

ENHANCING SERVICE USAGE BY IMPROVING ACCESS:

ESSAYS ON SERVICE MARKETING

by

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Professor Sengun Yeniyurt

and approved by

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## ABSTRACT OF THE DISSERTATION

Enhancing Service Usage by Improving Access:

Essays on Service Marketing

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One of the most effective ways to improve access, and in turn service usage, is by reducing barriers to access and strengthening enablers to access. Drawing from social exchange theory, relationship marketing theory, service-dominant logic and behavioral model of health service use, I examine customer access in the context of health care. To explore this issue, I conduct two studies to examine the likelihood of customer-initiated missed service encounters and the likelihood of customer's usage of preventive care services.

In my first essay, I explore the following questions: How does a customer's value of their relationship with a provider influence the likelihood of missed service encounters? How will incurring a service failure by a provider influence missed service encounters? How does the effect of loyalty to a provider influence the effect of service failures on future missed service encounters? Logistic regression results show that a customer's met service history is critical to the success of customer-provider

relationships and can have positive spillover effects to other relationships within the organization. Further, the results indicate that customer-provider relationships are reciprocal in nature. Provider-initiated service failures are found to weaken the value of the relationship between the customer and scheduled provider but can be buffered by a customer's loyalty to their scheduled provider.

In my second essay, I explore the following questions: How does a customer's need for service, enabling factors and pre-disposing characteristics influence future preventive service usage? How do different groups of customer's respond to the effect of enabling factors on future preventive service usage? Logistic regression results show that preventive service usage is influenced by the degree of need for a service, insurance coverage and type, and demographic variables. Of key interest are the findings that 1) the degree to which insurance coverage and type of coverage matters varies amongst different demographic cohorts, and 2) the type of insurance a customer carries influences the customer's need for services. This research offers a novel account of the service encounter phenomenon and offers management frameworks to improve service usage. I conclude by offering theoretical and practical implications for marketers and public policy.

## **Dedication**

I dedicate my dissertation work to my family who have made great sacrifices to see me succeed. I am especially grateful to my beloved husband, Brian Patrick Faulk, Esq. and my three adored sons; Dylan Patrick, Kyle Alexander and William Connor who inspire me each day. You make it all worthwhile.

A special feeling of gratitude to my mother, Dr. Sharon Anne O'Connor-Petruso, whose words of encouragement, pearls of wisdom and unconditional love have ignited a passion for learning that will burn in perpetuity. A heart-felt thank you to my wonderful grandmother, Stella Victoria Kowchefski, for her steadfast love and support.

I also dedicate this dissertation to my committee and Dr. Julie Ruth- who have provided me the essential tools to excel as a researcher and academic.

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## CHAPTER 1: INTRODUCTION

### 1.1. Service Usage

Across the globe, organizations continue to search for ways to increase service usage. One of the most effective ways to enhance customer's use of products and services is through strengthening and solidifying relationships between customers and providers (Christopher, Payne and Ballantyne 2013). By focusing on creating and sustaining mutually beneficial relationships managers can boost service usage. Organizations that successfully build relational bonds between customers and providers are able to competitively position themselves and attain competitive advantage while enhancing customer value (Berry 1995; Payne and Frow 2005; Palmatier et al. 2006). To ensure these relational bonds can effectively be instituted, I argue that the first step to better managing service usage is through increasing customer access to service.

The failure for a customer to access services is driven by four modalities. First, the customer does not schedule or seek the service- an apparent lack of awareness/need for the service encounter. Second, prevailing circumstances (e.g., enabling factors and pre-disposing characteristics) can serve as barriers to access and therefore detrimentally affect service usage. Third, the customer cancels or does not show up for the service encounter (e.g., their scheduled appointment with a provider) - signaling a lack of value in the relationship. Finally, the service provider bumps (reschedules) the service appointment- thereby initiating a service failure which affects the customer's value of the relationship. The goal of this research is to explore these drivers as they relate to service usage.

When customers fail to access a service, the customer, the provider and the service organization are placed at risk. To better understand how failure to access services affects the aforementioned parties, the following examples are presented in the context of health care.

Consider health care customer A, whose health insurance plan covers the flu vaccination. Having an insurance plan that covers the service enables customer A to schedule an appointment with her health care provider. However, after learning that the vaccine only covers a portion of the virus subtypes, customer A decides she does not need the flu shot and does not show up for her appointment with her scheduled provider. In this scenario, we see that although customer A's insurance serves as an enabler to access the service, her lack of need for the service serves as a deterrent to service access. As a result, we see that the customer's well-being and financial security is placed at risk if she catches the flu virus. Further, when the customer fails to meet the provider's expectations, customer A's no-show appointment is likely to disrupt her relationship with her scheduled provider (Jones and Hedley 1988; Pesata, Pallija and Webb 1999). Based on this scenario- access to service usage is influenced by three modalities; need for the service, external circumstances (e.g., insurance type) and the customer's no-show behavior.

On the other hand, health care customer B does not carry insurance. Although her lack of insurance serves as a deterrent to access services, customer B perceives the flu vaccination as necessary and she dutifully schedules the service with her provider. On the day of customer B's appointment, her scheduled provider bumps (re-schedules) her appointment to a later date due to overbooked time slots. Based on this scenario- access

to service usage is influenced by three modalities; need for the service, external circumstances (e.g., lack of insurance coverage) and provider-initiated service failures.

Customer-initiated missed service encounters (no-show appointments and cancelled appointments), place the provider and organization at increased risk. First, missed service encounters are a major drain on resources as providers and staff are idle when customers miss scheduled service appointments. Second, missed service encounters can be quite costly to the organization, affecting a significant amount of revenue. In the health care setting, previous research has found that no-show appointments can affect up to thirty percent of a clinic's operating income (Moore et al. 2001). Missed service encounters also present operational inefficiencies as they waste the time of staffers who prepare for appointments.

Barriers related to service access are widespread. Numerous service industries—such as financial services, personal care, lodging, transportation, etc., all face challenges related to improving service utilization. Consider a customer's reservation at a five star hotel. In this scenario, the customer has the financial resources to schedule the reservation, thereby enabling him access to high quality services. As a frequent patron of other hotels operated under the same brand, the customer feels compelled to try brand A's latest installment. Upon arrival at the hotel, the hotel manager informs the customer that his hotel room is currently unavailable (due to the reservation being overbooked) and offers to re-schedule the customer to another date. By bumping (re-scheduling) the customer's reservation to another date, the customer has incurred a service failure from the service provider. Metts (1994) research on inter-personal relationships has shown that the strength of a relationship is compromised when a relationship partner violates the

implicit or explicit rules governing the relationship. Similarly, when a provider fails to meet the customer's expectations by initiating a service failure, the customer's perceived value of the relationship is adversely affected. When a customer's expectations are not met, future performance in the service encounter can suffer.

The objective of this research is to shed light on how barriers related to service access service usage. To do so, I explore how customer behavior, provider behavior, and customer characteristics influence service usage in two essays. In the first essay, I explore the effect of a customer's service history and provider's service failure history on customer-initiated missed service encounters. In the second essay, I examine how need for service, enabling factors and pre-disposing characteristics influence service usage. A brief review of the conceptual frameworks and research questions are detailed below.

## **1.2. Theoretical Development**

There is an abundance of research in the literature investigating interpersonal relationships, however less has been written on how the relationship history of customers and providers and the characteristics of the customer and provider influence service usage. Previous research in social exchange theory has found that individuals maintain relationships when benefits exceed the costs; that is the relationship is regarded as having value (Thibaut and Kelly 1959; Blau 1964). The literature suggests that customers continue to patronize a service provider when the relationship offers value. Broadly speaking, I propose that the customer's value of the relationship can be conceptualized as their desire to have a relationship with a service provider and their willingness to continue services with their service provider. Research in relationship marketing has found that relationships between parties are exchange driven (Morgan and Hunt 1994),

building upon the premise that it is the interaction itself that is the key construct in all business activity (Ford 1994). Service dominant (S-D) logic affirms that transactions are reciprocal, service is exchanged for service, and customers and providers co-create the value within the exchange (Gronroos 2000). The organization co-creates value with the customer by offering the needed service and the customer co-creates value with the organization by enhancing the brand and relationship equity for the organization through their purchasing behavior (Vargo and Lusch 2010).

Each of these paradigms (e.g., social exchange theory, relationship marketing theory and S-D logic) offer unique insight into the customer-provider relationship. Primarily, value must be attained in transactions between the customer and provider in order for relationships to persevere. Early researchers in social exchange theory, Thibaut and Kelley (1959), suggest that Party A's dependence on Party B is a function of whether A believes the outcomes from the relationship with B are valuable in general, and in comparison to outcomes available from alternative relationship partners (i.e., Parties C, D, etc.). Similarly, research in relationship marketing has found that the customer's desire to maintain their relationship with the provider is largely determined by their evaluation of the relationship (Henning-Thurau and Klee 1997). The customer's evaluation of the relationship is a function of commitment and trust (Morgan and Hunt 1994), relationship quality (Crosby, Evan and Cowles 1990) and the mutual coordination of efforts (Anderson and Narus 1990).

