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Online Channel Use and Satisfaction in a Multichannel Service Context

Mitzi Montoya-Weiss, Glenn B. Voss, and Dhruv Grewal

When bricks and clicks compete, website design elements—especially information content and ease of use—drive consumer choice of the online channel. Moreover, channel competition isn't a bad thing: consumers who evaluated alternative channels positively report themselves as more satisfied overall.

Report Summary

As service providers reach customers via multiple channels, including “bricks and clicks,” telephone, and mail, managers need to know more about cross-channel synergies and conflicts. This study focuses on two critical questions: When a service provider offers customers many channels, what prompts consumers to choose the firm’s website to conduct business? Further, how do multiple channel offerings affect consumers’ overall satisfaction with the service provider?

Mitzi Montoya-Weiss, Glenn Voss, and Dhruv Grewal develop a model of the drivers of online channel use and overall customer satisfaction, and test their model via three online surveys. Two surveys focused on customer evaluations of a financial services institution; the third focused on customer evaluations of the course registration process at a university.

Survey results show that consumers’ evaluations of a website’s service quality and their perception of online security risk determine their choice of channel as well as their overall satisfaction with the service firm. Driving consumer

perceptions of online service quality, in turn, are three aspects of website design, in order of importance: information content, organizational structure (ease of use), and graphic style. Information content also influences consumers’ perceptions of the security risk: those who favorably evaluate a website’s information content are less likely to be concerned about security risk.

Perceptions of security risk also vary by context: in the financial services context, consumers’ perceptions of security risk have a significant negative effect on their online channel use. This is not the case for survey respondents in the university context (where the stakes involved are presumably lower).

Not surprisingly, Internet use and experience play an important role in online channel use: those with more experience are more likely to use the online channel (although this effect is somewhat mediated by perceptions of security risk).

While consumers who favorably evaluate the service quality of *alternative* channels are less likely to use the online channel, they are also

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more likely to report themselves as satisfied by the service provider overall.

For managers, these findings offer insight into the complexities of managing multiple channels. Website design, particularly information content and ease of use, are critical to encourage online channel use. In addition, while the cross-channel effects indicate that channels are in competition for consumer use, they also suggest that the broader exposure to a service firm's offerings increase customer satisfaction overall. ■

Introduction

The global electronic marketplace has the potential to change the fundamental nature of competition. However, online activities cannot be considered in isolation; they take place in a broader context of transactional activities simultaneously conducted via conventional channels (Peterson, Balasubramanian, and Bronnenberg 1997). In a multichannel environment, service providers reach customers using a mix of channels—including websites, direct mail, and kiosks—with the aim of distributing resources across the channel mix so as best to satisfy customers and maximize profits. Hence, understanding what drives customers' relative evaluations and use of alternative channels is an important first step toward creating complementary synergies across the expanding range of channel formats.

Cross-channel synergies are particularly important when customers have ongoing relations with a service provider and choose from different channels belonging to the same firm. For example, in service industries such as financial services, insurance, health care, telecommunications, utilities, and education, a single firm will often interact with its customers via multiple channels. In this type of relational exchange, the consumer has already chosen a service provider and is not likely to change providers in the short term; thus, channel comparison is across channels and activities for a specific service provider.

In this study, we examine the determinants of online channel use and overall satisfaction in a relational, multichannel context. The empirical studies explore two levels of customer evaluations: global (overall assessment) and activity-specific (assessment of a specific activity or interaction with a service provider). For example, customers may express overall satisfaction with a bank; they may also express satisfaction regarding specific activities, such as a loan application or balance inquiry or transfer. Similarly, customers may assess their general channel use or their use of a channel for a specific activity.

To examine the determinants of overall satisfaction and online channel use in a multichannel, relational context, we also develop a conceptual model. A key premise of the model is that, in a relational context, online channel use is driven by an evaluation of the relative advantages offered by different channels. We test the model in two service contexts reflecting our two levels of customer assessment. Our results offer insights to service providers seeking to influence online channel use while maintaining or enhancing overall customer satisfaction.

