matters to customers in these groups. In one case (gender), we find that there is no mean difference once the possibility of different compositional models of satisfaction is admitted.

CONCLUSION

Summary

In this article, we posit that the mixed results of prior studies that examine the relative importance to customers of core and peripheral components of the service concept may be related to a failure to adequately incorporate customers as co-creators and arbiters of value in use (Vargo and Lusch 2004, 2008). We hypothesize that, in addition to (or instead of) the differences in the mean level of satisfaction that has been documented in prior research, customers impart unique, phenomenologically determined elements to value determination that moderates the relation between service components and overall satisfaction. In other words, we posit that differences in customer characteristics are associated with differences in what customer value. With this formulation, we synthesize attribute-based models of customer satisfaction that decompose services into constituent elements, with an emerging view on the customer as cocreator and arbiter of the best (for that customer) combination of attributes. Using data from the U.S. airline industry, we empirically test whether the relative influence on customer satisfaction of core (e.g., operational performance) and peripheral (e.g., service interactions and physical setting) service components is moderated by customer characteristics. We conclude that, consistent with Vargo and Lusch's (2008) premise of the unique and phenomenological determinants of customer value, a parsimonious model of customer satisfaction in a service-dominated view of marketing demands consideration of both demographic and situational customer characteristics.

Managerial Implications

The results provide strong support for our hypothesis that both core attributes and peripheral attributes—segmented into interactional and physical—are positively related to overall satisfaction. This is consistent with prior studies that have documented the efficacy of attribute-based models to explain overall satisfaction and thus provides a replication in a different industry setting using an exceptionally complete dataset. More importantly, our

TABLE 5
Analysis of Effects of Passenger Characteristics on Overall Customer Satisfaction

	Gender		*Age*		*Income*		*Expertise (No. of Trips)*		*Class*	
Partition Variable	*Male*[a]	*Female*[b]	*Young*[c]	*Old*[d]	*Low*[e]	*High*[f]	*Low*[g]	*High*[h]	*Economy*[i]	*First*[j]
Peripheral dimensions										
INTERACTION	.45***	.51***	.47***	.48***	.47***	.46***	.49***	.45***	.48***	.43***
AIRCRAFT	.17***	.15***	.18***	.13***	.15***	.16***	.15***	.16***	.15***	.22***
PERSONAL SPACE	.26***	.25***	.28***	.24***	.24***	.28***	.25***	.28***	.25***	.24***
FOOD	.11***	.07***	.08***	.10***	.09***	.11***	.08***	.09***	.09***	.13***
Core dimensions										
TIME	.13***	.13***	.13***	.13***	.13***	.13***	.14***	.12***	.14***	.08***
FLIGHT	.01	.02	-.01	.04***	.02**	.00	.01	.01	.02**	–.03
Mean effect (H3a, H5a, H6a)	.00	.00	.00	.02*	.00	-.05***	.00	–.03***	.03*	.00
R^2 of customer satisfaction	.88	.85	.86	.87	.85	.87	.85	.88	.86	.88
Contribution to $\chi^2_{min.fit}$	14,415.71	12,753.30	14,308.12	12,562.95	10,407.27	10,351.41	13,488.87	13,949.80	22,369.80	4,962.88
SRMR	.059	.058	.066	.058	.055	.060	.056	.069	.057	.065
CFI	.90	.90	.89	.90	.90	.89	.90	.89	.90	.87
Model comparison statistics										
$\chi^2_{min.fit}$ (*df*)										
Restricted MM, unrestricted SM	27,169.01 (511)		26,871.08 (511)		20,758.68 (511)		27,438.67 (511)		27,332.68 (511)	
Fully restricted MM & SM	27,474.52 (524)		27,701.23 (524)		21,081.46 (524)		28,357.11 (524)		29,618.88 (524)	
p of χ^2 difference test	< .01 (H2b)		< .01 (H3b)		< .01 (H4b)		< .01 (H5a)		< .01 (H6b)	
Model fit statistics										
RMSEA	.073	.073	.072		.073		.073			
NNFI	.91	.91	.91		.91		.91			
GFI	.92	.91	.92		.91		.92			
Additional χ^2 difference tests										
Time			p < .01 (H4c)				p < .01 (H5b)		p < .01 (H6c)	
CMCS coefficients			.15***	.14**			.15***	.11***	.14**	.07***
Flight			p < .01 (H4c)				p < .01 (H5b)		p < .01 (H6c)	
CMCS coefficients			.02*	.02**			.02*	.01*	.02**	–.03*
Interaction	p < .01 (H2c)									
CMCS coefficients	.47***	.48***								

