

THE EFFECTIVENESS OF ONLINE SHOPPING CHARACTERISTICS AND WELL-DESIGNED WEBSITES ON SATISFACTION

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Appendix A

Details

Detailed Literature Review

Much research has been done to understand the motivations of consumers to choose among online retailers and the retailer factors driving customer satisfaction (e.g., Kim et al. 2009; Kotha et al. 2004; Pan et al. 2002; Qu et al. 2008; Smith et al. 2000; Wolfinbarger and Gilly 2003). Concentrating on e-tailing service quality, Wolfinbarger and Gilly (2003) argue that four factors—website design, fulfillment/reliability, privacy/security, and customer service—strongly predict customer satisfaction. Kotha et al. (2004) study the role of online buying experience as a competitive advantage along five dimensions: website usability, customer confidence in the web business, the selection of goods and services on the site, the effectiveness of relationship services such as virtual community building and site personalization, and the extent of price leadership. They conclude that website usability and product selection can be easily competed away via imitation, while superior customer service can lead to a sustainable competitive advantage. Devaraj et al. (2002) find that the usefulness and ease-of-use of online shopping, together with high service quality, are factors affecting consumer satisfaction and, subsequently, their channel preference. Price can also play a role in customer satisfaction. Because online stores are only a mouse click away, many studies have argued that price is an important factor in a customer's decision-making process (Lee and Overby 2004). Using BizRate data, Jiang and Rosenbloom (2005) find that after-delivery satisfaction and price perception have a stronger impact on customer satisfaction than at-checkout satisfaction. Combining the aforementioned studies while integrating their similar dimensions,¹ we review three retailer characteristics, namely website design, customer service, and pricing, and we provide theoretical background for this research.

¹For example, Wolfinbarger and Gilly's fulfillment/reliability and customer service as well as Kotha et al.'s effectiveness of relationship services are all about service. Moreover, Kotha et al.'s website usability is about website design, a dimension studied by Wolfinbarger and Gilly.

First, in the online environment, customers interact with a retailer through its website, which is essentially an information system. Therefore, the design of this information system plays an important role in shaping the customer's shopping experience. Website design has been studied from a usability perspective (Palmer 2002). Neilsen (2000) defines website usability as the ease with which users can navigate through a site. Website download speeds affect usability, as does the manner in which information is structured and integrated with the graphic design layout. A user-friendly interface design is critical in influencing traffic and sales (Lohse and Spiller 1998). Brynjolfsson and Smith (2000), for example, find that online retailers who make it easy to find and evaluate products can charge a price premium to time-sensitive customers. Szymanski and Hise (2000) suggest that both product information and site design are important in enhancing customer online experience. Forrester Research notes that better search tools provided by websites can increase sales (Hof 2001). Moreover, a well-designed website signals the retailer's ability to consumers: online purchase intentions are higher at a high-investment website than at a low-investment website (Schlosser et al. 2006).

Customer service (e.g., the level of responsiveness, reliability, and the manner of handling customer complaints) traditionally has been considered a key factor that affects customer satisfaction (Goodwin and Ross 1990; Kerin et al. 1992; Zeithaml et al. 1988). In electronic markets, customer service has taken on an additional aspect: online service. This includes online order fulfillment and order tracking delivered through technological interfaces such as the web. Online service quality can help online retailers create differentiation, ease price competition, and increase customer satisfaction (Ba and Johansson 2008; Clemons et al. 2002). Service quality represents the characteristics of a retailer that are independent of individual product characteristics. Good service can become a sustainable strategic resource, because it is usually hard for industry rivals to imitate. Zhang and Prybutok (2004) highlight the importance of service in an online shopping environment by demonstrating that service affects not only customer loyalty, but also the perceived usefulness of online shopping. Jun et al. (2004) show that a significantly positive relationship exists between overall online service quality and customer satisfaction. As a result, e-commerce sites should take service into consideration when being designed. Wirtz and Mattila (2004) find that in a service failure situation, recovery services have a significant effect on post-recovery satisfaction and behavioral intentions (repurchase intent).

Product price is also an important factor, often examined in the context of a customer's purchase decision (Dodds et al. 1991; Smith and Brynjolfsson 2001). Yet no consensus exists among researchers on the role of the price leadership strategy online. Reibstein (2002) finds product price important in attracting customers to a retailer's website. Martin-Consuegra et al. (2007), in a study of customer loyalty in the service industry, conclude that perceived price fairness positively influences customer satisfaction. On the other hand, Cao et al. (2003-04) study the relationships between pricing, price satisfaction, and satisfaction with the ordering and fulfillment process and conclude that competing on price may not be a viable strategy for online retailers.