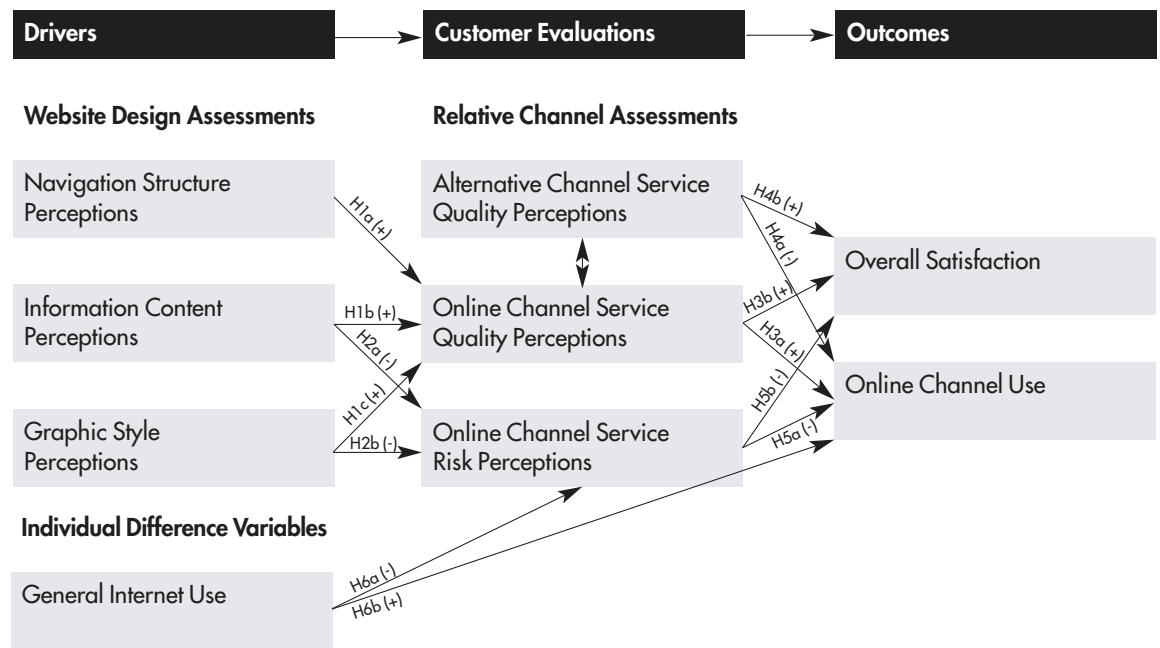
Model

As Figure 1 shows, the key determinants of customers' channel use and satisfaction include: (1) an evaluation of online channel service quality, which is driven by an assessment of the online channel web design; (2) an assessment of the service quality provided by service provider's primary alternative channel; (3) an evaluation of the risks associated with using the online channel; and (4) consumers' general Internet use and expertise.¹ We predict the following:

H1: Favorable assessments of online channel service quality will be positively associated with (a) perceived ease of use of a website's navigation structure, (b) favorable perceptions of a website's information content, and (c) favorable perceptions of a website's graphic style.

Figure 1

Modeling the Determinants of Online Channel Use and Overall Satisfaction in a Multichannel Context



H2: Perceptions of online channel risk will be negatively associated with (a) favorable assessments of the quality of a website's information content and (b) favorable assessments of a website's graphic style.

H3: Positive perceptions of online channel service quality will be positively associated with (a) online channel use and (b) overall satisfaction with the service provider.

H4: Favorable perceptions of the quality of the primary alternative channel will be (a) negatively associated with online channel use and (b) positively associated with overall satisfaction with the service provider.

H5: Perceived online channel risk will be negatively associated with (a) online channel use and (b) overall satisfaction with the service provider.

H6: Higher levels of general Internet use and experience will be (a) negatively associated with

perceptions of online channel risk and (b) positively associated with online channel use.

A fuller discussion of this conceptual background can be found in Appendix 1.

To test the conceptual model, we conducted three online surveys: two at a financial services institution and one at a university. For the financial services surveys, we focused on global customer evaluations of the service provider. For the university survey, we focused on activity-specific evaluations of the course registration process.

Survey 1

In Survey 1 customers provided overall evaluations of the online and alternative channels of a Fortune 500 financial services provider. The financial institution maintained uniform pricing for the delivery of services across channels, so price was not a differentiator of relative channel value. Instead, relative channel advantage was

Table 1
Standardized Structural Equation Model Coefficients and Fit Statistics for Surveys 1, 2, and 3

Hypothesized Paths		Expected Sign	Survey 1 Results	Survey 2 Results	Survey 3 Results
H1a	Navigation structure → Online channel service quality	+	.13 ^b	.26 ^a	.30 ^a
H1b	Information content → Online channel service quality	+	.74 ^a	.71 ^a	.41 ^a
H1c	Graphic style → Online channel service quality	+	.05	-.03	.08 ^c
H2a	Information content → Security risk perceptions	-	-.21 ^a	-.23 ^a	-.32 ^a
H2b	Graphic style → Security risk perceptions	-	-.14 ^a	-.16 ^a	.03
H3a	Online channel service quality → Online channel use	+	.20 ^a	.13 ^a	.19 ^a
H3b	Online channel service quality → Overall satisfaction	+		.39 ^a	.36 ^a
H4a	Alternative channel service quality → Online channel use	-	-.15 ^a	-.08 ^a	-.22 ^a
H4b	Alternative channel service quality → Overall satisfaction	+		.37 ^a	.20 ^a
H5a	Security risk perceptions → Online channel use	-	-.18 ^a	-.10 ^a	-.03
H5b	Security risk perceptions → Overall satisfaction	-		-.04 ^c	-.19 ^a
H6a	Online innovativeness propensity → Security risk perceptions	-	-.16 ^a	-.23 ^a	-.18 ^a
H6b	Online innovativeness propensity → Online channel use	+	.16 ^a	.10 ^a	.21 ^a

Fit Statistics

Degrees of freedom	255	280	280
χ^2	751.36	1027.10	792.62
Goodness-of-fit index	.90	.93	.90
Nonnormed fit index	.93	.95	.89
Comparative fit index	.94	.96	.91
Standardized root mean square residual	.04	.04	.06

^a Coefficient significant at $p < .01$.

^b Coefficient significant at $p < .05$.

^c Coefficient significant at $p < .10$.

measured by comparing the service quality of the online channel with the service quality of the branch offices.

Since customers of financial institutions provide extensive, sensitive personal information regardless of which channel they use, privacy concerns are not channel-specific in this context. Therefore, our empirical study focused on the perceived risk associated with online security violations.

The target population for our study included all customers who were actively using or trying the online channel. At the time of our study, the focal financial institution had one of the highest online banking penetration rates in the industry, with

22% of their customer base maintaining active online accounts. We posted an online survey with a link at the financial institution's website; 600 respondents clicked through and completed the survey. The use of the online sample and survey was appropriate given that respondents were evaluating an online channel. A similar methodology was employed by Meuter et al. (2000).

