An Innovative Approach Examining the Asymmetrical and Nonlinear Relationship Between Attribute-Level Performance and Service Outcomes

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This study introduces and tests an innovative approach for investigating the asymmetrical and nonlinear relationship between attribute-level performance and service outcomes. Such approach entails scale division, regression analysis and coefficient comparisons, and curve approximation. The analysis of a set of patient satisfaction survey data indicates: (1) the S-shaped value function suggested by the prospect theory cannot describe the relationships between patients’ likelihood to recommend the hospital (LTR) and perceived performances on all satisfaction-maintaining attributes; and (2) “Spiritual Care” is considered as “patient delight”, with continuous improvements on this attribute providing increasing marginal returns of LTR.

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EXTENDED ABSTRACT
Studies in customer satisfaction suggest that the relationship between the attribute-level performance and overall satisfaction/behavioral intentions may be nonlinear; attributes with differing characteristics can affect customer satisfaction differently. This study employs an innovative approach for a step-by-step evaluation of said relationships within a hospital service context.

Conceptualization
The prospect theory predicts that people follow an S-shaped value function when making decisions under risk. This curve changes from a reference point, steeper for losses than for gains, indicating a negative asymmetrical effect. In addition, the curve suggests a diminishing sensitivity of service outcomes to attribute-level performances, with changes at higher levels of positive/negative performance failing to influence service outcomes as dramatically as changes at the intermediate range.

However, empirical studies have revealed that both directions of asymmetrical effects (positive/negative asymmetry) and types of nonlinear relationships (increasing/diminishing sensitivity) vary depending on the nature of service attributes. For example, Anderson and Mittal (2000) posited that attributes with satisfaction maintaining qualities often exhibited negative asymmetrical effects, because these could be viewed as core attributes and were taken for granted by consumers. Moreover, higher order constructs were likely to have a decreasing sensitivity towards extreme levels of performance on these attributes. Meanwhile, for attributes with satisfaction enhancing qualities, positive performance was rarely expected by the consumer. Thus, changes in the positive domains of these attributes would bring about greater impacts than would changes in the negative domains and might create increasing rates of improvement on service outcomes.

In our study regarding the relationship between attribute-level performance and patient behavioral intention in terms of the likelihood to recommend the hospital (LTR), attributes are established through four aspects: Physiological Care, Psychological Care, Physical Environment, and Spiritual Care, and these specific attributes each has a particular nature. For instance, “competence” under Physiological Care may have satisfaction maintaining qualities, given the essential importance of this attribute to hospital services. LTR is expected to drop significantly if staff “competence” is viewed negatively. Meanwhile, attributes reflecting Spiritual Care may have a satisfaction enhancing nature, since these have been less addressed in hospitals previously and patients may be surprisingly delighted by positive experiences on these attributes. Therefore, we hypothesize that these attributes can be classified into three types according to the direction of asymmetrical effects: for Type I attributes, LTR can only be influenced if negative performances are encountered; for Type II attributes, LTR can only be influenced if positive performances are encountered; for Type III attributes, both positive and negative performances can significantly influence LTR. We then hypothesize that Type I and Type III attributes will display diminishing marginal returns on LTR, given the satisfaction maintaining qualities of these attributes; Type II attributes will be perceived as “delights” for customers, providing an increasing marginal return of LTR.

Method
Telephone-survey data was gathered from 2000 inpatients hospitalized in 2006. Patients were asked to indicate their experiences with 24 descriptors of hospital services on a seven-point likert-like scale and were also asked to rate, on an eleven-point scale, how likely they would recommend the hospital.

Five hidden aspects of hospital services were extracted through an exploratory factor analysis: “Compassionate Care”, “Mutual Communication”, “Procedure Efficiency”, “Reputation”, and “Spiritual Care”. A score for each factor was generated by taking the weighted average of ratings on items under the corresponding factor and ranged from 1 to 7. The authors then centered these scores, creating five new variables representing performances on each factor.

Next, a three-step approach was utilized to examine the asymmetrical and nonlinear relationships existent between performance on each aspect of hospital services and LTR. First, the original scale measuring attribute performance was divided into four parts: “extreme-positive”, “low-positive”, “low-negative”, and “extreme-negative”. Second, on each of these parts, LTR was regressed along the perceived performance on the individual aspect of hospital services. If either low-negative or extreme-negative performance was significant in predicting LTR, while neither part of the positive domains could influence LTR, said aspect of hospital service belonged to Type I attributes. If either part of the positive domains was significant in predicting LTR, while neither part of the negative domains could influence LTR, said attribute belonged to Type II. It was also possible to find some attributes on which both positive and negative performances could influence LTR. These attributes belonged to Type III. To assess nonlinearity (increasing/diminishing sensitivity), the regression coefficients on low versus extreme levels of perceived performance were compared by using Z-Test. Finally, for each attribute, the curves representing the relationship between LTR and attribute-level performance were delineated in both the positive and negative domains.

Major Findings
Spiritual Care was established as a Type II attribute; negative performance did not have a significant impact on LTR, but positive performance could significantly enhance LTR. Z-test also indicated an increasing rate of improvements of LTR as the Spiritual Care performance approaches “perfect”. The other four aspects of hospital care are regarded as Type III attributes, since both the positive and negative domains of perceived performances on these attributes could have a significant impact on LTR. However, Type III attributes did not relate with LTR in an S-shaped value function. For “Mutual Communication” and “Compassionate Care”, LTR was particularly sensitive to extremely negative performance and exhibited decreasing sensitivity towards the extreme upper end of positive domains. For “Procedure Efficiency”, LTR also demonstrated particular sensitivity towards extremely negative performance, while maintaining a linear relationship with perceived performance on its positive domain. For “Reputation”, LTR indicated decreasing sensitivity towards extreme values within the negative domain, but had a linear relationship with attribute-level
performance on the positive domain. Finally, no care aspect was identified as a Type I attribute.

Based on these research findings, we advocate that for hospitals that wish to advance from “good” to “great”, the priorities of service improvement programs should target levels of “Spiritual Care”, since continuous improvements on this attribute will bring increasing marginal returns of LTR.

REFERENCES