NOTE: This table reports the common metric, fully standardized coefficients (CMCS; i.e., comparable between groups) of the attribute model of customer satisfaction for customers with different characteristics. The reported coefficients are from a model in which groups are constrained to have a common measurement model but the structural model is allowed to freely vary. Mean differences in the level of satisfaction are estimated to permit testing of several hypotheses. In the lower section, chi-squared difference tests are reported to permit testing of the remaining hypotheses. The specific hypothesis number (H3–H6) associated with each coefficient or test statistic is indicated in parentheses. H = hypothesis; SRMR = standardized root mean residual; CFI = comparative fit index; MM = measurement model; SM = structural model; RMSEA = root mean square error of approximation; NNFI = non-normed fit index; GFI = goodness-of-fit index.

a. N = 10,492.
b. N = 9,460,
c. N = 9,864.
d. N = 9,635.
e. N = 7,979.
f. N = 7,411.
g. N = 10,484.
h. N = 9,562.
i. N = 17,158.
j. N = 2,674.
*p < .01. **p < .05. ***p < .10 (two-tailed tests for unstandardized coefficients).

examination of how customer characteristics affect the model of customer satisfaction yields important novel insights about the cocreation of services that has gained recent acceptance in the literature.

We find support for the proposition that the *level* of customer satisfaction is directly affected by the customer characteristics—specifically, that passengers with demographic characteristics of youth or higher income or those in situations that have traveled more or are seated in first class are also less satisfied. This implies that managers should not strive to improve mean levels of customer satisfaction without understanding the points of differentiation among the customer segments. Our results are broadly consistent with prior literature.

More importantly, though, our investigation reveals that both demographic and situational characteristics moderate the *composition* of overall satisfaction. Specifically, gender, income, class of service, experience in travel, and age are all found to moderate the relation between satisfaction with service attributes and overall satisfaction. Prior studies of how service attributes affect overall satisfaction implicitly assume that all customers

TABLE 6
Summary of Results Relating Passenger Characteristics to Satisfaction

Variable	*Significant Mean Difference in Satisfaction Level Found*	*Significant Compositional Difference Found in the Full Structural Model*	*Specific Compositional Difference(s) Found*
Gender	H2a not supported: No difference in mean level of overall satisfaction for men and women after attribute satisfactions are considered	H2b supported: Yes	H2c supported: Interactional attributes more important for women
Age	H3a supported: Older customers have higher mean level of satisfaction than younger customers after attribute satisfactions are considered	H3b supported: Yes	No hypotheses tested
Income	H4a supported: Higher income customers have lower mean level of satisfaction than lower income customers after attribute satisfactions are considered.	H4b supported: Yes	H4c supported: Core attributes are statistically less important for high income passengers than for lower income passengers; however, the magnitude of the differences does not appear to be material.
Experience	No hypothesis about difference due to conflicting theory. Experts are found to be significantly less satisfied on average than novice passengers after attributes satisfactions are considered.	H5a supported: Yes	H5b supported: Core attributes are less important for experts than novices.
Class of Service	H6a supported: First-class customers have lower mean level of satisfaction than economy-class customers after attribute satisfactions are considered	H6b supported: Yes	H6c supported: Core attributes are less important for first-class passengers than for economy-class passengers

NOTE: H = hypothesis.

value elements of the service concept similarly. This of course flies in the face of an extensive literature on customer segmentation and Vargo and Lusch's (2008) premise of value being uniquely determined by the customer. Our data show otherwise, and thus provide managers even more diagnostic power in designing the service concept to appeal to specific target customers. The current service-centered view of marketing posits that the customer cocreation experience is critical to satisfaction evaluations (Vargo and Lusch 2004). Our research provides timely evidence on one avenue by which customer characteristics influence cocreation and overall satisfaction.

