EVALUATING HEALTH CARE SERVICE QUALITY: THE MODERATING ROLE OF KNOWLEDGE

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ABSTRACT

This study focuses on the role of knowledge as a mediator variable in the relationship between expectations and customer perceived service. A distinction is made between latent and manifest expectations based on the assumption that consumers with a stronger knowledge-base have more pronounced and therefore more manifest expectations than consumers with a weaker knowledge-base. The results of an empirical study reveal that the stronger the knowledge-base of a consumer, the higher the level of perceived service quality.

INTRODUCTION

During the last decade a large number of studies in the services marketing area have focused on the conceptualization and measurement of service quality. Looking back and ahead, some authors argue that this research topic has finally reached a maturity stage in which further advances and nuances are being made (Grönroos 1993; Rust and Oliver 1994; Parasuraman *et al.* 1994). Recent research has been directed at deepening our understanding of the antecedents of service quality, expectations and performance (Bolton and Drew 1991; Boulding *et al.* 1993; Strandvik and Liljander 1994). Particularly with respect to the expectations construct, a number of determinants have been identified (Zeithaml *et al.* 1993). These include explicit and implicit service promises, word-of-mouth and past experience. The determinants lead to the formation of knowledge which in turn expectations are based upon (Wikström 1994). Thus, it seems that research on service quality will have to take knowledge into account as another antecedent construct. So far, this issue has not been raised explicitly in the literature. Therefore, our focus in this article is on the role of knowledge as an antecedent construct of perceived service quality and its interplay with expectations. The interaction between knowledge and perception is not addressed in this study.

The article is structured as follows. In the first place, we will briefly introduce the concepts of perceived service quality and knowledge based on our review of both the product and the services marketing literature. Secondly, a number of hypotheses with regards to the role of knowledge as an antecedent of perceived service quality and its interaction with expectations will be developed. Finally, we will report on an empirical test of these hypotheses in the context of a specific health care service.

PERCEIVED SERVICE QUALITY

Perceived service quality is often defined as the comparison of service expectations with actual performances (Zeithaml *et al.* 1990). Conceptually, service quality has been defined as an attitude. On an operational level, research in service quality has been dominated by the SERVQUAL model, also known as the gap-model. The central idea in this model is that service quality is a function of the difference scores or gaps between expectations and performance (P - E). It has been proposed that service quality is a multi-dimensional concept (Parasuraman *et al.* 1985). Five key determinants of service quality have been identified (reliability, responsiveness, assurance, empathy and tangibles). These dimensions are related to both the service process and its outcome, but it is not always clear how.

While the SERVQUAL instrument has been well-established it has also been well-criticized. Especially the expectations component has generated considerable debate in the literature. Apart from the fact that some authors question the necessity of the expectations component (Babakus and Mangold 1992; Cronin and Taylor 1992; 1994), the debate is on issues such as the operationalization of expectations (Teas 1993) and the fact that the SERVQUAL approach departs from *static* expectations. With regards to the latter, consumers, for instance, may change their expectations following an increase in their knowledge about a particular service, as the result of a positive service experience or negative word-of-mouth communications. Taking these issues into

account, the role that knowledge plays in the evaluation of the quality of a service should be emphasized.

KNOWLEDGE

Knowledge is a multi-faceted concept (Polyani 1983). For the purpose of this study, the distinction between objective and subjective knowledge seems to be relevant. Objective knowledge is the knowledge a consumer has stored in memory; subjective knowledge is the knowledge consumers perceive they have (Rao and Monroe 1988). Especially in relation to the perceived quality of the service delivery process, the subjectivistical approach plays an important role since it includes not only the knowledge level of a consumer but also the confidence the consumer has in his/her knowledge. This perception of knowing about a provided service is more likely to determine perceived quality and post-purchase behavior than objective knowledge, especially in the case of complex services (Brucks 1985). Furthermore, the difference between two dimensions of knowledge in terms of 'familiarity' and 'expertise' is stressed in the literature (Alba and Hutchinson 1987). Familiarity can be defined as the number of product/service-related experiences accumulated by a consumer and expertise is the ability to perform product/service-related tasks successfully. This distinction will not be addressed explicitly here, since it has been argued that the two dimensions largely overlap in a service setting as service encounters tend to be varied, complex and not habit forming (Andaleeb and Basu 1994).

