To automate or not to automate? Is that the question?

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Executive Summary

Managers fear that not only are consumers less satisfied and loyal when they use technology-based interfaces but that increased satisfaction may not necessarily result in higher loyalty. The underlying assumption is that technology is responsible for differences in evaluative processes used to judge electronically provided services, which affects customer satisfaction and loyalty and the link between the two. We bridge the gap in services literature by comparing an existing model of loyalty across three different interface types- human, automated phone, and Internet- to find support that technology does not alter the established relationships. The study contributes by identifying the role of technology in these relationships and the relative importance of constructs in predicting loyalty.

Introduction

Automation (service provided through technology) reduces labor costs when it substitutes interpersonal customer service (e.g. Federal Express's package tracking on the Internet), increases customer satisfaction when it provides service when and where the customer wants (e.g. online banking that gives 24-hour service) and creates new channels to reach customer segments that were not previously accessible (e.g. Amazon's ability to sell to worldwide markets through its website). Despite the listed advantages of automation, one of the concerns of service providers that use interchangeable interfaces (human and technology-based) is how technology affects the buyer-seller relationship. Managers fear that not only are consumers less satisfied and loyal when they use automated interfaces but even increased satisfaction may not necessarily result in higher loyalty (Shankar, Smith, & Rangaswamy, 2003). The predominant underlying assumption in this reasoning is that technology is responsible for differences in evaluative processes used to judge electronically provided services. While it seems reasonable that technology influences consumer satisfaction and, consequently, loyalty (Liljander, Gillberg, Gummerus, & Riel, 2006; Meuter, Ostrom, Roundtree, & Bitner, 2000), evidence exists that it does not (Selnes & Hansen, 2001).

A logical way to assess whether automation affects customers' satisfaction and ensuing loyalty would be to compare the relationship between satisfaction and loyalty across different human and technology-based interfaces. But few studies do this. We bridge this gap in the services literature by comparing an established model of the relationship (Johnson, Gustafsson, Andreassen, Lervik, & Cha, 2001) across three different interface types- personal, automated phone, and Internet. Replication research is advocated in the advancement of knowledge because it ascertains external validity and helps generalize findings to other populations (e.g. from one country to another country) or generalizations across subpopulations (e.g. different user groups

like frequent and infrequent users). It is the latter type of external validity that contributes to theory refinement (Easley, Madden, & Dunn, 2000a) and is vital to scientific progress (Evanschitzky & Armstrong, 2010; Evanschitzky, Baumgarth, Hubbard, & Armstrong, 2007). We use it to demonstrate that the relationships between satisfaction and loyalty in services marketing are generalizable to different subgroups of the population. We focus the replication on the core of the model even though the original Johnson et al (1999) model also includes corporate image, price and quality. We do not include these in developing our hypotheses as we are only interested in the relational aspects of loyalty. However, we do analyze the full model to make sure that the data replicates established relationships. Lisrel analysis on three subsamples based on consumers' preferred interface type with the service provider demonstrates that the relationships between the chosen constructs remain unchanged. The study contributes to services literature by identifying the role of technology in established relationships and ascertains the relative importance of different drivers of loyalty.

A subscription or membership service setting, where the consumer subscribes to gain access to the service is used for the purposes of our study. Subscription service providers sell periodic recurring services rather than individual ones to a known constellation of users. Some examples of such services are cell phone subscriptions, internet providers, fitness clubs, and financial institutions. Using a subscription service to demonstrate that consumers remain loyal despite the opportunity of switching easily (technology enables service users to compare alternatives easily), makes our claim even stronger: that it is the satisfaction with the service rather than the technology that is responsible for loyalty.

We begin with a description of drivers of loyalty and the relationship between them, followed by a discussion of automation's impact on these drivers to develop hypotheses. The subsequent sections describe the study, analyzes and results. The paper concludes with a discussion of the contributions and managerial implications of the findings.