Building upon relationship marketing theory, researchers in the services area maintain that the customer's evaluation of the value of the relationship is driven by the mutual commitment by the customer and provider (Berry and Parasuraman 1991), their

satisfaction (Cronin Brady and Hult 2000), and their cumulative perceptions (Boulding 1993). From an S-D logic perspective, we see that the relationship between Party A and Party B is reciprocal, where each party is obligated to fulfill promises to one-another in the co-creation of value (Gronroos 2006). Similarly, Anderson and Narus (1990) purport that the success of each firm in a working partnership is dependent upon the mutual recognition of each party's role in the success of the relationship and the mutual coordination of efforts to meet the needs of the marketplace.

The customer's value of the relationship, as I conceptualize it, focuses on a customer's likelihood to have and to maintain a relationship with a provider through continued usage of services (e.g., met service appointments). Parties remain in exchange relationships when the value obtained, as compared to the competition, is greater than the cost (Levinger 1979). Likewise, the customer may be dependent on a service provider because the partnership yields some valued outcomes. Essentially, Party A, will acquire or continue to acquire services from Party B when the customer is able to attain value from the relationship. It is important to note that the outcomes may surpass the customer's own subjective standard of performance. Alternatively, the customer may be dependent on the service provider because the relational outcomes—while not satisfying—are still better than alternatives (Anderson and Narus 1990). This suggests that dependence on the relationship partner is affected by the benefit of remaining in the relationship with the service provider relative to the expected benefit of a relationship with a competitor.

The customer's value of the relationship with their provider and the service organization can become adversely affected when the customer incurs a service failure from their provider or by other providers within the service organization. Previous



research has shown that two critical components of service relationships are managing delivery (strategic and tactical decisions) and customer satisfaction (successful enduring relationship) (Rust et al. 2006). When a service is disrupted by management, customer satisfaction and the relationship between the consumer and provider is placed at risk. How the relationship is affected can have great implications for the customer's future patronage to their provider. Service failures have been found to be a leading cause of customers becoming disloyal to a service or service provider (Smith, Bolton and Wagner 1999). A firm or company's failure to meet an obligation may be a catalyst for a consumer to switch providers. For various reasons providers may have to bump a customer's appointment to another time. This bump may be regarded as a breakdown in the customer- provider relationship and prompt a customer to become disloyal to their provider and to the service organization.

Research has found that the behavior of other participants (i.e., service personnel) in a service encounter can influence the customer and therefore the outcome of the service encounter (Bitner 1990). If a customer's service expectations are not met, their behavior could change. In the customer-provider relationship, when a provider disrupts service, the customer's needs are not met and the customer's value of the relationship suffers. To explore the effect of unfulfilled agreements (provider-initiated service failures) on the relationship between a customer and provider, I explore how incurring a service failure from a scheduled provider and other providers within the organization affect future service encounters. To explore how a customer's relationship with a provider can spill over to other relationships within the organization, I examine the spillover effect through the lens of umbrella branding.

Umbrella branding is the practice of labeling more than one product or service with a single parent brand name. Information about one service can serve as a signal to affect the demand for another service within the same organization (Erdem and Sun 2002). This effect is known as the spillover effect. Similarly, I believe a customer's experience with one service provider (e.g., Doctor X) will affect their experience with another service provider (e.g., Doctor Y) within the same organization. That is, if a customer has positive experiences with a service provider in the organization, that experience is likely to influence the customers' future experience with other providers within the organization. The same concept holds true for a negative experience; adverse experiences with one service provider may serve as a signal of inferior quality and negatively influence future experiences with a different provider within the same organization (e.g., the same brand). To explore the spillover effect within the service area, I examine how a customer's service history as well as their service failure history with other provider(s) than the scheduled provider influence future missed service encounters.

The customer's value of the relationship is integral to the relational exchange (Gronroos 2000; Morgan and Hunt 1994; Sirdeshmukh, Singh and Sabol 2002; Vargos and Lusch 2010). As discussed, repeat patronage to a provider has been found to positively influence future service encounters (Crosby and Steven 1987). Due to the value attained in the relationship, I believe that a customer's met service encounter history with a provider can act as a shield and mitigate the effects of provider-initiated service failures. Therefore, I explore how the effect of provider-initiated service failures on future missed service encounters differs by the customer's met service encounters.

In my second essay, I provide insight and recommendations into bridging the gap between access and service usage. There are a variety of factors which affect customer access to services. Identified barriers include accessibility and availability of services (Saxe, Cross and Silverman 1988), affordability (Knitzer et al. 1990), awareness (Scott, Balch and Flynn 1984), gender and race (Calsyn and Roades 2008), and lower socio-economic status (Briones et al. 1990). To capture the effect of these variables on customer access to health care, Andersen developed the behavioral model of health service use (1968, 1995).

A seminal model for analyzing health service usage, the behavioral model of health service use is one of the most widely used frameworks to understand drivers of health care utilization (Phillips et al. 1998). The behavioral model maintains that there are three primary drivers of health service usage; need, enabling factors and pre-disposing characteristics (Andersen 1968, 1995). Generally, before a customer utilizes a service, there is a need for the service. This need is typically expressed as a customer's health status (Babitsch, Gohl and von Lengerke, 2012). For example, customers seek appointments with their health care provider when they need to attain services with their primary care provider or specialty provider. Enabling factors are considered the necessary resources (i.e., capital) the customer must withhold in order to attain the selected service (Andersen 1968; 1995). The third component of the behavioral model is pre-disposing characteristics. Since behavior is subject to change based on socio-demographic characteristics, it is important to include the effect of pre-disposing characteristics in the model. To better understand service usage, I explore how the need for service, enabling factors and pre-disposing characteristics influence preventive health service usage.

Preventive health services are defined as health care services that are designed to reduce the likelihood of disease or illness. Common examples include services such as immunizations, counseling and screening tests. Although the use of preventive health care has been shown to improve health outcomes and save money (Cohen, Neumann and Weinstein 2008), only a small portion of Americans actually receive preventive care (Maciosek et al. 2010). I am confident that this research offers a framework for organizations to improve access to preventive services and ultimately improve customer outcomes.

As discussed, need for service, enabling factors and pre-disposing characteristics play a vital role in customers' access to services. Intuitively, the greater the need for a service, the greater the likelihood a customer will use that service. For example, a health care customer with a positive family history of breast cancer will have a greater need for routine mammography exams than a health care customer who does not have a positive family history of cancer (Zapka et al. 1992). Availability of resources are extrinsic environmental factors that enable a customer to access services with a service provider. For example, insurance coverage has been found to be positively related to health service utilization (Zapka et al 1992). Andersen (1968, 1995) defines pre-disposing characteristics as immutable customer characteristics (i.e., age, gender, and race). To capture the heterogeneity across customers in the model, pre-disposing characteristics are included.

Service access varies by gender, race and age (Hayward et al. 1998; Lasser, Himmelstein and Woolhandler 2006). Therefore, I expect that the effect of insurance coverage and type of insurance coverage will vary across different socio-demographic

groups. Further, I believe customers who have a greater need for preventive health services will be affected by the presence of insurance coverage and the type of insurance coverage held. Therefore, I explore how the effect of need for service on preventive health service usage differs by insurance coverage and type. In addition, I explore how the effect of pre-disposing characteristics on preventive health service differs by insurance coverage and type.

### **1.3. Research Questions**

In my first essay, to investigate the customer's value of their relationship with their provider and the value of their relationship with the service organization, I investigate the following: How does a customer's service history with their scheduled provider (e.g., supplier the customer has an appointment with) influence missed service encounters? How does a customer's service history with other providers within the service organization (e.g., supplier other than the scheduled provider) influence missed service encounters? How does provider-initiated service failures from either the scheduled provider or other providers within the organization influence the likelihood of future missed service encounters? Finally, can a customer's met service history with one provider buffer the effect of a service failure by any provider within the organization?

In my second essay, I apply the behavioral model of health services use to better understand drivers of preventive health service usage. As an exploratory essay, I pose the following questions: How does the need for a service influence service usage? How does insurance coverage and type of insurance influence service usage? How does service usage vary across different demographic groups? How does the effect of pre-disposing characteristics on future service usage vary by insurance coverage and type? Finally, how

does insurance coverage/type influence the effect of need for service on future service usage?

#### **1.4. Empirical Studies**

In the discussion above, I illustrate how access to services and in turn service usage is influenced by a variety of factors. The goal of this research is to better understand the service encounter phenomenon by exploring missed service encounters and preventive health service usage. In both essays, I had the privilege to utilize secondary data that were obtained through the cooperation of a major metropolitan hospital that serves a diverse mix of urban and suburban patients in an outpatient setting. Logistic regression analysis (logit) is used in both empirical studies. In the first essay, logit is used to estimate the effects of the explanatory variables on the probability of a missed service encounter for the customer's next appointment. In the second essay, logit is used to estimate the effects of the explanatory variables on the probability of scheduling a preventive health care appointment for the customer's next scheduled service appointment

Through this research, I add to the literature by providing unique insight into service access by offering theoretical and practical implications. In the first essay I add to social exchange theory, relationship theory and services literature by exploring the spillover effect in light of both historical service encounters and service failures. Second, I demonstrate how relationships are interdependent and rely on reciprocity for survival. Third, I build upon the literature by illustrating the effect of customer allegiance/loyalty in the presence of service failure. In the second essay, I extend the behavioral model by exploring how the effect of pre-disposing factors on preventive service usage is

influenced by insurance coverage and type of insurance coverage and how the effect of need for service on preventive health service usage varies by insurance coverage and type. In addition, I contribute to insurance theory by partitioning the effect of various sub-types of insurance on service usage. Each implication is discussed in detail in the accompanying essays.