We compared the demographic distribution of our sample with the financial institution's entire online banking population. The average age in our sample was 42 years and the average income was \$70,083. According to the financial institution's estimates, the average online banker at the time of our study was 37 years old with household

Table 2
Standardized Regression Coefficients for Surveys 1, 2, and 3

Hypothesized Paths		Expected Sign	Survey 1 Results	Survey 2 Results	Survey 3 Results
H1a	Navigation structure → Online channel service quality	+	.22 ^a	.29 ^a	.26 ^a
H1b	Information content → Online channel service quality	+	.54 ^a	.53 ^a	.31 ^a
H1c	Graphic style → Online channel service quality	+	.00	.02	.11 ^a
H2a	Information content → Security risk perceptions	–	–.20 ^a	–.23 ^a	–.20 ^a
H2b	Graphic style → Security risk perceptions	–	–.10 ^a	–.16 ^a	.01
H3a	Online channel service quality → Online channel use	+	.18 ^a	.13 ^a	.13 ^a
H3b	Online channel service quality → Overall satisfaction	+		.25 ^a	.33 ^a
H4a	Alternative channel service quality → Online channel use	–	–.16 ^a	–.07 ^a	–.16 ^a
H4b	Alternative channel service quality → Overall satisfaction	+		.29 ^a	.18 ^a
H5a	Security risk perceptions → Online channel use	–	–.23 ^a	–.12 ^a	–.04
H5b	Security risk perceptions → Overall satisfaction	–		–.07 ^a	–.10 ^a
H6a	Online innovativeness propensity → Security risk perceptions	–	–.07 ^b	–.23 ^a	–.11 ^a
H6b	Online innovativeness propensity → Online channel use	+	.10 ^a	.11 ^a	.17 ^a

^a Coefficient significant at $p < .01$.

^b Coefficient significant at $p < .05$.

^c Coefficient significant at $p < .10$.

income of \$62,887. Thus we conclude that our sample profile is consistent with the average online banker at the financial institution.

A discussion of Survey 1 measures is found in Appendix 2.

Results

The hypothesized relationships were tested using maximum-likelihood structural equation model estimation (Table 1) and standard regression analysis (Table 2). The results were consistent using the two methods, and our discussion will focus on the results of the structural equation. These results indicate that the structural model fit the Survey 1 data well. Survey 1 did not measure overall customer satisfaction with the service provider; however, all of the other paths outlined in Figure 1 were supported, with one exception. Contrary to our expectations, respondents' assessments of graphic style did not have a significant effect on their perceptions of online channel service quality.

Survey 2

Following Survey 1, the financial institution implemented a major website redesign. Four weeks after the redesign, we posted a second online survey with a website link. This second study allowed us to examine the stability of our initial findings with a new sample and a significantly redesigned website in the same research context. To ensure independence of our samples, we asked Survey 2 respondents if they had completed a similar online survey the previous month. Twenty-five respondents who indicated that they had participated in Survey 1 were excluded from further analysis, leaving a sample of 1,137 respondents for Survey 2.

A comparison of demographic profiles for Survey 1 and Survey 2 indicated that the two samples reflected similar distributions in terms of income, age, and marital status, and that Survey 2 attracted a slightly higher percentage of men and higher education levels than Survey

1. For Survey 2, the average respondent was 41 years old with an average income of \$71,783, both of which are comparable to Survey 1 and consistent with the financial institution's online customer population.

A discussion of Survey 2 measures can be found in Appendix 3.

Results

The confirmatory factor analysis measurement model results support the construct validity of the multiple-item scales in Survey 2 (see tables A1 and A2 in appendices). The results also indicate that the structural model fit the data well for Survey 2 (see Table 1). All of the findings from Survey 1 were replicated, including the hypotheses related to individual propensity for innovativeness, which was operationalized as general Internet use in Survey 2. The inclusion of overall satisfaction in Survey 2 led to three additional paths, all of which were significant and in the expected direction. Specifically, overall customer satisfaction is positively associated with favorable perceptions of online channel service quality (H3b supported) and alternative channel service quality (H4b supported) and negatively associated with perceptions of online security risk (H6b marginally supported). Thus, Survey 2 confirmed the stability of the Survey 1 findings in a financial-services context and supported the hypothesized drivers of overall satisfaction in the conceptual model.

Assessment of the website design change

As mentioned earlier, Survey 2 provided an opportunity to assess the effects of the redesign of an actual website. Between the time we conducted surveys 1 and 2, the financial institution implemented a complete redesign intended to improve the website's usability, information quality, and "look and feel." The site's overall organization was changed to make content and services accessible with fewer clicks. Content was added, and protocols were put in place to improve the accuracy, freshness, and relevance of the website content. The graphics were

completely changed from a family-oriented "Norman Rockwell" style to a more business-professional, modern graphic style and color scheme. Thus, we were able to examine the stability of the findings regarding the relative importance of website design factors, as we had essentially two entirely different website designs for the same service provider. As tables 1 and 2 indicate, the relative importance of information content, navigation structure, and graphic style perceptions were consistent before and after the website design change.

The redesign also provided a unique opportunity to explore the effects of objective website design characteristics on customer perceptions of website design. Though our investigation cannot be considered a true experimental design manipulation, we were able to explore whether the design change resulted in more favorable perceptions of the navigation structure, information content, and graphic style. The results (see Table 3) indicate that the changes implemented by the financial institution were on the right track; the mean scores for the three website design factors were all significantly higher in Survey 2.

Survey 3

To further examine the external validity of our model, we conducted a third survey in a different context: course registration at a major southeastern university. Registration represents a relational exchange context wherein the customer (the student) has a channel choice (online versus telephone) for registration activities. The level of customer assessment in Survey 3 is activity-specific (registration only) rather than global, as was the case for surveys 1 and 2. Survey 3 provides the opportunity to examine the robustness of the model in a different research context (see Figure 1). As with the financial services context, price was not a differentiating factor in determining relative channel value, nor was privacy risk unique to the online channel.

