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Structured Abstract

Purpose –The empirical study explores sufficiency conditions for patient loyalty to a hospital.

Design/methodology/approach –The study collected 645 self-administered questionnaires from patients in a major medical center in Taiwan and applies fuzzy set qualitative comparative analysis (fs/QCA) to explore the sufficiency conditions for patient loyalty.

Findings –The findings support the conclusion that the three conditions (patient satisfaction, patient participation in the process of diagnosis, and patient participation in treatment decision-making) in combination are sufficient for high patient loyalty to the hospital but high patient satisfaction alone is insufficient. While the three conditions in configural algorithm are sufficient, this expression is not necessary, which means the findings do not reject possible alternative conditions for high patient loyalty.

Originality/value – Along with patient satisfaction, this study clearly identifies two important stages of patient participation (i.e., participation in the process of diagnosis and treatment decision-making) that are important in forming patient loyalty to a hospital. Prior studies do not present empirical evidence to this proposition. The study applies a relatively new method, fuzzy set qualitative comparative analysis (fs/QCA) to test the sufficiency proposition of the theory. This method enables researchers to focus on examining sufficient conditions without worrying about various confounding factors and informs this study's conclusion that patients exhibiting high scores in all three conditions mentioned above constitute a near-perfect subset of highly loyal patients. Hospitals thus should provide their satisfied patients opportunities to share a role in the process of diagnosis and treatment decision-making.

Keywords: patient participation, satisfaction, loyalty, fs/QCA, patient-centered healthcare

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Introduction

Customers' loyalty toward hospitals and their hospital choices is an important concern to hospital management. This study aims to examine sufficiency conditions, including high patient satisfaction, involving patients in decision making, and patient active participation in the process of diagnosis, that lead to strong patient loyalty. The relationship between customer satisfaction and customer loyalty is well established in the relevant literature. Although satisfaction may lead to loyalty (Oliver, 1999; Bitner and Hubbert, 1994; Woodside, et al. 1989), the current study argues that obtaining superb patient satisfaction only is less of a sufficient condition of patient loyalty than more complex causal statements. To insure high patients' loyalty, a healthcare provider may need to achieve outstanding patient satisfaction as well as to meet other conditions.

Specifically, this study proposes and tests the view that patient satisfaction is a key but not sufficient condition in producing high patient loyalty. More complex statements together with patient satisfaction, are likely assure high patient loyalty. Current trends in medical care promote an atmosphere of increased communication between patients and their health care providers. This study follows this trend and tries to identify specific types of collaboration between patients and doctors, together with high patient satisfaction, to promote patients' loyalty in healthcare industry effectively.

Haug (1994) reviews relevant literature claiming that patient participation in decision-making speeds healing (e.g., Greenfield *et al*., 1985; Siegel, l987). "Nevertheless,

definitive conclusions on whether [or not] this participatory model increases the odds of a patient's favorable outcome have not been established" (Haug, 1994). Kraetschmer *et al.* (2004) also find that more than 60% patients preferred shared decision-making but the study did not go further to check how shared decision-making can influence patients' behavioral intention-to-revisit the same health care providers. The present study contributes by testing an outcome particularly relevant to hospitals of whether the participatory model is valuable for explaining patients' preferences toward hospitals for future medical services. The findings do support Haug's (1994) insights into the substantial benefits likely to result from explicitly designing health services to encourage patient participation in diagnosis and treatment selection.

The healthcare industry is intrinsically a service industry. In service industries, especially in people processing services, interactions between service providers and customers, that take a substantial portion of the whole service process, are extremely important in determining the customers' perception of the service. Hence, the interactions between medical doctors and patients are key processes in medical services that can play an important role in influences patients' perception of medical service quality and in influencing their intention-to-return.

Although the concepts of patient-centered communication and patient participation are central to current views of the ideal doctor-patient relationship (Cegala and Post, 2009), the relevant literature pays little attention to the distinctions of patient participation in different stages of the whole process and to identifying the key stages which may influence patients' perception of decisions related to their their service experience. The goal of the study is to clearly identify distinct patient participation in different stages that may make substantial contributions to patients' loyalty. By using a relatively new method, this research provides new evidence that supports the proposition that high patient satisfaction alone is less sufficient for predicting high

patients' loyalty in comparison to conjunctive statements which include patients' perceptions of their participation in the service decision stages.

Literature Review and Hypothesis Development

The marketing literature gives loyalty a very important role (Caceres and Paparoidamis, 2007) in influencing intentions to repeat purchase. As markets become more competitive, many companies recognize the importance of retaining current customers and some have initiated a variety of activities to improve customer loyalty (McMullan and Gilmore, 2008). Similarly, customers' loyalty toward hospitals and their hospital choices have become important concerns of hospital managers (Woodside *et al*, 1989). Customer loyalty is a deeply held commitment to rebuy or repatronize a preferred product/service consistently in the future (Faiswal and Niraj, 2011; Oliver, 1999).

Many academic studies on loyalty behavior focus on two factors: positive word-of-mouth (WOM) and repeat purchase intention, which respectively represent the customers' willingness to recommend the product/service to other consumers and the likelihood of repeat purchases in the future (Dabholkar *et al*., 1995; Lee *et al*., 2001; Parasuraman and Grewal, 2000; Reichheld and Teal, 1996). In the hospital context, Woodside and Shinn (1988) define the concept as patients' intention-to-return if inpatient care is necessary again.

Many benefits may accrue to the firm from achieving high customer loyalty. These benefits include lower costs relating to retaining existing customers, rather than constantly recruiting new ones especially within mature, competitive markets (Ehrenberg and Goodhardt, 2000). In addition, loyalty produces positive word-of-mouth recommendation (Arndt, 1967; Oliver, 1999; Dick and Basu, 1994). Loyal customers are thought to act as information channels, informally

linking networks of friends, relatives and other potential customers to the organization (McMullan and Gilmore, 2008).

The current study focuses on explicating causal conditions that lead to strong patient loyalty. Some empirical studies inform that satisfaction has strong positive relationships with loyalty (Oliver, 1999). Thus, this study firstly takes a look at literature of satisfaction and identifies patient satisfaction as one of the conditions that may lead to strong patient loyalty.