As a result of my research, I am able to offer frameworks to enhance theoretical and practical understandings of service usage. Identifying barriers to service access affords a distinct marketing opportunity for management to improve current practices that will improve operational efficiencies, enhance customer loyalty and improve their financial position. Albeit this research is limited to the health care setting, the frameworks and models are likely to be generalizable and applicable to most service organizations.

The essays are presented in the following manner: First, I provide a review of the literature related to service usage. I draw from the research literature to identify how a customer's service history, the provider's service failure history, need for service, enabling factors and pre-disposing characteristics relate to service usage. Second, I construct research models to explain the relationship of the aforementioned factors on service usage. Third, I generate research questions and empirically test them. Fourth, I offer theoretical and practical implications for marketers and public policy. Finally, I acknowledge limitations of the research and offer suggestions for future work.

## CHAPTER 2: ESSAY ONE

### THE VALUE OF CUSTOMER-PROVIDER RELATIONSHIPS: AN INVESTIGATION INTO MISSED SERVICE ENCOUNTERS

#### 2.1. Introduction

Whether a customer fails to arrive for their appointment with their physician or fails to arrive for their reservation at a restaurant, customer no-shows and cancellations are bad for business. In attempt to reduce these missed service encounters, many service professionals have resorted to charging customers and even shaming the customer over social media when they miss their appointment/reservation (Reddy 2012). Service industries have struggled with customer-initiated cancellations and no-shows for years and it still remains in the heart of what challenges managers today. A global phenomenon, missed service encounters affect any service industry that is driven by appointments or reservations.

Missed service encounters (missed service appointments), defined as customer-initiated cancellations and no-shows, affect the customer, the provider, and the umbrella organization providing the service. The umbrella organization is the firm that offers different services under the same brand name; e.g., different service providers working for the same organization. Consider the health care customer who misses an appointment with a doctor and who does not seek alternative care. The customer is potentially putting their health at risk as their condition may worsen over time, which places them at risk of further deterioration, relapse, hospital admission and unnecessary morbidity (Mitchell and Selmes 2007). Missed service encounters also impose additional costs to the customer. To assuage the effects of missed service encounters, numerous service



industries (i.e., health care, restaurant, travel, personal care, etc.) have tried to offset the losses incurred by cancellations and no-shows by double-booking (Bech 2005) and imposing fees (Alexandrov and Lariviere 2012).

In terms of risks to the provider and organization, when the relationship between the service provider and the customer is jeopardized, the provider's efficiency and productivity is affected. Missed service encounters decrease revenue and waste valuable departmental resources (Kopach et al. 2007). In particular, organizations lose potential revenue when scheduled appointment slots go unused due to a cancellation or no-show. Regarding the service provider, missed service encounters negatively affect the provider's level of engagement with the customer as they foster negative sentiments about the customer (Husain-Gambles et al. 2004) and decrease levels of quality customer-provider communication (Pesata, Pallija and Webb 1999).

The goal of this essay is to better understand service usage, specifically missed service encounters, through enhancing understanding of the service encounter phenomenon. Through the lens of a customer's appointment, I examine the marketing exchange in service encounters from three distinct perspectives; the customer, the service provider and the umbrella service organization in the context of health care. To explore missed service encounters, I examine the customer's value of the relationship with their scheduled provider and the organization (e.g., hospital). The scheduled provider is defined as the service supplier the customer has an appointment with. The relationship with the organization is conceptualized as the customer's relationship with other providers within the organization other than the scheduled provider. The literature suggests that relationships are transaction based; individuals will continue to maintain the

relationship when they find the outcomes of the relationship valuable in comparison to alternatives (Thibaut and Kelly 1959, Anderson and Narus 1990). Individuals form and maintain a relationship as long as they believe and subsequently find it in their mutual interest to do so (Burgess and Huston 1979). The relationships are assumed to grow, develop, deteriorate, and dissolve as a consequence of the social exchange process (i.e., the interactions).

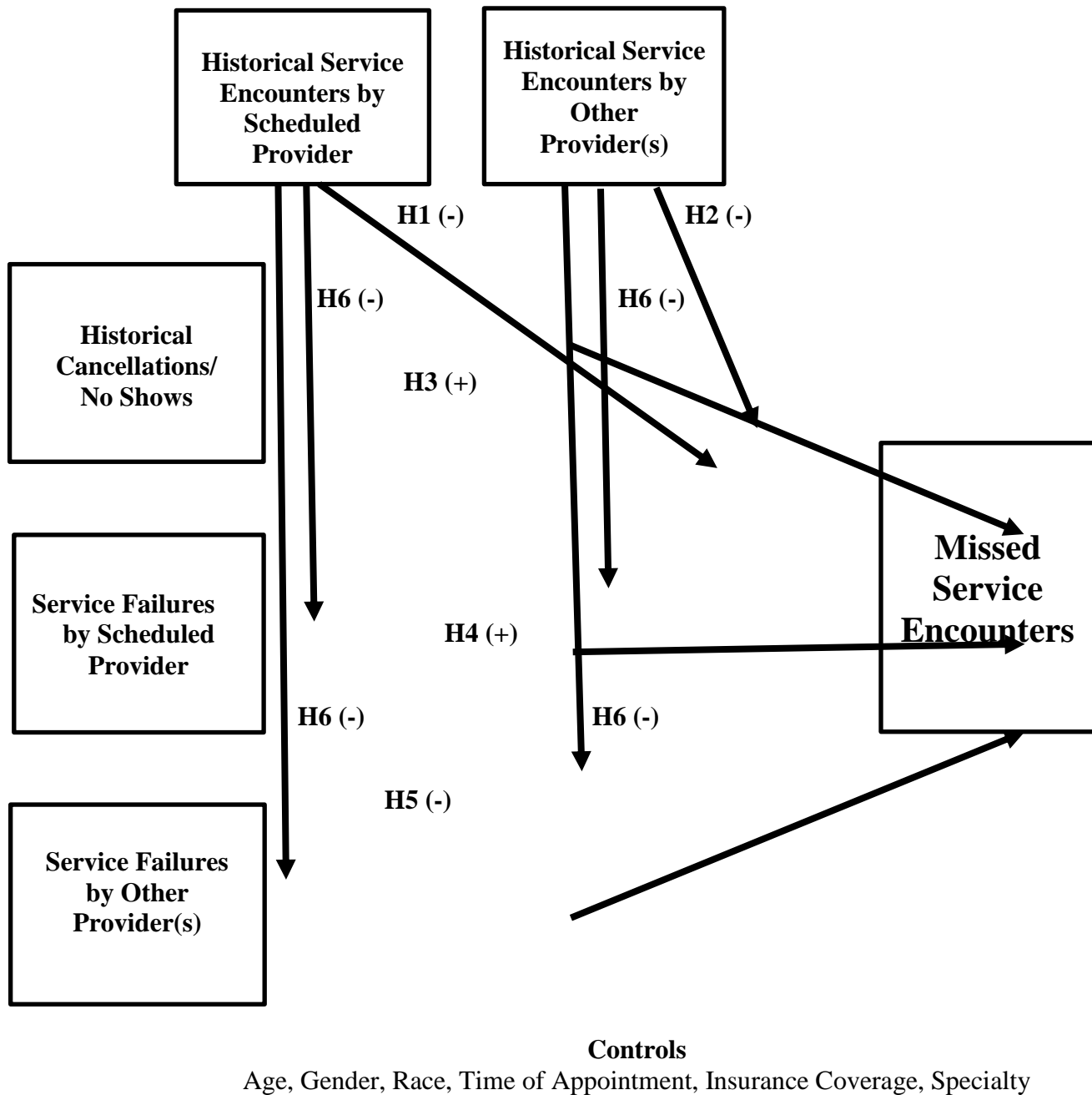
The customer and service provider depend on each-other in the co-creation of value (Gronroos 2000). Customers continue to utilize services from a service provider when they continue to attain value from the relationship. However the relationship itself can become threatened when the provider fails to provide value to the customer during an exchange (i.e., provider-initiated service failure). To explore this issue, I examine the effect of the customer's service relationship with their provider and their relationship with the organization on future missed service encounters.

Using social exchange theory (Blau 1964; Burgess and Huston 1979; Thibaut and Kelly 1959), relationship theory (Anderson and Narus 1990, Henning –Thurau and Klee 1997; Morgan and Hunt 1994;) and service-dominant logic (Gronroos 2000, 2006; Vargo and Lusch 2010) as my theoretical foundation, I explore the following questions: How does a customer's service history with their scheduled provider and other providers within the organization influence the likelihood of future missed service encounters? How will incurring a service failure from a scheduled provider or other providers within the organization affect future missed service encounters? Finally, how does the effect of met service encounters moderate the effect of service failures on future missed service encounters?