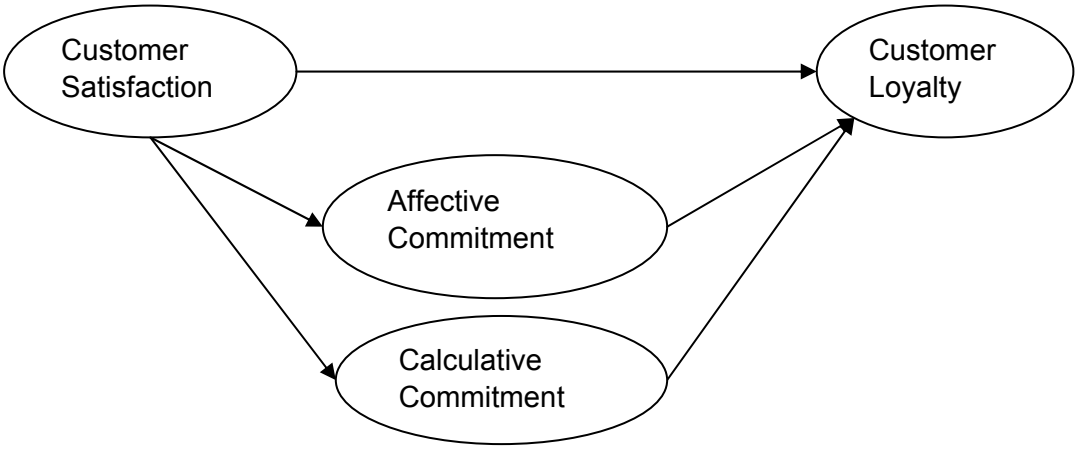
Established Drivers of Customer Loyalty

Customer satisfaction is the most recognized driver of customer loyalty (Johnson et al., 2001). It not only impacts repurchase intentions (Anderson & Sullivan, 1993), retains customers (Bolton, 1998), and secures future revenues (Fornell, 1992; Rust, Zahorik, & Keiningham, 1995) but, also reduces the cost of future transactions (Reichheld & Sasser, 1990). Although the literature supports the link between customer satisfaction and loyalty, other drivers like customer commitment may complement this relationship (Evanschitzky, Iyer, Plassmann, Niessing, & Meffert, 2006; Johnson et al., 2001; Morgan & Hunt, 1994). Commitment is a construct in marketing typically used to explain the relational exchanges between buyers and sellers (Dwyer, Schurr, & Oh, 1987). It is conceptualized to reflect a desire (affective), a need (calculative) and an obligation (obligatory) to maintain a relationship with the organization (Meyer & Allen, 1991). Most studies in services marketing employ only two of these three dimensions- the affective and the calculative one, which are differentiated by underlying motives (Geyskens, Steenkamp, Scheer, & Kumar, 1996). Affectively motivated commitment is a desire to continue

the relationship because of attachment and positive feelings for the partner. Calculative commitment, on the other hand, is the need to maintain the relationship due to the perceived costs associated with its termination, or perceived switching costs associated with leaving.

The relative importance of these drivers depends on the stage of the buyer-seller relationship. Loyalty develops in four sequential stages: cognitive, affective, conative, and action (Oliver, 1999). In the cognitive stage, consumers' loyalty is based on attribute performance levels. Thus, satisfaction with performance is the relevant driver of loyalty. The affective stage of loyalty evolves from cumulatively satisfying usage situations that develop a 'liking' (or affect) for the brand or company. This is the stage when commitment develops and satisfaction has to take place in the phase before (cognitive) for the consumer loyalty to progress to the affective phase or for commitment to develop. Conative and action loyalty are behavioral intentions oriented.

This sequential progression of loyalty and its related drivers, satisfaction and commitment, has been confirmed (Dwyer et al., 1987; Johnson, Herrman, & Huber, 2006; Omar & Sawong, 2007) and shown to be the most likely one of all possible variations. What emerges from these studies is that satisfaction is an important driver of loyalty in the early stages of the relationship and commitment in the subsequent ones. However, commitment alone cannot drive loyalty so it is imperative that it be driven by satisfaction. That is, satisfaction is a necessary boundary condition for commitment to impact loyalty. Figure 1 presents the relationship between loyalty and its selected drivers.



(Adapted from Johnson, Gustafsson, Andreassen, Lervik and Cha, 2001)

Figure 1. Selected drivers of loyalty

Effect of Automation on Satisfaction

Satisfaction depends on expectations about the service's performance (Oliver, 1977). Self-serve gas stations, vending machines, automated teller machines, and automated phone services have existed for decades and consumers have become accustomed to service without service personnel being present. Online shopping itself has been around since the early 1990s. Consumers now know what to expect from services that involve a mechanical or an electronic interface. Since customers are used to automated services, they already have expectations of them. Hence, neither the satisfaction derived from automated services, nor the ensuing loyalty, should be sensitive to the interface type.

One can argue that because consumers play a major role in co-creating services (Vargo & Lusch, 2004), their ability to operate the technology interface and their attitude towards technology could affect satisfaction. A positive attitude towards technology use has been shown to have a favorable impact on satisfaction (Dabholkar, 1996), whereas anxiety towards its use has an unfavorable impact (Meuter, Ostrom, Bitner, & Roundtree, 2003). However, the ubiquity of technology in consumers' experiences requires that one examine aspects of technology that impact satisfaction. More recent research has shown speed and accuracy of the technology (Collier & Kimes, 2013), technology error and its immediate resolution (Dabholkar & Spaid, 2012) contribute to satisfaction. Thus, differences in satisfaction may not necessarily stem from the mere presence of technology, but from how well it is applied.