Table 3
Indirect Effects of Website Design Perceptions on Online Channel Use and Overall Satisfaction*

Predictor Variables	Survey 1	Survey 2		Survey 3	
	Online Channel Use	Online Channel Use	Overall Satisfaction	Online Channel Use	Overall Satisfaction
Information content	.14 ^a (4.20)	.09 ^a (4.01)	.39 ^a (13.92)	.05 ^b (2.21)	.21 ^a (5.51)
Graphic style	.03 ^b (2.38)	.01 ^c (1.53)	-.01 (-.48)	.01 (.89)	.03 (1.11)
Navigation structure	.02 ^b (1.80)	.02 ^b (2.47)	.14 ^a (5.66)	.03 ^b (1.84)	.13 ^a (3.52)

* Standardized path estimates are reported with *t*-values in parentheses.

^a Coefficient significant at $p < .01$.

^b Coefficient significant at $p < .05$.

^c Coefficient significant at $p < .10$.

For Survey 3, we collected data from a sample of 493 students who were offered course credit as an incentive to participate. Sophomore-, junior-, senior-, and graduate-level classes were invited to participate to ensure variation in the level of experience with the registration process. Scale items were modified as necessary to fit the different context. For example, the wording of the satisfaction item focused on satisfaction with the registration process rather than overall satisfaction with the service provider, as was the case in the financial services context. Otherwise, the data collection and analysis procedures were identical to those followed in surveys 1 and 2. The CFA results indicate that the measurement model provided satisfactory fit with the data and the individual scales exhibited acceptable reliability (see tables A1 and A2).

Results

The fit statistics reported in Table 1 indicate that the structural model fit the data satisfactorily. Although the pattern of results for the individual paths is fairly consistent, there are some interesting differences. Ten of the 13 results from Survey 2 are replicated and supported in Survey 3. The three exceptions are (1) graphic style has a significant positive association with

online channel service quality in Survey 3 (H1c supported); (2) graphic style is not significantly associated with security risk perceptions in Survey 3 (H2b not supported); and (3) security risk perceptions are not significantly associated with online channel use in Survey 3 (H5a not supported).

Overall, Survey 3 provides further support for key components of our conceptual model, thereby lending confidence in the external validity and generalizability of the model and findings for different types of relational multi-channel research contexts. The differences between the two research settings provide the opportunity to interpret the subtle effects of context on the model and results.

Discussion

Our purpose in this study was twofold: first, to develop and empirically test a conceptual model that identified determinants of online channel use and overall satisfaction in a multichannel service context, and second, to explore the role of cross-channel synergies in such a context. The empirical studies generally supported the

hypothesized model. The results suggest that an online service provider can attempt to modify two sets of customer evaluations (of service quality and risk) and three website design assessments (of information content, navigation structure, and graphic style) in order to influence customers' use of the online channel and overall satisfaction with the service provider.

In addition, we found that positive evaluations of multiple channels have a positive effect on customers' overall satisfaction with the service provider. However, we found that positive perceptions of alternative channel service quality have a negative effect on consumers' use of the online channel; that is, the channels are in competition for customer use. These countervailing effects suggest the possibility of interesting cross-channel tensions and synergies that can be managed to deliver service to the customer.

Service quality perceptions

Our results concerning the competitive and complementary effects of multiple channels have several practical implications. The competitive cross-channel effects suggest that customer use of new channels can be influenced by the level of service provided through benchmark alternative channels. For example, a financial services manager who wants to shift customers from the branch channel to the online channel might increase the online channel service levels or cut back on branch services (for example, by offering fewer branches, fewer hours, or fewer service contact employees). At the same time, it is important to consider the complementary cross-channel effects a new channel option like the Internet may have for the service provider as a whole. Using multiple channels creates the potential for broadening the customer's exposure and access to the service provider's offering. Although each channel may offer a unique value proposition, our findings suggest that cross-channel coordination can drive overall customer satisfaction and ultimately profitability. Future research should explore the

complex effects of cross-channel brand transference, cross-channel promotion, and flexible cross-channel fulfillment on customer satisfaction and profitability.

Risk perceptions

The popular press reports that customer concerns about transaction security represent one of the biggest barriers to online channel use. Our results suggest that security risk perceptions may differ by context. For financial services, our results indicate that perceptions of security risk had a significant negative effect on online channel use, but the effect was not significant in the university registration context. It may be that the stakes involved in course registration are not significantly great to deter students' use of the online channel. Or it may be that students are more familiar with the Internet than typical bank customers, and hence perceive less risk overall. Additional research is needed to examine whether security is important in other contexts. Future research is also needed to explore additional dimensions of perceived risk (for example, fulfillment risk—the expectation that an order will be filled and shipped properly and in a timely fashion, the risk of loss of privacy, or psychological risk) that may be salient channel differentiators.

Website design factors

Overall, our findings suggest that website design perceptions are important antecedents to online channel evaluations. Our results clearly demonstrate that information content was the strongest determinant factor across all three studies. The standardized effect that perceptions of information content had on the assessment of online service quality was consistently greater than the effect of perceptions of navigation structure or graphic style. Perceptions of information content were also an important influence on security risk perceptions in the studies (see tables 1 and 2). As further evidence of the importance of information content, Table 3 reports the indirect effects of the three website design factors on online channel use and overall satisfaction. These findings support the notion

that information is one of the key motivators for website use (Alba et al. 1997; Keeney 1999).

It is important to note that information content may have been the dominant website design factor due to the contexts of our studies (financial services and university course registration) wherein the primary offering, both online and offline, is information. We expect that the relative importance of the three website design factors likely depends on the nature of the business of the firm and the target audience. This notion is consistent with prior services marketing research indicating that the strength of the determinants of service quality is not universal across all service settings (e.g., Parasuraman, Berry, and Zeithaml 1991; Carman 1990).

For example, we found a significant negative relationship between graphic style and security risk perceptions in the financial services context but not in the university registration context. For the banking context, this finding is consistent with prior research demonstrating that the physical environment affects customers' attitudes and behaviors, especially in terms of customer trust and confidence in the bank (Baker, Berry, and Parasuraman 1988). The results from Survey 3 suggest that respondents in the student registration study associate graphic style with online service quality. It may be that younger consumers have a greater degree of affinity for stylish graphics in their website interactions; 88% of the student sample reported being less than 21 years of age. Future research should explore moderating conditions for the three website design assessments in relational multichannel contexts, as well as assess the order of effects in different research contexts.