Evaluating and understanding factors influencing the ability to maintain service relationships (i.e., keep scheduled service appointments) are essential to customer relationship management; specifically in terms of creating value and gaining competitive advantage (Edvardsson et al. 2011; Karpen et al. 2012). To gain competitive advantage, organizations need to identify the determinants of missed appointments/reservations and their effect on customer-provider relationships as well as customer flow. In particular, a cancelled or no-show appointment is an unused time slot that could be used by another patient. By identifying these drivers, management will have the ability to quell detrimental factors thereby strengthening the customer-provider relationship and in turn the customer-organization relationship. Identifying drivers of missed service encounters affords organizations the ability to create and sustain superior performance and most importantly improve customer access to services.

Understanding that the one-to-one relationship between a customer and provider is driven by the mutual coordination of efforts between parties, (i.e., a reciprocal exchange), and that the dependence on the relationship partner is affected by the customer's value of the relationship relative to the competition, I investigate service usage. I develop and test a dynamic model of missed service encounters, identifying links among met service encounters, historical customer-initiated missed encounters, historical provider-initiated service failures and subsequent missed service encounters. I further examine how the relationship between service failure(s) and future missed service encounters is moderated by met service encounters (see Figure 2.1).

Figure 2.1. Conceptual Framework for the Proposed Model in Essay 1



This research offers two major contributions. First, I seek to build upon social exchange theory (SET), relationship theory, and service-dominant (S-D) logic to better understand how interactions with one provider can affect interactions with other providers- thereby eliciting a spillover effect. To explore the spillover effect in light of both historical service encounters and service failures I dichotomize the service relationship into two distinct layers: a customer's relationship with their scheduled provider and a customer's relationship with other providers within the organization. As discussed, exchange partners are motivated to continue relationships through observable reciprocated cooperative actions (Axelrod 2006). Essentially, customers will continue to stay in a service relationship as long as value is attained. Nonetheless, research has failed to fully examine how relationships with other providers within the service organization have the power to influence the relationship with the scheduled provider. Therefore, I seek to explore how relationships with other providers within the organizations have the power to positively influence future service usage (eliciting a positive spillover effect) and negatively influence service usage (eliciting a negative spillover effect). I believe that understanding how the spillover effect impacts service usage is essential to an organization's continued success.

I seek to fill the gap in services research by exploring the pre-encounter; the relationship between the customer and provider before an encounter transpires. Through this work I hope to offer a more comprehensive examination of the service encounter process. Identifying why customer miss appointments can help marketers and policymakers create and readily implement custom tailored programs that will better meet the needs of customers and society at large. It is important to note that

implementing customized marketing programs has the potential to have an immediate effect, which is mandatory in today's increasingly competitive environment.

In addition, I have the advantage of using customer and provider behavioral data that encompasses over 400,000 service encounters, thereby affording a unique opportunity to capture actual customer behavior while accounting for customer and provider characteristics. The analyses of this dataset afford the opportunity to capture actual behavior made by real decision makers in real environments. The health care industry is the ideal service to explore my research questions as first) improving access to health care services has the power to improve the lives of health care customers, second) afford the ability to explore the potential impact of brand alliances on the usage of other brands under the same umbrella brand (e.g., organization) and third) offer insight into the co-creation of value in one-to-one service relationships.

I first explore the customer-provider and customer-organization relationship through the lens of social exchange theory, relationship marketing theory and S-D logic to formulate my hypotheses and model of missed service encounters. I then test the model by exploring how a customer's service history with the scheduled provider and other providers within the organization yield different effects on service usage. As hypothesized, the findings show that customer's service histories with the scheduled provider or other providers within the organization are critical to the continuing success of service encounters. In addition, I find that incurring a service failure from the scheduled provider or other providers within the organization has the potential to be detrimental to relationships within the organization. I find that service failures are

moderated by a customer's allegiance/loyalty (proxied by met service encounters) to their scheduled provider. I discuss the implications of the findings for theory and practice.

## **2.2. Conceptual Framework**

### **2.2.1. Customer Service History**

Customer-provider relationships have been explored using social exchange theory, relationship marketing theory and S-D logic. The principal tenet of SET affirms that relationships are formed to maximize gains and minimize costs while employing comparison analyses. Introduced by Homans (1958) and developed by numerous researchers such as Emerson (1976) and Thibaut and Kelly (1959), the basic principal of SET affirms that interactions (e.g., encounters) between individuals lay the foundation for relationship development. Research in relationship marketing agree that relationships are exchange driven, with the purpose of connecting a customer's needs to a provider's offerings (Johnson and Selnes 2004; Morgan and Hunt 1994). S-D logic maintains that relationships are reciprocity driven; each partner is responsible for maintaining the commitments to one another (Gronroos 2004).

Obligations between parties are driven by interactions (Emerson 1976). Each interaction affords a customer and provider the opportunity to further develop their relationship. Customers who continue to receive some form of benefit from their encounter with their scheduled provider (or other providers within the organization) will continue to seek services and maintain their relationship. The relationship is likely to continue when there is greater value to maintain the relationship than to seek alternative relationship providers (Thibaut and Kelly 1959, Levinger 1979). Essentially, it is the customer's capability to evaluate the costs and benefits of maintaining a relationship that

affects their ability to convert to a closer relationship or to withdraw from a provider (Johnson and Selnes 2004).

Johnson and Selnes (2004) define exchange relationships as a mechanism for creating value through the mutual coordination of production and consumption between a customer and supplier. By offering products that meet the customer's needs the provider co-creates value. In turn, the customer chooses the provider who is able to provide the greatest benefits less any costs relative to the competitor. Through consumption, the customer co-creates value by enhancing the brand and relationship equity (Vargo and Lusch 2010). Research by Zeithamal, Berry, and Parasuraman (1996); Sierra and McQuitty (2005) found that as encounters increase between parties, so too does the opportunity to strengthen the relationship and consequently become more loyal (Dick and Basu 1994).

Relationships are dynamic processes that evolve with distinct phases (Dwyer, Schurr and Oh 1987). A customer's relationship history with their provider should not be viewed as multiple discrete transactions but rather as interdependent (Reinartz, Kraft and Hayer 2004). Interdependent relationships are formed by the cooperative actions of the customer and provider, where each encounter (e.g. transaction) is an opportunity to add value to the relationship. Based on social exchange theory, relationship continuity can serve as a signal for the value attained in the customer-provider relationship. Based on the discussion above, I believe that a customer's allegiance/loyalty to their scheduled provider will strengthen as the number of met service appointments with that scheduled provider increases.



To illustrate the proposed relationships, consider customer Sharon who has had five successfully met appointments to date with Dr. Smith, her scheduled provider, and ten successfully met appointments with other providers within the organization (Dr. Peters and Dr. Miller). As the ability to build and strengthen a relationship increases with each additional encounter, I believe each additional successfully met appointment Sharon has had with Dr. Smith, her scheduled provider, decreases the likelihood of her missing her next appointment with Dr. Smith. Thus, I posit:

H1: As the number of met service appointments with the scheduled provider increases, the likelihood of missing a scheduled service encounter decreases.

The service organization is perceived as the umbrella brand. Each front line service provider (employee) plays a role in how the brand is perceived by influencing the customer's service experience. Research has shown that each service provider has the power to influence the success of their service brand (Morhart et al. 2009) and is a source of brand equity (Berry 2000). According to SET, every relationship is evaluated against other relationships (Thibaut and Kelly 1959). Customers are likely to carry their assessments of previous providers within the organization when considering using a service with a different provider within the organization. This concept is known as the spillover effect (also known as a halo effect). The spillover effect is a brand name's ability to influence consumer's attitudes toward subsequent impressions of partner brands (Simonin and Ruth 1994). In the business realm, a spillover effect is defined as a cognitive bias toward a product or service due to a favorable or unfavorable experience with other products or services offered by a company.

Research has shown that repetitive service encounters (e.g., transactions) reduces uncertainty surrounding the cost and benefit of maintaining a relationship (Johnson and Selnes 2004). Each service encounter offers an opportunity for the service partner to learn more about the other party. Specifically, the customer becomes more familiar with the service provider and the related offerings and the service provider learns more about the customer and their needs. As a result, repetitive encounters can enhance the attractiveness of the provider relative to other providers (Hoch and Deighton 1989).

Through the spillover effect, a customer's relationship with one provider is likely to affect the relationship with a different provider within the same organization. Therefore, I propose that within the same organization, reciprocity exists between a customer and other providers within the organization. Consider the previous example, due to a spillover effect, Sharon's ten successfully met appointments with other providers within the organization (Dr. Peters and Dr. Miller) are likely to influence her likelihood of service usage with Dr. Smith. Thus, I propose:

H2: As the number of met service appointments with other provider(s) increases, the likelihood of missing a service encounter decreases.