Similarly, differences in satisfaction may emerge because of the type of services to which technology is applied. It has been shown that technology affected social bonds between service provider and customer only when the customer used services for operative purposes (low-complexity services) but had no affect when used for both operative and consultative purposes (high-complexity services) (Selnes & Hansen, 2001). Similar results were shown in a later study (Simon & Usunier, 2007) where technology did have a customer affect for simple services like cash withdrawal but not complicated ones like financial transactions. If it is the nature of the service rather than the technology that impacts satisfaction, then one should expect the drivers of loyalty to be the same regardless of the interface type. Technology may mean that the customer and the firm conduct their business in slightly different ways, but the business and the features that represent quality service (e.g. dependability, easy access, responsiveness, and flexibility) remain the same (Bitner, 2001).

In addition, measures of customer satisfaction typically require customers to evaluate their *overall* experience with the service provider. Because of the ongoing nature of subscription or membership services, consumers accumulate perceptions of (previous) encounters that eventually determine overall satisfaction. Such a retrospective evaluation would be cumulative and include encounters with the service provider through different interfaces. Technology, therefore, is likely to be an integrative part of the customers' evaluation and have no moderating effect on customer loyalty (as assumed in the literature).

Thus, we expect:

Hypothesis 1: The drivers of loyalty, namely customer satisfaction, affective, and calculative commitment, and their relative importance in determining loyalty are the same for the different types of interface

Hypothesis 2: The relationship between the drivers of loyalty is the same for the different interface types. That is, affective and calculative commitment mediates the direct relationship between satisfaction and loyalty.

Effect of Automation on Commitment

Commitment reflects the bond, whether rational or emotional, between buyers and sellers (Johnson et al., 2001). As the relationship between buyer and seller evolves, the role of commitment increases in importance (Dwyer, Schurr & Oh, 1987, Oliver, 1999), thus these relational bonds are particularly relevant in subscription services which are continuous. It is assumed that automation results in consumers having less affective commitment with the service provider because of the impersonal nature of the interface and more calculative commitment because of the ease of an economic-based assessment of alternatives.

The calculative behavior expected of consumers who use automated channels may be relevant for transactional services (e.g. hotel and airline booking) but does not necessarily hold true for those in subscription or membership ones. These consumers have a better offer that is only a mouse-click away (Internet has facilitated comparisons and thus reduced switching costs) and yet continue the relationship. This is because of the sequential progression of loyalty and its related drivers, satisfaction and commitment (Harris & Goode, 2004). Satisfaction is an important driver of loyalty in the early stages of the relationship and of commitment in the subsequent stages. In the early stages of a subscription relationship, consumers' loyalty is based on attribute performance. This is where technology facilitates comparison of alternatives and where consumers could possibly display calculative behavior. The next stage evolves from cumulatively satisfying usage situations that develop a 'liking' (or affect) for the brand. This is the stage when affective commitment (a motivation to continue the relationship because of the attachment and positive feelings for the service provider) develops. Therefore, loyalty will be more effective than calculative driven in the non-initial stages of a relationship.

In addition, customers in a subscription relationship choose to engage in a continuous relationship to reduce risk (Sheth & Parvatiyar, 1995). A continuous relationship with the service provider lessens consumers' anxiety towards technology use because the consumers know that the service provider will support them in the process of technology trial and use. This reduces the predictive role of the ability to use technology on satisfaction and loyalty (Liljander et al., 2006).

When the service is offered through multiple interfaces, technology is one of several attributes of the customer relationship. The same processes are used to evaluate an automated service experience as are used for interpersonal ones. Automation is not necessarily substituted for personal service as it may be adopted by consumers who see its added value (convenience, flexibility, etc.) while retaining the option of receiving certain services via a personal interface. Technology is seen as yet another way of interacting with the service provider. Because it is a choice the customer has made for perceived benefits, the affective commitment is still going to be the stronger driver of loyalty (as compared to calculative commitment). Therefore we expect,

Hypothesis 3: In subscription or membership services, affective commitment is the stronger driver of loyalty in comparison to calculative commitment regardless of the interface. That is, affective commitment plays a more important role than calculative commitment in building loyalty in ongoing relationships.

Data Collection, Analysis and Discussion

Banking is the chosen context for testing the hypotheses for two reasons. Banking services are one of the most technologically advanced today where customers can choose to interact with the bank through multiple interfaces. This situation allows comparison and contrast of the proposed relationships in different settings. In addition, a subscription relationship with the service provider is an important basis for our hypotheses and banking services offer such a relationship.