In this paper, our focus is not to explore the direct effects of retailer characteristics on customer satisfaction, as those direct effects have been extensively addressed by prior literature. Instead, we concentrate on the roles of product uncertainty and retailer visibility on customers' evaluation of their online shopping experiences, and the measures that online retailers can deploy to mitigate the impacts. Specifically, we investigate how website design, customer service, and pricing can help alleviate the effect of uncertainty and visibility on online customer satisfaction.

Control Variables

A number of control variables were included in the estimations to account for store-specific factors. Sorensen and Stuart (2000) find organizational age significantly affects organizational behaviors. Srinivasan and Moorman (2005) find that firms with moderate online experience can better leverage customer relationship management into superior customer satisfaction than firms with low or high experience. This finding implies an inverse U-shaped relationship between firm age and customer satisfaction. Thus we added firms' online age and age-square to control for possible confounding effects of online age. Alexa.com provides the date when stores first opened their online channels, which we used to calculate the number of years a store had been online up to July 2005 (the month when our data was collected). We named this variable "online age" for a retailer. We collected the number of total consumer ratings in the previous three months for each store to control for the factors motivating consumers to provide feedback. Odom et al. (2002) find a significant effect of web assurance seals on consumer trust, which will influence customer satisfaction. Bizrate.com puts a "Customer certified" seal on its website for stores committed to proactively soliciting customer feedback and to providing satisfactory customer service. To control for the effect, we added a dummy variable, "Customer certified," with 1 for stores with the seal and 0 for those without.

Data Analysis Details

We account for potential store-specific errors by directly controlling for each store characteristic, such as online age and the number of ratings. Although these controls cannot fully rule out the possible problem of endogeneity, they increase our confidence that our results are not an artifact of the difference in unobserved characteristics in retailers. Moreover, since the parameter estimates from both the fixed effects model and the random effects model we ran are similar in sign, magnitude, and significance, we are quite confident about the robustness of our results (see Table B5 in Appendix B). We also examined the possibility of multicollinearity, especially the possibility of multicollinearity between the three retailer characteristics factors. A pairwise correlation analysis ensured that no two regressors were highly correlated. The VIF statistics (Belsley et al. 1980) in the preliminary estimations suggested that multicollinearity was not a concern for most of the variables except the interaction terms between product uncertainty and the retailer characteristics. To address heteroscedasticity and the correlation of errors within retailers, the final models we ran are random effects models with robust standard errors clustered by retailer. To alleviate our concerns on the possible endogeneity problem of retailer visibility, we further employed a method of error component two-stage least squares for panel data (EC2SLS). Following common practice in time series study, we used the lagged average website traffic as the instrumental variable (IV) for the current average traffic. The estimates from EC2SLS are similar to our main results in sign, magnitude, and significance (see Table B6 in Appendix B).

Appendix B

Tables

Table B1. BizRate.com Customer Satisfaction Ratings

Rating	Source	Explanation
Would shop here again	after delivery	Likelihood to buy again from this store
Overall rating	after delivery	Overall experience with the purchase
Ease of finding what you are looking for	at checkout	How easily were you able to find the product you were looking for on the website
Product selection	at checkout	Types of products available on the website
Clarity of product information	at checkout	How clear and understandable was the product information on the website
Overall look and design of site	at checkout	Overall look and design of the website
Prices relative to other online merchants	at checkout	Prices relative to other websites
Shipping charges	at checkout	Shipping charges
Variety of shipping options	at checkout	Desired shipping options were available
Charges stated clearly before order submission	at checkout	Total purchase amount (including shipping/handling charges) displayed before order submission
Availability of product you wanted	after delivery	Product was in stock at time of expected delivery
Order tracking	after delivery	Ability to track orders until delivered
On-time delivery	after delivery	Product arrived when expected
Product met expectations	after delivery	Correct product was delivered and it worked as described/depicted
Customer support	after delivery	Availability/Ease of contacting, courtesy & knowledge of staff, resolution of issue

Table B2. PLS Weights of Formative Measures

Construct	Measures	Weight	Standard Error	t-statistics
Customer Satisfaction	Overall Rating (OR)	0.502	0.057	8.87
	Shop Again (SA)	0.565	0.056	10.19
Customer Service	Customer support (SU)	0.420	0.053	7.91
	Order tracking (OT)	0.046	0.035	1.30
	On-time delivery (OD)	0.210	0.049	4.29
	Product met expectation (PE)	0.413	0.040	10.25
	Product availability (PA)	0.077	0.030	2.59
	Ease of finding product (EF)	0.250	0.080	3.12
Website Design	Site design (SD)	0.179	0.073	2.45
	Clarity of product info (CP)	0.413	0.076	5.41
	Product selection (PS)	0.299	0.062	4.84
	Price (PR)	0.747	0.060	12.51
Pricing	Shipping Charges (SC)	0.362	0.072	5.06

