ABSTRACT

THE ROLE OF COMMUNICATION IN A CONSUMER-DRIVEN HEALTH CARE MARKET: AN ANALYSIS OF MEDICAL SETTING UNCERTAINTY AND HEALTH SYSTEM SATISFACTION

The ability of a patient to successfully access health care services is a vital component in their overall evaluation of service quality and patient satisfaction. Due to the foreign and complex nature of the health care environment patients often experience medical setting uncertainty, which can impact service evaluations and a patient’s intent to return for future service. Patient satisfaction in a consumer-driven market is discussed as it pertains to a health care firm’s long-term sustainability, and the primary role of communication satisfaction is addressed within the patient-provider dyad and health system.

An educational marketing tool was developed and provided to a treatment group in an outpatient medical imaging center to measure degree of medical setting uncertainty and the impact on ratings of health system satisfaction. A control group was also established. Using Uncertainty Reduction Theory, a research question was posed, expecting that the treatment group would report greater degrees of reduced medical setting uncertainty and increased health system satisfaction than the control group. Results are discussed and implications for health care firms are provided.

Matthew David Schulz
May 2010
THE ROLE OF COMMUNICATION IN A CONSUMER-DRIVEN HEALTH CARE MARKET: AN ANALYSIS OF MEDICAL SETTING UNCERTAINTY AND HEALTH SYSTEM SATISFACTION

by

Matthew David Schulz

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts in Interdisciplinary Studies in the Division of Graduate Studies California State University, Fresno May 2010
APPROVED

For the Division of Graduate Studies

We, the undersigned, certify that the thesis of the following student meets the required standards of scholarship, format, and style of the university and the student's graduate degree program for the awarding of the master's degree.

Matthew David Schulz
Thesis Author

Scott Moore (Chair) Communication

Craig Fowler Communication

Rudy Sanchez Craig School of Business

For the University Graduate Committee:

Dean, Division of Graduate Studies
AUTHORIZATION FOR REPRODUCTION
OF MASTER’S THESIS

____ X ____ I grant permission for the reproduction of this thesis in part or in its entirety without further authorization from me, on the condition that the person or agency requesting reproduction absorbs the cost and provides proper acknowledgment of authorship.

Permission to reproduce this thesis in part or in its entirety must be obtained from me.

Signature of thesis author: ________________________________
ACKNOWLEDGMENTS

There are no words to express my gratitude but mention of these two individuals: Janina Schulz, my beloved wife and partner; and Scott Moore, my good friend and advisor.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>2. LITERARY REVIEW</td>
<td>3</td>
</tr>
<tr>
<td>The Role of Patient Satisfaction in a Consumer-Driven Market</td>
<td>3</td>
</tr>
<tr>
<td>The Nature of Services</td>
<td>9</td>
</tr>
<tr>
<td>The Primary Role of Communication in Satisfaction</td>
<td>20</td>
</tr>
<tr>
<td>Uncertainty Reduction Theory</td>
<td>29</td>
</tr>
<tr>
<td>3. RESEARCH QUESTION AND METHODS</td>
<td>37</td>
</tr>
<tr>
<td>Methods</td>
<td>38</td>
</tr>
<tr>
<td>4. RESULTS</td>
<td>45</td>
</tr>
<tr>
<td>Materials</td>
<td>45</td>
</tr>
<tr>
<td>Subjects</td>
<td>45</td>
</tr>
<tr>
<td>Results of Research Question</td>
<td>48</td>
</tr>
<tr>
<td>5. DISCUSSION</td>
<td>49</td>
</tr>
<tr>
<td>Medical Setting Uncertainty</td>
<td>49</td>
</tr>
<tr>
<td>System Satisfaction and Respondent Characteristics</td>
<td>50</td>
</tr>
<tr>
<td>Theoretical Implications</td>
<td>52</td>
</tr>
<tr>
<td>Limitations and Future Directions</td>
<td>57</td>
</tr>
<tr>
<td>Conclusion</td>
<td>61</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>63</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>83</td>
</tr>
<tr>
<td>A. UNCERTAINTY REDUCTION THEORY: AXIOMS AND THEOREMS</td>
<td>84</td>
</tr>
</tbody>
</table>
Appendix

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. SURVEY PACKET</td>
<td>87</td>
</tr>
<tr>
<td>C. SCALES</td>
<td>93</td>
</tr>
<tr>
<td>D. CORRELATION MATRIX</td>
<td>96</td>
</tr>
</tbody>
</table>
Chapter 1

INTRODUCTION

The ever-changing nature of the health care environment provides compelling and challenging opportunities for both health care providers and consumers. How providers and consumers face those challenges will have enormous impacts on the consumer and the health care industry alike.

Over the past 25 years national health expenditures have increased from $253.9 billion in 1980 to over $838.6 billion in 2008 (American Hospital Association, 2007; Anderson, 1997), and recent data suggest that by 2020 health care spending will account for 21% of GDP in the United States (PricewaterhouseCoopers, 2005). While the rate of U.S. spending on health care outpaces the majority of other developed countries, the U.S. now ranks 19th on health outcomes across 37 core indicators of performance, and has shown negative growth over the past 2 years (The Commonwealth Fund, 2008).

At the same time, the ability of the consumer to pay for adequate health coverage is becoming increasingly more difficult as they are expected to pay a higher share of their total health care bills. Increases in premiums are higher than general inflation and growth in workers’ wages (Banthin, Cunningham, & Bernard, 2008). This has also led to the increased number of underinsured and uninsured, often resulting in a delay in accessing necessary health care services, or an inability to pay the bill for services rendered. The U.S. faces an issue with effective
health care spending that leads to improved health outcomes in a manner that is affordable for the average family.

The nature of health services and the manner in which they are provided is also undergoing tremendous change. Health care is increasingly focused on the patient as a consumer—one who plays an active versus passive role in their health. This consumer-orientation in health care has manifested in consumer-driven health plans (Wilensky, 2006), an increase in health information being provided online (Pew Internet and American Life Project, 2005), the increasing involvement of patients in medical decision-making (Guadagnoli & Ward, 1998), and even the development of health care delivery concepts like Patient-Centered Care, the aim of which is to improve the quality of care delivered, and build patient loyalty to better ensure organizational sustainability over the long-term (The Commonwealth Fund, 2007).

While this consumer-orientation has resulted in many positive steps being taken, there are also many obstacles that remain. Foreign and confusing medical terminology, complex health systems, and the increasing cost of health care to the consumer all pose intimidating barriers, often resulting in the consumer struggling to understand the information or services they need. This results in an increased level of uncertainty on the part of the consumer and can result in adverse outcomes for both the patient and health care firm. A better understanding of patient satisfaction, the nature of services, medical setting uncertainty, and the role that communication satisfaction with the health care provider and the health care system plays in a health care firm’s long-term sustainability is necessary.
Chapter 2

LITERARY REVIEW

The Role of Patient Satisfaction in a Consumer-Driven Market

In the modern marketplace the role that patient satisfaction plays in a health care firm’s long-term sustainability is critical. With the slowing growth of health care firms, maturing markets and increased competition, more firms are competing for a smaller number of patients (Anderson, Fornell, & Lehmann, 1994). In addition, the increasing cost being spent on health care by government, payer sources, and the consumer alike, without the desired outcomes (improvements in health), add to the rising tension. In better understanding the important role that patient satisfaction plays in the current marketplace an exploration of the variables that impact consumer health care decision-making is required. Attention is given to national health care costs, consumer costs, and the role that perceived service quality plays in patient satisfaction and the health care firm’s long-term sustainability.

National Health Expenditures and Outcomes

It is estimated that the United States spends $2.2 trillion on health care annually. Of that, $1.2 trillion is considered wasteful (PricewaterhouseCoopers, 2008). Wasteful spending is any spending that does not add value to health care outcomes (p. 3). The same report indicates that 80% of the American public believes that such
inefficiencies not only drive up costs, but also impact the quality of care (p. 1).

The U.S. spends more on health care per capita than any other developed country (U.S. Department of Health & Human Services, 2007) with some data indicating that expenses are twice per capita what other major industrialized countries spend, with approximately $1 of every $5 of national income going toward health care (The Commonwealth Fund, 2008). The same report also indicates that administrative costs are 30-70% higher in the United States than in other countries with mixed public/private systems, and three times higher than in countries with the lowest rates (p. 10).

Yet for all the spending on health care, the U.S. consistently ranks lowest in health outcomes in categories such as life expectancy and infant mortality, and the ranking of the U.S. has continued to drop steadily since 1960 within the 29 industrialized countries studied (Anderson, 1997). In the 2007 National Healthcare Quality Report, the Agency for Healthcare Research and Quality (2008) reported that while progress has been made in health care quality, improvements have slowed (p. 1).

**Consumer Costs**

As health care costs outpace both rates of inflation and GDP, health insurance (and its scope of coverage) becomes more costly and difficult to maintain for both the employer and individual. Since 1999 the percentage of individuals with private insurance has declined each year, reaching 68% in 2005, with a proportionate increase in individuals

Recent data from PricewaterhouseCoopers’ Health Research Institute (2009) indicate that as of 2009, 36% of health care costs will be shifted to the individual consumer (p. 9). This increase is not out of context either. Over the past decade there has been a steady increase in the share of health care costs shouldered by consumers. In 2005 American consumers paid more than $249 billion for health care expenses out-of-pocket, while the nation’s total health expenditures accounted for 16% of the United States GDP, a 6.9% increase since 1980 (American Hospital Association, 2007), and from 2003 to 2007 out-of-pocket expenses increased by 50% for in-network PPO coverage (PRC National Consumer Perception Study, 2009).

Within the next 10 years health care expenditures will continue to increase in record rates, accounting for 21% of the U.S. GDP by the year 2020 (PricewaterhouseCoopers, 2005). In 2010 alone health care costs are expected to increase by 9% (PricewaterhouseCoopers, 2009). Cost estimations through 2016 project the U.S. consumer will incur an increase in premiums that outpaces growth in wages, with a projected increase of 6-7% annually in private health insurance cost and out-of-pocket spending (Banthin et al., 2008).

Between 1999-2007 insurance premiums increased 114%, while earnings for the same time period only increased 27%, with an average
annual increase of 3% (Ginsburg, 2008). Historical growth and anticipated future growth provide a picture of increasing burdens and coverage concerns for the U.S. consumer.

As consumers continue to shoulder an increasing amount of the burden for health care costs, they will become increasingly more selective with where they receive health care services (California HealthCare Foundation, 2005). Sensitivity to prices will increase, meaning that insurance companies in turn will demand more competitive pricing in order for their firms to remain attractive to subscribers (PricewaterhouseCoopers, 2002).

Additionally, with the number of individuals investing in Health Savings Accounts (HSAs) and Health Reimbursement Arrangements (HRAs) expected to grow to 15-30 million within the next 10 years (Buntin et al., 2006), a greater number of consumers will exercise more control and flexibility in who and where they receive services. Consumers will gravitate to those health care firms they believe provide a better quality service (p. 518). With the increasing costs of health care, as well as increased flexibility in decision-making about where to receive services, the quality of health care services a consumer perceives a firm offers will play an increasingly crucial role in determining a firms’ long-term sustainability.

Increases in cost that often offer no additional benefits to the consumer result in an increase in uncertainty. Whether it is uncertainty about the future of their health coverage, coverage of specific services, changes in complex service deductibles, the changing nature of service copayments, or coverage limitations, increases in health care costs
precipitously increase medical uncertainty, which ultimately result in a
desire on the part of the consumer to exercise more control over their
health plan coverage.

Perceived Patient Service Quality
and Health Care Firm
Sustainability

The degree to which a patient perceives a high level of service
quality is a significant factor for health care firms as it pertains to their
long-term sustainability. The more satisfied a consumer is with the
quality of service provided, the higher the incidence of their intent to
return for future services (Jones & Suh, 2000; Lee, 2005; Otani & Harris,
2004; Szymanski & Henard, 2001) providing the firm a long-term
competitive advantage (Fottler, Ford, Roberts, & Ford, 2000).

As satisfied first-time customers turn into repeat customers they
become increasingly more valuable (Gwinner, Gremler, & Bitner, 1998;
Heskett, Jones, Loveman, Sasser, & Schlesinger, 1994; PRC National
Consumer Perception Study, 2008). Loyal customers lower the cost of
future transactions, and lower the costs the firm has to incur to attract
new customers (Anderson, Fornell, & Lehmann, 1994; Reichheld, 2003).