The Norwegian Customer Satisfaction Barometer administers a survey every year collecting data in a cross-sectional study. Eight hundred (800) randomly selected respondents were interviewed by telephone in 15-minutes long sessions out of which 743 were retained for analysis based on their preferred mode of interacting with their bank. Since bank customers typically do not exclusively use one interface when availing services, it would not be possible to classify respondents into three distinct groups of interest. The most-used interface type would be expected to most influence the respondent's relationship with the service provider. Thus, we classified them based on the preferred interface with the service provider. Similar questions have been used to distinguish between users and non-users of high-technology services (Parasuraman, 2000).

Three hundred and fifty eight (358) respondents mostly visit the bank when using the bank's services, 151 preferred automated phone banking and 234 preferred Internet banking. These different interface groups are named Visit, Telebank, and Netbank respectively hereafter.

Measures

Since our study is a replication, all constructs are operationalized based on the works summarized in Johnson et al. (2001), using multiple indicators. A 10-point Likert-type scale

consisting of exclusively positive values ranging from 1 to 10 is applied to measure the constructs. Table 1 lists these measures.

Table 1

Measures

Item	***Variable***
Price compared to quality	Price
Price compared to other companies	Price
Price compared to expectations	Price
Equipment and facilities	Quality
Opening hours	Quality
Deliver service at the right time	Quality
Helping when problems occur	Quality
Information about when service is available	Quality
Ability to provide prompt service	Quality
Employees create security	Quality
Corporate image compared to other companies	Corporate image
Image of the store (branch) you deal with	Corporate image
What friends say about the corporate image	Corporate image
Overall corporate image	Corporate image
Likelihood of recommending the company to others	Loyalty
Likelihood of speaking favorably about the company	Loyalty
Likelihood of retention	Loyalty
Overall satisfaction	Customer satisfaction
Performance versus the customer's ideal service provider in the category	Customer satisfaction
Expectancy disconfirmation (performance that falls short of or exceeds expectations)	Customer satisfaction
Identification with what the company stands for	Affective commitment
Relationship marked by reciprocity	Affective commitment
Feeling of belonging to the company	Affective commitment
The most profitable alternative	Calculative commitment
Suffer economic loss with break in relationship	Calculative commitment
Location advantages versus other companies	Calculative commitment

Service quality is measured on five dimensions of tangibility, reliability, empathy, assurance, and responsiveness with questions used in the SERVQUAL scales (Parasuraman, Zeithaml, & Berry, 1988). This is a widely used measure of service quality that is readily applied to evaluate different types of services.

The price construct is operationalized with three items reflecting the price/quality relationship, price compared to expectations, and price compared to that of other firms. Image of the bank is measured by four questions on how the bank's image compares to other banks, the image of the customer's particular store/branch, what the customer's friends would think of the bank's image, and the overall image of the firm.

Customer satisfaction is measured on three measures of cumulative satisfaction that capture the consumer's overall satisfaction with the service provider, how the service provider compares with the customer's ideal, and how the provider's performance compares to the consumer's expectations (expectancy disconfirmation).

Affective and calculative commitment are the result of the evolution of marketing from a transactional to a relational exchange. The two types of commitments capture the emotional (identification, reciprocity, and belongingness) and the rational (profitable, advantageous, and economic) aspects of the reason to remain with a service provider.

Customer loyalty is one of the consequences of the evaluation of the service encounter derived from the 'exit-voice-loyalty' theory (Hirschman, 1970). A consumer can change provider (when dissatisfied), complain (when dissatisfied), recommend (when satisfied), or continue patronage by choice (when satisfied). Satisfaction and dissatisfaction are two distinct constructs (Bitner, Booms, & Tetreault, 1990) and, since the purpose of this study is to examine the relationship between satisfaction and loyalty, we use recommendations and predispositions to continue patronage as measures of intentional (also called attitudinal) loyalty. These are measured by likelihoods of recommending the company, speaking favorably about the company, and continued patronage (Zeithaml, Berry, & Parasuraman, 1996).

Construct Reliability and Validity

Tests of composite reliability and average variance extracted show all constructs to be robust. The composite reliability is greater than the recommended 0.70 (Hair, Anderson, Tatham, & Black, 1998) for all constructs in the pooled sample and only loyalty falls below the recommended value in the subsamples. The average variance extracted are all above the advised 0.50 limit (Fornell & Larcker, 1981) except for calculative commitment. This test is a rather conservative one and constructs not reaching the 0.50 limit can still have acceptable reliabilities (Hatcher, 1994).