Thus far, the effect of knowledge on perceived service quality has remained "under-researched". This also holds true for the effect of knowledge on the quality antecedents of expectations (and perceived performance). While this relationship is implied by the integrative model of service expectations by Zeithaml *et al.* (1993), it has not been empirically verified. In the case of unfamiliar or new services of which consumers have little or no knowledge, the knowledge-base for expectations will be weak and ambiguous. In this case, valuative judgements will be based on related services or a more general class of services or on the relative utilization for the provision of more basic needs (Westbrook and Reilly 1983; Johnson and Fornell 1991). Expectations stemming from a weak knowledge-base can be termed *latent expectations*. Alternatively, as knowledge accumulates through information and experience the knowledge base for expectations becomes stronger, more stable and more in line with perceived performance. This results in *manifest expectations* (compare Bloemer 1993). Johnson and Fornell (1991) argue that eventually manifest expectations and perceived performance may run parallel in the case of an extremely strong knowledge-base.

In relation to products the role of knowledge has been more extensively studied, although a rather fragmented picture emerges from the literature. A number of studies have postulated that prior knowledge encourages information search by making it easier to process new information (Punj and Staelin 1983; Johnson and Russo 1984 and Brucks 1985). For example, knowledge of product attributes may allow the consumer to formulate more questions. Knowledge also helps the consumer evaluate responses to questions, thus reducing the cognitive cost of using information and increasing the benefit of obtaining it, leading to greater search with increased knowledge, and in the end to less satisfaction with the product. Concurrently, a number of other studies have found a negative relationship between the amount of product experience and amount of external search (Katona and Mueller 1954; Newman and Staelin 1971, 1972; Swan 1969). One explanation for this relationship claims that experienced consumers have prior knowledge about the attributes of various alternatives, and consequently do not need to acquire such information from external sources. However, a second explanation for these results holds that experienced consumers perform more efficient information searches because they know which attributes are more useful for discriminating between brands and can more quickly determine which alternatives are inferior. This implies a positive relation between knowledge and satisfaction with the product in the end. A consumer knows what to expect and does not look for any additional information that might disconfirm his or her expectations.

Furthermore, Rao and Monroe (1988) note that more knowledgeable consumers are better able

to comprehend and evaluate quality cues than low knowledgeable consumers. This indeed also suggests that knowledge moderates the expectation-quality relationship. In addition, it can be concluded that knowledgeable consumers assess overall quality more accurately. Unfortunately, it does not directly help in predicting the level of perceived service quality.

Finally, Alba and Hutchinson (1987) suggest, based on an extensive overview of the literature, that experts (consumers with a stronger knowledge-base) are better problem solvers than novices (consumers with a weaker knowledge-base). Expert might be expected to perceive higher service quality than novices because they are better equipped to more accurately predict the level of service quality they will receive. Experts will be more able than novices to match expectations and perceptions and therefore will perceive a higher level of perceived service quality (it is harder to disappoint a very knowledgeable consumer than to disappoint a novice). Therefore, in general, one might expect consumers with a great deal of knowledge to perceive a higher level of service quality than consumers with relatively less knowledge.

KNOWLEDGE AND PERCEIVED SERVICE QUALITY: DEVELOPING HYPOTHESES

Based on evidence from the product domain, one still could expect a positive as well as a negative effect of knowledge on perceived service quality. A strong base of prior subjective knowledge decreases the chance that expectations will be met or exceeded and therefore has a negative impact on perceived service quality. The consumer uses expectations as a comparison standard and it is hard for the service provider to deliver the service in accordance to the specifications of the consumer.

Alternatively, a strong subjective knowledge base could increase the chance that expectations are more in line with perceived performance and that this results in a positive effect on perceived service quality. The consumer knows what to expect from the service provider and has formulated its specifications of the service in line with the service the provider can offer. On the basis of Alba and Hutchinson (1987) we are inclined to favor this line of thinking. Especially since experts are found to be better problem solvers and, therefore, are expected to perceive higher service quality in general. We formulate the following hypothesis:

> Hypothesis 1: Knowledge will have a positive effect on perceived service quality.