The key implication of our research is that managers cannot treat customers the same and expect to obtain similar satisfaction evaluations. A more nuanced view of customers is required to devise appropriate service processes. For example, the results show that the interactional attributes are more important for women than for men and that core attributes are less important for experts and first-class passengers than for novices and economy-class passengers. If one of these segments is not in the target demographic, then marketers may intentionally choose to not enhance the service concept elements that matter most to that segment. Conversely, for key target segments, managers can identify those service concepts that are most highly valued and, combined with information on the cost of increasing satisfaction with that service element, may identify the best path toward increased overall satisfaction. Thus implicitly our results show the importance of understanding the various target markets and points of differentiation, for if marketers treat customers as homogeneous and try to raise overall customer satisfaction for the average customer, then the average customer satisfaction score will confound target and nontarget customers. Only with an understanding of the heterogeneity in importance of the attribute components can we hope to create a customized service solution unique to the individual customer (Oliver, Rust and Varki 1998).

These results, combined with knowledge of which market segments are being targeted, will help operations managers to most effectively deploy their limited resources to where they will matter most. In the short term (i.e., real-time service encounters), managers can focus on deploying resources to facilitate satisfaction with customer satisfaction attributes of interaction, aircraft cleanliness,

personal space (to the extent the airline can reseat passengers), and food. If a targeted market segment places more importance on a "fixed" attribute, then the company can evaluate the long-term feasibility of modifying the design of its service concept. For example, airline management could change the long-term component of personal space by reconfiguring seats to increase the space available to passengers and could enhance the "flight" attribute by purchasing "quieter" planes with better air quality. In sum, since we show that customer characteristics moderate the composition of customer satisfaction, managers can use this information to redesign the service concept to appeal to specific target customers and to enact somewhat different coproduction processes, leveraging knowledge of what customers most value.

Limitations and Directions for Future Research

Although our data are quite comprehensive in coverage of passenger response to air travel and in the demographic data collected about passengers, the data are not without limitations. We do not have direct measures of customers' ex ante performance expectations and other important cognitive antecedents of customer satisfaction, nor do we have objective data on service performance. Consequently, we can not disentangle differing passenger expectations from differing service encounters. We believe that the theoretical development proposed in this article—in which customer characteristics affect the relationship between service concept components and overall satisfaction—is a fruitful one. Explicit measurement of cognitive antecedents in real consumer settings is desirable; however, in light of the challenges that this poses, experimental approaches may yield more conclusive evidence on the precise role that cognitive antecedents play.

Another limitation of the data is that they may not accurately reflect evaluation processes of the customer. Although the service encounter takes place over a period from passenger check-in until arrival and baggage claim, the survey is completed after the service encounter. Without true longitudinal data we can not rule out hindsight bias or the possibility that critical events in one portion of the service encounter color the respondent's view of all parts of the service encounter.

In addition to overcoming these limitations through different research methods or data collection strategies, future research should extend this model to postconsumption behavior, specifically, to repurchase intentions and actual repurchases. Past research has found that the link between satisfaction and repurchase intention is moderated by individual differences, such as gender, age, and education (Mittal and Kamakura 2001). Thus, linking the different attribute weightings related to customer satisfaction to subsequent repurchase intention would provide managers with a more complete model on which to base their resource allocation decisions.

NOTES

1. Iacobucci and Ostrom (1993) use the terms *core* and *relational*, rather than *core* and *peripheral*, to emphasize that the relative importance of the categories varies across services. However, this terminology seems to confuse the relational with the "interactional" component, as discussed below. Thus, here we continue to use the terms *core* and *peripheral*, not because peripheral are less important but because they are peripheral to the delivery of the core service.

2. The terminology of core, peripheral, physical, and interactional elements is well established in the marketing and operations management literature and has been previously applied to the airline industry (see, e.g., Bitner 1990).

3. Some typologies discriminate among services based on the nature of contact between the service provider and the customer (e.g., Kellogg and Chase 1995). However, these typologies do not explore the role of demographic (permanent) and situational (transient) differences between customers for a given service.