All constructs but calculative commitment demonstrate a high degree of variance explained by the model Only 12 to 30 % of the variance in calculative commitment is explained. The variance of calculative commitment explained has been shown to vary by industry and prior research documents similar results (Gustafsson, Johnson, & Roos, 2005; Johnson et al., 2001). Calculative commitment may be explained by other variables, yet unidentified, than only satisfaction (Johnson et al., 2001), indicating that the construct is still in its developmental stages. Despite this limitation, it is used in studies in services marketing (Gustafsson et al., 2005). Again, our intention is to replicate an existing model in a new context, not to improve existing scales. Since the composite reliability, average variance extracted and squared multiple correlation indicate construct robustness for most constructs, we include all measures in the

analysis. Table 2 presents the psychometric properties of the constructs used in the core model[1], both for the entire sample and also grouped by preferred interface type.

Table 2

Psychometric Properties of Measures in Hypothesized Relationships*

Pooled Group	***Mean***	***CR***	***R^2***	***Variance***			
				1	2	3	4
1. Loyalty	7.35	.90	.72	**.76**			
2. Satisfaction	7.20	.84	N/A	.50	**.61**		
3. Aff. Commitment	6.23	.89	.54	.53	.39	**.72**	
4. Calc. Commitment	4.62	.70	.18	.18	.09	.25	**.45**
Visit Group	***Mean***	***CR***	***R^2***	***Variance***			
				1	2	3	4
1. Loyalty	7.74	.90	.60	**.75**			
2. Satisfaction	7.41	.84	N/A	.48	**.63**		
3. Aff. Commitment	6.75	.89	.62	.50	.39	**.73**	
4. Calc. Commitment	5.07	.69	.30	.15	.08	.22	**.45**
Telebank Group	***Mean***	***CR***	***R^2***	***Variance***			
				1	2	3	4
1. Loyalty	6.99	.90	.78	**.74**			
2. Satisfaction	7.02	.78	N/A	.49	**.55**		
3. Aff. Commitment	5.63	.86	.49	.51	.32	**.68**	
4. Calc. Commitment	4.46	.67	.08	.11	.03	.22	**.41**
Netbank Group	***Mean***	***CR***	***R^2***	***Variance***			
				1	2	3	4
1. Loyalty	7.01	.92	.76	**.79**			
2. Satisfaction	6.99	.86	N/A	.52	**.67**		
3. Aff. Commitment	5.81	.89	.53	.53	.41	**.72**	
4. Cal. Commitment	4.13	.55	.12	.20	.12	.28	**.49**

CR: construct reliability; Variance: Shared variance between constructs and the diagonal the average variance extracted (AVE) for each construct.

*Psychometric properties of all the measures in the model were calculated but are not reported in the table for purposes of brevity.

[1] For brevity, we report statistics only for constructs used in the hypothesized relationships. However, we calculated statistics for all constructs in the full model. All were within an acceptable range.

The variance extracted is higher than the shared variance with other constructs for all constructs in the pooled sample as well as the subsamples; so we conclude that the constructs display adequate discriminant validity (Fornell & Larcker, 1981).

Test for Common Method Bias

The Harman single-factor test is used to evaluate common method bias. A single-factor model where all manifest variables are explained through one common method factor is compared to the multifactor measurement model used in the study. The single-factor model yielded a chi-square of 4648.945 (df =303). The goodness of fit statistics, RMSEA (0.14) and CFI (0.91), of this model are significantly worse than the fit of the measurement model with all constructs 1052.723 (df =303) ($\Delta\chi2$=3596.222, Δdf= 25, p=.00), RMSEA (.060) and CFI (0.98), indicating that the correlations between observed variables cannot be adequately explained by one common method factor. Next, the degree of invariance in the core model across groups is identified, the invariance of the core structural model tested, and the structural models for each group established.

Testing the Full Model: Does the data replicate established relationship between constructs?

Covariance structural analysis first tests the full model on the whole sample and then individually in each group to make sure that it replicates established relationship between the constructs in all groups. These results are presented in Table 3. The model provides expected solutions and supports the paths with fit statistics that are all within an acceptable range (Hu & Bentler, 1999) except for the chi-square, which is sensitive to sample size.

Table 3

Goodness-of-fit Statistics and Path Coefficients for Full Model

	Visit	***Telebank***	***Netbank***
	GFI=.74,CFI=.95 RMSEA=.094 *GFI=.84,CFI=.97* *RMSEA=.076*	GFI=.76,CFI=.95 RMSEA=.086	GFI=.77,CFI=.95 RMSEA=.080 *GFI=.82,CFI=.97* *RMSEA=.074*
Satisfaction→image	.87, .10, 8.95 *.87, .06, 13.47*	.81, .12, 6.79	.71, .09, 7.98 *.78, .08, 10.35*
Satisfaction→affective	.81, .10, 7.97 *.80, .06, 13.05*	.73, .10, 7.49	.83, .09, 9.78 *.82, .07, 11.92*
Satisfaction→calculative	.46, .10, 4.49	.25, .11, 2.31	.49, .10, 4.82