Patient Satisfaction

Customer satisfaction is generally assumed to be a critical determinant of customer retention, repeat sales, word of mouth, and consumer loyalty (Bearden and Teel, 1983; Faiswal and Niraj, 2011; Goodwin and Gremler, 1996; Stephens and Gwinner, 1998; Woodside *et al*., 1989) and some costly behaviors, such as appointment breaking (Bean and Talaga, 1992). Thus, customer satisfaction (or, more appropriate for health care organizations, patient satisfaction) is considered to be a major indicator in the evaluation and improvement of quality in health care services (Aharony and Strasser, 1993; Carey and Seibert, 1993; Hekkert *et al*., 2009; Saila *et al*., 2008; Taylor and Cronin, 1994). Satisfied patients are important for hospitals because they can lower the cost associated with new client acquisition (Drain, 2001; Nelson *et al*., 1992; Pascoe, 1983; Powers and Bendall-Lyon, 2003).

The relationship between customer satisfaction and brand loyalty is well established in the literature (Bitner and Hubbert, 1994; Oliver, 1999). Research findings have offered robust evidence in this respect – demonstrating a definite positive relationship between customer satisfaction and behavioral intentions (Caceres and Paparoidamis, 2007; Cronin *et al*., 2000). Many related empirical studies report that satisfied consumers demonstrate more loyal behavior

(Gwinner *et al*., 1998; Henning-Thurau *et al*., 2002; Reynolds and Beatty, 1999; Wong and Zhou, 2006; Woodside *et al*., 1989).

Because highly satisfied patients are more likely to return is one of the important reasons for conducting patient satisfaction studies (Ford *et al*.,1997; Marquis *et al.*, 1983), many studies ask how to continuously improve patient satisfaction (Friesner et al., 2009; Meterko et al., 2004; Vahey et al., 2004) and how to pursue an "excellent" level of patient satisfaction (Otani et al., 2009). However, this does not necessarily mean attaining more excellent satisfaction ratings is sufficient or the only way to gain patients' loyalty.

Some researchers argue that patients who are merely satisfied will move to another provider when they have an opportunity (Carr, 1999; Jones and Sasser, 1995; Stewart, 1997). No empirical studies so far can support that excellent satisfaction ratings promises patient loyalty to a hospital. Fisk *et al.* (1990) even suggest that "high satisfaction" alone is not a predictor of greater brand loyalty. Thus, only focusing hard efforts on pursuing excellent patient satisfaction ratings may be too risky for healthcare providers.

Importantly, the current study does not reject the significance of patient satisfaction in securing patient loyalty. Rather, this study recognizes patient satisfaction as part of a key condition, but an insufficient single condition in producing high patient loyalty. Somewhat more complex conditions that include patient satisfaction are likely to assure healthcare providers with high loyalty among their patients. The question is: what are these more complex conditions?

The Concept of Patient-Centered Healthcare

Health professionals are beginning to accept that patients' views should be taken into account; while the paternalistic model in which doctors diagnose without hearing patients'

opinions and make decisions about treatment on behalf of their patients is increasingly regarded as old-fashioned (Longtin *et al*., 2010). Accordingly, many academics advocate shifting away from a paternalistic, detached approach to the patient-centered healthcare model (Cegala and Post, 2009). By focusing the individual patients' own perceptions and motivation, a patient-centered rehabilitation program significantly decreased length of hospital stay (12.2 vs. 26.3 days in a control group) and added to a more successful rehabilitation (Olsson *et al*., 2006). Another study found that when the doctors interacted with high participation patients, the doctors provided more information overall, more information in response to questions, and offered more treatment information than when they spoke with low participation patients (Cegala *et al*., 2007).

Empirical evidence identifies that interactions among servicepersons and customers have important impact on customer loyalty (Sirdeshmukh *et al*., 2002). Kraetschmer *et al.* (2004) also find that most patients have a high preference for taking a shared approach in their clinic encounters. The current study draws on social exchange theory to support the possibility. According to social exchange theory, the value received from an exchange relationship determines a person's attitude and behavior toward that relationship (Lawler, 2001; Thibaut and Kelley, 1959). Whereas conventional neoclassical theory restricts the definition of value to tangible elements, social exchange theory extends the definition to conjoin intangible elements as well. Thus, in the context of services, the psychological value associated with acquiring and consuming a service, though not significant in the neoclassical definition of value, plays an important role.

Social exchange theory also argues that to the extent that partners in an exchange relationship create value for each other over time, positive sentiments such as trust and

commitment derive from the exchange relationship (Blau, 1964; Morgan and Hunt, 1994). Conversely, failing to create the value may cause customers engaging in "exit" from or "neglect" of the relationship (Farrell, 1983; Gronhaug and Arndt, 1980).

Following the concept of patient-centered healthcare, involving patients' opinions in the healthcare process may create precious value for patients in their experience. Since doctors are the key servicepersons in the whole service process, this article focuses on the interactions between doctors and patients, and identifies two distinct stages: the process of diagnosis, and the selection of treatment options. This study argues that those satisfied patients who can actively participate in the process of diagnosis and have the chance to participate in treatment decision making tend to have a better position to return to the same hospital, since those patients usually have better health outcomes and feel respect for their autonomy from the healthcare provider, and thus receive 'value' from the relationship.

Although many patient participation studies do not clearly differentiate between the two stages, the distinction of patient participation between the two stages is necessary. Patients who can actively participate in the process of diagnosis do not always have the opportunities to provide their opinions about different treatment options. Some doctors may like to hear patients during the process of diagnosis but are reluctant to have patients' opinions about different treatment options because that may 'cheapen' their specialty in the medical field.

Patient Participation in the Process of Diagnosis

Nowadays, patient participation is a basic condition for good care (Wallersten, 2006), and is as a key component in the redesign of health care processes (Longtin *et al*., 2010). Definitions of patient participation is not clear and can range from the patient actively engaging in the treatment

process, to the patient making the final treatment decision (Guadagnoli and Ward, 1998). Most organizations and research on patient participation seems to maintain this idea that participation primarily relates to decision making, regarding one's treatment. For example, the US National Library of Medicine defines patient participation as "Patient involvement in the decision-making process in matters pertaining to health" (www.ncbi.nlm.nih.gov/mesh).

Simpson and Weiner (1989) also define participation as "the active involvement of members of a community or organization in decisions that affect their lives and work (p.268)." However, this focus on the decision-making process does not include the many and varied aspects of health care in which the patient could participate (Coulter and Ellins, 2006).

Apart from the above narrow definition, there are some other meanings for the term patient participation. Some lexical definitions convey participation as "associating", or "sharing" with others in some action or matter, or as synonymous with "cooperation" or "contribution" (Fergusson *et al*., 2000). The International Classification of Functioning, Disability and Health (ICF) takes a broader view and defines participation as "being involved in a life situation" (WHO, 2001, p. 10). This definition suggests that participation reaches beyond decision making and should have clarity with respect to patients' views.