Firms with loyal customers experience improved organizational
and financial performance in the short-and-long-term (Lytle &
Timmerman, 2006; Raper & Wren, 1998) with research indicating that a
5% increase in customer loyalty can result in anywhere from a 25-85%
increase in profits (Reichheld & Sasser, 1990). Some research has
indicated that retaining customers is more profitable than attempts to
increase market share or reduce overhead costs (Zeithaml, 2000).
In the counter-example, having to develop new customers is estimated to cost five times more than the costs to a firm in retaining a current customer (Mittal & Lassar, 1998). Thus, a loyal patient becomes a very valuable commodity that should be carefully protected.

Previous research has found when a customer perceives poor service quality they are more likely to switch (Beaulieu, 2002; Fottler et al., 2000; Weitzel, Schwarzkopf, & Peach, 1989). Keaveney (1995) found that while competitors do attract some customers away from their current service provider, a more significant reason that led to switching was due to core service failures, service encounter failures, and employee response when service failures occurred (p. 76). When service failures occur it leaves a negative, and often lasting impression on the consumer.

Consumers hold onto negatively held views of service more than positive views, which impact their intent to return for future services, as well as word-of-mouth references. Negatively held views have a more significant impact on overall customer satisfaction than positively held views (Otani, Kurz, Burroughs, & Waterman, 2003).

When a service failure occurs it not only affects the immediate perception of the quality of the service being provided, it also increases uncertainty due to the inconsistency in service delivery, leaving a negative impression. Not making efforts to manage a patient’s experience can prove disastrous for a health care firm, and can lead to the loss of a potentially valuable and profitable customer. Having a better understanding of the nature of services, consumer expectations, and the primary role of communication in patient satisfaction and medical setting uncertainty is necessary.
The Nature of Services

Previous research has shown that level of satisfaction with service has one of two outcomes for businesses. Good service quality leads to increased levels of customer satisfaction, increased loyalty and improved financial sustainability for the service firm, or in the case of poor service quality, the customer leaving the firm. To better understand the factors that lead to good service quality the nature of services must be explored and how satisfaction, or dissatisfaction, results from perceived service quality. First, service and service quality is defined. This is followed by a discussion on the characteristics of services, consumer evaluations of service quality, and service gaps.

Definition of Service and Service Quality

Guo (2002) defines a service as any value-creating activity performed for a buyer that cannot be evaluated before the task is completed (p. 1157). Grönroos (2001) offers a similar definition that injects the consumer into the service-production equation, stating “A service is a process that leads to an outcome during partly simultaneous production and consumption processes” (p. 150).

In designing services, the goal of a firm is to minimize barriers necessary in order for the consumer to access the service offering. This is accomplished through an intimate understanding of consumer needs and expectations (Drucker, 1973). Knowledge of customer needs and expectations is brought back to the firm, and key components of the firm’s overall operation are structured to meet those needs and expectations. The extent to which a firm structures its services to meet
customer needs and expectations leads to overall perceptions of service quality.

Grönroos (1984) defines service quality as “the outcome of an evaluation process where the consumer compares his expectations with the service he perceived he has received” (p. 32). Thus, service quality is the result of the service encounter and is the difference between perceptions and expectations (Bendall-Lyon & Powers, 2004; Brady & Cronin, 2001a; Parasuraman, Zeithaml, & Berry, 1988). Service outcomes have also been described as the service product the customer evaluates after service delivery (Rust & Oliver, 1994) or as the actual service received (Czepiel, Solomon, & Surprenant, 1985).

Characteristics of Services

Unlike products that are purchased and then taken by the consumer, services are both created and consumed within the service setting. For this reason services can be harder for the consumer to evaluate and for service firms to manage. However, the more informed a service firm is on the nature of services, the better they can manage consumer expectations, reduce uncertainty, and increase satisfaction. Services share three common characteristics: structure and process, service history, and intangibility. Each domain is discussed.

Structure and process. Services are represented through physical and process-based structures, and it is through these structures that consumers form their evaluations of service quality (Brady & Cronin, 2001b).
Physical structure deals with those items of a service encounter that are tangible, including the geographic location, physical environment, the ability of a customer to access information easily, equipment, appearance of personnel (Bitner, 1992; Parasuraman et al., 1988; Ward, Rolland, & Patterson, 2005) as well as the way in which interactions between customer and service personnel are ordered (Bendall-Lyon & Powers, 2004; Krepapa, Berthon, Webb, & Pitt, 2003).

The ordering of interactions is a significant factor in meeting customer expectations. The service-delivery process must be carefully designed and integrated to lead to the desired outcome (Day, 2000). Service firms must manage each interaction in the process to ensure optimal communication and understanding of the customers’ desired level of service is provided (Bitner, 1990). Previous research has found that the more dynamic the interpersonal relationship at critical junctures in the service-delivery process, the more successful a firm is in creating trust-based relationships (Sirdeshmukh, Singh, & Sabol, 2002).

Firms that are successful at creating trust-based relationships are perceived as more customer-oriented, and are successful at incorporating a relational-orientation in all members of an organization in their overall mind-set, values, and norms (Day, 2000). The benefits of this to the firm are greater customer loyalty, intent to re-purchase in the future, positive word-of-mouth (Brady & Cronin, 2001a), and long-term sustainability (Esteban, Millan, Molina, & Martin-Consuegra, 2002).
Service history. Previous research has shown that consumers bring past encounters with them into the current service context (Omachonu, Johnson, & Onyeaso, 2008; Ramsaran-Fowdar, 2005).

Within the health care context research has shown that a patient’s intent to repurchase is informed by their past experiences (Headley & Miller, 1993). Patients who held more positive perceptions of service quality were more likely to repurchase from that provider in the future (p. 40). It is the customer’s perception of satisfaction over time with specific service transactions that develop into perceptions of overall service quality (Ryan & Ployhart, 2003).

In their research on relational expectations in the provider-patient context, O’Hair, Allman, and Moore (1996) explain that patients utilize memory organization packets, or MOPs (p. 310), which help them navigate the provider-patient interaction. A MOP is an ordered array of scenes the patient has developed over time that helps the patient develop specific goals and plans, or expectations, for social interactions (LePoire & Parrot, 1988).

These ordered scenes are developed into specific scripts the patient draws from to inform current interactions. The successful navigation of the provider-patient interaction utilizing the script reinforces the stability of the script (its accuracy), and serves to reinforce the patient’s beliefs about the relationship they have (or do not have) with their provider (p. 315). With the confirmation of expectations, especially if they are positive, the patient is likely to continue their relationship with the provider (Headley & Miller, 1993; O’Hair, Allman, & Moore, 1996).
Scripts are not static constructs, but are updated with each new interaction (Beaven & Scotti, 1990). Because services are processes with outcomes it is through the firm’s management of its service processes that the patient develops positive or negative scripts. These scripts become the most tangible part of the patient’s experience with a service provider, and thus form the foundation for designing and then evaluating a firm’s service offerings.

With more developed scripts a patient can more easily develop evaluations of services. As many health care firms rely on patients remaining with them over time, working to ensure that current interactions match past experiences, and that they are positive, becomes critical to ensuring future loyalty (Beaven & Scotti, 1990).

At the core of scripts and memory organization packets is the development of “will” and “should” expectations. These expectations are what lead to confirmation or disconfirmation of service quality evaluations, and ultimately to the continuation or termination of the customer’s patronage. While “will” expectations reflect what a customer believes is most likely going to happen in the service encounter, “should” expectations reflect what a customer wants to happen in the interaction (Boulding, Kalra, Staelin, & Zeithaml, 1993).

“Will” and “should” expectations are determined by both current service delivery and expectations formed as outcomes from previous interactions. Boulding et al. (1993) found that “should” expectations negatively affect perceptions of service quality due to their subjectivity, while “will” expectations positively affect perceptions of quality (p. 20). The greater the customer’s perception of service quality a firm provides,
the greater the likelihood the customer will continue to repurchase from that firm (p. 24). This conclusion is supported by research performed by Licata, Chakraborty, and Krishnan (2008) who found that purchase intentions were directly affected by appraisals of service performance as dictated by service expectations held by customers (p. 184).

Intangibility. Customers access a service in order to solve some current or future need (Stell & Donoho, 1996). As services are represented through a series of interpersonal interactions that are intangible in nature, and as the service is not fully rendered until the end of the service process, there is a perceived degree of risk involved on the part of the consumer (Hutton & Richardson, 1995).

Depending on the degree of need the consumer will be more-or-less willing to engage in the behaviors and processes necessary to obtain the desired service. When they are unwilling to accept much risk there is a necessity on the part of the service provider to work to reduce the perceived level risk and uncertainty (Stell & Donoho, 1996).

Level of perceived risk is either increased or decreased through the service interaction. Whereas a product is purchased and then removed from the purchase environment, services are consumed within the immediate context in which they are created (Schneider, Chung, & Yusko, 1993). In this regard, both parties are co-producers of the service, requiring the active involvement of customer and provider (Krepapa et al., 2003).

An implicit assumption of the co-productive nature of services is the inherent need for the two parties to coordinate their efforts, a concept
referred to as simultaneity (Beaven & Scotti, 1990; Berry, Seiders, & Grewal, 2002). Due to the co-productive and simultaneous nature of the service context, customers rely on the behaviors of the service provider in gauging the level of service they are being provided, which informs the perceived degree of risk being taken (Ryan & Ployhart, 2003).

In reducing degree of risk and uncertainty consumers seek to identify staff behaviors who establish trust and reliability between themselves and the service provider (Lytle & Mokwa, 1992).

Research has shown that due to the complexity of the medical field health care consumers evaluate quality based on the manner in which they are treated, not the methods (Oswald, Turner, Snipes, & Butler, 1998; Reeves, Binder, & Carolus-Gnida, 2008; Ward et al., 2005). Many consumers expect or trust that the clinical quality of care they receive is of high quality (Berry & Leighton, 2004) thus their evaluations of quality rest on their interpersonal interactions with service staff (Howard, 1999) making their interpersonal behaviors all the more important (Berry et al., 2002; Hartman & Lindgren, 1993; Peyrot, Cooper, & Schnapf, 1993).

Service behaviors valued by consumers include responsiveness, providing assurance, empathy, ability to meet customers’ changing needs, exhibiting competence in service recovery efforts, maintaining a customer orientation resulting in avoiding actions that sacrifice customer interests, exhibiting high levels of teamwork, civility, congeniality, respect, genuine service recovery efforts when mistakes are made, and positive interpersonal communication practices (Farrell, Souchon, & Durden, 2001; Gabbott & Hogg, 2000; Sarel & Marmorstein, 1998, Winsted, 2000).
Webster and Sundaram (2009) found higher levels of satisfaction among patients when service providers used a communication style that more actively engaged the customer, effectively obtained information about a patient’s problems, offered solutions, answered questions, and helped to reduce any anxiety the patient was experiencing. In cases where the service was more complex, as in the health care context, patients desired more direction and a high affiliation communication style that conveyed empathy and concern (p. 111).

Reliability is a key behavior consumers look for to reduce perceived risk and uncertainty (Farrell et al., 2001; Smith, Bolton, & Wagner, 1999). Reliability is defined as the ability of a service provider to maintain consistency of service performance, and be dependable and accurate (Farrell et al., 2001). Reliability is a significant aspect of service delivery due to the intangible and uncertain nature of many service encounters. Whether an individual is a first-time customer or repeat customer, because they bring historical experiences with them to the service setting, the more reliable an organization is in its service delivery process, the lower the level of uncertainty experienced by the consumer, likely resulting in improved decision-making and an increase in satisfaction.

In decision-making, consumers work to maximize decision accuracy and ease of justification, and minimize cognitive effort and negative emotion (Bettman, Luce, & Payne, 1998). This is influenced by the degree to which the consumer views something as favorable or unfavorable, otherwise known as valence (Brady & Cronin, 2001b). Thus, to some extent, the outcome of a service encounter, or the way in which
the consumer will respond, may be outside of the control of the service provider.

Within the health care context it is not uncommon for the promised service to result in an unfavorable outcome for the patient (i.e., being told they have cancer, experienced a miscarriage, need more tests, inconclusive outcomes, etc.). The delivery of undesirable information can impact the perceived quality of service delivered. This increases the importance of every other service encounter the patient has with the health care firm. It is thus in the health care firm’s best interests to help manage the patient’s “will” expectations through proper socialization.