Role of individual differences

Our findings suggest that individual differences in experience with the Internet in general can be a potential impediment or impetus to online channel use (although customer perceptions of security risk partially mediate the effects of general Internet use on online channel use). It seems likely that individuals who are more

experienced Internet users will be earlier adopters of the online retail channel. This suggests a potentially useful market segmentation strategy when launching a new online channel. Further research is needed to examine additional adopter characteristics and their value as segmentation variables. Because users may evaluate the extent to which the online channel helps them better achieve their goals, studying goal orientation and additional usage situations (for example, browsing versus buying) would be an interesting extension of our model.

Limitations

Our findings should be viewed as a first step toward understanding online channel use and overall satisfaction in a multichannel service context. Further research is needed to extend the conceptual model to examine other potential determinant factors and overcome limitations. For example, although our multi-item service quality scale included convenience as one item, convenience of the online channel may be of such significance to some customers that it deserves deeper treatment as a separate construct. Other factors that could be explored in future research include differential cross-channel pricing and trust.

A limitation of our empirical testing is that our measure of channel use is self-reported, and we employ a single-item measure of overall satisfaction. Future research should explicitly measure actual usage behavior across channels and incorporate additional measures of overall satisfaction. Also, our sample has two important limitations: First, the respondents self-selected into the surveys, and second, it is likely that our sample underrepresented certain segments of the target population, especially nonactive users and triers of the website. We did not collect data from non-Internet users because the focus of this study was online channel use. It would be an interesting extension to explore the factors that motivate individuals to move through the very early stages of the adoption process (for example, awareness and interest). A fruitful direction for future research would be to

examine the earlier stages of the adoption process and incorporate additional data collection techniques to capture those individuals who may have discontinued use of the online channel after trying and evaluating it.

Conclusion

Organizations such as the financial institution and university examined in this study are experimenting with ways to make alternative channels—“bricks and clicks”—work together. There are many research questions to address; our study addressed the question of what drives

customers' use of the online channel and how multichannel evaluations affect overall satisfaction when the service provider offers the customer a choice of channels. Understanding how each channel provides value to customers is critical because service providers must allocate resources effectively across the channel mix. The challenge is to leverage and coordinate the strengths of online and offline channels to increase the overall value of the service provider. We contend that the future evolution of multichannel marketing will focus on deriving synergies across channels and attracting customers to the channel that best satisfies their needs on any given occasion. ■

Appendix 1. Literature Review and Research Hypotheses

Antecedents to Online Service Quality

Online marketers enjoy and exercise considerable latitude in designing their online offerings and website interface to enable (or subvert) customer search and exchange activities (Alba et al. 1997; Hoque and Lohse 1999). The ultimate success of electronic marketing will depend on understanding how customer interaction with the website interface influences subsequent consumer evaluations and behaviors. Prior research on technology adoption has shown that user perceptions of usefulness and ease of use determine individuals' adoption of a new information system (Davis 1989, 1993; Davis, Bagozzi, and Warshaw 1989; Venkatesh and Davis 2000). Consistent with information search theory and human-computer interaction research (Alba et al. 1997; Card, Moran, and Newell 1983; Hoque and Lohse 1999), we propose that customers' assessments of three website design characteristics—navigation structure, information content, and graphic style—influence subsequent evaluations of online channel service quality.

Navigation structure refers to the organization and hierarchical layout of the content and pages within a website. Navigation structure governs a user's forward, backward, and lateral movement through a website and can be characterized by the number of clicks it takes to get into and through a website. Past research has shown that navigation structure affects the effort required to use a retail site (Baty and Lee 1995; Hoque and Lohse 1999). Less complex websites that are intuitive and readily navigable can be characterized as easy to understand and use (Hoque and Lohse 1999; Lohse and Spiller 1999; Nielsen 2000). Because perceived ease of use is associated with positive evaluations of new systems we expect that navigation structures that people perceive as easy to use will contribute to positive perceptions of online service quality.

H1a: Perceived ease of use of a website's navigation structure will be positively associated with favorable assessments of online channel service quality.

The primary purpose of most websites is to share information content, which can include anything related to the service offering, order status or tracking, corporate policies, or public relations. A review of past research on the dimensionality of information (e.g., Deshpandé and Zaltman 1982, 1987) suggests that three broad characteristics of information content are of particular importance: (1) information utility, which is the extent to which customers perceive the content to be useful and necessary for completion of the task at hand; (2) information accuracy, which is the perceived correctness or integrity of the content; and (3) information timeliness, which is the degree to which the content is perceived to be fresh and up-to-date. Consistent with past research, we propose that a positive perception of the quality of information content contributes to a positive perception of the website's service quality (Alba et al. 1997; Swaminathan, Lepkowska-White, and Rao 1999).

H1b: Favorable perceptions of a website's information content will be positively associated with favorable assessments of online channel service quality.

The *graphic style* of a website creates the website's look and feel and is the primary determinant of its perceived attractiveness. Graphic style is the primary tangible aspect of the online environment. We conceptualize graphic style as the virtual equivalent of atmospherics in traditional retail stores (Lohse and Spiller 1999). In this sense, an aesthetically pleasing website design may attract customers if it generates pleasurable feelings associated with the online experience. Prior research has found that poor graphical design elements and presentation style can create confusion and contribute to negative reactions that interfere with customers' willingness to browse or buy through the

online channel (Hoque and Lohse 1999; Lohse 1993; Nielsen 2000). All of this suggests that positive perceptions of a website's graphic style will contribute to positive perceptions of online service quality.