In addition to this direct effect of knowledge on perceived service quality which has been discussed above, a moderating effect of knowledge can also be expected. This moderating effect of knowledge leads us to expect different types of expectations. Manifest expectations will have a more pronounced effect on perceived service quality than latent expectations (i.e., expectations that are less knowledge-based). On the basis of this we derived the following hypothesis.

> Hypothesis 2: Manifest expectations will have a greater positive effect on perceived service quality than latent expectations.

In the next section we will report on an empirical study that was conducted to test the above hypotheses.

AN EMPIRICAL STUDY

Research setting

The research question was answered and the hypothesis was tested for the high-involvement health care service of chiropractic care in the Netherlands. Chiropractic treatment concerns itself primarily with balancing the relationship between the spine and the nervous system through manipulative treatment. While a number of (longitudinal) studies (Meade *et al.* 1990; Manga *et al.* 1993) have revealed the effectiveness of chiropractic treatment so that it can no longer be denounced as 'quackery', a focus on client evaluations of service quality and consumer knowledge of this health care service is judged as vitally important for a number of reasons. In the first place, chiropractic treatment is a service that still suffers from misinformation and misperception on the part of consumers as well as health policy makers and planners. This not only concerns the

treatment itself, but also issues like insurance coverage (Sanchez 1991). Secondly, in a health market characterized by intensified competition, this type of service relies heavily on personal referrals by former and current clients. While word-of-mouth communications form a significant source of knowledge, they remain difficult to influence and control by chiropractors. Finally, the market for treatment of back pain seems to be subject to the principle of 'revealed preference'; research has shown that clients clearly prefer chiropractic treatment to available alternatives (e.g., physician care) despite the fact that higher (out-of-pocket) costs have to be paid (Wardwell 1989). Positive evaluations of service quality are thus decisive in ensuring chiropractor's competitive edge over other providers of health care services. Again, the role of an extending knowledge base in the market place seems pivotal in this respect. In the Netherlands, chiropractic treatment is a relatively new health care practice that is largely unknown to the general public.

A chiropractic clinic in a mid-sized city in the Netherlands was selected for conducting our research. This clinic serves 7700 registered clients and performs approximately 1000 treatments on a monthly basis. Three chiropractors and four administrative assistants are employed in the clinic.

Questionnaire design

With regards to perceived service quality, SERVQUAL items for expectations and performance were 'translated' for the chiropractic setting, using a 7-point scale, ranging from disagree to agree. In accordance with Zeithaml *et al.* (1993) expectations were phrased in the predictive sense ('would'). The relative importance of the five SERVQUAL dimension was established on the basis of assigning 100 points among them. Furthermore, one question was added that directly measured the perceived service quality of the service delivery process on a 7-point scale, ranging from disagree to agree too. To measure knowledge regarding the service delivery process (i.e., procedural knowledge) we followed Brucks (1985) who measured subjective knowledge, ranging from 'poor' to 'excellent' as the ends of a 7-point scale to obtain patients' self-ratings of knowledge. We used subjective/procedural knowledge because it seemed more relevant than objective knowledge in a subjectively perceived service quality context, i.e. the SERVQUAL instrument is primarily focused on a subjective evaluation of the service delivery process also. Furthermore, subjective knowledge includes the knowledge level as well as the confidence level of the consumer. One question about the willingness to recommend the service was included in our questionnaire. In addition, five descriptive variables (age, sex, reason for treatment, treatment duration and referral type) were included in the questionnaire.

Sampling and surveying

Five-hundred questionnaires were handed out to clients at the clinic. Clients were invited to participate in the research by filling in the questionnaire at home and to send it directly to the University in a self-addressed, stamped envelope. This resulted in a total of 297 usable questionnaires, or a response of 59.4%. All returned questionnaires could be used for analysis.

RESULTS

Descriptive Analysis

According to clinical records, our sample could be considered representative of the total population (i.e., all the clients that were registered at the clinic). Our results also compare well to previous research in this area of health care service (Meade *et al.* 1990; Manga *et al.* 1993). Fifty-three percent of the respondents were female and 47% of the respondents were males. Seventy percent of the respondents were younger than 50 years old. The most frequently cited reasons for treatment relate to back pain (66.6%) and neck pain (55.6%), either with or without radiation. Ninety-five percent of the clients cited more than one reason for treatment. Thirty-five percent of the respondents in our sample have undergone treatment for a period of one to six months. Finally, the large majority (57.9%) was referred to the clinic through positive word-of-mouth communications from friends, family and acquaintances.