As discussed, individuals determine a relationship's worth by adding the benefits and subtracting the costs. As rational profit seekers, individuals will choose a course of action that leads to maximizing rewards (Thibaut and Kelly 1959). Therefore, when the benefits outweigh the costs, the relationship will continue to prosper. In turn, when the costs outweigh the benefits, or alternative relationships are more promising, individuals will withdraw from the relationship (Gassenheimer, Houston and Davis 1998). When customers fail to attain value from their relationship with their provider the relational

bonds become weakened. Dissatisfaction in the relationship can result when either the customer or provider's expectations are not met (Swartz and Brown 1989). When the customer does not perform as expected, each customer-initiated failed encounter via a no-show or cancellation increasingly weakens the tie between the customer and provider.

Thus, I posit:

H3: As the number of historical cancelled/no-show appointments increases, the likelihood of missing a service encounter increases.

### **2.2.2. Service Failure History**

Establishing and developing relationships with customers are highly sought by service providers and organizations alike, as developed relationships lead to trusting, loyal and mutual commitments (Cropanzano and Mitchell 2005). Since these one-to-one relationships are predominantly based on reciprocity, in order for the relationship to succeed, both parties must play a participative role. Relationship success is dependent upon the mutual coordination of efforts (Anderson and Narus 1990) and fulfillment of promises to one another (Cropanzano and Mitchell 2005). When a service is disrupted by a provider, the relationship between the customer and provider is put at risk. Specifically, provider misbehavior will attenuate and cease to bind the buyer to the incumbent (Ganesan et al. 2010). In the customer-provider relationship, when a provider disrupts service, the provider fails to fulfill their obligation to their customer and performance in the encounter suffers, which in turn can affect the duration of the service provider relationship (Bolton 1998).

A central construct common to SET, relationship marketing and S-D logic is the pivotal role of the interaction. The interaction is the exchange between the customer and

provider through which relational bonds are established and value is created. When the exchange between the customer and provider yield a loss, the relationship between the customer and provider as well as the relationship between the customer and organization, is placed at risk. Bolton (1998) found that how service failures are perceived by the customer can affect the duration of the relationship, as the failed transaction can have a greater effect on the customer's perception than an executed transaction.

Building upon SET, Smith, Bolton and Wagner (1999) define a service failure as an exchange in which a service provider is temporarily unable to deliver a service and in which the customer experiences a loss. A lack of ability to deliver the service has great implications for the customer and provider. Left unnoticed, provider-initiated failures can drive customers to competing firms (Smith, Bolton and Wagner 1999) resulting in substantial financial losses. Certain circumstances prevail which prompt a provider-initiated schedule change. In the health care sector, hospital administration/staff may have to bump a health care customer's appointment to another time. This bump may be regarded by the customer as a breakdown in the relationship and may prompt them to seek services elsewhere. Although this provider-initiated bump may be enacted due to legitimate reasons, the customer may be forced to seek alternative services especially when the services demanded require immediate attention. Thus, this essay examines how provider-initiated rescheduling (i.e., service failures) regarding service encounters may influence a customer's allegiance/loyalty to their provider.

A customer who has a scheduled appointment with a service provider and is subsequently rescheduled by that provider to another date may become disenchanted with the service provider because expectations have not been met and services have not been

delivered. When the provider does not meet their intended obligation, the customer is left dissatisfied and possibly less inclined to utilize the service for their next scheduled encounter. According to Bitner (1995), service encounters have a cumulative effect on a customer's perception of a provider, whether it is positive or negative. Customers who continue to have negative experiences with a provider are left feeling dissatisfied, which ultimately impacts their future encounters. When interactions between a customer and provider yield a loss (via a service failure), the cumulative effect of incurring service failures are expected to negatively influence the customer's value of the relationship. Based on the notion that service failures will promote dissatisfaction and ultimately a loss for the customer, I posit:

H4: As the number of provider-initiated service failures by the scheduled provider increases, the likelihood of missing a service encounter increases.

An individual may use an experience with one provider as a benchmark for future interactions with different providers (Bickart and Schwarz 2001). This benchmark, or anchor, can lead the individual to make judgments that are biased on an initially presented value (Tversky and Kahneman 1974). Individuals will continually update and adjust their anchor (or benchmark) based on continued encounters. Blocker et al. (2011) found that customers who experience relational transgressions update their perceptions with the new information and will subsequently use the updated perceptions for future evaluations.

As discussed, Bickart and Schwarz (2001) argued that encounters with one provider can have spillover effects to other providers. The information obtained through

the exchange with one provider can help customers decide to utilize a different service provider when quality cannot be observed (Wernerfelt 1988). Whether an experience is positive or negative, once a customer experiences a service with one provider, the information obtained through that experience will spill over to other services provided by the umbrella organization. In terms of service failures, Schumann, Wunderlich and Evanschitzky (2014) found that incurring a service failure from one brand partner has a negative effect on a customer's loyalty to the other brand partner. I believe that customers who experience a service failure from any provider within the organization will update their perceptions with the new information and will subsequently use the updated perceptions for future evaluations of other providers within the umbrella organization.

Customers who incur a service failure from other providers within the organization prior to their encounter with their scheduled provider may harbor negative feelings toward the brand (i.e., organization) which could influence their evaluation of the scheduled provider. For example, Sharon (patient) has two upcoming appointments scheduled with Dr. Smith and Dr. Jones. Sharon's appointment with Dr. Smith is scheduled for March 5th and her appointment with Dr. Jones is scheduled for April 11th. On March 4<sup>th</sup> Sharon receives a call from Dr. Smith's office informing her that Dr. Smith will be away on a conference and that her appointment will need to be rescheduled. Sharon reschedules her appointment to March 30<sup>th</sup>. Based on the discussions presented in support of H4 I believe Sharon will be less inclined to attend her appointment on March 30<sup>th</sup> because she incurred a service failure from her scheduled provider. In addition, I believe that Dr. Smith's initiated service failure will negatively affect Sharon's service usage with other providers within the organization. I believe the negative effect of the

service failure Sharon incurred from Dr. Smith (e.g., her scheduled provider) will spill over to other relationships Sharon has within the organization (e.g., Dr. Jones).

Service literature considers cumulative perceptions of transactions rather than isolated transactions (Bitner 1995; Boulding et al. 1993). Each transaction or encounter is heavily judged in relation to the prior. Customers continually update their perception of each transaction to establish their level of overall satisfaction, which in turn affects their future usage of a service (Bolton and Lemon 1994). The relationship between the service provider and customer suffers when the provider fails to perform as expected as the opportunity to co-create value is lost. I believe service failures will have a cumulative negative effect on a customer's perception; strengthening with each additional encounter. Based on the above discussions I posit:

H5: As the number of provider-initiated service failures by other providers increases, the likelihood of missing a service encounter increases.

### **2.2.3. The Moderating Role of Met Service Encounters**

A customer's evaluation of a service experience is based on both their past experiences and the actual delivered service (Boulding, et al. 1993). As discussed in the preceding section, I expect that a customer's met encounters and accorded service failure(s) will influence the likelihood of future missed service encounters. Christopher et al. (2004) maintains that a customer's lifetime value is maximized through repeat patronage; i.e., an ongoing exchange through multiple transactions. Further, repeat purchase behavior has been found to be a key factor positively influencing future service usage (Zeithamal, Berry and Parasuraman 1996). I recognize that certain circumstances

may exist (i.e., service failures) which necessitate a loss for the customer and in turn can negatively affect future service encounters. I believe the degree to which a service failure influences future missed service encounters is based on the customer's met encounter history.

Failures that occur early in the relationship are likely to have a greater negative effect on the likelihood of future service usage as there have been fewer successful service experiences to counterbalance the failure (Boulding et al. 1993). Similarly, research by Berry (1995), Tax, Brown, and Chandrashekar (1998) maintain that loyal customers will be more tolerant of service failures. The successful service history between a customer and provider can serve as a buffer from provider-initiated failures and will protect the relationship. The cumulative effect of the value obtained from previous transactions will therefore insulate the provider from the loss they initiated via a service failure.

Successful service encounters affords the customer and the provider opportunities to co-create value (Gronroos 2000; Vargo and Lusch 2010) and establish trust and commitment in the relationship (Morgan and Hunt 1994). Further, customer-provider loyalty is related to the degree of customer involvement with an organization (Sierra and McQuitty 2005). When interactions increase between parties, customers have an opportunity to further develop their relationship with their provider. As the relationship strengthens with each met encounter, I believe the customer's tolerance of transgressions initiated by the provider will increase. I believe each additional met appointment by the customer will serve as an insulator and protect the relationship from the detrimental effects of service failures.



H6: The effect of provider initiated service failures on future missed service encounters will vary by customer's historical met encounters.

## **2.3. Method**

### **2.3.1. Sample and Data**

To better understand service usage, I make use of patient/physician appointment and billing records from a major metropolitan hospital located in the mid-Atlantic region of the United States. The health care domain involving patients and providers is an apt study context for several reasons. First, patient-provider encounters offer a rich understanding of service encounters as these interactions are primarily scheduled (i.e., appointments). Second, the encounters involve a specific patient and specific provider allocated to a specific time slot, a limited resource that is necessary for service delivery. Third, the health care industry is one of the largest service sectors in the U.S. economy (U.S. Department of Labor 2012) and important on the basis of size and impact on society.