4. Each year, several different surveys are used by our third-party data provider. Questions differ somewhat from one survey to the next in response to client (i.e., airline management) interests. Our use of data from the last quarter of 2000 is motivated by a desire to use the largest number of customer records from a single survey type and to avoid the period following the terrorist attacks of 2001.

5. For the 10 airlines studied, the passengers in our database constitute on average, 0.016% (maximum of 0.025%, minimum of 0.006%) of all passengers emplaned during the last quarter of 2000.

6. Some attributes of air travel are experienced by a small number of passengers (e.g., onboard telephone and video service). Listwise deletion of cases that omitted evaluation of unused services would produce a biased sample since many evaluations are missing by design rather than at random. Similarly, imputation of all missing data would err by creating meaningless data. Consequently, we limit our analysis to attributes for which at least 50% of our more than 20,000 customers provided an evaluation and use full information maximum likelihood to estimate the models.

7. This factor structure is robust to all versions of the survey administered during the period of 1998 to summer 2001. Although each survey variant uses somewhat different questions and covers somewhat different core and peripheral attributes, there are strong similarities in the factor loadings and the interpretations of the factors. As noted earlier, the survey that we select as the basis for this study was administered for the longest period with the greatest number of customers providing complete responses. The factor solution explains 68% of the variance extracted.

8. In untabulated results we examine the robustness of our findings under alternative measurement and modeling strategies. Specifically we repeat our tests, substituting factor scores for the latent variables and employing regression analysis. We find no qualitative differences with the results reported.

9. An interaction effect is evidenced in group differences in model parameters. This approach is preferred to alternatives (e.g., Ping 1995) when interaction variables are categorical and when the functional form of the nonlinearity is unknown.

10. In unreported tests we allowed the measurement model to vary. While this statistically improves model fit, in no case do the item loadings become insignificant, and although we find moderate differences in the size of some parameter estimates, we find no substantive differences in the estimates for the structural parameters. Thus we conclude that minor differences in the measurement models are not critical to the interpretation of the structural models (Cheung and Rensvold 2002).

REFERENCES

Alba, Joseph W. and J. Wesley Hutchinson (1987), "Dimensions of Consumer Expertise," *Journal of Consumer Research,* 13, 411-454.

——— and Vikas Mittal (2000), "Strengthening the Satisfaction-Profit Chain," *Journal of Service Research,* 3 (2), 107-120.

Anderson, Eugene W., Claes Fornell, and Donald R. Lehman (1994), "Customer Satisfaction, Market Share, and Profitability: Findings from Sweden," *Journal of Marketing,* 58 (July), 53-66.

Athanassopoulos, Antreas D. and Anastasios Iliakopoulos (2003), "Modeling Customer Satisfaction in Telecommunications: Assessing the Effects of Multiple Transaction Points on the Perceived Overall Performance of the Provider," *Production and Operations Management,* 12 (2), 224-245.

Bitner, Mary Jo (1990), "Evaluating Service Encounters: The Effects of Physical Surroundings and Employee Responses," *Journal of Marketing,* 54 (2), 69-82.

Bolton, Ruth N. and James H. Drew (1994), "Linking Customer Satisfaction to Service Operations and Outcomes," in *Service Quality: New Directions in Theory and Practice,* Roland T. Rust and Richard L. Oliver, eds. Thousand Oaks, CA: Sage, 173-201.

Bryant, Barbara Everitt and Jaesung Cha (1996), "Crossing the Threshold," *Marketing Research,* 8 (4), 20-28.

Butcher, Ken (2005), "Differential Impact of Social Influence in the Hospitality Encounter," *International Journal of Contemporary Hospitality Management,* 17 (2), 125-135.

———, Beverley A Sparks, and Frances O'Callaghan (2003), "Beyond Core Service," *Psychology & Marketing,* 20 (3), 187-208.

Chase, Richard and Douglas Stewart (1994), "Make Your Service Fail-Safe," *Sloan Management Review,* 35 (3), 35-44.

Cheung, Gordon W. and Roger B. Rensvold (2002), "Evaluating the Goodness-of-Fit Indexes for Testing Measurement Invariance," *Structural Equation Modeling,* 9, 233-255.