Eldh, Ehnfors, and Ekman (2004, 2006) find that to patients with chronic heart failure (CHF), the concept of patient participation encompassed being listened to and regarded as a resourceful individual whose knowledge was recognized and supported. A more recent study also found that patients' descriptions of patient participation focused on having knowledge, rather than being informed, and on interacting with health professionals, rather than merely partaking in decision making (Eldh *et al*., 2010).

The general focus on patient participation relates to patients acquiring knowledge and having

comprehension. Patient participation requires that the patient experiences respect in his or her encounter with the health professional and that knowledge is shared, that is, that professionals listen to and consider the patients' knowledge about their body and situation and provide information according to individual needs (Eldh, *et al*., 2006). The current study takes this point-of-view and regards patient participation as patients actively acquiring knowledge and having comprehension throughout the whole processes of diagnosis. Specifically, this study follows the definition that Cegala and Post (2009) provide and defines patient participation as information seeking (e.g., asking questions, verifying the accuracy of information obtained), information provision (e.g., presenting detailed information about symptoms, medical history, psychosocial matters), assertive utterances (e.g., stating preferences opinions), and expressing concerns (e.g., expressing emotional states).

Involving patients in healthcare decision making

Many healthcare professionals and administrators advocate that patient-centered communication is important (Cegala and Post, 2009). Administrators encourage doctors to identify and fulfill the particular information needs of individual patients (Entwistle *et al*., 2006). There is growing emphasis on incorporating communication training into medical education, considering ethical responsibilities to involve patients in their care, and enhancing informed consent procedures to assure optimal patient involvement in treatment decision making. Guadagnoli and Ward (1998) also point out that patients want to be informed of treatment alternatives and want to be involved in treatment decisions. Involving patients in healthcare decision making has been studied in terms of encouraging patients to take a more active role in medical decision-making and in participation in various medical treatments (Arnetz et al., 2004).

The current study clarifies that: the degree of patients' involvement in the decision-making processes" is the degree to which the doctors allow or encourage patients to decide about treatment options and disclose their preferences and concerns. Shared decision-making is increasingly advocated as an ideal model of treatment decision-making in the medical encounter (Deber, 1994). A shared decision-making model has been proposed by Charles, Gafni, and Whelan (1997) with the key characteristics: (1) at least two participants (e.g., doctor and patient), (2) both parties share information, (3) they both act to build a consensus about the preferred treatment, and (4) an agreement is eventually reached.

Research Hypothesis

To sum up, the current study proposes that patient satisfaction alone is insufficient for high patient loyalty to the hospital. Specifically, this study hypothesizes that satisfied patients who (a) actively participate in the process of diagnosis and (b) take an active role in treatment decision-making can most likely become loyal patients to the hospital. The three conditions act together to represent a sufficient condition for creating high patient loyalty to the hospital. Patients with high scores on all three conditions mentioned above constitute a perfect (or near-perfect) subset of loyal clients. Thus, the research has the following proposition.

Hypothesis: Patient satisfaction, patient participation in the process of diagnosis, and patient participation in treatment decision-making in combination are sufficient for predicting high patient loyalty to the hospital but high patient satisfaction alone is insufficient.

Study Method

Data Collection

To collect data in a medical center, the researchers received approval from the hospital institutional review board. The institutional review board (IRB) is an independent ethical review board. The IRB is a committee that is formally designated to approve, monitor, and review biomedical and behavioral research involving patients with the aim to protect the rights and welfare of the research subjects. An IRB performs critical oversight functions for research conducted on patients that are ethical and regulatory. The study has been approved by IRB. Questions were designed after a comprehensive literature review. Additionally, before final distribution, the questionnaires were tested in a pilot study composed of teachers, doctors and patients to clarify ambiguous or misleading questions, which were modified or eliminated if necessary.

The data used in this study come from a major medical center in Taiwan and follows from approval by this surveyed medical center. Entwistle *et al*. (2006) points out that decision-making relating to surgery raises a number of issues that have been neglected in recent considerations of informed consent and patient involvement. This study collected data from patients of surgery, since there are several treatment options available and the choice of the best treatment for a particular patient requires value judgments on the part of the patient and doctor.

The subjects were randomly selected. College students who majored in health care management issued self-administered questionnaires to patients and collected them following completion. All questionnaires were issued to patients who agreed to participate in the study. Each questionnaire was prefaced with a note assuring respondents of anonymity in their response. All of the participants received a pen set as a reward and were also informed that the survey was only for academic purposes. The period of data collection was between January 2009 and March

2009. Among the total returned 645 questionnaires, 45 were excluded because of incomplete responses. The number of effective returned questionnaires was 600, and the response rate was 93percent.

Instruments

A cross-section design was employed. Participants were surveyed using a questionnaire containing items dealing with loyalty, satisfaction, patient participation and decision making. All questionnaire items were closed-ended and they measured patient perceptions on 5-point Likert-type scales ranging from *strongly disagree* to *strongly agree*.

Loyalty was measured on a modified version of a three scale developed by Gil et al. (2007). These items were "If there is a need to seek medical advice, I will think of this hospital first", "If there is a need to seek medical advice, this hospital will be my first choice", and "I feel that I am a loyal patient of this hospital."

Although Ware et al. (1983) developed a comprehensive patient satisfaction questionnaire (PSQ), for parsimony reason, the study applied three items measuring satisfaction adapted from Hausman (2004) as follows: "I am satisfied with my decision to receive the service of this hospital," "My choice to this hospital was a right one," and "I truly enjoy this hospital."

Patient participation was measured with a seven-item scale adopted from Ouschan *et al.* (2006). These items were "I keep a record of my progress to inform my doctor", "I discuss alternative care with my doctor", "I discuss information received from other sources (e.g. friends, media) with my doctor", "I ask a lot of questions during my consultations", "I direct my doctor on what need to be addressed", "I have input in the choice of treatment" and "I fully inform the doctor about my concerns."

Five items measuring decision making were adapted from Hausman (2004) as follows: "My doctor asks my advice and council regarding treatment options", "I helped the doctor in planning my treatment", "My doctor encourages suggestions about appropriate treatment of my illness", "Both the doctor and I participated extensively in planning treatment of my illness" and "Together, my doctor and I set goals and discuss treatment options".

