Investigating Relational Selling Behaviors, Relationship Quality, and Customer Loyalty in the Medical Device Industry in Taiwan

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ABSTRACT
This study examines how relational selling behavior and expertise affect customer satisfaction, trust of relationship quality, and customer loyalty in the medical device industry in Taiwan using constructs that are usually investigated separately. Based on empirical results, four conclusions were drawn: (1) relational selling behaviors positively affect the trust of relationship quality; (2) expertise positively affects both the trust and customer satisfaction with relationship quality; (3) relational selling behaviors positively affect customer satisfaction with relationship quality; and (4) relationship quality positively affects customer loyalty.

Keywords: relationship marketing, relationship quality, customer loyalty, medical device industry
1. INTRODUCTION

More than 15 years have passed since the implementation of a national health insurance system in Taiwan. The system has been effective in generating income and providing a business and operating model for every medical institution in the country. It has also produced far-reaching implications for relevant medical equipment industries, mostly by making competition in this sector fiercer than ever. These days, it is more important that medical device manufacturers maintain and serve their existing customers than it is to find new customers. For this reason, manufacturers are placing increased emphasis on developing long-term relationships and promoting and improving the loyalty of existing customers. Customer loyalty, a major theme in marketing research, has become an especially critical concern for managers and a strategic obsession for many [Bodet, 2008]. This increasing concern has mainly been due to intense competition and to the current focus on the relationship between organizations and the customers they serve. The latter issue is at the core of the relational marketing approach.

Marketing research now recognizes that acquiring new customers costs more than retaining current ones [Reichheld, 1996]. Although customer loyalty has been recurrently studied, the psychological processes underlying its formation are still unknown, even if numerous antecedents have been identified [Bodet, 2008].

This study therefore aims to test the relationship quality-behavior loyalty relationship based on five constructs that are usually investigated separately. These are relational selling behavior, expertise, trust, customer satisfaction, and loyalty.

2. RESEARCH FRAMEWORK

The conceptual model shown in Figure 1 is a direct modification of those given by Crosby et al. [1990], Lin and Ding [2009], and Orth and Green [2009].
The model not only includes trust and customer satisfaction, but also integrates two key variables specific to the medical device service field: relational selling behavior and expertise [Crosby et al., 1990], which are rarely tested in the context of medical device services.

![Conceptual Model for Current Study](image)

**Figure 1. Conceptual Model for Current Study**

In the purposed model, *expertise* and *relational selling behavior* indirectly influence *customer loyalty* through the mediation of *relationship quality*.

*Relationship quality* is a general evaluation of relationship strength and the extent to which a relationship meets the needs and expectations of the parties involved, based on a history of successful or unsuccessful encounters or events [Crosby et al., 1990]. Even though no consensus exists concerning the constructs that form relationship quality [Kumar, Scheer, and Steenkamp, 1995], it often is conceptualized as involving trust between relaters and their satisfaction with a relationship. In other words, relationship quality is regarded as a construct comprising at least two components: (1) trust in a sales agent and the service he
or she provides [Swan, Trawick, and Silva, 1985]; and (2) satisfaction with a sales agent and the service he or she provides [Crosby and Stephens, 1987].

*Trust* is usually considered necessary for successful relationships [Berry, 1995]. Trust is logically and experientially a critical variable in relationships [Morgan and Hunt, 1994]. Drawing on Sirdeshmukh et al. [2002], we define *trust* as “the expectation by the customer that the service provider is dependable and can be relied on to deliver on its promise.” Consumer trust in the provider has been shown to develop around two distinct facets – front-line employees and management policies and practices [Sirdeshmukh et al. 2002]. This distinction is important because the inferential basis of customer evaluation is different. Front-line employee evaluations are based on observed behaviors demonstrated during service encounters, whereas judgments of management policies and practices are based on the policies and practices governing the exchange.

*Satisfaction* is regarded as a key outcome of buyer-seller relationships [Anderson and Sullivan, 1993]. In contrast with the way we view more rational outcomes, we conceptualize satisfaction as a consumer’s affective state resulting from an overall appraisal of their relationship with a retailer [Anderson and Narus, 1990]. In addition, we view it as a cumulative effect over the course of a relationship, compared with satisfaction specific to a particular transaction [De Wulf et al., 2001].

*Customer relationships* with service personnel have been recognized as a means by which a firm can gain service loyalty [Bove and Johnson, 2006]. Researchers have suggested and shown that customer relationships with service personnel are influential in the development of customer loyalty to a service firm [Goodwin and Gremler, 1996; Gremler and Brown, 1996; Gwinner, Gremler, and Binter, 1998]. This is because of the proximity and interaction of service workers and customers.
3. **HYPOTHESIS DEVELOPMENT**

The following hypotheses are therefore presented, based on previous research and the foregoing observations.

*Relational selling behavior, relationship quality, customer loyalty*

H1: Relational selling behavior has a positive effect on trust of relationship quality.

H2: Relational selling behavior has a positive effect on customer satisfaction of relationship quality.

H3: Relational selling behavior has a positive effect on customer loyalty.