	.41, .07, 6.01		*.52, 08, 6.54*
Satisfaction→loyalty	.30, .20, 1.54*	.36, .14, 2.61	.57, .16, 3.64
	.46, .13, 3.58		*.46, .12, 3.78*
Affective →loyalty	.28, .11, 2.49	.22, .09, 2.56	.20, .12, 1.66*
	.28, .07, 3.75		*.28, .09, 3.12*
Calculative→loyalty	.07, .06, 1.14*	.14, .06, 2.19	.10, .07, 1.47*
	*.01, .04,.31**		*.08, .06, 1.53**
Image→loyalty	.35, .14, 2.42	.37, .11, 3.23	.08, .09,.92*
	*.16, .10, 1.66**		*.13, .08, 1.68**
Quality→Satisfaction	.58, .09, 6.75	.71, .10, 7.10	.55, .08, 6.57
	.63, .06, 11.06		*.52, .07, 7.43*
Price→Satisfaction	.41, .08, 5.15	.28, .09, 3.25	.48, .08, 5.83
	.40, .05, 7.70		*.50, .07, 7.43*

*not significant at p<.05
Fit statistics for the original sample sizes (Visit n= 358 and Netbank n= 234) are in italics

The paths between the model's constructs are all significant but the link between calculative commitment and loyalty is not as strong as the other paths. The reason for this could be the indicators of calculative commitment. One of the indicators' factor loading is low (0.42) and its corresponding error variance high (0.82). Another indicator has an error term that tends towards the high side (0.45). The reliability and the convergent validity of this construct had been lower than that of other constructs and below desirable levels in the psychometric analysis performed earlier which was later confirmed by the Lisrel analysis. Regardless, we conclude that the full conceptual model is replicated in the pooled sample.

Testing Hypothesis 1: Are the variables the same across interfaces?

The different interface samples (Visit, Telebank, and Netbank) were unequal in size so equally-sized groups are created with a random sample of 151 (the smallest of the three groups) from the two larger groups. Generating equal-sized groups for the analyzes ensures unambiguous interpretations of the results as the goodness of fit statistics in Lisrel are sensitive to differences in sample size. Recommended tests of equality for variance-covariance matrices, factor patterns, factor loadings and error terms on factor loadings (Bollen, 1989; Steenkamp & Baumgartner, 1998) analyze the measurement model. Table 4 summarizes these results.

Table 4

Testing the Core Measurement Model

	X^2 value	***Df***	***RMSEA***	***CAIC***	***CFI***	***NNFI***
Equality of variance-	1540.724	702	.075	3785.594	.97	.95

covariance matrix						
Equal loadings	2067.278	872	.083	3068.086	.95	.95
Equal loadings, construct variances	2089.254	886	.083	2993.619	.95	.95
Equal loadings, construct variances and factor covariance	2199.532	924	.084	2822.404	.95	.95

Chi-square differences tests

Equivalency tests	***Model comparison***	ΔX^2	Δ ***Df***	***p-value***	***Conclusion***
Equality of covariance	N/A	N/A	N/A	N/A	N/A
Equality of metrics	2-1	-526.554	170	0.000	Supported
Metric and factor equivalency	3-2	-21.96	14	0.079440	Supported
Metric, factor variance and error variance equivalency	4-3	-110.278	38	0.000	Not supported

The RMSEA (0.075), CFI (0.97) and NNFI (0.95) are all within the acceptable range. Tests for other invariances show that the CAIC improves and supports loadings, metric and factor variance equivalency. This finding implies that the factor loadings and variances of the constructs are the same across groups. We conclude that the measurement model overall holds across the three groups: the constructs determining loyalty are the same for the three interface types, thus supporting Hypothesis 1. The same constructs– satisfaction, affective and calculative commitment, and loyalty – remain relevant regardless of the interface type.

We next test whether the expected relationship between these constructs remains unchanged when the sample is divided based on interface type, which would confirm that the technology is not a moderator of loyalty as assumed by previous researchers.

Testing Hypotheses 2 and 3: Does commitment mediate the relationship between satisfaction and loyalty?

Test of path invariance at two different levels test whether the relationships in the model are the same across interfaces. The chi-square tests demonstrate that these relationships are statistically the same in all samples. However, the goodness-of-fit statistics are not particularly strong thus there may be differences in the strengths of the paths across the groups. Path analysis with all three interface types simultaneously shows all paths except one to be the same across the interface types - the path between calculative commitment and loyalty.