Validation of the Instruments

To check the validity and reliability of the instruments, this study firstly conducts a correlation analysis between items of all the scales. Table 1 includes the correlation coefficients between the measurement items. The findings in Table 1 indicate sub substantial discrimination among scales for the two patient groups (clinic patients and overnight patients). The patterns for high and low correlations for specific comparisons are highly similar above (clinical patients) and below (overnight patients) the main diagonal in Table 1.

Table 1 here.

The data analysis includes a confirmatory factor analysis using LISREL 8.8 statistical package. Factor analysis shows the pattern of relationships among the variables and the constructs. The fit between the model implied covariance matrix and sample covariance matrix is judged by different statistical tests of the goodness-of-fit. Confirmatory factor analysis was conducted because it is considered appropriate for scale validation in measuring specific constructs (Steenkamp and van Trijp, 1991). LISREL output provides several measures of goodness-of-fit. The χ^2 value of 698.62 with 129 degrees of freedom shows a ratio of 5.41.

Given that the χ^2 statistic is sensitive to sample size and may produce a false positive when the sample size is large, no clear-cut value of the χ^2 exists for estimating an acceptable model fit.A χ^2 ratio of 5 or less has been advocated as an acceptable level of fit for confirmatory factor model (Jöreskog and Sörbom, 1993).

As the chi-square test is an omnibus test, this measure was supplemented with other goodness-of-fit measures to judge the fit between the model-implied covariance matrix and the sample covariance matrix. The goodness-of-fit index was 0.89, which shows a marginal fit. The adjusted goodness-of-fit index of 0.85 shows an acceptable fit. The root mean square residual, which is an average of the residuals between the observed and estimated input matrices, was 0.08. Other indices also supported this model, with the IFI (0.97) and CFI (0.97) above the recommended .90 cutoff and the RMSEA (0.086) well below the recommended limit of 0.1 (Browne and Cudeck, 1993).

The composite reliability measures, which are similar to Cronbach's coefficient alpha, were also calculated for the four dimensions. For satisfaction the reliability was 0.899, for loyalty 0.898, for patient Participation 0.895, and for decision making 0.906. These reliability measures are higher than the recommended level of 0.70 (Hair et al., 1998). Lastly, factor loadings were all higher than 0.6.

Figure 1 here.

Analysis and Results

Fuzzy Set Qualitative Comparative Analysis

Analyses of a quantitative dataset can focus either on identifying patterns of relationships between variables or on examining the configurations of cases that constitute the rows of a data

matrix. Most marketing researchers focus on the former; they are interested in looking at interaction effects, covariation between variables, or examine the "fit" of variable-based patterns with some pre-specified model. However, such techniques are limited in their ability to handle logical rather than statistical relationships (Kent and Argouslidis, 2005). They assume that the pattern of relationships between variables is symmetrical, which makes them uneasy to translate some simple, logical expressions, such as "Y will be high if X1 *and* X2 *or* X3 is high", into conventional linear models (Smithson, 1988). In practice, patterns are commonly triangular (Ragin, 2000), such that while high values of X associate with high values of Y, low values of X associate with the whole range of values for Y. Nevertheless, such asymmetric relationships are not observable using regression-based statistics.

In examining logical relationships, researchers usually try to identify the occurrence of either necessary or sufficiency conditions. Necessary conditions are simple or complex causal recipes that are found in all instances of the outcome occurring; sufficiency conditions, however, are those conditions wherever they occur, the outcome is present and when the sufficiency condition does not occur, instances of the outcome condition both occur and do not occur.

The proposition here is that if a patient's satisfaction to the hospital is high, participation in the process of diagnoses is active, and the patient is encouraged to provide suggestions regarding treatment options, the patient become a "highly-loyal customer" to the hospital. The conjunction of the three conditions, therefore, represents a sufficient condition for predicting high patients' loyalty to the hospital.

Ragin (1987) and Drass and Ragin (1992) provide computer programs based on Boolean algebra that checks (a) for all those cases that demonstrate the outcome whether any condition is always (or nearly always, using probabilistic criteria) present to establish logical necessity and,

(b) for every logically possible groupings of case configurations whether the outcome is always present (or nearly always present) to establish logical sufficiency. The process Ragin describes as "qualitative comparative analysis" (QCA) can handle logical complexity conveniently. However, QCA originally was limited to the analysis of binary variables.

Fuzzy sets permit membership scores in the interval between 1 and 0, which makes continuum scores available for handling logical complexity of both binary and metric variables. The technique can distinguish between cases that are "more in" a set than others with a crossover point (of 0.5) for those who are neither 1 nor 0. Different from in conventional analysis, in fuzzy set analysis the distinction between 'high' and 'low' scores are specific to theoretical and conceptual criteria established by the researcher. Fuzzy set analysis enables the researcher to draw conclusions about logical relationships, as with QCA, but without having to reduce all the data to crisp binary sets.

When conducting fuzzy set qualitative comparative analysis (fs/QCA), scores for each case concerning the degree of membership of the antecedent factor are plotted against membership scores for the outcome. A sufficient condition finding looks like Figure 2. As Ragin (2000) argues, high membership of the cause (X1) ensures – acts as a floor for – high membership of the outcome (Y), but high membership of Y can come about in other ways, so high membership of Y may be accompanied by a wide range of scores on X1. In this situation, membership of Y must always be greater than or equal to membership on X1.

Figure 2 here.

Analysis of necessary or sufficient conditions using fuzzy categories can be achieved by the

principles of combinatorial logic. Combinatorial fuzzy scores of various conditions are added using Boolean algebra. For example, the logic expression "and" means taking the minimum fuzzy score in each of the sets being combined. If a person is 0.75 in the category "satisfied to the hospital", 0.5 in the category "participation in the processes of diagnoses", and 1 in the category 'involving in healthcare decision making', then the patient is 0.5 in the combined category "satisfied to the hospital, actively participating in the processes of diagnoses, and encouraged to provide opinions about their own treatment options.".

Findings

The program fuzzy-set/qualitative comparative analysis 2.5 (fs/qca.com) is applied to test alternative sufficient conditions propositions of patients' loyalty to the hospital in the current study. The first step is to calibrate (or "fuzzify") the data collected in the questionnaire survey. This means all variables need to be given values between 0 and 1. This needs to be done in a way that "makes sense". In order to have cases more distinguishable, the analysis includes multiplying the values of all measurements of a variable to make the range of the variable wider, and then proportionally transform those multiplied values into a fuzzy number between 0 and 1. For example, this study uses three items, with a Likert scale range from 1 to 5, in the questionnaire to measure patients' satisfaction to the hospital. After multiplying values of the three items in the dataset, the highest value would be 125 and the lowest would be 1.