*Expertise, relationship quality*

H4: Expertise has a positive effect on trust of relationship quality.

H5: Expertise has a positive effect on customer satisfaction of relationship quality.

*Relationship quality, customer loyalty*

H6: Trust of relationship quality has a positive effect on customer satisfaction of relationship quality.

H7: Trust of relationship quality has a positive effect on customer loyalty.

H8: Customer satisfaction of relationship quality has a positive effect on customer loyalty.

4. **SAMPLE CHARACTERISTICS**

The current study used convenience sampling to survey customers of medical institutions in Taiwan who have had experience with medical devices. The survey included medical institutions at all levels, including the departments
of medical imaging, departments of nuclear medicine, and departments of laboratory medicine.

A written questionnaire was administered to collect pertinent data. A total of 459 completed copies were returned, of which 32 contained either omissions or incomplete answers. Omitting the 32 left a usable sample of 427 questionnaires. The majority of respondents (53%) were female; 38.9% were between the ages of 31 and 40 years; 60.7% had a college degree; and 39.6% has less than five years’ seniority with their company.

5. SURVEY RESULTS

This section discusses scale reliabilities and validity and model assessment and tests of hypotheses.

5.1. Scale Reliabilities and Validity

The Cronbach’s $\alpha$ coefficients for this study indicate internal consistency reliability. With regard to a minimum acceptable criterion, Nunnally [1978] suggested that a Cronbach’s $\alpha$ coefficient greater than 0.7 indicates high reliability and that a coefficient of less than 0.35 indicates low reliability and should be rejected. As indicated in Table 1, the reliability of each of the five multi-item reflective scales exceeded 0.87, which means that the internal consistency reliability is high. In addition, we assessed the reliability jointly for all items of a construct by computing the composite reliability (CR). From Table 1, we can see that the composite reliability value for each construct was 0.84 or more, which indicates an acceptable fit to the data. These data show that this study possesses the better composite reliability.

Validity is the measurable implement used to accurately examine the level of items that researchers want to measure. Factor analysis showed that the items loaded on a single factor, which provides proof of unidimensionality. This study
computes the average variance extracted (AVE) to confirm the discriminant validity. In Table 1, the AVE exceeded 0.583, which means that the questionnaire used in this study performs converged validity. In addition, AVE can be used to evaluate discriminant validity. In addition, the factor loadings in all constructs in this study were higher than 0.7, indicating that the overall quality of the questionnaire was good and had a better construct validity. Table 2 shows the descriptive statistics and correlations between the constructs.

Table 1

<table>
<thead>
<tr>
<th>Variables</th>
<th>No. of Items</th>
<th>Factor Loading</th>
<th>Cronbach’s α</th>
<th>Eigen-value</th>
<th>Explained Variance</th>
<th>Composite Reliability</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relational selling behavior</td>
<td>5</td>
<td>0.792~0.848</td>
<td>0.874</td>
<td>3.331</td>
<td>0.6661</td>
<td>0.875</td>
<td>0.583</td>
</tr>
<tr>
<td>Expertise</td>
<td>4</td>
<td>0.855~0.902</td>
<td>0.906</td>
<td>3.122</td>
<td>0.7804</td>
<td>0.907</td>
<td>0.708</td>
</tr>
<tr>
<td>Trust of relationship quality</td>
<td>3</td>
<td>0.886~0.907</td>
<td>0.877</td>
<td>2.411</td>
<td>0.8037</td>
<td>0.846</td>
<td>0.646</td>
</tr>
<tr>
<td>Customer satisfaction of relationship quality</td>
<td>3</td>
<td>0.866~0.934</td>
<td>0.875</td>
<td>2.406</td>
<td>0.8021</td>
<td>0.880</td>
<td>0.711</td>
</tr>
<tr>
<td>Customer loyalty</td>
<td>3</td>
<td>0.917~0.942</td>
<td>0.918</td>
<td>2.579</td>
<td>0.8596</td>
<td>0.918</td>
<td>0.789</td>
</tr>
</tbody>
</table>

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Table 2

Analysis of Discriminate Validity (SEM Correlations *)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Relational Selling Behavior</th>
<th>Expertise</th>
<th>Trust of Relationship Quality</th>
<th>Customer Satisfaction w/ Relationship Quality</th>
<th>Customer Loyalty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relational selling behavior</td>
<td>0.764b</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expertise</td>
<td>0.685</td>
<td>0.841</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust of relationship quality</td>
<td>0.626</td>
<td>0.796</td>
<td>0.804</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer satisfaction of relationship quality</td>
<td>0.620</td>
<td>0.753</td>
<td>0.689</td>
<td>0.843</td>
<td></td>
</tr>
<tr>
<td>Customer loyalty</td>
<td>0.622</td>
<td>0.690</td>
<td>0.702</td>
<td>0.764</td>
<td>0.888</td>
</tr>
</tbody>
</table>

a: All correlations are significant at p < 0.05.
b: Diagonal elements in bold are square roots of average variable extracted (AVE).

5.2. Model Assessment and Tests of Hypotheses

The relationships hypothesized in Figure 1 were tested using LISREL 8.54, with the sample covariance matrix as input. The results are summarized in Table 4. The model fit statistics in Table 4 collectively indicate that the proposed model fit the data acceptably.