Greater degrees of socialization not only further develop the patient’s set of “will” expectations, but also result in decreased levels of medical uncertainty. Patients who are successfully socialized by a service firm have a more accurate understanding of what resources will be provided during the service encounter, and thus a better foundation in which to evaluate outcomes (Kelley, Donnelly, & Skinner, 1990).

To mitigate levels of frustration and uncertainty, firms should develop communication strategies and train front-line staff to better understand patient expectations at the pre-encounter, encounter, and post-encounter stages (Lytle & Mokwa, 1992). In providing staff proper training in communication behaviors that better socialize patients, health care firms can reduce uncertainty and establish healthy rapport (Day, 2000; Macintosh, 2002; Schneider et al., 1993).

The degree to which a health care firm reduces level of medical uncertainty will either lead to increases in perceived risk and uncertainty, resulting in dissatisfaction and the customer leaving the
firm (Berry et al., 2002) or with a complementary matching, provide the service firm an edge over competitors (Roberts, Varki, & Brodie, 2003). When a health care firm does not meet consumer expectations or needs it creates gaps in service quality, the focus of the next section.

Service Gaps

The degree to which discrepancies exist between perceptions and expectations is affected by perceived or actual gaps in services (Solomon, Surprenant, Czepiel, & Gutman, 1985). Gaps affect overall satisfaction and can result in increases in uncertainty and satisfaction with the quality of the service.

Guo (2002) identified five reasons that gaps occur in the service context. The first gap is the difference between customer expectations of a service versus management’s perceptions of customer expectations. Firms that are not familiar with historical and current expectations are likely to experience such gaps.

The second gap occurs when a firm’s management is aware of the service-delivery expectation, but is unable to translate customer expectations into action, engaging the resources of the firm to meet the expectation.

The third gap occurs when front-line staff fails to deliver services to the highest standards according to guidelines set by the firm.

The fourth service-delivery gap occurs when a firm fails to get the message out to the relevant audience(s) about the services they have to offer.
The fifth and final gap is the difference between the expected service and the perceived service received. The fifth gap occurs as a result of the previous four (Guo, 2002, p. 1160).

When a firm regularly experiences gaps, whether it be individual gaps or combinations of gaps (as in the case of the fifth gap) it can result in increased levels of uncertainty and customer dissatisfaction. Global dissatisfaction results from the degree of discrepancy between the consumer’s expectation for service quality and the quality of the actual service delivered. When gaps occur it creates uncertainty on the part of the consumer. Small gaps in service delivery may add up (long wait time, lost paperwork, getting the customer’s name wrong, dirty environment), or one significant gap may occur (failure to provide the core service), ultimately resulting in the customer taking their business elsewhere.

An understanding on the part of management and front-line employees is necessary in order to provide consistent and reliable service. Within the health care context identifying service gaps is important as patients are often unable to evaluate the technical quality of the service (the clinical aspect of their service) due to its complexity, and thus resort to the qualitative aspects of their care (staff behaviors, wait time, cleanliness of facility, degree of personalized care, etc.). To the extent that gaps occur in communication between patient and provider, or the health system, a health care firm has an opportunity to provide exemplary service. Communication satisfaction is discussed next.
Communication Satisfaction

The degree to which an individual perceives a relationship to be satisfactory or dissatisfactory influences the likelihood that the relationship will continue or be dissolved. Previous research has shown that relational satisfaction is closely tied to communication satisfaction (Hecht, 1984; Hecht & Sereno, 1985).

Communication satisfaction is an internal, secondary reinforcer arising from the generalization of environmental reinforcement of behaviors manifested in response to the presence of a discriminative stimulus (Hecht, 1978). Communication satisfaction can be the result of one’s own communication and that of the party, or with one’s own behavior or that of the other (Hecht & Sereno, 1985).

In the vein of expectation theory, satisfaction results from the way the individual interacts with the world they have come to expect to encounter (Hecht, 1978). The individual’s expectations are either reinforced or violated. For violation to occur, some minimal level of expectation for a positive outcome must exist. When expectations are confirmed or positively exceeded, satisfaction results (p. 58). As individuals who exist in a society, over time expectations are confirmed, denied (negatively violated), adjusted to account for new experiences, and newly created. Through this ever-evolving process individuals become conditioned to deal with their environment.
In that they exist in a larger society, individuals are guided in their interactions by a set of frames they have incorporated into their identity: personal, enacted, relational, and communal (Hecht, 1993).

The first frame, the personal frame, consists of an individual’s feelings about self, self-image or self-concept, and their spiritual sense of self. The personal frame is how an individual comes to understand themselves in general and specific situations (p. 79).

The second frame is also known as identity as enactment. An individual’s identity is enacted in social situations through acts of communication. It is through such acts that identity is actually experienced (p. 79).

The relational frame manifests through relationships the individual manages in society. Management of the relational frame occurs at three levels. People first define themselves in terms of who they are with. Their behaviors are matched to what they understand to be socially acceptable or unacceptable based on their immediate environment. Second, people define themselves in terms of their relationships, through which they gain a sense of self. Lastly, relationships themselves can take on their own identity, creating its own dyad and becoming its own entity. The way a husband communicates with his wife is different than they way he communicates with his boss, and lifelong friends communicate differently and have different expectations than co-workers who have met for the first time (Montgomery, 1992; Wood, 1982).

The last frame, the communal frame, is a frame held by a group of individuals, bonding the group together. In this dynamic, identity lies in the group, not the individual or interaction (Hecht, 1993).
The degree to which an individual successfully navigates communication interactions to obtain the desired end goal will determine their level of satisfaction with the relationship. Hecht (1984) found that in newer relationships the degree of control felt by individuals was a significant factor in overall communication satisfaction. Specifically, individuals desired more control of the conversation and information exchange, whereas in longer-term, intimate relationships, individuals were more concerned with self-presentation and participation (p. 214).

Other research on communication satisfaction has focused on the use of persuasive messages and willingness to change. When individuals had positive communication interactions, resulting in satisfying communication and liking of the other party, they were more likely to be persuaded to change than if threats (negative communication) were used (Hecht, 1984).

Lastly, research on communication satisfaction and uncertainty in initial encounters found that as individuals reduced uncertainty they experienced more communication satisfaction than in situations where uncertainty remained high (Neuliep & Grohskopf, 2000). Thus, the more positive the communication interaction is, and the lower the degree of uncertainty that exists in a relationship, the greater the degree of overall communication satisfaction.

Communication satisfaction is particularly important in the health care context. For many individuals the medical environment is characterized by a low degree of familiarity, both with environmental factors and interactions with clerical and clinical staff. Relationships, even when the patient has been with a provider for many years, are often
defined by short interactions, focused on information-gathering, giving little time for true dialogue or relational development. They are largely superficial interactions, meant to provide the health care professional with necessary information more than they are meant to establish a positive communication interaction. It is reasonable to assume the patient is likely to experience increased levels of uncertainty in the medical setting, which are likely to result in decreased levels of satisfaction.

**Patient-Provider Satisfaction**

One of the most significant interpersonal relationships in the health care context is between the patient and provider. For the health care provider to prescribe courses of treatment they must engage the patient in interpersonal dialogue, and for the patient to receive care they must disclose information to their provider. In this regard the patient-provider interaction is essentially a co-productive encounter (Berry et al., 2002; Lytle & Mokwa, 1992).

What often complicates the interaction is the degree of familiarity and comfort on both the part of the patient and provider. Patients both desire more information from physicians (Bowers, Swan, & Koehler, 1994; California HealthCare Foundation, 2005; Cegala, Coleman, & Turner, 1998; Guadagnoli & Ward, 1998), and find it difficult to ask questions (Beisecker & Beisecker, 1990). The result is often unsuccessful attempts, or lack of any attempt in obtaining information. Expectations may not be well understood, which can lead to dissatisfaction and frustration for both parties. The result is low levels of overall satisfaction,
compromised medical outcomes, and increased levels of uncertainty (Beisecker, 1990).

As discussed in previous sections, in their efforts to assign value to the service being received, and because patients are not educated to evaluate physicians based on the technical (clinical) components of their care, patients often evaluate physicians based on the quality of their interactions (Bowers et al., 1994; Oswald et al., 1998; Reeves et al., 2008; Ward et al., 2005).

Physicians whose interpersonal communication practices are more affiliative and partnership-building in nature are more effective than controlling or dominant styles (Buller & Buller, 1987; Cardello, Berlin Ray, & Pettay, 1995). Affiliative communication is characterized by behaviors that seek to establish and maintain positive relationships, communicate interest, friendliness, candor, warmth, honesty, compassion, authenticity, humor, nonjudgmental attitudes, empathy, reliability, respect for the patient, immediacy, and less dominant behaviors (Beach, Sugarman, Arbelaez, Duggan, & Cooper, 2005; Bowers et al., 1994; Burgoon et al., 1987; Cardello et al., 1995; Cegala, McGee, & McNeilis, 1996; Jung, Van Horne, Wensing, Hearnshaw, & Grol, 1998; Ong, DeHaes, Hoos, & Lammes, 1995; Ross, Wheaton, & Duff, 1981; Wanzer, Booth-Butterfield, & Gruber, 2004).

Physicians who exhibit affiliative behaviors are perceived by their patients as more credible, professional, and as having more expertise (Lutby, Cedraschi, Perrin, & Allaz, 2005; Schattner, Rudin, & Jellin, 2004; Schneider & Tucker, 1992; Wrench & Booth-Butterfield, 2003). They secure greater degrees of patient-compliance, and have higher
levels of overall patient satisfaction and loyalty (Froehlich & Welch, 1996; Geist & Hardesty, 1990; Hall, Roter, & Katz, 1988; Kaplan, Greenfield, Gandeck, Rogers, & Ware, 1996; Ross & Duff, 1982; Roter & Hall, 1989; Wrench & Booth-Butterfield, 2003). Lastly, and importantly, their patients are also more likely to experience decreases in overall medical uncertainty (Wanzer et al., 2004) and improved clinical outcomes (Beach et al., 2005; Cegala, 2003; Greenfield, Kaplan, & Ware, 1985; Harrington, Noble, & Newman, 2004; Otani & Harris, 2004; Roter & Hall, 1989).

In an increasingly consumer-driven health care environment, patients expect to play a more active role in the delivery of their care (American Hospital Association, 2004; Beisecker, 1990; The Commonwealth Fund, 2003; Pillittere, Bigley, Hibbard, & Pawlson, 2003; PricewaterhouseCoopers, 2002; Wade, 2001) a perspective that runs contrary to the historic power-differential that placed control of decision-making and provision of information in the hands of the physician. Research has shown physicians underestimate their patients’ desire to take a more active role in their health (American Hospital Association, 2004; The Commonwealth Fund, 2008; Employee Benefit Research Institute, 2006; Ong et al., 1995) or maintain an expectation that the patient will take a more passive role (Cahill, 1998; Cegala, 1997; Crouch & McCauley, 1986).

A mismatch between patient and provider expectations for the type of communication interaction results in increased levels of uncertainty on the part of the patient and can lead to the patient switching providers (Federman et al., 2001; Howard, 1999; Kaplan et al., 1996; Ryan & Ployhart, 2003; Safran, Montgomery, Chang, Murphy, & Rogers, 2001).
In more extreme cases it has even led to insurance carriers dropping the provider from their list of approved physicians (Zimmerman, Zimmerman, & Lund, 1997).

These outcomes have significant implications for health care firms as research has shown continuity of care is of primary importance to the health care consumer (Donahue, Ashkin, & Pathman, 2005; Forrest, Shi, vonSchrader, & Ng, 2002; Mainous, Goodwin, & Stange, 2004; Pope, 1978; Ross et al., 1981; Saultz & Albedaiwi, 2004), and that patients with greater continuity of care report higher levels of satisfaction (Donahue et al., 2005).

Previous research has demonstrated the benefits of communication training for physicians and patients as well (Cegala, Gade, Broz, & McClure, 2004; Cegala, McNeilis, McGee, & Jonas, 1995; Williams, Weinman, Dale, & Newman, 1995).

Physicians who went through courses in communication asked more open-ended questions, more frequently asked their patients’ opinion, provided more information (Levinson & Roter, 1993), had patients who reported higher levels of patient satisfaction (Evans, Stanley, & Burrows, 1992; Kidd, Marteau, Robinson, Ukoumunne, & Tydeman, 2004), took less time in the medical interview, and utilized health services less (Clark et al., 1998).