Data were obtained through the cooperation of an integrated health care delivery organization that serves a diverse mix of 500,000 urban and suburban patients in an outpatient setting. Proprietary data is used to investigate the likelihood of a missed service encounter between a health care customer and hospital-employed provider in the department of medicine. The unit of analysis is the health care customer's appointment with a health care provider in the organization. Since this analysis is based in the health care setting, hereinafter, service appointment will be used interchangeably for service encounter. There are 416,428 appointments scheduled across 331 hospital-employed

providers by 96,343 patients/customers over one year, April 1, 2010- March 31, 2011. Of these appointments, 198,822 are between the scheduled patient and the scheduled provider. Patients are referred to as health care customers throughout this essay to depict the growing role of consumerism in the health care industry.

Due to the size and diversity of the health care customer and provider population, the data set is sufficient to evaluate the variables that affect the likelihood of missing a service encounter (MSE). As depicted in Table 2.1, the patient population is 62% white, 62% female, and 56 years of age, on average. The majority of patients (98%) are covered by private health insurance (e.g., HMOs, PPOs, POS plans) and government-sponsored programs (Medicare, Medicaid and other federal programs). Customers seek a diverse array of subspecialty care under the department of medicine. Appointments are scheduled in both urban and suburban locations. The average patient has approximately 1 appointment with the scheduled provider and approximately 3 appointments with other providers within the organization. On average, each patient cancels or does not show for 2 appointments. In terms of patients who incurred service failures, the average patient incurs .1 bumps by their scheduled provider and .2 bumps from other providers within the organization. Due to the diversity in customer and provider characteristics, and the size of the data set across a one-year time period, the results are likely to be generalizable to many health care settings and other service industries that are driven by appointments.

Table 2.1. Descriptives of Dependent, Independent and Control Variables

	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>S.D.</u>
<b>DEPENDENT VARIABLE:</b>				
Missed Service Encounters	0	1	0.34	0.47
<b>INDEPENDENT VARIABLES:</b>				
<b>Customer's Service History</b>				
MetSchedProv	0	104	1.31	3.06
MetOtherProv	0	120	2.69	5.02
HisCan/NS	0	130	1.62	3.74
<b>Service Failure History</b>				
BumpSchedProv	0	5	0.09	0.34
BumpOtherProv	0	10	0.18	0.54
<b>CONTROL VARIABLES:</b>				
Age at Appointment	0	103	56.11	17.53
Gender (Female)	0	1	0.62	0.49
Residency (In-State)	0	1	0.98	0.14
Christian	0	1	0.35	0.48
Catholic	0	1	0.28	0.45
Unknown Religion	0	1	0.21	0.41
Jewish	0	1	0.03	0.18
Uninsured	0	1	0.02	0.14
Appointment Time (Afternoon)	0	1	0.45	0.50
Caucasian	0	1	0.62	0.49
Cardiology	0	1	0.17	0.38
Endocrinology	0	1	0.05	0.22
Gastroenterology	0	1	0.10	0.30
Hematology/Oncology	0	1	0.13	0.34
Pulmonary	0	1	0.06	0.24
Dermatology	0	1	0.02	0.14
Health & Wellness	0	1	0.01	0.06
Infectious Disease	0	1	0.02	0.15
Rheumatology	0	1	0.04	0.19
Nephrology	0	1	0.02	0.13
Neurology	0	1	0.04	0.21
January	0	1	0.09	0.28
February	0	1	0.08	0.27
March	0	1	0.09	0.29
April	0	1	0.09	0.28
May	0	1	0.08	0.27
June	0	1	0.09	0.28
July	0	1	0.07	0.27
August	0	1	0.08	0.27
September	0	1	0.08	0.28
October	0	1	0.08	0.28
November	0	1	0.08	0.28

The proposed relationships are conceptualized in one model to predict the likelihood of a missed service encounter for a customer's next scheduled appointment. The model tests the effect of a customer's service history with the provider, the effect of a customer's service history with other providers within the service organization, the effect of incurring a service failure, and the interaction between met appointments and service failure(s).

### **2.3.2. Dependent Variable**

As depicted in Table 2.2, the dependent variable is the result of a health care customer's service encounter; MSE (arrive=0, missed service encounter=1). Arrive appointments are successfully met service encounters where a customer received services from the scheduled provider. Arrive appointments serve as the reference category for the model. MSEs are defined as either cancelled or no-show appointments. A cancelled appointment is defined as a terminated appointment that was communicated in advance by a customer. No-shows are defined as non-communicated customer-initiated missed appointments. Since the goal of this research is to identify variables that influence customer-initiated MSEs, choosing these two potential outcomes of a health care customer's appointment is a valid measure of the dependent construct.

Table 2.2. Operationalization of Variables

<b>Dependent Variable:</b>	<b>Operationalization</b>
Missed Service Encounters	Dummy variable for missed service encounters, Arrive is reference category. Arrive=0, Cancelled/No-Shows=1.
<b>Independent Variables:</b>	
<i>Customer's Service History</i>	
MetSchedProv	Discrete variable representing historical cumulative met appointments with a patients scheduled provider.
MetOtherProv	Discrete variable representing historical cumulative met appointments with other provider(s) within the organization.
HisCan/NS	Discrete variable representing historical cumulative cancelled or no-show appointments for any provider.
<i>Service Failure History</i>	
BumpSchedProv	Discrete variable representing historical cumulative provider-initiated bumped appointments with a patients scheduled provider.
BumpOtherProv	Discrete variable representing historical cumulative provider-initiated bumped appointments with any provider(s) within the organization.
<i>Interactions</i>	
BumpSchedProv X MetSchedProv	Interaction variable, Met service encounters with a scheduled provider moderates the causal effect of service failures by a scheduled provider on missed service encounters.
BumpOtherProv X MetSchedProv	Interaction variable, Met service encounters with a scheduled provider moderates the causal effect of service failures by other provider(s) within the organization on missed service encounters.
BumpSchedProv X MetOtherProv	Interaction variable, Met service encounters with other provider(s) within the organization moderates the causal effect of service failures by a scheduled provider on missed service encounters.
BumpOtherProv X MetOtherProv	Interaction variable, Met service encounters with other provider(s) within the organization moderates the causal effect of service failures by other provider(s) within the organization on missed service encounters.

### **2.3.3. Independent Variables**

As depicted in Table 2.2, the independent variables are operationalized to predict the probability of a MSE for a customer's next appointment. Independent variables include a customer's service history, provider-initiated service failures, and interaction variables.

#### **Customer's Service History**

A patient's service history is represented by three variables: (1) number of past met appointment(s) with the scheduled provider (MetSchedProv); (2) number of past met appointment(s) with providers other than the scheduled provider (MetOtherProv), and (3) number of past cancelled/ no-show appointment(s) (HisCanNS). Each variable is the cumulative number of met encounters or customer cancellations/no-shows on record in the data set excluding the current appointment – the one the model will be predicting – per individual patient prior to a patient's next scheduled appointment.

#### **Service Failure History**

Service failure history refer to two variables: (1) cumulative number of past service failures initiated by the scheduled provider (BumpSchedProv) or (2) cumulative number of past service failures initiated by provider(s) other than the scheduled provider (BumpOtherProv). Each variable is the cumulative number of provider-initiated service failures on record in the data set excluding the current appointment – the one the model will be predicting – per individual patient prior to a patient's next scheduled appointment.

#### **Interaction Variables**

To determine if the effect of incurring a service failure by either a scheduled provider or other providers within the organization differs by a customer's met

appointment history with either the scheduled provider or by other provider(s) within the organization I include interaction terms: BumpSchedProv X MetSchedProv, BumpOtherProv X MetSchedProv, BumpSchedProv X MetOtherProv, and BumpOtherProv X MetOtherProv.

#### **2.3.4. Measurement of the Control Variables**

Extant literature shows that service interactions may vary by customer demographics (e.g., customer's age, gender, race, residence, religion). Further, health care studies suggest that factors such as insurance coverage (Jhanjee et al. 2004), time of appointment and department type (Deyo and Inui 1980) may also affect outcomes. These characteristics are treated as controls in the model.

#### **2.4. Statistical Analyses**

Basic descriptive and logistic regression analyses are conducted using Stata 12 software (Tables 2.1 and 2.2). The initial sample size of 472,253 observations (number of appointments) is reduced by 21,655 (5%) after removing provider-initiated bumped appointments and by 34,170 (7%) to account for missing data, yielding 416,248 usable appointment observations. Provider-initiated service failures were removed as my intent is to study two potential customer-initiated appointment outcomes; a customer's arrival, and a customer's MSE (cancellation or no-show). Thus, I retain the bump information from the dataset to capture service failure and eliminate bump as a potential outcome. Since my objective is to determine how a customer's value of the relationship influences future service usage, I evaluate the customer's likelihood of missing their next scheduled appointment. The customer's service history and failure history at time 1 (t1) is used to

predict the likelihood of missing a service encounter at time 2 (t2); e.g., the next scheduled appointment.

Means, standard deviations and zero ordered-correlations of the variables are examined (Table 2.1 and 2.3). To determine if multicollinearity is present, I examine the relationships between independent variables by analyzing multicollinearity diagnostic statistics. There is little evidence to suggest that the independent variables are correlated with MSE since all of the correlations with this outcome are close to zero. Each condition index is less than 30, further indicating multicollinearity is not a problem.