H1c: Favorable perceptions of a website's graphic style will be positively associated with favorable assessments of online channel service quality.

Antecedents to Perceptions of Online Channel Risk

Risk is defined here as the uncertainty and potential adverse consequences associated with engaging in online activities with a particular service provider (Dowling and Staelin 1994). Prior research suggests that website content can contribute to a customer's sense of security and comfort with a website (Jarvenpaa, Tractinsky, and Saarinen 1999; Urban, Sultan, and Qualls 2000). The website design and content are the online equivalent of the traditional salesperson and physical surrounding (Lohse and Spiller 1999), which means that the website mediates the relationship between the customer and the organization. In an effort to reassure customers and increase their confidence in the site, some online service providers publish stories and customer testimonials, or post their security and privacy policies (Jarvenpaa, Tractinsky, and Saarinen 1999; Urban, Sultan, and Qualls 2000). This suggests that information content can help reduce the uncertainty and perceived risk associated with the online channel, ultimately increasing the likelihood of use. Therefore, we expect that information content that is perceived as useful, accurate, and timely will be negatively associated with perceptions of online channel risk.

H2a: Favorable assessments of the quality of a website's information content will be negatively associated with perceptions of online channel risk.

For the online channel, the atmosphere is digital rather than physical, and it is created through the genre and details of the graphic style (Lohse and Spiller 1999). Considerable research has examined attributes of retail store environment that are associated with customers' feelings of comfort (Baker et al. 2002; Bitner 1992). Imagery and iconography that promote customer confidence in the professionalism of the organization and security of the site and all transactions are important. Past research suggests that the graphical interface should be consistent throughout the site, and that it should complement the site content, such that the result is an intuitive, pleasant, and secure-feeling environment (Lohse and Spiller 1999; Nielsen 2000; Urban, Sultan, and Qualls 2000). We expect that positive feeling about the graphic style will be negatively related to perceived risk associated with using the online channel.

H2b: Website graphic style that is perceived as attractive will be negatively associated with online channel risk perceptions.

Relating Online Service Quality to Online Channel Use and Overall Satisfaction

From the customer's perspective, we expect that the possibility of interacting with the service provider through

multiple channels has both competitive and complementary effects—competitive in that customers will prefer the channel or channels that they perceive as offering higher service quality, complementary in that customers' overall levels of satisfaction will be higher when they perceive higher service quality in any channel. When the online channel is perceived to offer high service quality, we expect that customers will use the online channel more frequently and that overall satisfaction with the service provider will be higher.

H3: Positive perceptions of online channel service quality will be positively associated with (a) online channel use and (b) overall satisfaction with the service provider.

The Role of Service Quality in Alternative Channels

If a service provider offers multiple channels for customer interaction, customers are likely to make use of more than one. In fact, so long as all the channels create customer value and contribute to overall satisfaction, customers may alternate use among a set of acceptable channels. We contend that in a multichannel context, online channel service quality is assessed relative to a benchmark alternative channel; that is, the service provider's primary alternative channel forms the referent basis for customers' evaluations. Our expectation is that perceptions of the service quality offered by the primary alternative channel will act as the comparison standard for assessment of the online channel. Consistent with adaptation-level theory (Helson 1964) and with the brand and store choice literature (e.g., Ailawadi, Neslin, and Gedenk 2001; Richardson, Jain, and Dick 1996), we further expect that when an alternative channel is perceived to offer superior service quality, this will be negatively associated with use of the online channel.

It is appropriate to view alternative channels as competitive when the focus is on customers' evaluation or comparison of channel service quality and channel choice, but customer satisfaction research suggests that customers' evaluations of competing alternatives (including rejected alternatives) have an effect on their satisfaction levels even after they have made their choice (Dröge, Halstead, and Mackoy 1997). Even when the primary alternative channel is not chosen, positive evaluations of it should positively affect overall customer satisfaction.

H4: Favorable perceptions of the quality of the primary alternative channel will be (a) negatively associated with online channel use and (b) positively associated with overall satisfaction with the service provider.

Relating Online Channel Risk Perceptions to Online Channel Use and Overall Satisfaction

Customers' confidence in transaction security and privacy are linked to their online behavior (Jarvenpaa, Tractinsky, and Saarinen 1999; Swaminathan, Lepkowska-White, and Rao 1999). Although customers should feel less concerned with online risk as they become more technically proficient and comfortable with Internet security, we expect that customers who associate the online channel with higher levels of risk are less likely to use it. Though risk perceptions associated with any channel likely would

impact overall satisfaction with the service provider, we focus here on the relationship between satisfaction and online channel risk.

H5: Perceived online channel risk will be negatively associated with (a) online channel use and (b) overall satisfaction with the service provider.

The Role of Individual-Difference Characteristics

Consumer diffusion research has shown that earlier adopters of innovations tend to be heavier users of products within a product category, perhaps because of their greater knowledge and ability to evaluate new information (Gatignon and Robertson 1985; Rogers 1995). Thus, greater knowledge of and experience with the Internet may create a greater sense of comfort with the online channel and reduce its perceived uncertainty or risk. Past research suggests that consumers' general patterns of

Internet use may affect their evaluation and use of the online channel (Ernst & Young 2000; Goldman Sachs 2000; Novak, Hoffman, and Peralta 1999). Results from various studies and industry reports suggest that individuals with more education and more experience using the Internet have fewer security concerns regarding online transactions (Ernst & Young 2000; Goldman Sachs 2000; Georgia Tech Research Corporation 1998). It may be that prior experience with the Internet contributes to greater knowledge and ability to evaluate new information. All of this suggests that greater Internet use may positively influence use of the online channel, but this effect may be partially mediated by customers' risk perceptions.

H6: Higher levels of general Internet use and experience will be (a) negatively associated with perceptions of online channel risk and (b) positively associated with online channel use.