Cooil, Bruce, Timothy L. Keiningham, Lerzan Aksoy, and Michael Hsu (2007), "A Longitudinal Analysis of Customer Satisfaction and Share of Wallet: Investigating the Moderating Effect of Customer Characteristics," *Journal of Marketing,* 71, 67-83.

Cook, David P., Conh-Huat Goh, and Chen H. Chung (1999), "Service Typologies: A State of the Art Survey," *Production and Operations Management,* 8 (3), 318-338.

Danaher, Peter J. (1998), "Customer Heterogeneity in Service Management," *Journal of Service Research,* 1 (2), 129-139.

Eagly, Alice H., Mona G. Makhijani, and Bruce G. Klonsky (1992), "Gender and the Evaluation of Leaders: A Meta-Analysis," *Psychological Bulletin,* 111, 3-22.

Folkes, Valerie S. (1988), "Recent Attribution Research in Consumer Behavior: A Review and New Directions" *Journal of Consumer Research,* 14, 548-565.

Gilbert, Faye W. and William E. Warren (1995), "Psychographic Constructs and Demographic Segments," *Psychology & Marketing,* 12 (3), 223-337.

Homburg, Christian and Annette Giering (2001), "Personal Characteristics as Moderators of the Relationship between Customer Satisfaction and Loyalty—An Empirical Analysis," *Psychology & Marketing,* 18 (1), 43-66.

Hu, L. T. and Peter M. Bentler (1999), "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria versus New Alternatives," *Structural Equation Modeling: A Multidisciplinary Journal,* 6, 1-55.

Iacobucci, Dawn and Amy Ostrom (1993), "Gender Differences in the Impact of Core and Relational Aspects of Services on the Evaluation of Service Encounters," *Journal of Consumer Psychology* 2 (3), 257-286.

John, Deborah Roedder and Catherine A. Cole (1986), "Age Differences in Information Processing: Understanding Deficits in Young and Elderly Consumers," *Journal of Consumer Research,* 13 (3): 297-315.

Johnson, Michael D. and Claes Fornell (1991), "A Framework for Comparing Customer Satisfaction across Individuals and Product Categories," *Journal of Economic Psychology,* 12, 267-286.

Jöreskog, Karl and Dag Sörbom (1993), *LISREL 8: Structural Equation Modeling with the SIMPLIS Command Language.* Lincolnwood, IL: SSI Scientific Software International.

Kamakura, Wagner A., Vikas Mittal, Fernando de Rosa, and Jose Afonso Mazzon (2002), "Assessing the Service-Profit Chain," *Marketing Science,* 21 (3), 294-317.

Kellogg, Deborah L. and Richard B. Chase (1995), "Constructing an Empirically Derived Measure for Customer Contact," *Management Science,* 41 (11): 1734-1749.

Kline, Rex B. (1998), *Principles and Practice of Structural Equation Modeling.* New York: Guildford.

Lovelock, Christopher H. (1983), "Classifying Services to Gain Strategic Marketing Insights," *Journal of Marketing,* 47 (3), 9-20.

Lusch, Robert F. and Stephen L. Vargo (2006), "Service-Dominated Logic: Reactions, Reflections and Refinements," *Marketing Theory,* 6 (3), 281-288.

McDougall, Gordon H. G. and Terrence Levesque (2000), "Customer Satisfaction with Services: Putting Perceived Value into the Equation," *Journal of Services Marketing,* 14 (5), 392-405.

Meyers-Levy, Joan (1991), "Gender Differences in Information Processing," in *Cognitive and Affective Responses to Advertising,* Pat Cafferata and Alice Tybout, eds. Lexington, MA: Lexington, 219-260.

Mittal, Vikas and Wagner A. Kamakura (2001), "Satisfaction, Repurchase Intent, and Repurchase Behavior: Investigating the Moderating Effect of Customer Characteristics," *Journal of Marketing Research,* 38, 131-142.

——, Pankaj Kumar, and Michael Tsiros (1999), "Attribute-Level Performance, Satisfaction, and Behavioral Intentions over Time: A Consumption-System Approach," *Journal of Marketing,* 63, 88-101.