Patients who received training in communication skills were more likely to provide their physician with more detailed health information (Cegala & Broz, 2003; Cegala, McClure, Marinelli, & Post, 2000; McGee & Cegala, 1998; Tran et al., 2004), took a more active role in their health, experienced increased rapport with their physician (Cegala, Street, &
Clinch, 2007; Lewis, Pantell, & Sharp, 1991), increased their level of participation in decision-making (Greenfield et al., 1985), recalled more information after their appointment, and reported an increased perception of control over their health (Harrington et al., 2004). They also experienced greater confidence and commitment to their health care decisions, and were more likely to follow the advice of their physician (Ballard-Reisch, 1990; DiMatteo, Reiter, & Gambone, 1994; Hall et al., 1988).

**Health System Satisfaction**

While the patient-provider dyad has received much attention, empirical research on overall health system satisfaction as impacted by individual components within that system of care has not (Adame, Moore, & Fowler, 2009). It is reasonable to assume that the extent to which a patient is able to successfully navigate a health system will have an impact on their level of satisfaction with the health system as a whole.

Previous research has shown that due to the complexity of the medical environment, patients look to environmental factors and staff behavior to evaluate the quality of the service (Howard, 1999; Hutton & Richardson, 1995; Oswald et al., 1998; Pakdil & Harwood, 2005; Peyrot et al., 1993; Ramsaran-Fowdar, 2005; Wang, Chang, Liu, & Chen, 2007; Ward et al., 2005).

Environmental factors include timely and affordable access to health services including phone and web capabilities, cost of services, and test results (Caplan & Sussman, 1966; Kasteler, Kane, Olsen, & Thetford, 1976; Ward et al., 2005); wait-time in the waiting room or exam
room; comfort and pleasantness of the exam room (Press Ganey Associates, 2007); the aesthetics and functional design and comfort of the health care facility (Peyrot et al., 1993), and the degree to which staff present themselves professionally (Bitner, 1992).

Staff behaviors identified by patients as important in their evaluations of service quality were the degree to which staff communicated with each other to provide consistent service (Greenley & Schoenherr, 1981), staff responsiveness to concerns or complaints, efforts made by staff to include the patient in decision-making, sensitivity to service failures, the degree to which hospital staff addressed the patient’s emotional needs, and how well staff kept the patient informed (Howard, 1999; Press Ganey Associates, 2007, 2009; Ward et al., 2005).

The value of this research is that it illustrates the wide range of variables that must come together in order for health services to be successfully administered. However, while the research has identified and measured the range of independent variables that factor into patient satisfaction, it has not looked at how interaction with the range of individual variables affects perceptions of overall health system satisfaction.

In exploring the degree to which different aspects of the health care environment impact overall health system satisfaction, Moore, Wright, and Bernard (2009) hypothesized that patient perceptions of physician credibility and patient satisfaction would affect overall satisfaction with the health system.

Using Structural Equation Modeling (SEM) Moore et al. (2009) found a significant path between patient wait-time, perceived physician
credibility, and overall health system satisfaction (p. 290). Specifically, the longer a patient waited for service, the less credibility they assigned to their physician, which in turn affected overall system satisfaction (p. 291).

Another recent study on health system satisfaction by Wright and Frey (2008) looked at the impact of the health environment in a cancer center on a patient’s willingness to communicate about health (WTCH). Patients who perceived the cancer center as an environment that encouraged interpersonal interaction with staff reported an increased willingness to communicate about their health and seek out health information (p. 375). Stated differently, the more comfortable patients were with the health environment, the more willing they were to engage available staff and resources to learn about their condition.

It is reasonable to assume that the more comfortable a patient feels with their health care environment—both the environmental and interpersonal factors—the lower their medical uncertainty will be, and that with lower uncertainty they will experience increased levels of satisfaction. To better understand the role that uncertainty in interpersonal relationships plays, a discussion on Uncertainty Reduction Theory (URT) is necessary.

**Uncertainty Reduction Theory**

Uncertainty is a cognitive state which results from an individual’s assessment of the number of alternative predictions available for future behavior, or for alternative explanations available to explain past behavior (Bradac, 2001).
Berger and Calabrese’s (1975) Uncertainty Reduction Theory (URT) offers a framework through which to better understand the nature of an individual’s interpersonal decision-making processes. Central to their theory is the assumption that an individual’s primary desire in an uncertain situation (such as a new relationship) is to reduce their uncertainty in order to increase predictability (p. 100).

Berger and Calabrese (1975) proposed a three-stage process in which individuals engage others in conversation and develop (or dissolve) relationships. Stage one, referred to as the entry phase, is the point in which two strangers first meet and begin conversing. In this stage, communication is relatively superficial in nature, usually consisting of pleasantries and salutations. It also consists of fairly demographic information exchange, and is symmetric in nature (individuals trade the same information).

Individuals then move to the second stage, referred to as the personal phase. This phase is characterized by communication between individuals about personal problems, values, opinions on issues, issues in society. Individuals typically move to the second stage after a few interactions with one another.

The final phase is the exit phase. In this phase individual make decisions about future interactions, whether it is to meet again at a later time, or to dissolve the relationship due to lack of interest on the part of one or both parties (p. 100).

In better understanding how relationships are managed, Berger and Calabrese (1975) offer seven axioms and 21 theorems (see Appendix A) as research priorities for studying interpersonal relationships and the
set of rules that guide them. Axioms concern the nature of early interpersonal relationships, nonverbal affiliative expressiveness, information seeking, intimacy level of communication content, reciprocity rate, similarity, and liking (Sunnafrank, 1990).

Individuals often experience varying degrees of uncertainty which, depending on whether an individual is a high or low self-monitor, may lead them to seek out more information (Gudykunst & Nishida, 1984; Rosen, Knauper, & Sammut, 2007), or to avoid seeking information (Brashers, Goldsmith, & Hsieh, 2002). Individuals who are high self-monitors tend to seek out additional information when faced with increased levels of uncertainty, whereas low self-monitor do not (Rosen et al., 2007). High self-monitors will also tend to overestimate the severity of situation and the potential outcomes (p. 415). Level of uncertainty as it mediates an individual’s information-seeking behaviors has been shown to result in incorrect health decisions (Brashers, 2001), and increased worry or emotional stress (Dugas, Freeston, & Ladouceur, 1997).

Information-seeking behaviors are a direct function of uncertainty. Individuals whose information-seeking behaviors drive them to search for information experience a decrease in levels of uncertainty (Douglas, 1990; Hurley, Miller, Costalas, Gillespie, & Daly, 2001). Conversely, individuals who are high in global uncertainty (uncertainty about acquaintanceship in general) have been found to experience communication apprehension, which further impedes their ability to effectively communicate in order to reduce uncertainty (Douglas, 1991). Individuals who score high on uncertainty, though they may disclose large amounts of information, are not necessarily successful at gaining
information necessary to make more informed decisions. This inability to collect necessary information has been found to lead to the dissolution of relationships (Berger, 1986; Douglas, 1991).

Uncertainty Reduction Theory has been researched in a wide range of contexts, including romantic relationships and friendships (Davis & Todd, 1985; Parks & Adelman, 1983; Planalp & Honeycutt, 1985, 1988), during initial social encounters (Clatterbuck, 1979; Douglas, 1990; Sunnafrank, 1986, 1990), across cultures (Douglas, 1994; Gudykunst, 1983, 1985; Gudykunst & Nishida, 1984), and within the organizational context (Kramer, 1993, 1999).

Uncertainty Reduction Theory has also been researched extensively within the health care context from a range of different perspectives. Research has focused on the patient-provider dyad (Hewson, Kindy, Van Kirk, Gennis, & Day, 1996; Robinson & Stivers, 2001; Sheer & Cline, 1995), among cancer patients (Bailey, Wallace, & Mishel, 2007; Hurley et al., 2001), mental health (Reich, Johnson, Zautra, & Davis, 2006), in advance care planning (Hines, 2001), chronic illness (Mishel, 1990), and from the interpersonal context that manifests within the health care system (Babrow, Kasch, & Ford, 1998; Begun & Kaissi, 2004; Brashers et al., 2002; Douglas, 1991; Rosen et al., 2007).

Uncertainty in the health care context often centers around severity of the illness, success of treatment, the impact of being ill on the individual’s life, and the ability to pursue one’s dreams (Mishel, 1990). High levels of uncertainty about illness, treatment, or the social and socioeconomic impact of illness on an individual can result in the
individual being unable to engage in the very information-seeking behaviors needed to reduce uncertainty.

In situations when no decisions are made, or when the wrong decisions are made, adverse outcomes can occur, both for the patient (worsening of health condition), and for the provider, including the loss of a patient and in some cases malpractice claims (Brashers, 2001). The ability of health care professionals to understand the different forms that uncertainty takes, and a framework for responding to uncertainty has clear benefits for the delivery of necessary medical services, reducing uncertainty, and increasing patient satisfaction.

In attempting to explain uncertainty in illness, Mishel (1988) presents four forms that uncertainty takes specific to the health care context: (a) ambiguity concerning the state of the illness, (b) complexity regarding treatment and the system of care, (c) lack of information about the diagnosis and seriousness of the illness, and (d) unpredictability of the course of the disease and prognosis (p. 225).

In order to better understand the implications for various forms of uncertainty in the medical setting, researchers (Babrow, 2001; Babrow et al., 1998) developed a general framework for the meanings of uncertainty in illness comprised of five dimensions: complexity, quality of information, probability, structure of information, and lay epistemology (Babrow et al., 1998).

Complexity deals with the issue at hand facing the individual, and the multi-causal nature of the issue. Multi-causality has the potential to increase unpredictability, which in turn has the potential to increase
uncertainty, especially if the individual cannot successfully navigate the situation (Babrow et al., 1998).

Medical uncertainty is also mitigated by the quality of information provided. Quality is comprised of eight subdimensions: clarity (unclear message and imprecise wording), accuracy (impacted by faulty observations, misrepresentation, or inaccurate records), completeness of information (due to ignorance on the part of the patient, provider, or both parties), volume (amount of information provided can overwhelm a patient), degree of ambiguity (as information can be interpreted in multiple ways), consistency (as in case of “double messages” or information that contradicts itself or other pieces of information provided), and applicability (the result of not knowing what to do with information that has been provided). Quality of information plays a significant role in increasing or decreasing medical uncertainty (Babrow et al., 1998). For health care providers, keeping information limited to that which is most beneficial helps reduce ambiguity for the patient, and helps establish source credibility.

The third dimension, probability, consists of two directions. The belief a patient holds in a specific probability, or the belief in a range of probabilities (Babrow et al., 1998). Either one of these beliefs can lead to positive or negative behavioral outcomes, as impacted by the focus of the belief.

The structure of information being presented is the fourth dimension. Logically structured information based on the most relevant way to order information as informed by the specific context (what is logical may vary depending on the context), can lead to improved
understanding. This results in a more complete integration of the information on the part of the individual, which further increases the likelihood of value being assigned to that information and the proper action being taken (Babrow et al., 1998).

The fifth and final component of the framework addresses uncertainty as impacted by an individual’s lay epistemology. The way in which an individual interprets uncertainty is influenced by their views on knowledge and certainty. In some cultures, to know something is the only way in which to be certain (and thus reduce uncertainty), whereas in other cultures it is through the very presence of indeterminacy that one is enlightened (Babrow et al., 1998).

Research on uncertainty reduction within health care contexts has focused on various strategies to help reduce uncertainty, including how to design and distribute information that provides the necessary context and thus coherence for the recipient (Berger & Calabrese, 1975; Brashers, 2001; Ford, Babrow, & Stohl, 1996; Sheer & Cline, 1995), the range of nonverbal cues in the medical interview context that impact an individual’s understanding of a prognosis (Robinson & Stivers, 2001), and interviewing and information-gaining techniques for both physicians, nursing staff and patients (Hewson et al., 1996).

Provision of information to reduce uncertainty has been shown to lead to increased patient satisfaction (Wanzer et al., 2004), improved physician-patient communication (McGee & Cegala, 1998), increased compliance with prescribed courses of treatment (Beisecker, 1990), improved health outcomes (Lewis et al., 1991), and an increase in the patients sense of control over their situation (Hjelm-Karlsson, 1989).
In understanding the role of uncertainty as it pertains to a health care firms long-term sustainability and customer satisfaction, research has shown that higher-performing and more effective health care organizations are those that perceive uncertainty and ambiguity and work to reduce it in the environment (Ellis, Almor, & Shenkar, 2002; Shortell, Gillies, Anderson, Erickson, & Mitchell, 2000).
Chapter 3

RESEARCH QUESTION AND METHODS

As Uncertainty Reduction Theory is a theory of interpersonal communication, and as it has been shown that in the service industry in general, and health care sector specifically, services are provided through a series of interpersonal interactions (Schneider et al., 1993) largely navigated by front-line employees, such employees play a critical role in the customer’s overall evaluation of service quality and the resulting level of satisfaction (Bitner, 1990; Bitner, Booms, & Mohr, 1994; Czepiel et al., 1985; Harris, Swindle, Mungai, Weinberger, & Tierney, 1999).