Tests of the causal model group by group show satisfaction is a strong driver of affective commitment across all interface types but has a somewhat weaker impact on calculative commitment. However, satisfaction's impact on loyalty increases across interfaces: stronger for

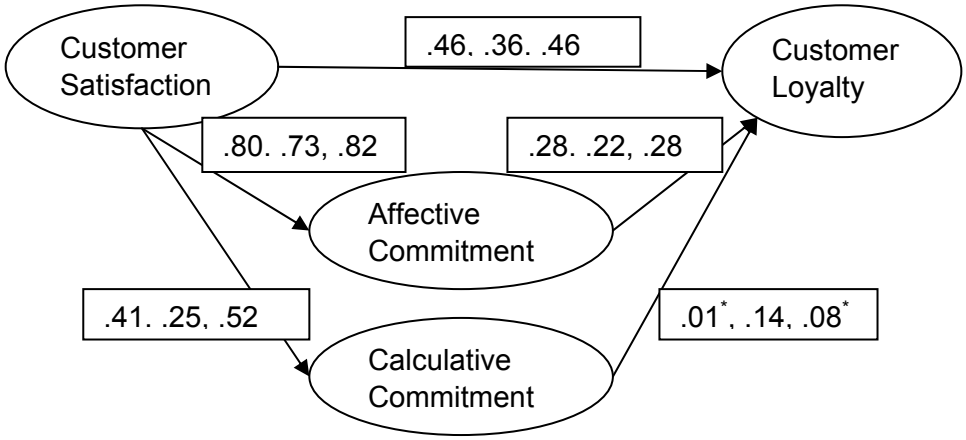
Telebank and Netbank than for Visit. Results for affective and calculative commitment as drivers of loyalty are mixed. While affective commitment is a stronger driver of loyalty than calculative commitment for all interfaces, calculative commitment is not a significant driver of loyalty for Visit or Netbank. Thus, we can conclude that Hypothesis 2 is partly supported and Hypothesis 3 is fully supported. Table 5 summarizes these results and Figure 2 presents them visually. The goodness-of-fit statistics for the causal model are all within an acceptable range, although the RMSEA is a bit high (Hu & Bentler, 1999).

Table 5

Goodness-of-fit Statistics for the Core Causal Model (Beta Coefficient, Error Terms, t-Values)

	Visit	**Telebank**	**Netbank**
	GFI=.90,CFI=.97, RMSEA=.086	GFI=.89,CFI=.96, RMSEA=.090	GFI=.90,CFI=.97, RMSEA=.086
Satisfaction→affective	.78,(.09),9.22	.70,(.10),7.31	.73,(.09),8.56
Satisfaction→calculative	.54,(.11),4.99	.28,(.11),2.41	.35,(.10),3.62
Satisfaction→loyalty	.44,(.14),3.20	.59,(.11),5.50	.53,(.10),5.27
Affective→loyalty	.41,(.12),3.37	.30,(.10),2.97	.29,(.09),3.14
Calculative→loyalty	-.08,(.09),.85*	.15,(.07),2.07	.23,(.07),3.37

* not significant at p<.05



*not significant at p<.05

Figure 2. Beta Coefficients for Full Sample (Visit, Telebank, Netbank)

Although the relationships between constructs explaining loyalty are the same for the three interfaces, the strength of these relationships is different for each interface type. Interestingly, the relationship is the weakest in the Visit interface, the group that this model is developed for in the first place. This weakness can be explained by the fact that loyalty develops through four sequential phases (cognitive, affective, conative, and action) which impacts the relationship between satisfaction and loyalty (Oliver, 1999): satisfaction dominates as a driver of loyalty in the early stages while commitment in the later stages. The Visit respondents have a much longer relationship with the bank than the other two and are, therefore, in a different phase of loyalty development, evaluating the service more affectively than cognitively. However, respondents who prefer to use technology to receive the service also have a relatively long experience with the bank (14 years) so in addition to evaluating the services cognitively, they also evaluate it affectively.

The direction of the relationship between affective and calculative commitment and loyalty is again the same for the three interface types but the relationship between affective commitment and loyalty is stronger than the relationship between calculative commitment and loyalty for *all* groups. The literature proposes that consumers who receive the service through a technology interface are going to be more calculative in their relationships with the service provider because of apparently lower switching costs. However, our results show that affective commitment still plays a more important role in building loyalty than calculative commitment for *all* three interface types.

The impact of calculative commitment on loyalty is significant for only the respondents that prefer to use automated services (Telebank and Netbank customers). Though this finding supports the idea that expectations of such customers are more calculative than the ones who receive the service personally (Shankar et al., 2003), affective commitment is still the stronger

driver of their loyalty. While customers that use technology may be more calculative when compared with the customers who prefer interpersonal services, the impact of calculative commitment on their loyalty is still relatively small.