Furthermore, and not surprisingly, we found

our respondents very willing to recommend the chiropractic service to friends, family and acquaintances; almost 81.6% are definitely willing to recommend the clinic to others. This is undoubtedly due to the high quality scores which were found. Ten percent of the respondents indicated that they had very little (subjective/procedural) knowledge of chiropractic treatment, while 67.5% indicates that they know a great deal about this service. The majority of respondents (68.8%) label their perceived service quality of the delivery process as 'very high'. Of all respondents no one indicated that they perceived a low service quality. As far as the SERVQUAL dimensions which are rendered in table 1 below are concerned, relatively negative quality (i.e., P - E) scores were found for two of the empathy-based items: personal attention (-0.23) and personal care (-0.15). The ranking of the SERVQUAL dimensions in terms of their relative importance yielded an order lead by empathy (23 out of 100) and closed by tangibles (15 out of 100).

Table 1
SERVQUAL Score Per Item

	Expectations	Perceptions	P - E
Tangibles			
equipment	6.29	6.32	0.03
practice room	6.54	6.80	0.26
clothing employees	6.43	6.84	0.41
Reliability			
keeping promises	6.69	6.65	-0.04
problem resolution	6.84	6.71	-0.13
accuracy of treatment	6.50	6.44	-0.06
registration of data	6.69	6.56	-0.13
Responsiveness			
making an appointment	6.63	6.80	0.17
helping quickly	6.27	6.37	0.10
willingness to help	6.40	6.53	0.13
never too busy	5.89	5.87	-0.02
Assurance			
inspiring confidence	6.62	6.66	0.04
insurance of client	6.59	6.55	-0.04
act gently and friendly	6.46	6.81	0.35
knowledge chiropractor	6.90	6.78	-0.12
knowledge assistants	5.77	6.11	0.34
Empathy			
acceptable 'office' hours	6.16	6.67	0.50
personal attention	6.79	6.56	-0.23
personal care	6.74	6.59	-0.15
understanding needs and wants	6.41	6.38	-0.03

Hypotheses testing

To test the first hypothesis, the correlation coefficients between (subjective/procedural) knowledge and (overall perceived service) quality are computed. The results are presented in table 2.

Table 2
Correlations Between the Variables in the Model

	expectations	perceptions	overall service quality
knowledge	.30**	.32**	.29**
expectations		.72**	.31**
perceptions			.56**

n = 248; **: $p < .001$

From this table it can be concluded that there is a positive relation between knowledge and perceived quality ($r_{x.y}$=.29; $p < .001$). This indicates that an increase in knowledge has a small positive effect on the perceived service quality. Therefore, we can accept hypothesis 1. Theoretically, this is in line with the argument that a strong subjective knowledge base increases the chance that expectations are in line with perceived performance and therefore will result in a positive effect on perceived service quality. However, in order to further nuance our findings we examined our data with regard to hypothesis 2.

The second hypothesis is tested with logistic regression because the distribution of both the independent and the dependent variables are rather skewed. Therefore, it can not validly be tested with hierarchical regression analysis (Baron and Kenny 1986). Two groups of clients are distinguished: those who perceive the service quality to be very high versus those respondents who chose other options.

The following two models were tested. In model 1 quality is a function of expectations and knowledge. In model 2 quality is a function of expectations, knowledge and the interaction between expectations and knowledge. The results are rendered in table 3.

The difference in the improvement of the Chi-square is an indication of the necessity to add the interaction term; it significantly attributes to the explanation of quality. From table 3 it can be concluded that there is a significant improvement when the interaction variable is added to the original model. Therefore, hypothesis 2 can be accepted. The interaction between knowledge and expectations (i.e., manifest expectations) has an additional positive effect on quality. The latter implies that knowledge moderates the effect of expectations on perceived service quality. In addition, knowledge has a direct positive effect on perceived service quality.