Research has shown consumers seek to reduce uncertainty (Hutton & Richardson, 1995). When successful they experience an increase in satisfaction, which often results in increased loyalty to a health care firm. This provides the firm with improved economic returns (Anderson, Fornell, & Rust, 1994; Raper & Wren, 1998; Szymanski & Henard, 2001; Zeithaml, Berry, & Parasuraman, 1996). It is thus in a health care firm’s benefit to understand those areas in their service operation where the customer experiences uncertainty and work to reduce them.

In seeking to reduce medical setting uncertainty the health care firm should work to develop “will” expectations on the part of the patient, as it is these expectations that positively influence perceptions of quality, and drive overall satisfaction (Boulding et al., 1993). In managing “will” expectations previous research has shown both the
need and benefits of providing the patient with more relevant, timely information that enables the patient to make more informed decisions (Cegala, 2006; Harrison & Verhoef, 2002; Lambert et al., 1997; Osborn, 2000).

As patients experience medical setting uncertainty regarding the complexity of treatment and system of care (Mishel, 1988), providing information to the patient about what to expect during their visit should enable a health care firm to reduce the level of uncertainty a patient experiences. This is consistent with Axiom 1 of Berger and Calabrese’s (1975) Uncertainty Reduction Theory, which states,

Given the high level of uncertainty present at the onset of entry phase, as the amount of verbal communication between strangers increases, the level of uncertainty for each interactant in the relationship will decrease. As uncertainty is further reduced, the amount of verbal communication will increase. (p. 101)

Drawing on Axiom 1 the following research questions were formed:

*Research question 1*: Will providing patients an informational tool detailing communicative strategies for interacting with medical staff decrease levels of medical uncertainty?

*Research question 2*: Will providing patients an informational tool detailing communicative strategies for interacting with medical staff result in an increase in levels of health system satisfaction?

**Methods**

A study was undertaken to test whether decreases in medical setting uncertainty would result in increased health system satisfaction.
The next sections explain the development of the treatment tool, pre- and posttest surveys, research context, and protocols.

**Treatment Tool**

An educational tool was created and provided to patients (see Appendix B). The educational tool drew on four of Berger and Calabrese’s seven axioms presented in their seminal work on Uncertainty Reduction Theory (1975).

Previous research has shown that communication-skills training for patients has resulted in an increase in question-asking and information-seeking behaviors (Cegala & Broz, 2003). Research has also shown that patients experience increases in satisfaction when they are provided information (Bowers et al., 1994; Peyrot et al., 1993).

The educational tool developed for this study included information on what to expect during the appointment, who would be involved in the delivery of the medical imaging exam, and who to ask if the patient had any questions. The tool also included pictures of the various aesthetic and design features of the exterior and interior of the facility.

In developing the content of the educational tool four of Berger and Calabrese’s (1975) axioms were determined to be relevant.

Given Axiom 1 states that in the entry phase of a relationship individuals will have high levels of uncertainty, and will thus engage in an increased amount of verbal communication (p. 101), one may expect that through reading the educational tool patients will feel better informed and socialized with their immediate environment. By feeling
better informed it is expected that verbal communication will increase and level of uncertainty decrease.

It is expected that through conversation between the patient and medical imaging staff, level of uncertainty will decrease. As a result of obtaining desired information the degree to which the patient continues to seek information is likely to diminish. This is consistent with Axiom 3, which states, “High levels of uncertainty cause increases in information seeking behavior. As uncertainty levels decline, information seeking behavior decreases” (p. 103).

Due to the fact that many patients are first time or infrequent visitors to medical imaging facilities, it is expected they will have relatively high levels of uncertainty, resulting in low levels of communication intimacy. The goal of the educational tool is to help decrease levels of uncertainty in order to increase both the amount of verbal communication, and the quality of that communication. This is consistent with Axiom 4, which states, “High levels of uncertainty in a relationship cause decreases in the intimacy level of communication content. Low levels of uncertainty produce high levels of intimacy” (p. 103).

Lastly, by providing an explanation of the various steps involved in administering the medical imaging exam, and the range of staff the patient will likely encounter, it is expected that the patient will feel more familiar with staff, which will enhance interpersonal communication and overall communication satisfaction, as well as reduce medical setting uncertainty. Axiom 7 states, “Increases in uncertainty level produce
decreases in liking; decreases in uncertainty level produce increases in liking” (p. 107).

**Control Condition**

In order to measure the difference that the educational tool is expected to have, a control condition was created. The control condition received marketing collateral, similar to the treatment in style, replacing the treatment text with a list of medical facilities the imaging center was affiliated, along with the names of executive administrative staff.

**Materials**

Two scales were used for the current study. Sheer and Cline’s (1995) Medical Setting Uncertainty Scale, which reported an alpha reliability of .89, asked patients to answer a set of eight questions using a 9-point Likert Scale (1=strongly agree, 9=strongly disagree). Questions dealt with process of care (“I am not familiar with the procedures of the appointment”), and medical environment (“The setting here makes me feel relaxed”).

The second scale used was the Health System Satisfaction Scale (Adame et al., 2009) which achieved an alpha reliability of .95. The scale asked patients to answer seven questions using the same 9-point Likert Scale (1=strongly disagree, 9=strongly agree). Questions included health system satisfaction (“I was satisfied with the overall experience with the hospital and its staff”), and delivery of care (“I was satisfied with the level of care delivered by the nurses”).
Using these two scales a survey was developed to measure medical setting uncertainty and health system satisfaction in a freestanding outpatient medical imaging center (see Appendix C for both scales).

To account for a different health care setting, terms used in five questions on the (Adame et al., 2009) scale were changed to reflect the current research setting. Specifically, questions 2 and 3 both used “hospital” in the phrasing of the statement. As the current research context was a medical imaging center “hospital” was removed. The resulting questions did not require the substitution of other phrases for respondents to answer the question.

Question 6 (“The hospital had good facilities”), was changed to read “The medical imaging center had good facilities. Question 7 (“I was satisfied with the level of care delivered by the physicians”), was changed to “I was satisfied with the level of care delivered by the technologist and nursing staff.” Lastly, question 8 (“I was satisfied with the level of care delivered by the nurses”), was changed to “I was satisfied with the level of care delivered by clerical staff.”

Subjects

In total, 450 surveys were provided to patients over the course of a 1-month period. After a review of completed surveys 28 were removed from analysis due to a significant portion of incomplete answers (i.e., posttest survey not completed) or lack of signed consent. Of the 450 distributed, 123 surveys were never provided back to the front desk staff, leaving 301 surveys for analysis, a response rate of 67%.
Procedures

Prior to distribution of the survey the researcher met with front-desk staff, providing them an orientation on proper distribution methods. Clinical staff who provided the medical imaging exam were also given an orientation on how to handle questions patients may ask about the research study. Staff was directed to defer the patient to the contact information on the consent form for all questions.

After being checked in for their exam patients were given the opportunity to participate in the study. If the patient decided to participate they were provided the survey packet from the top of the stack of surveys. The patient signed a consent form, which was later collected by the researcher and stored separately from the rest of the survey packet. Patients were reassured that their medical imaging exam would not be affected by either their decision to participate in the study or to opt out from participation.

Patients completed the pretest survey before being taken back for their exam. After the exam was provided, survey respondents completed the posttest survey. Survey packets were collected by front-desk staff before the patient left the facility. The researcher picked up completed surveys at the end of each day, storing them in a locked cabinet.

The pretest survey asked eight questions about medical setting uncertainty, as well as sociodemographic data, including age, sex, income, the number of times the patient had visited the current medical imaging center in the past 6 months, and the number of times the patient had visited another medical imaging center in the last 6 months,
race, type of insurance, and the medical imaging exam the patient was scheduled to receive that day.

Patients were instructed to complete the posttest survey after receiving their medical imaging exam. Respondents completed the same eight questions about medical setting uncertainty, along with seven questions that addressed health system satisfaction. Respondents were also asked to give approximate time estimation on how long their visit took, as well as the amount of time they expected their exam to take. Lastly, as some patients are sedated for their exam, a question was asked to determine if they had received sedation.

To better ensure questions about medical setting uncertainty were answered prior to reading the treatment tool or control, they were placed behind the pretest survey. Respondents were given verbal instructions to complete the pretest survey before reading the rest of the packet.

A total of 250 survey packets containing the treatment tool were created along with 250 survey packets containing the control. Survey packets were randomly ordered before being distributed to patients. Completed packets contained (in order) consent form, pretest survey, treatment tool or control, and posttest survey.
Chapter 4

RESULTS

Materials

In order to determine the reliability of Sheer and Cline’s (1995) Medical Setting Uncertainty Scale, a Cronbach’s Alpha test was run for both pretest and posttest survey responses. Reliability of responses in the pretest had an alpha reliability of .80. Alpha reliability of posttest survey responses was .79.

Alpha reliability was also run for the (Adame et al., 2009) Health System Satisfaction Scale. The current study reported increased strength of the scale, showing an alpha reliability of .97.

Subjects

As previously reported, 450 surveys were provided to patients over the course of a 1-month period. After analysis, 28 were removed due to insufficient response rates. An additional 123 surveys were never returned, leaving 301 surveys left for analysis, a response rate of 67%.

Age

Of the 301 surveys used for analysis, 299 survey respondents provided their age, while two opted to leave this field blank. Mean age of respondents was 51.75 years old (SD=12.5, R=20-82).
Sex

Women accounted for 92% (n=276) of the survey respondents, while males accounted for 8% of the population surveyed (n=24). This may be explained in part by the fact that the medical imaging center is known in their geographic market area as a provider of women’s imaging services (digital mammography, obstetric/gynecologic ultrasound).

Income

Of the 301 surveys, 96 respondents did not report their income, leaving 205 for analysis. Median income of respondents was $50,000; income range was $6,000-$200,000.

Facility

Survey respondents were asked how many times they had used the current medical imaging facility in the last 6 months. Three respondents left the field blank. The mean score of the remaining respondents (n=298) was .68 visits.

Respondents were also asked how many times they had used a different medical imaging facility in the last 6 months (m=.27 visits, n=296). Five respondents left this field blank.

Race

Survey respondents were asked to indicate which race they most identified with from a list of the following options: American Indian/Alaskan Native, Asian/Pacific Islander, Black, Hispanic, and White.

The majority of survey respondents identified themselves as White (n=175, 58.1%). Hispanics were the second largest group (n=80),
accounting for 26.6% of respondents. American Indian/Alaskan Natives accounted for 3% (n=9) of the respondents. Asian/Pacific Islanders accounted for 5% (n=15), and Blacks (n=11) were 3.7% of the respondents. Eleven respondents (3.7%) did not indicate a race. Based on U.S. Census Bureau data (2008), Caucasians were overrepresented in our sample (Sample=58.1%, Population=53.3%).

Insurance

Participants were asked to indicate what type of insurance they had, with three options to select. The options were as follows: have private insurance, do not have medical insurance, and use government medical insurance programs.

Patients with private medical insurance (n=267) accounted for 88.7% of the respondents, while those who used government medical insurance programs (n=46) accounted for 15.3% of all respondents. One percent (1%) of patients reported no insurance (n=3).

Service

The medical imaging center in which the research was performed offers a wide range of imaging services, thus drawing a large and diverse range of patients presenting with clinical needs.

More than 56% of respondents (n=170) were scheduled to receive a digital mammogram. Ultrasound patients (n=78) were the next largest group of patients, accounting for 25.9% of respondents. The third largest group were patients scheduled for an MRI (n=23). MRI patients accounted for 7.6% of respondents. Patients receiving a standard X-Ray (n=18) accounted for 6% of respondents, while patients who received a
CT exam (n=16) accounted for 5.3%. Patients receiving a DEXA exam (n=12) accounted for 4% of respondents, while fluoroscopy patients (n=1) accounted for 3% of survey respondents. Five patients indicated “other” as their service, accounting for 1.7% of survey respondents. While the medical imaging facility also offers nuclear medicine, because this service is offered at a remote location these patients were not included in the survey. Correlation matrix data for ratio-level variables can be found in Appendix D.