Table B3. Descriptive Statistics and Correlations

Constructs	Mean	SD	1	2	3	4	5	6	7	8
1. Customer Satisfaction	8.67	2.54								
2. Customer Service	9.52	2.61	.88							
3. Website Design	9.84	1.55	.56	.59						
4. Pricing	8.85	2.05	.49	.50	.64					
5. Product dummy	—	—	-.14	-.13	-.15	-.24				
6. Website traffic	193.66	208.47	.05	.02	-.04	.02	.07			
7. Number of Ratings	579.55	449.75	-.01	.03	.01	.17	.05	-.31		
8. Online Age	8.72	1.85	.06	.04	.07	-.07	.08	.50	.24	
9. Customer Certified	—	—	.003	.04	.05	-.02	.10	.24	.42	.12

Table B4. Common Methods Bias Path Coefficients

	Paths/Loadings	Original Sample (R)	Squared Factor Loadings (R²)	T-Statistic
Common methods variance (CMV) factor loadings	CMV → EF	-0.031	0.001	0.32
	CMV → PS	0.049	0.002	0.36
	CMV → CP	0.057	0.003	0.55
	CMV → SD	-0.074	0.005	0.62
	CMV → PR	0.119	0.014	1.52
	CMV → SC	-0.121	0.015	1.44
	CMV → OD	-0.152	0.023	0.76
	CMV → SU	0.072	0.005	0.36
	CMV → PA	0.179	0.032	0.72
	CMV → PE	0.131	0.017	0.60
	CMV → OT	-0.224	0.050	1.13
	CMV → OR	0.017	0.0003	0.19
	CMV → SA	-0.018	0.0003	0.19
Substantive constructs factor loadings	WEB → EF	0.893	0.797	23.71
	WEB → PS	0.834	0.695	15.33
	WEB → CP	0.882	0.778	24.66
	WEB → SD	0.877	0.769	24.50
	PRICING → PR	0.890	0.793	37.42
	PRICING → SC	0.885	0.783	34.45
	SERVICE → OD	0.827	0.685	13.35
	SERVICE → SU	0.880	0.774	23.69
	SERVICE → PA	0.773	0.597	11.01
	SERVICE → PE	0.804	0.646	12.73
	SERVICE → OT	0.829	0.687	12.82
	SATISFACTION → OR	0.954	0.910	56.23
	SATISFACTION → SA	0.953	0.908	53.57

Table B5. Fixed Effects Estimates of Customer Satisfaction			
	Model 1	Model 2	Model 3
Constant	0.031** (0.006)	0.035** (0.011)	0.041** (0.012)
Customer service	0.846** (0.017)	0.879** (0.021)	0.710** (0.053)
Website design	0.047** (0.015)	0.034 (0.020)	0.035 (0.046)
Pricing	0.020 (0.016)	0.011 (0.020)	0.036 (0.059)
Moderating Effects			
Customer service × Retailer visibility	—	-0.040** (0.015)	-0.048** (0.016)
Website design × Retailer visibility	—	0.015 (0.013)	0.015 (0.014)
Pricing × Retailer visibility	—	0.012 (0.015)	0.015 (0.015)
Customer service × Product uncertainty	—	—	0.197** (0.056)
Website design × Product uncertainty	—	—	0.004 (0.049)
Pricing × Product uncertainty	—	—	-0.036 (0.061)
R ²	0.78	0.78	0.78
χ^2 statistics for retailer visibility interactions	—	2.29	3.32*
χ^2 statistics for product uncertainty interactions	—	—	5.42**