Contributions

This study's first and foremost contribution is identifying the role of technology in the established relationships between satisfaction, commitment, and loyalty, something that has remained unclear in the literature so far. Our results show that technology does not alter the relationship, at least not in ongoing subscription relationships.

Second, the study demonstrates, contrary to popular belief, that affective commitment is still the stronger driver of loyalty, regardless of the interface type. This finding does not mean that calculative commitment is unimportant in determining loyalty. It is a relevant driver of loyalty for customers who prefer automated services (Telebank and Netbank) but its impact is rather small. Our finding also confirms the sequential progression of loyalty where the more rational and calculative evaluations of attributes dominate in the earlier stages of loyalty development and more affective evaluations dominate in the later ones.

The third contribution of the study is establishing the external validity of the constructs in the modeled relationships by replicating them across three interface types. While a close replication of a prior study or a deliberate modification are useful ways for testing phenomena in multiple settings, replication is necessary for advancing knowledge in a discipline (Easley, Madden, & Dunn, 2000b). Although similar models have been tested in different settings and contexts (Gustafsson et al., 2005), few simultaneously compared these relationships across different settings with the aim of ascertaining the generalizability of these relationships.

The above-mentioned contributions lose significance if the conclusions are not based on sound analyzes. A major strength of the study is the use of rigorous procedures to test and validate the relationships between the constructs of interest. Multi-group analysis in structural equation modeling already uses triangulation to test the model, where results from one group of respondents are compared with those from another group to establish relationships between constructs. Not only is multi-group analysis used to test the hypothesized effects, but the results were cross-validated with regression analysis. Data from one interface type estimated the parameters which were then used to predict those of the remaining interfaces.

Limitations and Future Research

Despite the encouraging results of our study, we need care to broadly generalize our findings. Consumers' usage of multi-channels has been shown to greatly vary by product category (Konuş, Verhoef, & Neslin, 2008). The choice of retail banking as a setting puts two boundary conditions on our results. First, the results are relevant and limited to ongoing subscription relationships and second, they are specific to retail banking. Whether our results hold true for transaction-based or one-time received services that the customer does not have to be a 'member' of (e.g. buying a cinema ticket via an electronic interface) can only be discovered with further tests of the model. These tests should not only be in such services but, also, in comparisons to subscription services.

The operationalization of constructs in our study is primarily driven by the goal of testing established relationships which meant we use the same measures as Johnson et al (2001) despite their shortcomings. The loyalty measure portrays only the attitudinal or intentional loyalty and calculative commitment has an average variance extracted below the recommended 0.50. Future research would benefit from including behavioral loyalty in addition to attitudinal and developing a more robust measure of commitment.

Services offered through multiple channels are typically not used exclusively from one interface. Our method of grouping subjects based on their most preferred interface for receiving services thus, does not take into account how a particular customer divides his/her usage among the different interface types. Future studies should use this as a covariate in the relationship.

Managerial Implication: To Automate or not to Automate?

The present study shows that technology does not alter the relationship between loyalty and its drivers in subscription-based service relationships. Moreover, we found that affective commitment is the stronger driver of loyalty. Other studies have evidenced similar results showing that customer's use of automated services is initially rationally driven and, later, emotionally (Wang, Harris, & Patterson, 2013). Managers should perhaps not contemplate whether or not to automate services but rather focus on which services to automate, to what extent, and how to integrate the automated services with those provided through other interfaces.

Which services are suited for automation depends on the attributes of the service itself. Is the service complex or simple? Is the service part of a service delivery process (e.g. air travel that consists of ticket purchase, check-in, dropping off baggage, boarding, etc.) or a stand-alone service (e.g., cash withdrawal from an ATM)? Identifying attributes of the service and the situations when automation enhances service quality perceptions adds value to the service experience, strengthening the relationship between the customer and the service provider.

To what extent the service ought to be automated will be dictated by how technology improves the service experience. Technology should be considered as just another service feature in a customer-provider relationship and firms should concentrate on optimizing use of technology vis-à-vis personal service, rather than evaluating how to replace personal service with

automated ones. Our findings show that affective commitment rather than calculative commitment is the stronger driver of loyalty, regardless of the interface type. Affective commitment can be further enhanced by identifying customer touch points with the help of service blueprints which are better served by technology (e.g. to improve convenience and speed of service delivery).

How to integrate automated services with other interfaces is the last piece of the puzzle for service providers. Having the possibility of human interaction in case of technology failure not only reduces negative attribution to the service provider but also improves satisfaction (Dabholkar & Spaid, 2012). Moreover, as consumers become more habituated with services offered through multiple interfaces, they seek flexible and agile service interfaces that provide them the possibility of starting the service experience in one channel and completing it in another. For example, customers may want financial advice on investments in person at the bank affiliate but purchase stocks online.

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