Results of Research Question

Paired sample t-tests were also run for both groups to measure the medical setting uncertainty from pretest to posttest. Contrary to the expected outcome, all subjects reported statistically significant increases in level of uncertainty from pretest (M=7.66) to posttest (M=7.96, t=-5.334, df=300, p<.001).

Next, the treatment and control groups were evaluated individually to see if the same phenomenon existed. Similarly, the treatment group reported significant increases in uncertainty from pretest (M=7.75) to posttest (M=8.02, t=-4.089, df=157, p<.001), as did the control group, pretest (7.56) to posttest (M=7.89, t=-3.551, df=142, p<.001).

In the analysis of health system satisfaction, a t-test between the treatment group (n=158, M=8.15, SD=1.83) and control group (n=143, M=7.86, SD=2.18) was nonsignificant (t=1.27, df=299, p=ns). However, it should be noted that health system satisfaction did increase in the treatment group, just not to statistical significance.
Medical Setting Uncertainty

The purpose of this study was to investigate whether or not the introduction of a treatment tool that explained medical procedures and expectations would alter medical setting uncertainty. Interestingly, when a paired-sample t-test was run between pretest and posttest uncertainty, subjects reported an increase in medical setting uncertainty from the time they arrived at the facility (M=7.65) to after they received the service (M=7.95; t=-5.334, df=300, p<.001). Similarly, a paired sample t-test found increased levels of health system satisfaction between the treatment group (M=8.15) and control group (M=7.86, t=1.268, df=299, p .103).

The increased levels of uncertainty and increased system satisfaction across both groups may be explained by the unique nature of the health care context in the study. Unlike many health care settings at the conclusion of the medical imaging exam the patient does not receive any outcome. A clinical report is generated by a physician (a radiologist) and provided to the patient’s referring physician. Often times the patient does not learn the results of their exam for a few days, if not longer (the exception being when clinically urgent findings are indicated. In such cases the referring physician is contacted immediately so the patient can be notified).
The treatment effect did, however, mitigate the increase in uncertainty between the pretest and posttest periods. Subjects who received the treatment reported a smaller increase of uncertainty (M=.2695) compared with the control group, whose uncertainty increased at a greater rate (M=.3237). While the difference between these two scores is statistically insignificant, it does provide some evidence that the treatment had some effect on reigning in medical uncertainty. When looking at medical setting uncertainty, it can be said that the introduction of the tool may have mitigated increases in medical setting uncertainty by helping the patient feel more informed, resulting in an increase in verbal communication between the patient and nurse or technologist. This indicates that the educational tool, while not producing the desired directional effect to the degree of statistical significance, mitigated the increase of uncertainty found in the control group.

Thus, while a patient may have a positive experience with the health system as represented by the facility, staff, and delivery of care (with the exception of exam results being provided), potentially leading to increased levels of health system satisfaction, they may still have the same level of medical uncertainty, or possibly higher levels at the conclusion of their appointment if their expectation to receive an outcome at the conclusion of their exam was strong enough.

System Satisfaction and Respondent Characteristics

A second variable of interest was health system satisfaction. A paired sample t-test was run to determine the difference between health
system satisfaction for the treatment group and the control group. There was no statistical significance in the one-tailed t-test between patients who received the informational tool (M=8.15) and those who did not (M=7.86, t=1.27, df=299, p=.103).

In addition to testing the main research question, a number of additional tests explored the nature of the outcomes for specific demographic information provided by respondents.

Medical Insurance

Interestingly, privately insured patients (n=267) had higher medical uncertainty (M=8.00) compared to nonprivately insured patients (n=29, M=7.50, t=1.93, n=297, p=.0275). Further, the same group had lower satisfaction (M=7.96) compared to nonprivately insured patients (M=8.65, t=1.80, n=294, p=.037).

Patients who reported having insurance through the government (n=46) reported a higher degree of system satisfaction (M=8.50) compared to patients who did not report subscription to a government plan (n=250, M=7.94, t=1.77, p=.04).

Although there is no previous research on health system satisfaction for comparison, a similar result was found by Moore, O’Hair, and Ledlow (2002) that showed higher interpersonal satisfaction between patient and provider for those patients subscribed to government plans, compared with privately insured or fee-for-service (FFS) patients. This may be due to the set of expectations held by FFS patients versus patients with government plans. FFS patients likely have higher expectations for the type of service they should receive due to the fact
they are paying higher premiums, and with some plans, a higher share-of-cost. Conversely, patients covered by a government plan may have lower expectations for service. Thus, even a nominal level of service quality may result in higher ratings of patient satisfaction for a patient covered by a government plan than a FFS patient.

System Satisfaction and Ethnicity

Continuing with the analysis of system satisfaction as an outcome variable, while there was an insufficient number of American Indian, Pacific Islander and Black respondents for test of differences, a statistically significant difference existed between Hispanic (n=80) and White respondents (n=175, F=3.04, p=.02), with Hispanics reporting a system satisfaction mean of 7.90, compared to Whites mean of 8.01, using Games-Howell post hoc MCP. The reason for this is unknown, however it is noted the difference is very small. Additionally, the racial composition of the imaging center staff roughly mirrors the data pool, with more White staff than Hispanic staff, perhaps indicating mere racial homophony.

While the current study did not intend to flush out the difference between ethnicities, finding disparities between racial groups is a potential concern. Future research must address the degree of health disparities, including potential disenfranchisement of ethnic groups in the medical context.

Theoretical Implications

Berger and Calabrese’s (1975) Uncertainty Reduction Theory posits that in new relationships individuals work to reduce their uncertainty (p.
This is accomplished through a range of methods, posed as axioms. Axiom 1 states that in order to reduce uncertainty individuals engage in an increased level of verbal communication. As uncertainty decreases so will the amount of verbal communication (p. 101). It is reasonable to assume that as uncertainty goes down satisfaction will increase, thus the main research question in the current study proposed that as medical setting uncertainty decreased, health system satisfaction would increase. Results did not indicate a statistically significant reduction in medical setting uncertainty between patients who received the educational tool (M=8.15) and the control group patients (M=7.86, t=1.268, df=299, p=.103).

It is also interesting that medical setting uncertainty increased from pretest (M=7.65) to posttest (M=7.95). Some research on Uncertainty Reduction Theory has found that contrary to Axiom 1 (as verbal communication increases uncertainty will decrease), obtaining additional information can actually lead to increases in uncertainty as it leads to other unanswered questions (Babrow & Kline, 2000), or by overwhelming the individual, leading to increases in stress and anxiety, which can result in increased levels of uncertainty (Brashers, 2001). In testing the assumptions of Uncertainty Reduction Theory, Sunnafrank (1990) found that individuals were motivated to maximize outcomes, not to reduce uncertainty (p. 98). Thus, if at the conclusion of an episode of care a patient is not able to secure the results of the exam, increases in uncertainty may result.

This is consistent with Problematic Integration Theory (Babrow, 2001) which calls attention to fundamental associations (i.e., have an
exam, receive the results) which are held with utter certainty (p. 556). When those assumptions are applied to a situation that violates the assumptions, the individual experiences uncertainty. This example can be applied to the health care context, where patients take Memory Organization Packets (MOPs) that provide a construct made up of interdependent variables for the process of care and delivery of medical outcomes (O’Hair et al., 1996) with them into the health system. In episodes when the interdependent variables do not match with the previously constructed MOP, the individual will often experience uncertainty (Babrow, 2001, p. 558).

One last application of Problematic Integration (PI) Theory to the current study can be found in the epistemology of uncertainty. PI posits that because individuals vary in their understanding of what it means to know something, they can differ in their interpretation of what it means to be certain or uncertain (p. 560). Thus, for one patient, not having the results at the conclusion of the medical imaging episode may not be problematic and may not result in increased uncertainty, while for another individual not having the results of the exam not only calls their assumptions about the health system encounter into question, but in doing so increases uncertainty. Due to the increased level of uncertainty in the current study the latter example would seem to apply.

In the current study given that patients were not provided the medical outcome at the time of their departure, coupled with the fact patients had just received a tangible medical imaging exam, could have caused the patient to attend to their medical uncertainty to a degree that was not present at the time they completed the pretest. In this case
patients were not able to maximize their desired outcome (being provided exam results), but within the medical imaging episode, due to positive interpersonal interactions with staff and the system of care, could still report increased levels of health system satisfaction.

**Uncertainty and Continuity of Relationships**

The majority of survey respondents (n=170) were at the medical imaging center to receive a mammogram. At the time the research was performed the vast majority of women over age 40 receive a mammogram every year (annually). As the mean age for respondents was 51.75 years of age, it is likely that uncertainty among these respondents was low due to the annual nature of their visits since age 40. If the level of uncertainty was low at the start of the medical imaging exam it is expected that it would remain low, and likely not further decrease. Additionally, in the case of mammography, due to the annual nature of the exam, there is often a historical relational component (for patients who are returning). The fact that these patients accounted for a majority of the survey respondents is likely to have impacted the overall outcome for medical setting uncertainty and health system satisfaction.

Uncertainty Reduction Theory proposes that relationships develop in three stages, the first stage of which is the entry stage. In this stage individuals first meet and exchange fairly superficial information (name, age, profession, where they are from, etc.). Through this information exchange each individual reduces relational uncertainty. While the interaction between the female patient and mammography technologist is punctuated by a 365-day period of time, if a female patient has been
going to the same medical imaging center since age 40, it likely she has a high degree of familiarity and comfort with both the health system and mammography technologists.

This was likely a significant contributing factor in the current research. A standard practice at medical imaging centers is to have the same mammography technologist perform a patient's mammogram year-after-year, or to accommodate a patient request for a specific technologist. Anecdotal evidence supports this conclusion. The researcher had the opportunity to review patient satisfaction surveys completed earlier in the year the current research was performed. Of significance was the number of times mammography patients referenced in their written comments how pleased they were with the continuity of care provided by the medical imaging center and the mammography technologists (i.e. “I was so happy Kris did my mammogram again this year”). Previous research has shown that continuity of care positively affects levels of patient satisfaction (Donahue et al., 2005; Forrest et al., 2002; Mainous et al., 2004). Additional research supports the significance of continuity of care as it pertains to relational development and uncertainty reduction.

In their research on uncertainty reduction and communication satisfaction, Neuliep and Grohskopf (2000) found that uncertainty reduction was associated with positive communication outcomes such as relational development (p. 74). To the degree that women return to the same provider for their screening mammogram and the same service providers (mammography technologists), it is fair to assume they have a familiar relationship with the technologists. Thus, due to level of
familiarity with the health system from previous episodes, and previously established relationships, levels of uncertainty would be low even prior to the exam being provided.

Limitations and Future Directions

Cegala and Broz (2003) indicate that in working to improving health by providing communication skills training, it likely requires more than reminding patients to ask questions or providing clear communication, like the educational tool in the current study. They propose that in order to affect actual change health care providers must model the desired behaviors, and provide patients opportunities to practice those skills modeled (p. 119).

The educational tool in the current study provided a general overview of the imaging center environment, what to expect regarding interactions with staff, and who to ask if patients had questions regarding their exam. It may be that this information, while helpful, may have been better reinforced through the addition of a hypothetical question on the handout, or by a staff member asking the patient if they had any questions about the contents of the handout, thus giving the patient an opportunity to apply some aspect of the information they read. Considering that medical setting uncertainty actually increased from pretest to posttest, information that explained the results would be provided to the patient’s referring physician (and not provided at the end of the exam) may have helped mitigate level of uncertainty.

One limitation of the current study is that while the educational tool provided information about the medical setting, staff involved in the
delivery of care, and who could answer questions, the posttest survey did not ask any questions to measure whether the patient actually engaged in question-asking or other information-seeking behaviors. Future research should include questions about the degree to which patients engaged in question-asking or information-seeking behaviors.

Another limitation pertaining to the educational flyer pertains to its content. While the flyer provided information on the facility, staff who would be helping the patient, and who the patient could go to for questions, it did not fully represent all of the dimensions of medical setting uncertainty measured by the scale used in the study. One example of this is the lack of explanation about the process of care, especially as it pertained to the results of the patient’s exam.

**Delivery Method and Familiarity of Environment**

As patients received the educational tool just prior to being taken back for their exam they may not have had enough time to read through the information completely and think of questions. Additionally, the medical context in which the information was provided may have had an impact on the patient. A patient may visit their primary care provider multiple times a year, or, if they have maintained the same provider for a number of years, they are highly familiar with the environment, staff, and health care provider. When compared to the primary care setting, visits to a medical imaging center are much less frequent, and the environment and system of care structured differently. Thus, the patient’s level of familiarity and comfort may have impacted their ability
to absorb and process the information contained in the educational tool adequately.