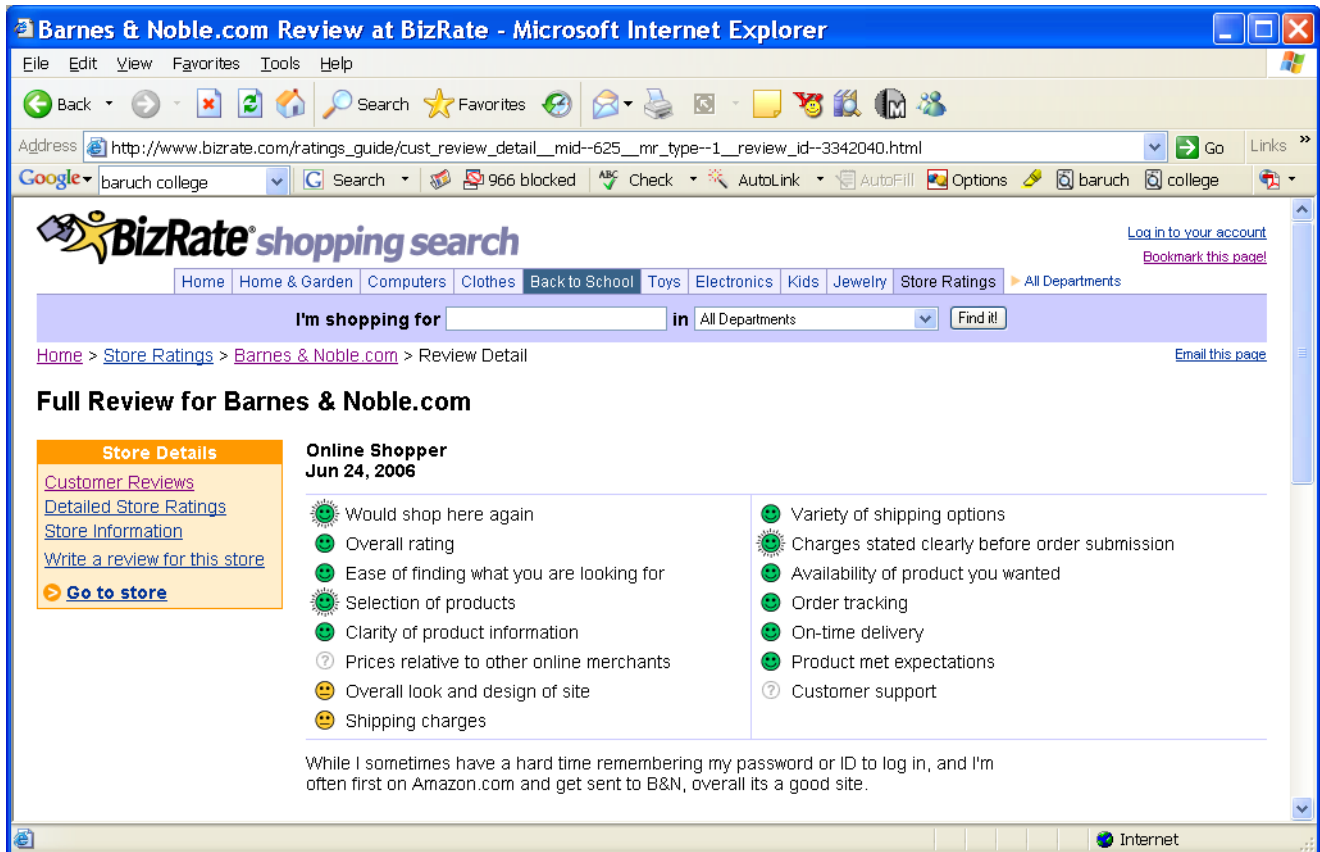
Notes: * = significant at 0.05 level. ** = significant at 0.01 level. Standard errors are reported in parentheses.

Table B6. EC2SLS Estimates of Customer Satisfaction			
	Model 1	Model 2	Model 3
Constant	-0.193 (0.890)	-0.240 (0.991)	-0.118 (0.425)
Customer service	0.848** (0.017)	0.881** (0.021)	0.728** (0.050)
Website design	0.045** (0.015)	0.031 (0.020)	0.035 (0.046)
Pricing	0.021 (0.016)	0.010 (0.021)	0.033 (0.058)
Product uncertainty	-0.001 (0.024)	-0.033 (0.24)	-0.070 (0.058)
Retailer visibility	0.016 (0.050)	0.006 (0.061)	0.022 (0.016)
Moderating Effects			
Customer service * Retailer visibility	—	-0.042** (0.016)	-0.054** (0.016)
Website design * Retailer visibility	—	0.018 (0.014)	0.019 (0.014)
Pricing * Retailer visibility	—	0.013 (0.016)	0.017 (0.015)
Customer service * Product uncertainty	—	—	0.18** (0.054)
Website design * Product uncertainty	—	—	-0.003 (0.049)
Pricing * Product uncertainty	—	—	-0.030 (0.060)
Control Variables			
Number of ratings	ns	ns	ns
Online age	ns	ns	ns
Online age square	ns	ns	ns
Customer certified	ns	ns	ns
R ² (adjusted)	0.78	0.78	0.79
χ^2 statistics for retailer visibility interactions	—	7.58*	12.19**
χ^2 statistics for product uncertainty interactions	—	—	15.55**

Notes: * = significant at 0.05 level. ** = significant at 0.01 level. Standard errors are reported in parentheses.

Appendix C

An Example of an Individual Consumer's Ratings of Barnes&Noble.com on BizRate.com



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