Appendix 2. Survey 1 Measures

Table A1 presents the scale items along with results from a confirmatory factor analysis to assess the reliability and validity of the multi-item latent scales. Past research on the dimensionality of information provided the basis for developing multi-item scales to measure respondents' perceptions of information content (e.g., Deshpandé and Zaltman 1982, 1987; Zmud 1978). The navigation structure measures were developed based on the notion of ease of use in the technology adoption literature (Davis 1989, 1993; Venkatesh and Davis 2000). The graphic style measures were based on measures of retail environment design (Baker, Grewal, and Parasuraman 1994). The service quality items were designed to measure global service performance perceptions (Voss, Parasuraman, and Grewal 1998). The security perceptions measures were adapted from research on customer confidence in online shopping (Jarvenpaa, Tractinsky, and Saarinen 1999; Quelch and Klein 1996; Swaminathan, Lepkowska-White, and Rao 1999). All latent construct items used 5-point scales. The anchor labels for the security perceptions scales were *completely secure* and *not at all secure*; anchor labels for all other scale items were *strongly disagree* and *strongly agree*.

Consumer diffusion research has shown that early adopters and users of innovations tend to have higher

incomes, be more educated, and be heavier users of products within a related product category (Gatignon and Robertson 1985; Rogers 1995), so consumers' individual propensity for innovativeness was operationalized as a formative construct using self-reported income and education levels as indicators of socioeconomic status (see, for example, Edwards and Bagozzi 2000). Online channel use was operationalized as the self-reported frequency of online channel use relative to offline channel use. The five response options for frequency of use were *never*, *once a month or less*, *several times per month*, *several times per week*, and *daily*. We coded these responses as 0, 1, 2, 3, and 4, respectively, and then summed across channels for an overall frequency score. Relative online frequency was calculated by dividing online frequency by overall frequency. This calculation produced a percentage score with values ranging from 0 to 1 and an average score of .46. We did not operationalize overall satisfaction in Survey 1.

In Table A2, we report summary statistics for each construct in the first column of numbers, construct reliabilities for each latent construct along the diagonal (in bold) and construct correlation estimates with standard errors below the diagonal. All assessments of construct validity were supported, leading us to conclude that our scales measured distinct constructs.

Appendix 3. Survey 2 Measures

To address concerns of potential question order bias in Survey 1, we created three versions of the survey in Survey 2, varying the order of questions across versions. All of the measures for Survey 2 were identical to Survey 1, with two exceptions. First, we added two items that provide a more context-specific operationalization of individual propensity for innovativeness. Drawing from information systems research on computer self-efficacy (Venkatesh and Davis

2000), we developed two items that reflect individual experience and expertise as an Internet user. One item asked respondents to report their level of general Internet use on a four-point semantic differential scale anchored by *light* and *extremely heavy*. The second item measured general Internet expertise with a four-point semantic differential scale anchored by *no expertise* and *high expertise*. We labeled this two-item construct "general Internet use" and substituted it for the construct used in Survey 1.

Table A1

Scale Items and Confirmatory Factor Analysis Results for Surveys 1, 2, and 3

Item Descriptions (FI = Financial Institution)	Survey 1 Lambda Loadings	Survey 2 Lambda Loadings	Survey 3 Lambda Loadings*
Information content perceptions			
The FI.com site provides the information necessary to make informed decisions.	.79	.82	.68
The FI.com site provides me with useful information.	.78	.79	.76
Information on the FI.com site is accurate.	.76	.81	.77
Information on the FI.com site is up-to-date.	.63	.69	.76
Graphic style perceptions			
I like the look and feel of the FI.com site.	.84	.85	.75
The FI.com site is an attractive website.	.87	.88	.91
I like the graphics on the FI.com site.	.82	.84	.84
Navigation structure perceptions			
It is easy to find what I am looking for on the FI.com site.	.85	.86	.72
The FI.com site provides a clear directory of products and services.	.82	.84	.68
It is easy to move around on the FI.com site.	.80	.83	.78
The FI.com site offers a logical layout that is easy to follow.	.87	.86	.82
Security risk perceptions			
How secure do you feel about applying for a loan or credit online?	.92	.89	.85
How secure do you feel about doing online investment activities?	.86	.85	.64
How secure do you feel about doing online banking (e.g., viewing account balances, transferring funds, making payments)?	.75	.77	.59
Online channel service quality perceptions			
FI provides a high level of overall service through its FI.com site.	.88	.88	.80
FI provides convenient service through its FI.com site.	.80	.80	.68
FI provides reliable service through its FI.com site.	.81	.83	.66
FI provides helpful assistance through its FI.com site.	.74	.78	.52
Alternative channel service quality perceptions			
FI provides a high level of overall service through its branches.	.83	.84	.78
FI provides convenient service through its branches.	.68	.74	.70
FI provides reliable service through its branches.	.79	.81	.67
FI provides helpful assistance through its branches.	.84	.83	.60
Online channel use **			
Self-reported frequency of online channel use divided by the summed frequency of total use	1.0	1.0	1.0
Income (Survey 1) **	1.0		
Education (Survey 1) **	1.0		
Overall satisfaction (surveys 2 & 3) **			
Considering all of your experiences as a FI customer, how satisfied are you with the level of service that FI provides? (completely dissatisfied - completely satisfied)		1.0	1.0
General Internet use (surveys 2 & 3)			
How would you characterize your Internet use? (light - extremely heavy)		.68	.67
How would you characterize your level of expertise with the Internet? (no expertise - high expertise)		.79	.73
Fit statistics			
Degrees of freedom	242	265	265
χ^2	736.11	979.67	716.66
Goodness-of-fit index	.90	.93	.90
Nonnormed fit index	.92	.95	.89
Comparative fit index	.94	.96	.91
Standardized root mean square residual	.04	.04	.06

* Item wording for Survey 3 was modified to fit the university registration context.