——, William T. Ross Jr., and Patrick M. Baldasare (1998), "The Asymmetric Impact of Negative and Positive Attribute-Level Performance on Overall Satisfaction and Repurchase Intentions," *Journal of Marketing,* 62, 33-47.

Oliver, Richard L., Roland T. Rust, and Sanjeev Varki (1998), "Real-Time Marketing," *Marketing Management,* 7 (Fall), 28-37.

Oliver, Richard L. (1997), *Satisfaction: A Behavioral Perspective on the Consumer.* Boston: Irwin/McGraw-Hill.

Ostrom, Amy and Dawn Iacobucci (1995), "Consumer Trade-Offs and the Evaluation of Services," *Journal of Marketing,* 59, 17-28.

Ping, Jr. Robert A. (1995), "A Parsimonious Estimating Technique for Interaction and Quadratic Latent Variables," *Journal of Marketing Research,* 32, 336-347.

Reinartz, Werner and V. Kumar (2002), "The Mismanagement of Customer Loyalty," *Harvard Business Review,* July, 86-94.

Sasser, W. Earl, R. P. Olsen, and D. D. Wyckoff (1978), *Management of Service Operations.* Boston: Allyn & Bacon.

Schafer, Joseph L. (1997), *Analysis of Incomplete Multivariate Data.* New York: Chapman and Hall.

Söderlund, Magnus (2002), "Customer Familiarity and Its Effects on Satisfaction and Behavioral Intentions," *Psychology & Marketing,* 19 (10), 861-880.

Vargo, Stephen L. and Robert F. Lusch (2008), "Service-Dominant logic: Continuing the Evolution," *Journal of the Academy of Marketing Science,* 36 (1), 1-10.

Vargo, Stephen L. and Robert F. Lusch (2004), "Evolving to a New Dominant Logic for Marketing," *Journal of Marketing,* 68, 1-17.

Verbeke, Willem and Richard Bagozzi (2002), "A Situational Analysis on How Salespeople Experience and Cope with Shame and Embarrassment," *Psychology and Marketing,* 19 (9), 713-741.

Wangenheim, Forian V. (2003), "Situational Characteristics as Moderators of the Satisfaction-Loyalty Link: An Investigation in a Business-to-Business Context," *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior,* 16, 145-156.

Zeithaml, Valarie A. (1985), "The New Demographics and Market Fragmentation," *Journal of Marketing,* 49, 64-75.

——— and Mary Jo Bitner (2002), *Services Marketing: Integrating Customer Focus Across the Firm,* 3rd ed. New York: McGraw Hill/Irwin.

Shannon Anderson is an associate professor of management at Rice University and a professorial fellow at the University of Melbourne. She received doctorate and master's degrees in business economics at Harvard University and a bachelor's degree in engineering at Princeton University. Her research focuses on the design and implementation of performance measurement and management control systems. She serves as an editor of the *Accounting Review* and an associate editor of *Management Science*, and she is on the editorial boards of *Accounting*, *Organizations and Society*, *Production and Operations Management*, *Management Accounting Research*, and the *Journal of Management Accounting Research.*

Lisa Klein Pearo is a visting assistant professor of marketing at the School of Hotel Administration at Cornell University. She earned her DBA and MBA from the Harvard Business School and a BA in economics from Yale University. Her research focuses on information search, learning, and decision making in interactive environments. She has published in *Journal of Interactive Marketing*, *International Journal of Research in Marketing*, *Journal of Business Research*, *Organizational Behavior and Human Decision Processes*, and *Sloan Management Review.* She serves on the editorial boards of *Journal of Interactive Marketing* and *Journal of Business Research.*

Sally K. Widener received her PhD from the University of Colorado at Boulder in 1999. Since 2001, she has been an assistant professor at the Jones Graduate School of Management at Rice University, where she has received four teaching awards. Previously, she held a position at Colorado State University. Her research primarily investigates the design of performance measurement and control systems. She has published in journals including *Accounting*, *Organizations and Society*, and *Contemporary Accounting Research.* She serves on the board of directors for the National Association of Women MBAs, is a certified public accountant, and is a certified internal auditor.