The calibration process would then proportionally transform the value 125 to 1, and the value 1 to 0. The "crossover" point between satisfied and unsatisfied patients would be 63 in the middle and coded as 0.5 in the fuzzy set. Other categories in this study are created in parallel fashion. Table 2 exhibits the extreme values and the crossover point of each variable in this

study.

Table 2 here.

The current study proposes that satisfied patients who actively participate in the process of diagnosis and have the opportunity to provide opinions about treatment decisions become highly loyal customers to the hospital. According to the proposition, patient loyalty to the hospital would be the key "output" variable (equivalent to the dependent variable in regression analysis), and satisfied patients (S), patients actively participating in the process of diagnosis (P), and patients involved in treatment decision making (D) are the conditions as potential causes. A fuzzy-set analysis is run. The results suggest patients highly satisfied (S) with the hospital, actively participating (P) in the process of diagnosis, and having opportunities to provide their opinions about treatment (D) options are likely to become loyal customers of the hospital.

The consistency of this set relation is 0.995. A 0.995 consistency means 99.5% fuzzified data have the membership scores in the cause conditions less than or equal to their corresponding membership scores in the output variable, providing evidence for the cause conditions to be *almost* sufficient for the output variable.

To check the empirical importance of this sufficient relation, examining the coverage of this set relation is necessary. The 0.215 coverage of the combinations of conditions for the output variable means the causal combination of satisfied patients, patients actively participating in the process of diagnosis, and patients encouraged to provide opinions about treatments options covers for 21.5% of the instances of loyal patients of the hospital. Although this also means 78.5% loyal patients of the hospital may be caused by some other conditions or factors, the three

identified conditions accounting for more than one-fifth of the instances of the interested outcome leave no room for doubt about their importance. Figure 3 presents the plot of this analysis.

Figure 3 here.

The cases low in the membership of the proposed conditions exhibiting high membership in the output (patient loyalty to hospital) do not challenge the claim that patients who are satisfied with the hospital, actively participating in the process of diagnosis, and encouraged to provide opinions about their treatment options are loyal to the hospital, since the claimed logical relationship does not reject that other conditions or combination of conditions may also lead to loyal patients of the hospital. However, such cases undermine the correlation view for the proposed combination of conditions and the output in traditional variable-centered analysis which focuses on establishing statistical relationships.

The above analysis supports the conclusion that configuration of the three conditions are sufficient for patient loyalty to hospital. However, this study also argues that patient satisfaction only (S) is not as sufficient as the three conditions (S · P · D) together to support high patient loyalty. A separate analysis using only patient satisfaction as the condition confirms this view. The consistency of this set relation is 0.86 and the coverage is 0.868. Many cases occur below the diagonal line. Figure 4 shows these results and indicates that patient satisfaction only is not a condition as sufficient as (S · P · D) in predicting high patient loyalty.

Figure 4 here.

To be more cautious about the analysis, this study further conducts fsQCA for all "causal recipes" of the three conditions and for different groups of patients (clinic and overnight patients). Table 3 displays the results of these analyses. Patient satisfaction only (S) is not the best predictor of patient loyalty for both clinic (consistency = .855; coverage = .865) and overnight patients (consistency = 928; coverage = .913).

All the other causal recipes (e.g., S • P; S • D, D • P; S • P • D) are more sufficient in predicting patient loyalty than patient satisfaction only (S), whether for clinic patients, for overnight patients, or for all the patients. Among the causal recipes, the conjunction of the three conditions (S • P • D) produces the highest consistency which further strengthens the hypothesis of this study.

Table 3 here.

Test for Common Method Variance

As with all self-report data, the potential exists for the occurrence of common method variance. Harmon one-factor test (Podsakoff *et al.,* 2003) was conducted to estimate the extent of method variance in the current data. The underlying premise of this procedure is that if one general factor emerges through factor analysis, then a significant amount of method bias exists. The study includes an analysis of entering all into responses into a factor analysis. Results from the unrotated factor solution suggested the presence of four factors with eigen values greater than one, accounting for 68% of the total variance. This finding suggests that a significant amount of common method variance is not present.

Conclusions

The discussion follows from the view that customer loyalty is imperative for organizations that want to survive and prosper. Substantial customer churn is expensive and risky for any organization because it may cost five times as much to gain a new customer than to hold on to an existing one (Lee *et al*., 2001). Turning onetime customer transaction into long-term relationships by rendering exceptional service is worthwhile. Customer loyalty is not only psychologically rewarding but translates into growing profits. Customer loyalty is every organization's reason for being and its future. This study explores sufficient conditions for high patient loyalty. Based on the fuzzy set qualitative comparative analysis, the results show that "high satisfaction" only is not a good predictor of patient loyalty, which is consistent with the argument of Fisk *et al*. (1990). Instead, the current study firstly confirmed that satisfied patients who can participate in the process of diagnosis and can be involved in treatment decision making constitute a near-perfect subset of high loyal patients.

Theoretical Implication

There are several theoretical implications for this study. First, the analytical model demonstrates that satisfaction alone is not the optimum condition to secure patient loyalty. Many related empirical studies report that satisfied consumers demonstrate more loyal behaviors. Therefore, administrators of hospitals draw their attention on how to continuously improve patient satisfaction or how to pursue an "excellent" level of patient satisfaction. The findings suggest that administrators of hospitals should not pay attention only to how to pursue an "excellent" level of patient satisfaction. To gain patients' loyalty, administrators may need to achieve outstanding patient satisfaction as well as to meet other conditions. Secondly, the

analyses reveal that high levels of patient loyalty occur for those patients who perceived substantial shared diagnosis and treatment decision-making along with high satisfaction. In other word, satisfied patients who can participate in the processes of diagnosis and treatment decision-making constitute a near-perfect subset of loyal clients.

Although some empirical studies demonstrate that patients prefer to play a shared role in their clinical encounters (Guadagnoli and Ward, 1998; Kraetschmer et al., 2004), Guadagnoli and Ward (1998) report that the benefits of patient participation have not yet been clearly identified in these research studies. Studies addressing this issue suffer from methodological problems such as small sample sizes and lack of control for potential confounding variables. The fs/QCA method provides a useful method for researchers not to bypass those methodological problems because this method cares about set-theoretic connections rather than correlational connections.