Table 2.3. Correlation Matrix

	1	2	3	4	5	6
1 Missed Service Encounters	1					
2 MetSchedProv	0.004 *	1				
3 MetOtherProv	0.002	0.399 ***	1			
4 HisCan/NS	0.074 ***	0.497 ***	0.657 ***	1		
5 BumpSchedProv	0.012 ***	0.048 ***	0.024 ***	0.033 ***	1	
6 BumpOtherProv	-0	0.093 ***	0.298 ***	0.189 ***	0.043 ***	1

\*p< 0.05, \*\*p< 0.01, \*\*\*p< 0.001.

Note: Due to space constraints controls are omitted from view

### 2.4.1 Model

Logistic regression analysis is used to estimate the effects of the explanatory variables on the probability of a MSE for the customer's next appointment. Logistic regression is an appropriate analytical approach since MSE is a binary dependent variable with two possible outcomes (arrive or missed service encounter).

Using logit, I estimate a model of MSEs for the total sample of 416,428 scheduled appointments. The data are arranged so that there is one observation for each



scheduled appointment. This model expresses the probability of missing a service appointment as a function of series of explanatory variables.

$$E \{ Y_i \} = \exp (X_i' \beta) / 1 + \exp (X_i' \beta)$$

where Y denotes a MSE, X is the vector of independent variables and E stands for the likelihood of one of the response outcomes (arrive or miss service encounter). Subscript i refers to the ith trial (X<sub>i</sub>, Y<sub>i</sub>), where i = 1, ..., n (Kutner et al. 2005). Logit bounds the value of the dependent variable by 0 and 1, and each coefficient estimate represents the change in log-odds for a one unit increase in the independent variable. The parameter vectors β are estimated by maximum likelihood method. The magnitude of the effect of independent variables (Petersen 1985) is reflected in the percent change in odds.

#### **2.4.2. Logistics Analysis**

Table 2.4 presents the results from the logistic regression of MSEs. The model fits the data, with a  $\chi^2$  statistic, 47 d.f. significant at .001 confidence level. The pseudo R<sup>2</sup> in this model accounts for 1.7% of the possible change in the log likelihood and the Effrons R<sup>2</sup> accounts for 2.2% of the variation in the likelihood of MSEs .

#### **2.4.3. Results**

##### **Customer's Service History**

Derived from the value customer's attain in a service relationship, H1-3 posited that a customer's service history will influence service usage with the scheduled provider and other providers within the organization. These hypotheses are fully supported (Table 2.4). In support of H1, for each additional met service encounter with the scheduled provider in the past, the likelihood of a future scheduled MSE decreases by 1.2% (b= -0.012, p<.001). In support of H2, for each additional met appointment with any other

provider(s) in the organization in the past, the likelihood of a future MSE decreases by 2.8% ( $b = -0.029$ ,  $p < .001$ ). In support of H3, historical cancelled/no-show appointment(s) has a positive influence on the likelihood of missing a scheduled service encounter. That is, for each additional cancelled/ no-show appointment in the past, the likelihood of a future MSE increases by 7.8 % ( $b = 0.075$ ,  $p < .001$ ).

Table 2.4. Logit Results for Predicting Missed Service Encounters by Customer and Provider Characteristics

<b>Variable Group</b>	<b>Hypothesis</b>	<b>Variable</b>	<b>b (rse)</b>	<b>% Change in Odds</b>
Customer's History	<b>H1</b>	MetSchedProv	-0.012*** (0.004)	-1.20%
	<b>H2</b>	MetOtherProv	-0.029*** (0.002)	-2.80%
	<b>H3</b>	HisCanNS	0.075*** (.005)	7.80%
Service Failure History	<b>H4</b>	BumpSchedProv	0.137*** (0.014)	14.70%
	<b>H5</b>	BumpOtherProv	0.012 (0.010)	0.60%
Service History Failure X Met Appointment History	<b>H6</b>	BumpSchedProv X MetSchedProv	-0.013** (0.005)	-1.40%
		BumpOtherProv X MetSchedProv	-0.008** (0.003)	-2.10%
		BumpSchedProv X MetOtherProv	0.001 (0.002)	0.10%
		BumpOtherProv X MetOtherProv	0.001 (0.001)	0.10%
		Constant	-0.193	
		<b>Model Fit</b>	Log-Likelihood	-262466.03
	Wald Chi-Square	5681.09 (43)		
	Pseudo R2	0.018		
	Efrons R2	0.024		
	AIC	525020.1		
	BIC	525501.4		
	N	416,248		

Entries are unstandardized (b) with robust standard errors in parentheses.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Note: Due to space constraints, controls are omitted from the table.

### **Service Failure History**

Hypotheses 4 and 5 proposed that provider-initiated service failures will positively influence the likelihood of a MSE. Specifically, if a provider bumps a service (reschedules an appointment) a customer's sense of obligation or loyalty may become compromised and the customer will thereby be less likely to utilize services (either by not showing up or by cancelling). In support of H4, for each additional service failure accorded by the scheduled provider, the likelihood of a future scheduled MSE increases by 14.7% ( $b = 0.137$ ,  $p < .001$ ). A negative spillover effect was not present in this analysis, thus H5 is not supported ( $b = 0.012$ , n.s.). That is, service failures by other providers within the organization did not have a statistically significant effect on future MSEs.

### **Interactions**

Two of the four interactions are supported. I found that the effect of being bumped by a scheduled provider on MSEs varies by a customer's met appointment history with their scheduled provider. For each additional one unit increase in the interaction term  $\text{BumpSchedProv} \times \text{MetSchedProv}$ , the likelihood of a future scheduled MSE decreases by 1.4% ( $b = -0.013$ ,  $p < .01$ ). Similarly, for each additional one unit increase in the interaction term  $\text{BumpOtherProv} \times \text{MetSchedProv}$ , the likelihood of a future scheduled MSE decreases by 2.1% ( $b = -0.008$ ,  $p < .01$ ). These results are consistent with the hypotheses that the customer's loyalty to their provider, conceptualized as their successful past service history, will mitigate the effect of a service failure from a service provider or other providers within the umbrella organization. Remarkably, I found no evidence to support that a customer's met encounter history with other providers within the organization moderates the effect of service failures on the likelihood of future MSEs.

#### 2.4.4. Model Respecification

To determine if the number of service failures incurred by a customer influences service utilization I split service failures into two distinct groups; a single provider-initiated service failure and more than one provider-initiated service failure. Specifically, I test the effect of incurring one service failure and more than one service failures on future MSEs as compared to not incurring a service failure(s). I find that when the scheduled provider has initiated one service failure the likelihood of a missed service encounter increases by 17.1% ( $b = 0.158, p < .001$ ) as compared to patients who have never incurred a service failure from their scheduled provider. When the scheduled provider has initiated more than one service failure, the likelihood of a missed service encounter increases by 26.2% ( $b = 0.232, p < .001$ ) as compared to patients who never incurred a service failure from their scheduled provider. Interestingly, the effect of a service failure or service failures from other provider(s) within the same organization on MSEs was not significant.

To determine if the effect of a patient's historical met encounters with their scheduled provider or other providers within the organization influences the effect of a single service failure or more than one service failures on MSEs I tested for interaction effects. I found that met service encounters by a scheduled provider eradicate the detrimental effect of incurring one service failure by other providers within the same organization ( $b = -0.013, p < 0.05$ ). Similarly, when a customer has incurred more than one failure from another provider within the organization, due to the moderating effect of met service encounters by a scheduled provider, customers are less likely to miss service encounters ( $b = -0.015, p < .05$ ). These findings provide empirical support for the findings

in my model adding robustness to the analysis. Interestingly, met service encounters by the scheduled provider did not yield a significant moderating effect when a service failure or service failures were initiated by other providers within the organization. Further, the interactions between met encounters by other providers within the organization and service failure(s) was not found to be significant.

#### **2.4.5. Likelihood Ratio Test**

To determine if 1) the effect of met appointments on future MSEs is different between a scheduled provider and other providers within the organization and 2) the effect of bumped appointments on future MSEs is different between a scheduled provider and other providers within the organization I imposed and tested for equality constraints in predicting a missed service encounter through the likelihood-ratio test. I find that there is a statistically significant difference in outcome between a customer with a history of met appointments with their scheduled provider and customers with a history of met appointments with other providers within the organization (LR  $\chi^2(1) = 63.66$ ,  $p < .001$ ). Based on these findings, it is evident that met encounters by other providers within the organization has a greater effect on MSEs than met encounters by the scheduled provider. Further, I find that there is a statistically significant difference in outcome between bumps by a scheduled provider and bumps by other providers within the organization (LR  $\chi^2(1) = 91.25$ ,  $p < .001$ ). Thus, provider-initiated service failures by the scheduled provider has a larger effect on MSEs than service failures by other providers within the organization.

#### **2.4.6. Robustness Check**

To test for model robustness, and assess the potential for left censoring bias, a sensitivity analysis was conducted on the model where the last three months of data (January 1, 2011– March 31, 2011) were removed from the estimation, while the full dataset were retained to compute the independent variables. The results from this analysis are identical in terms of the valence and significance of the estimates, indicating that there is no significant left censoring bias in the data.