Previous research has shown similar results, based on timing of information provision and the medical context in which the information was distributed. vanVliet, Grypdonck, vanZuuren, Winnubst, and Kruitwagen (2004) found that patients who were provided with educational information just prior to a gastrointestinal endoscopic procedure did not report higher levels of satisfaction or reduced levels of anxiety. Yet other research has shown the benefits of pre-exam education in the primary care setting (Cegala, 1997; Cegala et al., 1995, 2000; Greenfield et al., 1988; Socha McGee & Cegala, 1998; Webber, 1990).

In the current study and in the study of the gastrointestinal patients, the environment was more foreign compared to the primary care setting. The primary care setting is a more familiar setting than the medical imaging or surgical setting, especially if the patient has been with a provider for a longer period of time.

Future research should study the impact of providing educational information prior to the day of the exam or medical procedure, and the impact of various communication mediums (standard mail, email, a medical provider’s website, blogs, etc.). It may be that if the patient is provided more time to review the educational information they will think of questions, and with more time, be able to seek out appropriate answers. This process may ultimately result in reduced medical setting uncertainty.
Delivery of Exam Results

One possible reason a decrease in uncertainty was not documented is because while patients received their medical imaging exam they were not provided with the results of the exam itself. Therefore, some degree of medical uncertainty regarding the clinical condition was still present in the population at the time of the posttest. This is a standard practice in medical imaging, and may produce higher levels of medical uncertainty than when the patient arrived. To measure the impact of receiving results, future research might include providing patients a postresults survey after they have received the exam outcomes from their referring physician. This may provide logistical problems for the researcher, as most patients do not learn of the outcomes of their study until their next appointment, which may be anywhere from 1 day to 2 weeks after the date of their exam. The likelihood of other variables being introduced that could affect a patient’s response is probable. These variables would likely affect the patients reported level of uncertainty and satisfaction, but have nothing to do with their actual visit to the medical imaging center.

At the same time, providing a postresults survey could broaden the scope of health system satisfaction, evaluating levels of intra-health system satisfaction (satisfaction across different health systems; i.e., satisfaction between medical imaging center and primary care provider). The goal of this type of research must then be explicitly to learn more about intra-health system satisfaction and not health system satisfaction and uncertainty for one health care system. The interdependent nature
of health delivery systems stands in stark contrast to the fragmented nature of multiple office visits of patients (Babrow, 2001).

When episodically studying health system satisfaction that does not provide a tangible outcome (such as the case of the current study), the temporal measurement of health system satisfaction could be in flux. Stated differently, while the episode of the medical imaging exam was an important part in the delivery of care, it did not provide information which was both needed and desired by the patient for addressing their health concern, leading to increased medical setting uncertainty.

**Conclusion**

Previously cited research in this study has shown the link between level of patient satisfaction and profitability. With the maturing of the health care market, health care firms must compete for an increasingly smaller pool of patients. Firms that desire to remain profitable must consider the significant role that medical setting uncertainty, health system satisfaction, and the primary role that communication plays in patient loyalty.

Health care firms who outperform their competitors will be those that understand the variables leading to patient satisfaction and loyalty over time. The modern consumer desires and expects more information that enables them to play a more active role in their health care.

Health care firms must take the time to understand their patient base. Additionally, they must look at the range of expectations held by patients within that base (a concept referred to as segmentation),
whether those differences are driven by age, gender, race, or type of insurance, that lead to patient satisfaction.

To remain competitive, health care firms must then identify the means by which to provide information to their patients in a timely and effective fashion that enable them to take a more active role in their health. Equally important, health care firms must ensure they understand what kind of information patient’s desire or expect, such that uncertainty is reduced, expectations fulfilled, and satisfaction increased.

Lastly, as system satisfaction by its nature is a collection of interpersonal interactions between the patient and various caregivers within the health system, health care firms must not neglect the significant role that both clerical and clinical staff plays in delivering the expected level of service. The closer firms are able to match patient expectations with actual delivered service (reducing the likelihood of any service gaps), the better the patients overall evaluations of service quality, and the more likely they are to remain loyal to that health care firm.
REFERENCES
REFERENCES


Hurley, K.E., Miller, S.M., Costalas, J.W., Gillespie, D., & Daly, M.B. (2001). Anxiety/uncertainty reduction as a motivation for interest in prophylactic oophrectomy in women with a family history of ovarian cancer. *Journal of Women’s Health and Gender-Based Medicine, 10*(2), 189-199.


APPENDIX A

UNCERTAINTY REDUCTION THEORY: AXIOMS AND THEOREMS
**Uncertainty Reduction Theory: Axioms and theorems**

| Axiom 1 | Given the high level of uncertainty present at the onset of the entry phase, as the amount of verbal communication between strangers increases, the level of uncertainty for each interactant in the relationship will decrease. As uncertainty is further reduced, the amount of verbal communication will increase. |
| Axiom 2 | As nonverbal affiliative expressiveness increases, uncertainty levels will decrease in an initial interaction situation. In addition, decreases in uncertainty level will cause increases in nonverbal affiliative expressiveness. |
| Axiom 3 | High levels of uncertainty cause increases in information seeking behavior. As uncertainty levels decline, information seeking behavior decreases. |
| Axiom 4 | High levels of uncertainty in a relationship cause decreases in the intimacy level of communication content. Low levels of uncertainty produce high levels of intimacy. |
| Axiom 5 | High levels of uncertainty produce high rates of reciprocity. Low levels of uncertainty produce low reciprocity rates. |
| Axiom 6 | Similarities between persons reduce uncertainty, while dissimilarities produce increases in uncertainty. |
| Axiom 7 | Increases in uncertainty level produce decreases in liking; decreases in uncertainty level produce increases in liking. |

| Theorem 1 | Amount of verbal communication and nonverbal affiliative expressiveness are positively related. |
| Theorem 2 | Amount of communication and intimacy level of communication are positively related. |
| Theorem 3 | Amount of communication and information seeking behavior are inversely related. |
| Theorem 4 | Amount of communication and reciprocity are inversely related. |
| Theorem 5 | Amount of communication and liking are positively related. |
| Theorem 6 | Amount of communication and similarity are positively related. |
| Theorem 7 | Nonverbal affiliative expressiveness and intimacy level of communication content are positively related. |
| Theorem 8 | Nonverbal affiliative expressiveness and information seeking are inversely related. |
| Theorem 9 | Nonverbal affiliative expressiveness and reciprocity rate are inversely related. |
| Theorem 10 | Nonverbal affiliative expressiveness and liking are positively related. |
| Theorem 11 | Nonverbal affiliative expressiveness and similarity are positively related. |
| Theorem 12 | Intimacy level of communication content and information seeking are inversely related. |
| Theorem 13 | Intimacy level of communication content and reciprocity rate are inversely related. |
| Theorem 14 | Intimacy level of communication content and liking are positively related. |
| Theorem 15 | Intimacy level of communication content and similarity are positively related. |
| Theorem 16 | Information seeking and reciprocity rate are positively related. |
| Theorem 17 | Information seeking and liking are negatively related. |
CONT.

<table>
<thead>
<tr>
<th>Theorem 18</th>
<th>Information seeking and similarity are negatively related.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theorem 19</td>
<td>Reciprocity rate and liking are negatively related.</td>
</tr>
<tr>
<td>Theorem 20</td>
<td>Reciprocity rate and similarity are negatively related.</td>
</tr>
<tr>
<td>Theorem 21</td>
<td>Similarity and liking are positively related.</td>
</tr>
</tbody>
</table>

APPENDIX B
SURVEY PACKET
Consent Form

SURVEY CONSENT FORM

Dear patient,
You are being invited to participate in a study conducted by Advanced Medical Imaging and California State University, Fresno. Through this study we hope to learn more about the factors that affect patient satisfaction and patient uncertainty in the medical setting. You have been selected as a possible participant in this study because we value your feedback and insights on your experience.

If you decide to participate, you will be asked to complete a pre-exam survey and provide standard demographic information. After your exam you will complete a post-service survey. We expect the total amount of time to complete these surveys to be approximately 8-10 minutes.

By providing us with your input it will help us identify those factors in the organizational context that create uncertainty and affect patient satisfaction. This research is not a medical study and will not affect the quality of your care. Your feedback will not affect how your medical imaging exam is provided today. There are no risks or benefits to participating in this study.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. We plan to provide a summary of patient’s perceptions as part of the study. No patient names will be included.

Your decision whether or not to participate will not prejudice your future relations with California State University, Fresno, or with Advanced Medical Imaging. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without penalty. The Department of Communication Committee on the Protection of Human Subjects at California State University, Fresno has reviewed and approved the present research.

If you have any questions, please ask to speak with Matthew Schulz, or call him at (559) 325-5800. Questions regarding the rights of research subjects may be directed to Constance Jones, Chair, CSUF Committee on the Protection of Human Subjects, (559) 278-4468.

If you wish, a copy of this form can be provided to you for your records. Please ask the front desk receptionist.

YOU ARE MAKING A DECISION WHETHER OR NOT TO PARTICIPATE. YOUR SIGNATURE INDICATES THAT YOU HAVE DECIDED TO PARTICIPATE, HAVING READ THE INFORMATION PROVIDED ABOVE.

Date: __________________ Signature: ___________________________
Pretest survey

Please take a couple minutes to answers the questions below. Your answers will help us improve our patient care and will be greatly appreciated. This information is being collected by a graduate student at California State University, Fresno, as part of a graduate thesis. Your responses will help us understand more about patients’ experiences in medical facilities. Your information will be kept confidential.

**PRE-EXAM SURVEY**

Medical reason you are here today: ____________________________________________

*Please rate the degree to which you agree or disagree with each of the statements below.*

<table>
<thead>
<tr>
<th></th>
<th>Totally disagree</th>
<th>Neutral</th>
<th>Totally agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>There are so many types of staff, and I don’t know who is responsible for what.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>I am not familiar with the procedures of the appointment.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>I am confused about the clinical setting.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>I am not familiar with this clinic.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>I do not know what is going on here.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>I cannot predict what I am supposed to do next.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>The setting here makes me feel relaxed.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>I don’t know who will be able to answer my questions.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
</tbody>
</table>

9. Age: ____________________________
10. Sex: __________________________
11. Income: _________________________
12. In the past 6 months how many times have you used this medical imaging facility? _____________
13. In the past 6 months how many times have you used a different medical imaging facility? _____________
14. With what race do you most identify? □ American Indian/Alaskan Native □ Asian/Pacific Islander □ Black □ Hispanic □ White
15. Do you: □ Have private medical insurance □ Not have medical insurance □ Use government medical insurance programs
16. Service you are here for today: □ CT □ Bone density scan (DEXA) □ Digital Mammogram □ Fluoroscopy □ MRI □ Nuclear Medicine □ Ultrasound □ X-Ray □ Other: ____________________________

STOP HERE
Do not complete the Post-Exam survey (yellow sheet) until after your exam.

*Survey 1 of 2*
Posttest survey

POST-EXAM SURVEY

Please rate the degree to which you agree or disagree with each of the statements below.

<table>
<thead>
<tr>
<th></th>
<th>Totally disagree</th>
<th>Neutral</th>
<th>Totally agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>There are too many types of staff, and I don’t know who is responsible for what.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>I am not familiar with the procedures of the appointment.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>I am confused about the clinical setting.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>I am not familiar with this clinic.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>I do not know what is going on here.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>I cannot predict what I am supposed to do next.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>The setting here makes me feel relaxed.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>I don’t know who will be able to answer my questions.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>I was satisfied with the overall experience with the facility and its staff.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>The staff was competent in answering questions.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>The staff was competent in caring for me or my family member.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>The day-to-day care and services were performed consistently.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>The medical imaging center had good facilities.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>I was satisfied with the level of care delivered by the technologists.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>I was satisfied with the level of care delivered by non-clinical staff.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Approximately how long was your visit today?</td>
<td>_______ min _________ hrs</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>How long did you expect your visit to take?</td>
<td>_______ min _________ hrs</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Did your exam involve sedation or anesthesia?</td>
<td>☐ Yes ☐ No</td>
<td></td>
</tr>
</tbody>
</table>

We greatly appreciate your participation.
Please provide your signed Informed Consent form and completed surveys (pink and yellow paper) to our Front Desk Receptionist before you leave.