By using fs/QCA to analyze the data, this study firstly claims that along with patient satisfaction, patient participation in diagnosis and treatment decision-making together provide near-perfectly assurance of high patient loyalty. As predicted, patient loyalty appears highest when patients and health care providers collaborate in diagnosis and treatment decision-making. Prior studies do not identify clearly this important role of patient participation in the two stages of decision-making.

The findings in the present study have important implications for adopting the view that patient participation in decisions concerning their service experiences should be incorporated in their healthcare visits. Together, these results support the validity of the patient-centered model, and more importantly, this study provides additional empirical evidence in healthcare industry that supports social exchange theory.

This study has limitations. First, data from a single medical center limit the applicability of the results to other medical institutions. Future studies can verify or extend the results of this study by a cross-hospital validation process. Due to time and resource limitations, this study targets only surgery services. A future study should compare the findings between two or more medical services.

Managerial Implications

The results in this study carry out important managerial implications for hospital administrators. The findings revealed that three conditions together (patient satisfaction, patient participation in the process of diagnosis, and patient participation in treatment decision-making) in combination are sufficient for high patient loyalty to the hospital but high patient satisfaction alone is insufficient. The translation of these research findings in practice implies heightening attention to the role of patient participation in diagnosis process and treatment decision-making. The findings suggest that hospital administrators should promote an atmosphere of increasing collaboration between patients and doctors.

The need exists to move from rhetoric about patient participation to actually implementing such participation in managerial practice. These results may be useful for hospital administrators to encourage doctors to adopt a communication style which empowers patients with chronic illness conditions.

Doctors also stand-to-gain directly from a patient-centered approach since participation enhances high patient loyalty. According to the findings, we suggest that doctors need to be prepared for the new and facilitative role, advocated in the nature of patient participation. Not only the doctors but also the patients need to be re-educated for their new role as partners in care

and therapy. As such, hospital administrators should create a number of educational programs and interventions to enable doctors become more patient-centered and culturally sensitive in their communication with patients.

Hospital administrators should do specific things to help patients become more active in their own care. Patients could be encouraged to take on the task of understanding the relevant information and to share their values and decisions with doctor. In sum, the findings provide useful and new insights into the nature of the doctor–patient relationship. In fact, the patient-centered approach is not a luxury but an important key to sustain patient loyalty.

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Table 1

Correlations between Items in the Scales

	S1	S2	S3	L1	L2	L3	P1	P2	P3	P4	P5	P6	P7	D1	D2	D3	D4	D5
S1		**.64**	**.59**	**.47**	**.45**	**.45**	**.21**	**.21**	**.26**	**.10**	**.13**	**.14**	**.12**	**.29**	**.18**	**.24**	**.28**	.29
S2	**.71**		**.75**	**.50**	**.50**	**.48**	**.20**	**.18**	**.19**	**.07**	**.12**	**.14**	**.12**	**.24**	**.14**	**.22**	**.25**	.30
S3	**.54**	**.83**		**.50**	**.47**	**.46**	**.22**	**.20**	**.23**	**.12**	**.16**	**.17**	**.10**	**.27**	**.13**	**.27**	**.26**	.29
L1	**.43**	**.49**	**.56**		**.89**	**.75**	**.24**	**.21**	**.25**	**.19**	**.22**	**.16**	**.18**	**.30**	**.23**	**.30**	**.27**	.27
L2	**.48**	**.54**	**.62**	**.93**		**.75**	**.22**	**.22**	**.23**	**.19**	**.22**	**.18**	**.19**	**.24**	**.23**	**.29**	**.25**	.27
L3	**.54**	**.71**	**.77**	**.69**	**.75**		**.23**	**.18**	**.20**	**.15**	**.23**	**.15**	**.14**	**.28**	**.24**	**.25**	**.28**	.30
P1	**.32**	**.37**	**.25**	**.24**	**.29**	**.46**		**.53**	**.45**	**.39**	**.46**	**.31**	**.37**	**.25**	**.37**	**.27**	**.26**	.29
P2	**.25**	**.15**	**.17**	**.11**	**.19**	**.34**	**.79**		**.62**	**.45**	**.45**	**.48**	**.42**	**.33**	**.37**	**.35**	**.39**	.42
P3	**.10**	**-.01**	**.03**	**.23**	**.28**	**.25**	**.59**	**.82**		**.50**	**.45**	**.43**	**.41**	**.39**	**.42**	**.40**	**.42**	.44
P4	**.47**	**.46**	**.39**	**.28**	**.35**	**.31**	**.48**	**.53**	**.49**		**.52**	**.48**	**.51**	**.35**	**.34**	**.30**	**.32**	.35
P5	**.42**	**.32**	**.25**	**.40**	**.38**	**.33**	**.55**	**.57**	**.67**	**.69**		**.51**	**.49**	**.29**	**.40**	**.31**	**.29**	.35
P6	**.37**	**.15**	**.02**	**.12**	**.11**	**-.04**	**.26**	**.50**	**.60**	**.65**	**.78**		**.54**	**.34**	**.34**	**.31**	**.40**	.42
P7	**.13**	**.25**	**.24**	**.38**	**.27**	**.35**	**.50**	**.50**	**.48**	**.58**	**.65**	**.41**		**.32**	**.31**	**.28**	**.35**	.37
D1	**.45**	**.46**	**.45**	**.41**	**.41**	**.45**	**.38**	**.53**	**.53**	**.58**	**.64**	**.65**	**.60**		**.43**	**.47**	**.59**	.57
D2	**.10**	**.06**	**.02**	**-.20**	**-.07**	**-.06**	**.20**	**.43**	**.41**	**.29**	**.31**	**.42**	**.24**	**.33**		**.56**	**.48**	.51
D3	**.55**	**.39**	**.18**	**-.12**	**.03**	**.10**	**.42**	**.49**	**.32**	**.61**	**.49**	**.56**	**.31**	**.47**	**.46**		**.67**	.63
D4	**.51**	**.43**	**.35**	**.40**	**.40**	**.43**	**.43**	**.52**	**.48**	**.49**	**.77**	**.56**	**.64**	**.72**	**.38**	**.61**		.82
D5	.42	.51	.42	.28	.38	.33	.40	.43	.33	.46	.51	.45	.37	.66	.45	.67	.71	

Note: 1. S means patient satisfaction; L means patient loyalty; P means patient participation; D means decision-making; 2. the correlation coefficients (decimals omitted) between measurement items for the clinic patients (outpatients) are above the main diagonal (n = 572); 3. the correlation coefficients between measurement items for the overnight patients (inpatients) are below the main diagonal (n = 28).