Among all the hypothesized paths run by LISREL, this study found the following outcomes in Table 3, that:

(1) relational selling behavior and expertise have a significant positive effect on trust of relationship quality;
(2) relational selling behavior, expertise, and trust of relationship quality have a significant positive effect on customer satisfaction of relationship quality; 

(3) relational selling behavior, trust of relationship quality, and customer satisfaction with relationship quality have a significant positive effect on customer loyalty; and 

(4) expertise is the most important factor influencing trust and customer satisfaction with relationship quality.

Table 3
Measurement Model Results for Theoretical Model

<table>
<thead>
<tr>
<th>Theoretical Model</th>
<th>Parameter Estimates</th>
<th>t-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: Relational selling behavior → Trust of relationship quality</td>
<td>0.15</td>
<td>3.83*</td>
</tr>
<tr>
<td>H2: Relational selling behavior → Customer satisfaction with relationship quality</td>
<td>0.18</td>
<td>3.85*</td>
</tr>
<tr>
<td>H3: Relational selling behavior → Customer loyalty</td>
<td>0.16</td>
<td>3.90*</td>
</tr>
<tr>
<td>H4: Expertise → Trust of relationship quality</td>
<td>0.67</td>
<td>17.44*</td>
</tr>
<tr>
<td>H5: Expertise → Customer satisfaction with relationship quality</td>
<td>0.50</td>
<td>8.62*</td>
</tr>
<tr>
<td>H6: Trust of relationship quality → Customer satisfaction with relationship quality</td>
<td>0.23</td>
<td>4.05*</td>
</tr>
<tr>
<td>H7: Trust of relationship quality → Customer loyalty</td>
<td>0.29</td>
<td>6.59*</td>
</tr>
<tr>
<td>H8: Customer satisfaction with relationship quality → Customer loyalty</td>
<td>0.46</td>
<td>11.47*</td>
</tr>
</tbody>
</table>

Fit Statistics:
- CFI=1
- IFI=1
- GFI=1
- AGFI=1
- RMSEA=0.000
- SRMR=0.0013
- Chi-Square=0.11
- df=1
- P-value=0.73753

*p< 0.05.
Table 4

The Direct and Indirect Effect of Modified Model

<table>
<thead>
<tr>
<th></th>
<th>Trust of Relationship Quality</th>
<th>Customer Satisfaction with Relationship Quality</th>
<th>Customer Loyalty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Path</td>
<td>t-value</td>
<td>Path</td>
</tr>
<tr>
<td>Relational selling behavior</td>
<td>Direct</td>
<td>0.15</td>
<td>3.83*</td>
</tr>
<tr>
<td></td>
<td>Indirect</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>0.15</td>
<td>3.83*</td>
</tr>
<tr>
<td>Expertise</td>
<td>Direct</td>
<td>0.67</td>
<td>17.44*</td>
</tr>
<tr>
<td></td>
<td>Indirect</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>0.67</td>
<td>17.44*</td>
</tr>
<tr>
<td>Trust of relationship quality</td>
<td>Direct</td>
<td>0.23</td>
<td>4.05*</td>
</tr>
<tr>
<td></td>
<td>Indirect</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>0.23</td>
<td>4.05*</td>
</tr>
<tr>
<td>Customer satisfaction with relationship quality</td>
<td>Direct</td>
<td>0.46</td>
<td>11.47*</td>
</tr>
<tr>
<td></td>
<td>Indirect</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>0.46</td>
<td>11.47*</td>
</tr>
</tbody>
</table>

Table 4 shows the direct and indirect effects in the theoretical model. From these data, we deduced that trust may mediate the relationships between relational selling behavior, expertise, customer satisfaction with relationship quality, and customer loyalty. We also found that customer satisfaction with relationship quality may mediate the relationships between relational selling behavior, expertise, trust of relationship quality, and customer loyalty.
Although we found indirect effects in the model, the path coefficients for the direct effects were higher than those for the indirect effects. The direct effects between dimensions were stronger than the indirect effects.

6. CONCLUSIONS

The goal of this research was to examine how relational selling behavior and expertise affect customer satisfaction, trust of relationship quality, and customer loyalty. The empirical results led to four conclusions: (1) relational selling behaviors positively affect the trust of relationship quality; (2) expertise positively affects the trust of relationship quality and customer satisfaction with relationship quality; (3) relational selling behaviors positively affect customer satisfaction with relationship quality; and (4) relationship quality positively affects customer loyalty.

As with all research, there are several limitations associated with our study that suggest directions for further research. Many of the questions raised in this paper can be answered only through further empirical research. First, this study’s assessment of relationship quality as it affects loyalty was based on self-evaluation by the respondents to the questionnaire. Future studies could use a more objective basis for assessment. Second, although we included several departments within medical institutions in Taiwan, we did not include all divisions within those institutions. Future research might explore these other areas. Future research could also focus on equipment and other consumables as a way to investigate how relational selling behavior and relationship quality affect customer loyalty.

REFERENCES


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