Survey 2 of 2
To Our Patients,

Thank you for choosing Advanced Medical Imaging to receive your medical imaging exam. Opened in 1992, Advanced Medical Imaging is the Central Valley’s largest and most comprehensive freestanding outpatient medical imaging center. Advanced Medical Imaging is the only facility in the Central Valley to offer Digital Mammography, Bone Density (DEXA), CT, Fluoroscopy, MRI, Nuclear Medicine, Ultrasound, and Digital X-Ray.

STAFF THAT CARE. A number of different staff will be involved with your care during your exam, from our front desk registration personnel, to nurses and technologists. If you are unsure about what their role is, or the steps involved in providing your exam today please do not hesitate to ask them for an explanation.

TRUSTED EXPERTISE. Your physician referred you for a medical imaging exam because they are looking for additional information that will assist them in providing you with the best care possible. Our technologists and nurses are certified and licensed in their respective medical imaging areas. If you have any questions about your exam and what to expect please ask them for an explanation.

A WELCOMING ENVIRONMENT. Advanced Medical Imaging was designed with your comfort and privacy in mind. From a soothing atmosphere created by softened lighting, earth-tone paint accents and aesthetic artwork, to private patient waiting areas and quiet rooms, your experience at Advanced Medical Imaging is sure to be a positive one.

READILY AVAILABLE. Our goal is to provide you with a quality experience during your visit today. If you have any questions or concerns please feel free to ask for our site supervisor, or visit the “Contact Us” page on our company website (advancedmedicalimaging.com) and send us a message.
Control Group

Advanced Medical Imaging is a healthcare partner with Community Medical Centers (CMC). Below is information about Community Medical Centers.

<table>
<thead>
<tr>
<th>FACILITIES</th>
<th>LEADERSHIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals</td>
<td>Corporate administration</td>
</tr>
<tr>
<td>Clovis Community Medical Center</td>
<td>Tim Joslin, chief executive officer</td>
</tr>
<tr>
<td>559-324-4000</td>
<td>Patrick Raftery, executive vice president, chief operating officer</td>
</tr>
<tr>
<td>Community Regional Medical Center</td>
<td>Craig Castro, senior vice president, chief information officer</td>
</tr>
<tr>
<td>559-459-6000</td>
<td>Mary Contreras, R.N., senior vice president, chief nursing officer</td>
</tr>
<tr>
<td>Fresno Heart &amp; Surgical Hospital</td>
<td>Thomas A. Ulrich, M.D., senior vice president, chief quality officer</td>
</tr>
<tr>
<td>559-433-8000</td>
<td>Stephen Walter, senior vice president, chief financial officer</td>
</tr>
<tr>
<td>Urgent Care facility</td>
<td>John Zelaya, senior vice president, chief communication officer</td>
</tr>
<tr>
<td>Community Medical Center-Oakhurst</td>
<td>Ginny Burdick, senior vice president, human resources</td>
</tr>
<tr>
<td>559-683-2692</td>
<td>Abdul Kassir, senior vice president, managed care</td>
</tr>
<tr>
<td></td>
<td>Mark Mathieson, senior vice president, facilities management</td>
</tr>
<tr>
<td></td>
<td>Vick Anderson, vice president, managed care</td>
</tr>
<tr>
<td></td>
<td>Berj Ashotian, vice president, medical affairs</td>
</tr>
<tr>
<td>Outpatient centers</td>
<td>Karon Bradford, vice president of audit and compliance</td>
</tr>
<tr>
<td>Advanced Medical Imaging</td>
<td>Sylvia Coyle, vice president, legal services</td>
</tr>
<tr>
<td>559-447-4000</td>
<td>Jamie Franklin, chief project management officer</td>
</tr>
<tr>
<td>California Cancer Center</td>
<td>Roy Saroyan, vice president, Community Medical Foundation</td>
</tr>
<tr>
<td>559-447-4050</td>
<td>Colleen Stott, vice president, quality, regulatory &amp; risk management</td>
</tr>
<tr>
<td>California Imaging Institute</td>
<td>George Vasquez, chief technology officer</td>
</tr>
<tr>
<td>559-325-5800</td>
<td>Debbie Vega, vice president, finance administration</td>
</tr>
<tr>
<td>Community Health Center—Sierra</td>
<td></td>
</tr>
<tr>
<td>559-459-6000</td>
<td></td>
</tr>
<tr>
<td>Community SPORT Center</td>
<td></td>
</tr>
<tr>
<td>559-459-1700</td>
<td></td>
</tr>
<tr>
<td>Community Health Center-Cedar</td>
<td></td>
</tr>
<tr>
<td>559-459-6000</td>
<td></td>
</tr>
<tr>
<td>Deran Kolligan Ambulatory Care Center</td>
<td></td>
</tr>
<tr>
<td>559-459-4600</td>
<td></td>
</tr>
<tr>
<td>Living/Long-term care centers</td>
<td></td>
</tr>
<tr>
<td>Community Living Center-Fresno</td>
<td></td>
</tr>
<tr>
<td>559-459-1711</td>
<td></td>
</tr>
<tr>
<td>DeWitt Subacute &amp; Skilled Nursing Center</td>
<td></td>
</tr>
<tr>
<td>559-459-2050</td>
<td></td>
</tr>
<tr>
<td>Mental health facility</td>
<td></td>
</tr>
<tr>
<td>Community Behavioral Health Center</td>
<td></td>
</tr>
<tr>
<td>559-440-6800</td>
<td></td>
</tr>
<tr>
<td>Affiliations</td>
<td>Community Regional Medical Center</td>
</tr>
<tr>
<td>Central California Faculty Medical Group</td>
<td>Jack Chubb, chief executive officer</td>
</tr>
<tr>
<td>Community Medical Providers</td>
<td>Phyllis Baetz, chief operating officer</td>
</tr>
<tr>
<td>Sante Community Physicians</td>
<td>Joe Nowicki, chief financial officer</td>
</tr>
<tr>
<td>University of California, San Francisco</td>
<td>Karen Buckley, R.N., chief nursing officer</td>
</tr>
<tr>
<td>School of Medicine</td>
<td>Fresno Heart &amp; Surgical Hospital</td>
</tr>
<tr>
<td>University of the Pacific</td>
<td>Wanda Holdeman, R.N., chief executive officer</td>
</tr>
<tr>
<td>Samuel Merritt College</td>
<td>Cindy Cervantes, N.P., P.A., chief nursing officer</td>
</tr>
<tr>
<td></td>
<td>Community Behavioral Health Center</td>
</tr>
<tr>
<td></td>
<td>Dawan Haubursin, chief executive officer</td>
</tr>
</tbody>
</table>
APPENDIX C

SCALE
**Health System Satisfaction scale**

1. I was satisfied with the overall experience with the hospital and its staff.

2. The hospital staff was competent in answering questions.

3. The hospital staff was competent in caring for me or my family member.

4. The day to day care and services were performed consistently.

5. The hospital had good facilities.

6. I was satisfied with the level of care delivered by the physicians.

7. I was satisfied with the level of care delivered by the nurses.

Medical Setting Uncertainty Scale

Please indicate, on a scale from “1” to “9,” to what degree you agree or disagree with the following statements. (1=Totally Agree, 9=Totally Disagree).

1. There are so many types of staff, and I don’t know who is responsible for what.

2. I am not familiar with the procedures of the appointment.

3. I am confused about the clinical setting.

4. I am not familiar with this clinic.

5. I do not know what is going on here.

6. I cannot predict what I am supposed to do next.

7. The setting here makes me feel relaxed.

8. I don’t know who will be able to answer my questions

APPENDIX D

CORRELATION MATRIX
## Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Income</th>
<th>Approximate Wait Time</th>
<th>Expected Wait Time</th>
<th>Medical Setting Uncertainty Pretest</th>
<th>Medical Setting Uncertainty Posttest</th>
<th>Health System Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>Pearson Correlation</td>
<td>1.000</td>
<td>.072</td>
<td>.021</td>
<td>-.075</td>
<td>.096</td>
<td>-.040</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.309</td>
<td>.725</td>
<td>.216</td>
<td>.096</td>
<td>.494</td>
<td>.979</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>299.000</td>
<td>204</td>
<td>295</td>
<td>276</td>
<td>299</td>
<td>299</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td>Pearson Correlation</td>
<td>.072</td>
<td>1.000</td>
<td>-.043</td>
<td>-.168*</td>
<td>.015</td>
<td>.087</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.309</td>
<td>.547</td>
<td>.019</td>
<td>.826</td>
<td>.215</td>
<td>.092</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>204</td>
<td>205.000</td>
<td>201</td>
<td>194</td>
<td>205</td>
<td>205</td>
</tr>
<tr>
<td><strong>Approximate Wait Time</strong></td>
<td>Pearson Correlation</td>
<td>.021</td>
<td>-.043</td>
<td>1.000</td>
<td>.683**</td>
<td>-.177**</td>
<td>-.048</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.725</td>
<td>.547</td>
<td>.000</td>
<td>.002</td>
<td>.409</td>
<td>.565</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>295</td>
<td>201</td>
<td>296.000</td>
<td>276</td>
<td>296</td>
<td>296</td>
</tr>
<tr>
<td><strong>Expected Wait Time</strong></td>
<td>Pearson Correlation</td>
<td>-.075</td>
<td>-.168*</td>
<td>.683**</td>
<td>1.000</td>
<td>-.122*</td>
<td>-.013</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.216</td>
<td>.019</td>
<td>.000</td>
<td>.042</td>
<td>.832</td>
<td>.364</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>276</td>
<td>194</td>
<td>276</td>
<td>277.000</td>
<td>277</td>
<td>277</td>
</tr>
<tr>
<td><strong>Medical Setting Uncertainty Pretest</strong></td>
<td>Pearson Correlation</td>
<td>.096</td>
<td>.015</td>
<td>-.177*</td>
<td>-.122*</td>
<td>1.000</td>
<td>.744**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.96</td>
<td>.826</td>
<td>.002</td>
<td>.042</td>
<td>.000</td>
<td>.021</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>299</td>
<td>205</td>
<td>296</td>
<td>277</td>
<td>301.000</td>
<td>301</td>
</tr>
<tr>
<td><strong>Medical Setting Uncertainty Posttest</strong></td>
<td>Pearson Correlation</td>
<td>-.040</td>
<td>.087</td>
<td>-.048</td>
<td>-.013</td>
<td>.744**</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.494</td>
<td>.215</td>
<td>.409</td>
<td>.832</td>
<td>.000</td>
<td>.016</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>299</td>
<td>205</td>
<td>296</td>
<td>277</td>
<td>301.000</td>
<td>301</td>
</tr>
<tr>
<td><strong>Health System Satisfaction</strong></td>
<td>Pearson Correlation</td>
<td>.002</td>
<td>-.118</td>
<td>.034</td>
<td>.055</td>
<td>.133*</td>
<td>.138*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.979</td>
<td>.092</td>
<td>.565</td>
<td>.364</td>
<td>.021</td>
<td>.016</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>299</td>
<td>205</td>
<td>296</td>
<td>277</td>
<td>301</td>
<td>301</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed); **Correlation is significant at the 0.01 level (2-tailed).
California State University, Fresno

Non-Exclusive Distribution License
(to make your thesis available electronically via the library’s eCollections database)

By submitting this license, you (the author or copyright holder) grant to CSU, Fresno Digital Scholar the non-exclusive right to reproduce, translate (as defined in the next paragraph), and/or distribute your submission (including the abstract) worldwide in print and electronic format and in any medium, including but not limited to audio or video.

You agree that CSU, Fresno may, without changing the content, translate the submission to any medium or format for the purpose of preservation.

You also agree that the submission is your original work, and that you have the right to grant the rights contained in this license. You also represent that your submission does not, to the best of your knowledge, infringe upon anyone’s copyright.

If the submission reproduces material for which you do not hold copyright and that would not be considered fair use outside the copyright law, you represent that you have obtained the unrestricted permission of the copyright owner to grant CSU, Fresno the rights required by this license, and that such third-party material is clearly identified and acknowledged within the text or content of the submission.

If the submission is based upon work that has been sponsored or supported by an agency or organization other than California State University, Fresno, you represent that you have fulfilled any right of review or other obligations required by such contract or agreement.

California State University, Fresno will clearly identify your name as the author or owner of the submission and will not make any alteration, other than as allowed by this license, to your submission. By typing your name and date in the fields below, you indicate your agreement to the terms of this distribution license.

Matthew D. Schulz

Type full name as it appears on submission

March 12, 2010

Date