Table 2

Calibration: The Extreme Values and the Crossover Points of Each Condition

	Patient satisfaction	Patient participate	Decision making	Patient loyalty	Calibration of the value
Highest value	125	78125	3125	125	1
Crossover point	63	39063	1563	63	0.5
Lowest value	1	1	1	1	0

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Table 3

Set Membership Findings using fsQCA for Explaining Customer Loyalty
C1 = Consistency and C2 = Coverage

Causal Recipe	Clinic Patients (n = 572) C1	C2	Overnight Patients (n = 28) C1	C2	All Patients (n = 600) C1	C2
S	.855	.865	.928	.913	.860	.868
S · P	.981	.250	.943	.303	.978	.253
S · D	.980	.375	.981	.425	.980	.378
P · D	.976	.217	.968	.248	.975	.219
S · P · D	.997	.213	.968	.248	.995	.215

Dictionary. S = Satisfaction; P = patient participation in diagnosis; D = patient participation in treatment decision.

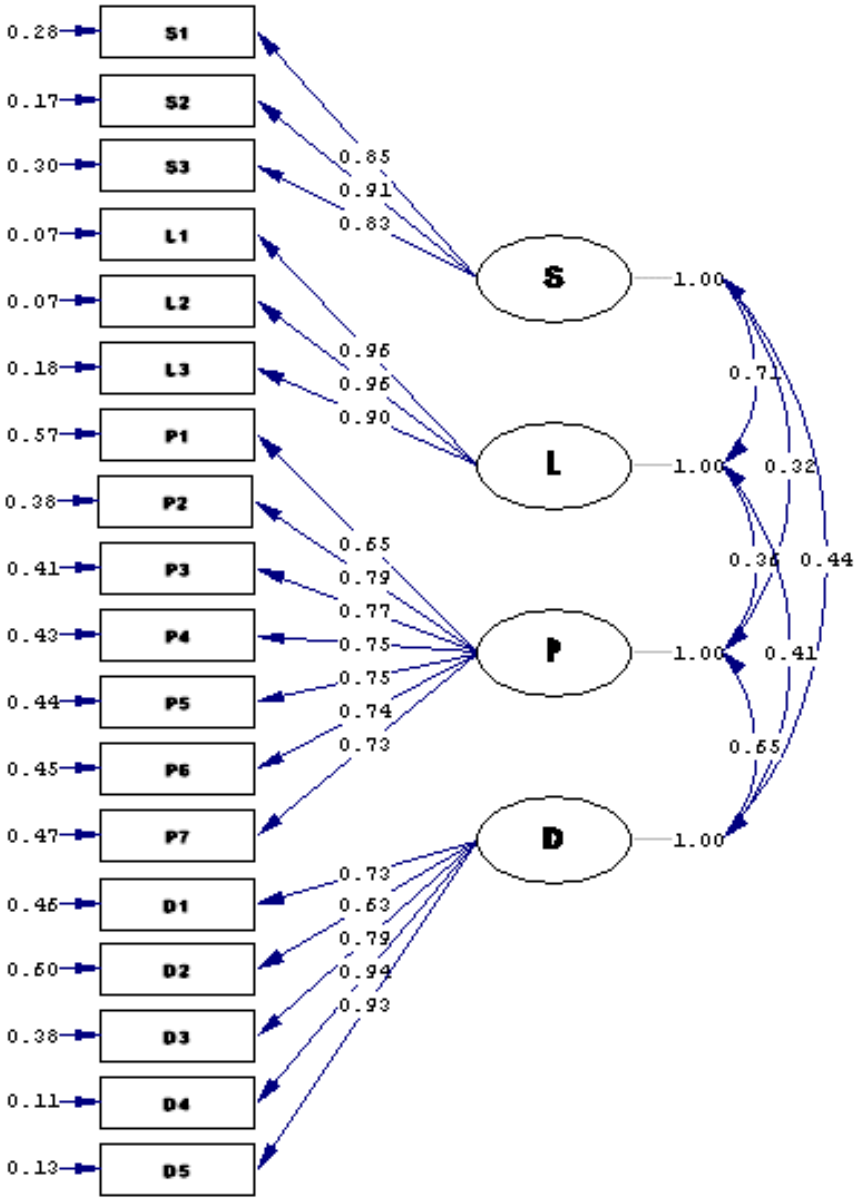

Figure 1

Confirmatory Factor Analysis of the Scales

Note: S means patient satisfaction; L means patient loyalty; P means patient participation; D means decision-making