** These items are included in the measurement model as a way of communicating complete information. Their inclusion does not significantly change the results for the overall measurement model fit or individual fit statistics for the multi-item latent construct scales.

Table A2

Summary Statistics, Construct Reliabilities, and Correlations (with Standard Errors)*

	Means (SDs)	1	2	3	4	5	6	7	8	9
Survey 1										
1 Information content perceptions	3.94 (.77)	.83								
2 Graphic style perceptions	3.77 (.76)	.44 (.04)	.88							
3 Navigation structure perceptions	3.84 (.86)	.61 (.03)	.69 (.03)	.90						
4 Security risk perceptions	2.76 (1.08)	-.26 (.04)	-.21 (.04)	-.22 (.04)	.88					
5 Online channel service quality perceptions	4.06 (.85)	.80 (.02)	.43 (.04)	.58 (.03)	-.19 (.04)	.88				
6 Alternative channel service quality perceptions	4.04 (.83)	.31 (.04)	.21 (.04)	.24 (.04)	-.12 (.05)	.27 (.04)	.87			
7 Online channel use	.46 (.17)	.19 (.04)	.00 (.04)	.08 (.04)	-.22 (.04)	.19 (.04)	-.09 (.04)	NA		
8 Income	3.00 (1.45)	-.04 (.05)	-.09 (.04)	-.15 (.04)	-.08 (.04)	-.04 (.04)	.00 (.04)	.13 (.04)	NA	
9 Education	4.62 (1.48)	-.03 (.05)	-.17 (.04)	-.13 (.04)	-.08 (.04)	-.05 (.04)	-.11 (.04)	.11 (.04)	.28 (.04)	NA

	Means (SDs)	1	2	3	4	5	6	7	8	9
Survey 2										
1 Information content perceptions	4.02 ^b (.78)	.86								
2 Graphic style perceptions	3.92 ^a (.79)	.63 (.02)	.89							
3 Navigation structure perceptions	3.98 ^a (.84)	.71 (.02)	.74 (.02)	.91						
4 Security risk perceptions	2.55 ^a (1.07)	-.34 (.03)	-.32 (.03)	-.31 (.03)	.88					
5 Online channel service quality perceptions	4.17 ^a (.85)	.82 (.01)	.56 (.02)	.70 (.02)	-.31 (.03)	.89				
6 Alternative channel service quality perceptions	4.16 ^b (.79)	.38 (.03)	.33 (.03)	.32 (.03)	-.24 (.03)	.35 (.03)	.88			
7 Online channel use	.48 ^a (.14)	.08 (.03)	.01 (.03)	.07 (.03)	-.15 (.03)	.14 (.03)	-.02 (.03)	NA		
8 Overall satisfaction	5.05 (.97)	.48 (.02)	.35 (.03)	.37 (.03)	-.24 (.03)	.53 (.02)	.52 (.02)	.02 (.03)	NA	
9 General Internet use	3.00 (.64)	-.01 (.04)	.01 (.04)	.00 (.04)	-.26 (.04)	.00 (.04)	-.08 (.04)	.13 (.04)	-.08 (.04)	.70

* For latent constructs, the construct reliability is reported on the diagonal in bold.

^a Means are significantly different across surveys 1 and 2 at $p < .01$.^b Means are significantly different across surveys 1 and 2 at $p < .05$.

Table A2

Summary Statistics, Construct Reliabilities, and Correlations (with Standard Errors)*

	Means (SDs)	1	2	3	4	5	6	7	8	9
Survey 3										
1 Information content perceptions	4.29 (.62)	.83								
2 Graphic style perceptions	3.63 (.75)	.41 (.04)	.87							
3 Navigation structure perceptions	4.23 (.62)	.67 (.03)	.54 (.04)	.84						
4 Security risk perceptions	2.24 (.67)	-.29 (.05)	-.11 (.05)	-.26 (.05)	.74					
5 Online channel service quality perceptions	4.25 (.62)	.61 (.04)	.37 (.05)	.60 (.04)	-.20 (.05)	.76				
6 Alternative channel service quality perceptions	3.51 (.81)	.24 (.05)	.21 (.05)	.19 (.05)	-.02 (.06)	.25 (.05)	.78			
7 Online channel use	.44 (.16)	.05 (.05)	.01 (.05)	.07 (.05)	-.10 (.05)	.15 (.05)	-.18 (.05)	NA		
8 Overall satisfaction	4.85 (.81)	.28 (.05)	.19 (.05)	.26 (.05)	-.19 (.05)	.44 (.04)	.30 (.05)	.06 (.04)	NA	
9 General Internet use	2.91 (.58)	-.05 (.06)	.07 (.06)	.06 (.06)	-.18 (.06)	.04 (.06)	-.06 (.06)	.23 (.05)	.12 (.05)	.66

* For latent constructs, the construct reliability is reported on the diagonal in bold.

We also added a single item measuring overall customer satisfaction with the service provider. This item was adapted from Parasuraman, Zeithaml, and Berry's (1994) notion that customers make global evaluations based on an aggregation of transaction experiences. The item asked

respondents to consider all of their experiences as a customer and to rate their level of overall satisfaction with the service provided by the financial institution on a six-point semantic differential scale anchored by *completely satisfied* and *completely dissatisfied*.

Notes

1. The mediated model structure presented in Figure 1 is consistent with technology adoption research, which has demonstrated the important mediating role of user evaluations and the role of system attributes as antecedents to those evaluations (Davis 1989, 1993; Davis, Bagozzi, and

Warshaw 1989). Given our focus on the service context, we make service quality perceptions the central mediating factor in our model. This is consistent with past research that has shown that service quality perceptions are important indicators of customer evaluations and market performance in service industries (Parasuraman, Zeithaml, and Berry 1994; Zeithaml 1988).

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