Table 3
Model Testing with Logistic Regression Analysis

	Chi-square	df	sign	correctly classified
Model 1	54.179	2	.000	68.48%
Model 2	71.838	3	.000	70.29%
Increase	17.659	1	.000	

Variables in the equation models:

	B	S.E.	Wald	df	Sig	R	Exp(B)
knowledge	.32	.112	7.99	1	.005	.13	1.37
expectations	-.11	.086	1.61	1	.205	.00	.90
interaction	.25	.061	16.67	1	.000	.201	.28

DISCUSSION

The purpose of our study was to know more about knowledge, how it relates to perceived service quality and the expectations construct. We made a distinction between latent and manifest expectations. This distinction was based on the assumption that consumers with a stronger knowledge-base have more pronounced and therefore more manifest expectations than consumers with a weaker knowledge-base. The type of expectations was operationalized in terms of the interaction between knowledge and expectation. Our results indicate that indeed a distinction should be made between the influence of manifest and latent expectations on perceived service quality. The more manifest the expectations, the stronger the influence of these expectations on perceived service quality. Furthermore, we found a small direct positive effect of knowledge on perceived service quality. Hardly any direct effect of expectations as such on quality was encountered.

The fact that expectations have hardly any direct effect on service quality is in line with the findings of a number of recent studies in the services marketing field (Babakus and Mangold 1992; Cronin and Taylor 1992; 1994). Moreover, it has been demonstrated that in case of high involvement services (and products), the effect of the expectations component on quality is almost neglectable and perceived service quality can predominantly be predicted on the basis of perception (Oliver and Bearden 1983; Fornell 1992). This seems even more applicable to the relatively unknown service of chiropractic treatment in the Netherlands.

Our results with respect to the effect of knowledge on service quality appear to be rather straightforward. The stronger the knowledge-base of a consumer, the higher the level of perceived service quality. The consumer knows what to expect from the service provider and has formulated his/her specifications of the service in line with the service the provider offers (this consumer solves its problem well). Additionally, the evaluative judgement will be based increasingly on the perception of the service. This coincides with the arguments presented by Johnson and Fornell (1991) who pose that expectations and perceptions eventually run parallel in the case of extreme ability to evaluate the quality of a service.

The additional positive interaction effect between knowledge and expectations implies that it is necessary to distinguish between manifest and latent expectations. Although no significant effect of expectations was found, this moderating effect should not be overlooked. Thus, expectations do matter. Consumers with manifest expectations are more convinced of their expectations and therefore provide a more strict guideline of how the service should be provided. If such expectations are met, than consumers will perceive a high level of service quality. Alternatively, consumers with manifest expectations will be able to predict service specifications more accurately and will

therefore perceive a higher service quality level.

Further research is required to examine the impact of knowledge on expectations and perceived service quality. Nuances should be made concerning the conceptualization and operationalization of knowledge. Distinctions between objective and subjective knowledge should be taken into account, for it might well be that the effect of the various types of knowledge or different dimensions of knowledge, such as familiarity versus expertise, on expectations and quality differs. In addition, more research is needed to establish a conceptually valid distinction between knowledge and experience, familiarity and expertise.

Moreover, explicit attention should also be paid to the interaction between knowledge and perception in addition to the test of a model that incorporates all antecedents of service quality. A deeper understanding of the role of knowledge could be obtained by duplicating the research for both high and low involvement services. Also, since both expectations and knowledge develop over time they should also be measured from a dynamic perspective.

Another limitation of our research concerns the so-called up-ward bias, i.e., consumers who have visited a service provider previously, are probably more satisfied and believe that the service is of relatively high quality than novices to this service. Further research is needed to address this issue.

Finally, an important managerial implication that follows from our study is that service providers should provide consumers with relevant information so that they can strengthen their knowledge-base. This refutes the essence of the issue raised by Ölander (1977) with regards to satisfaction; the less they know, the less they expect, the more satisfied they are. On the contrary, it seems worthwhile to invest in consumer education. Another reason why it seems important for service providers to provide consumers with knowledge-building information is that knowledgeable consumers will use their knowledge for evaluating various service providers. In contrast, less knowledgeable consumers will be more susceptible to external influences that attempt to steer consumer decision-making (e.g., advertising, word-of-mouth communications). Consumers with less knowledge will rely more on these external influences when they lack the expertise to evaluate the service quality of a provider.

It has been demonstrated that knowledgeable consumers tend to elaborate on the content of information rather than so-called nonclaim cues (e.g., pictures). Therefore, consumer information should be fine-tuned as to the knowledge level of different consumers.

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