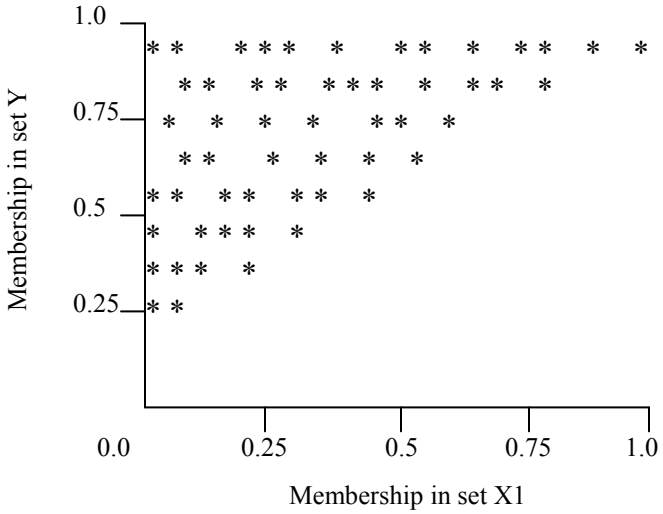

Figure 2

A Fuzzy-Set Sufficient but not Necessary condition

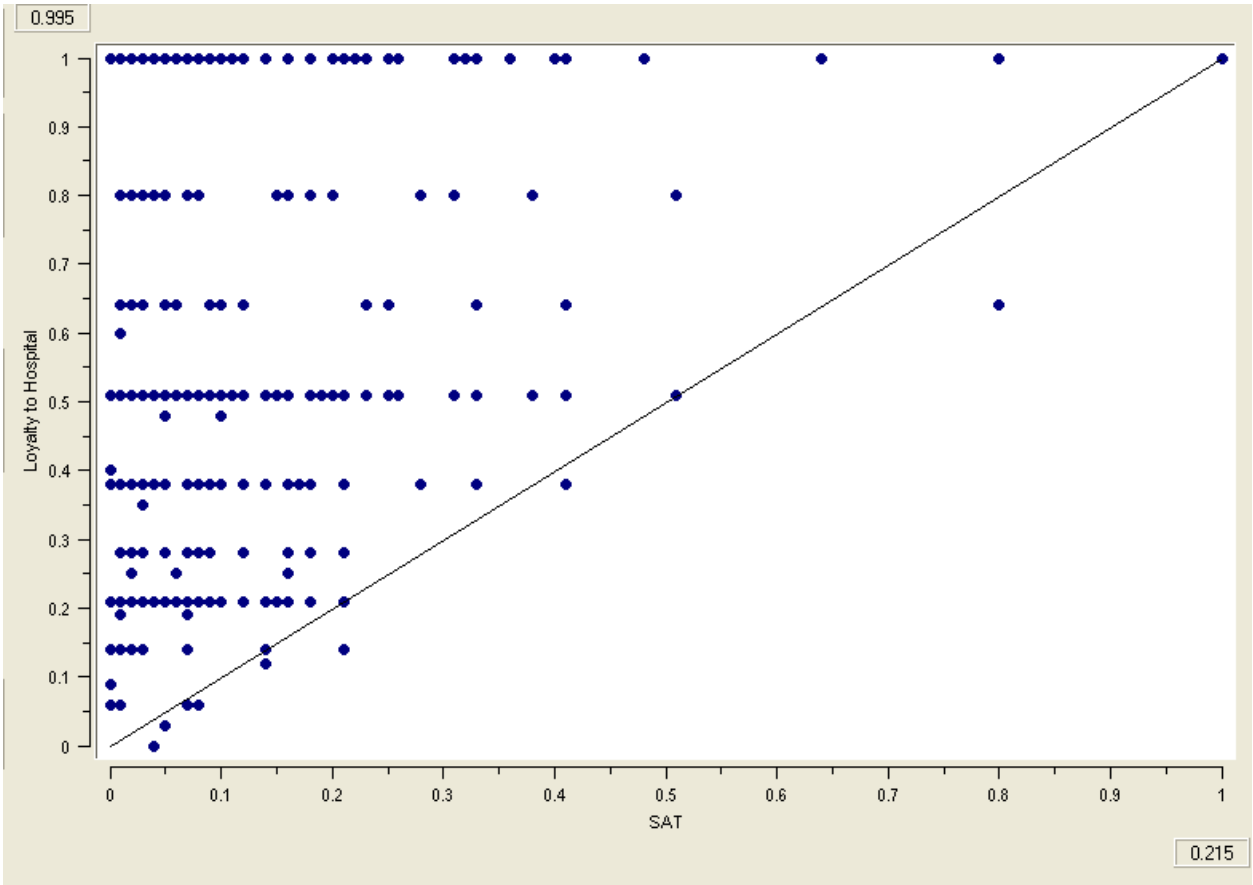

Figure 3
fs/QCA Plot for the Complex Condition (S · P · D) and Outcome Condition (L) such at (S · P · D) → L for the Total Sample (n = 600)

Dictionary. S = patient satisfaction with hospital; A = patient actively contributes to diagnosing her illness; T = patient contributes to deciding on appropriate treatment; L = patient loyalty to the hospital.

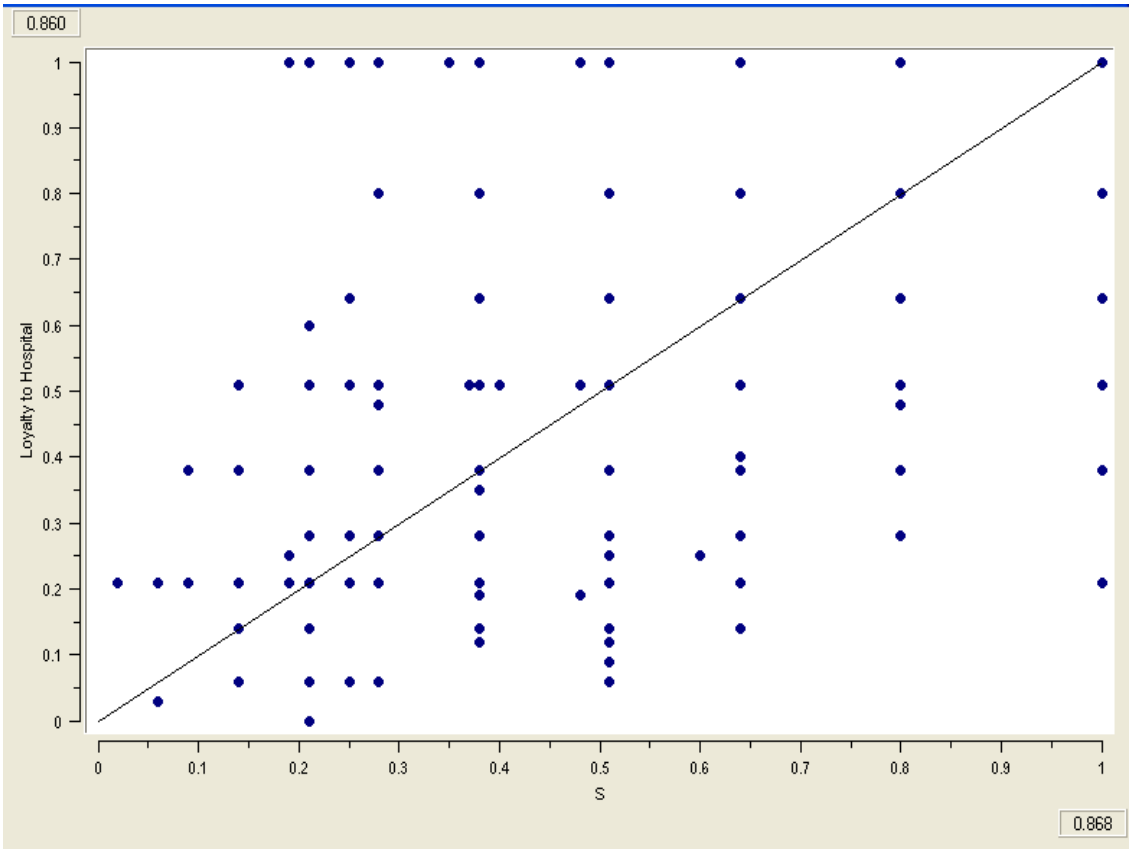

Figure 4
fs/QCA Plot for the Simple Condition (S) and Outcome Condition (L) such as (S) → L for the Total Sample (n = 600)