To further test for model robustness, a cross tab analysis of observed and predicted outcomes was conducted to determine the percentage of cases that are correctly predicted where a positive relationship is present if the probability is .5 or more and a negative outcome otherwise. In this application, I predict 66.1% of the cases.

## **2.5. Discussion**

Analyses of more than 400,000 observations on nearly 100,000 customers and hundreds of service providers over a one year time frame indicate that a customer's service history and provider-initiated service failures play a vital role in predicting the likelihood of future missed service encounters. As expected, customers will continue to remain loyal to a service when the relationship offers value to the customer. I found evidence to support a positive spillover effect, patient's loyalty (i.e., repeat patronage) to their scheduled provider helps drive their patronage to other providers within the organization.

My results found that relationships are reciprocal in nature. When a customer's scheduled service provider fails to meet their intended obligation, that is the provider initiates a service failure via a bumped/rescheduled appointment, customers are more likely to miss their next scheduled appointment. Any disruption to service, when a

customer's expectations have not been met, can provoke a customer to become disloyal to the service or service provider (Smith, Bolton and Wagner 1999). When a customer incurs a service failure from the scheduled provider, their loyalty or allegiance to that provider can be affected.

As discussed, I find that positive encounters with a scheduled provider (e.g., met appointments) will positively influence relationships with other providers within the organization by decreasing the likelihood of future MSEs (e.g., a positive spillover effect). In contrast, I found that negative encounters initiated by a scheduled provider (e.g., bumped appointments) is not found to have a significant effect on relationships with other providers within the organization. Based on these results, I surmise that the customer's loyalty to their scheduled provider is strong enough to withstand service failure(s) from other providers within the organization. However, the customer's loyalty to their scheduled provider is abated when the scheduled provider initiates the service failure.

It is interesting to note how the detrimental effect of incurring a service failure can be buffered by a met service encounter history with the scheduled provider. I find that the negative effect of service failures can be mitigated by the presence of met encounters with a scheduled service provider. My results support the premise that a customer's loyalty to their scheduled service provider can serve as a shield from service failure(s). However, it is important to recognize that customer-provider relationships are not impervious to failure. Although customer-provider relationships are social, they are primarily economic relationships, and the relationship will dissolve when the economics of the relationship dictate (Johnson and Selnes 2004).



As discussed, the interaction between service failures and met encounters by other provider(s) was insignificant. It appears that the shield of met service history by other providers is absent when a customer incurs a service failure. This result leads me to surmise that the customer's loyalty to the scheduled provider is stronger than their loyalty to the service brand (i.e., organization). This analysis is further supported by the finding that service failures by scheduled providers have a large effect on future MSEs, whereas the effect of service failures by other providers was found to be insignificant. It appears customers consider their relationship with the organization when choosing to utilize a service, but their primary concern is the value that can be attained by maintaining their relationship with the scheduled provider.

## **2.6. Theoretical Implications**

This research provides a novel analysis account of the service encounter phenomenon by which I offer three key contributions to the theoretical framework. First, I find that relationships are multi-layered; customers consider both their relationship with their scheduled service provider and their relationship with other providers within the organization when evaluating the value of the relationship and in turn deciding to utilize services. In effect, the relationship between the customer and provider dyad is sensitive to other relationships within the organization, as the relationship can benefit from a positive spillover effect.

Second, I find that customer's loyalty to their scheduled provider is the predominant force driving usage in the presence of service failures. Such as, the moderating effect of met service encounters with a scheduled provider on service failures negated the large effect (14.7%) of service failures by a scheduled provider. This result

suggests that customers tend to be affected by service failures, but the failure can be mitigated by a positive relationship history.

Third, this research offers a greater understanding into the co-creation of value in a one-to-one customer-provider relationship. I find that a customer's service history is a strong predictor of their future service usage; adding additional insight into the pre-encounter. Customers who continue to attain benefits from the service relationship are less likely to miss service encounters. In accordance, customers who were found to abandon their relationship (via cancellations/no-shows) will continue to miss service encounters.

## **2.7. Practical Implications**

Keeping promises and fulfilling obligations are essential to successful service relationships (Bitner 1995). Through this research managers have the requisite knowledge and framework to manage customer relationships and services more efficiently and effectively. Based on my findings, which are supported by extant literature, a customer's service history and service failure history are strong indicators of service usage. Firms must identify variables that have the potential to affect the strength of the customer-provider relationship and in turn the customer's loyalty to their provider in order to improve access to services.

Building a strong service brand affords management the ability to build awareness, drive loyalty and signal quality (Aaker 2012). Customer's loyalty to partner brands (e.g., providers within an organization) should be recognized and promoted by management in attempt to build brand and relationship equity. Further, to best meet customer's needs, management should segment customers based on their service history

with their scheduled provider and all providers within the organization. Management should customize their marketing efforts to meet the distinct needs of customers with a successful service history and customers with a history of cancellations and no-shows. Specifically, management could focus on the benefits of maintaining relationships with a provider as each interaction affords an opportunity to create value in the relationship. Management could also highlight the deleterious effects of cancellations and no-shows; further highlighting the importance of maintaining relationships with a service provider.

In addition, management needs to employ marketing research campaigns to better meet the needs of customers with a history of customer-initiated service failures (e.g., cancelled/no-show appointments). It is important to identify the specific factors in these relationships that hinder the relationship's worth or value. Specifically, management needs to uncover specific circumstances or events in the relationship where the cost of maintaining the relationship outweighs the benefits.

It is my intent that this framework offers organizations a way to isolate customer groups to target, and to recognize diversified ways to meet the target market's needs. This framework could help the organization segment their customer population into three groups; 1) customers with a successful history of attained appointments with the scheduled provider, 2) customers with a successful history of attained appointments with other providers in the organization and 3) customers with a history of cancelled or no-show appointments. The provider's primary concern should be when to schedule appointments with these different groups. Based on the results, it is evident that the main effect of historical cancelled and no-show appointments has a large impact on future missed service encounters. Customers who continue to cancel or not show for

appointments should be flagged in the scheduling organization and scheduled at times when they are least likely to affect customer flow (Woodcock 2005). In turn, schedulers should consider customer's met service encounters with all providers in the organization rather than limiting their evaluation to the provider being scheduled. Customers with a successful service history should be scheduled at times of the day when cancellations and no-shows are highest as this group is the least likely to miss future service encounters. Implementing a scheduling protocol that helps reduce missed service encounters will enhance access to services and improve provider and organizational productivity.

Of chief importance is the finding that customer's historical met service appointments with the scheduled provider can attenuate the detrimental effects of service failures incurred by the scheduled provider or other providers within the network. As service failures are inevitable, schedulers should bump customers that already have a successful service history with the scheduled provider as these customers are found to be the most resilient to service failures.

Understanding this phenomenon is of great interest to policymakers and the health care community as it helps ensure an organization (e.g., hospital) is affording appropriate care for customers. To offset the drastic number of missed appointments, the health care community needs to find ways to minimize customer cancellations and no shows. By gaining a better understanding of the dynamics that drive missed service encounters, policy makers will gain greater insight for customer's needs and as a result will be able to better meet the needs of its customers. This research affords management the necessary tools to competitively position their providers, services, and the organization to decrease missed service encounters.

## 2.8. Limitations & Future Research

The analyses of this dataset offers a rich understanding of customer-provider and customer-organization relationships. However, limiting the analyses to a one year time-span may not fully capture the relational history between the customer and scheduled provider as well as the customer and other providers within the organization. Although left censoring bias is addressed by implementing a sensitivity analysis, including a longer history of the relationships specified would enrich the understanding of service usage.

Research has found that relationship marketing is more effective when relationships are built on one-to-one interactions, rather than a customer and the entire selling firm (Johnson and Selnes 2004). This research affords greater insight to the one-to-one service relationship and offers tactical tools to strengthen the relational bonds between the customer and provider. It is through these personal relationships in which providers have the opportunity to build closer relationships and create value (Palmatier, et al. 2006). Future research should further investigate how one-to-one service relationships influence customer-organization relationships.

I recognize that this essay does not tap into the psychological aspect of customer's missed service encounters. Dick and Basu (1994) argue that customer loyalty is driven by their patronage to a partner and their relational attitude toward a partner. Although the customer's actual behavior is captured, we are not privy to the mindset of the customer. It would be interesting to explore how a customer's attitude influences service usage. Certain circumstances exist- such as external shocks to the system (i.e., inclement weather, employment status, behavior of other service personnel etc.) personal conditions (i.e., forgetfulness, lost need for service, etc.) or practice customs (i.e., lack of

appointment availability) that may also influence missed service encounters. To further fill the gap in missed service encounters research, future work will incorporate both attitudinal and behavioral measures to garner a more comprehensive evaluation of the richness of customer-provider relationships. Particularly, including variables that measure the customer's attitude is likely to help explain additional variability in the model.

The framework and conclusions found in this analyses can be applied to other service sectors, such as personal care, law, automotive repair, etc.; all of which are service areas that are driven by one-to-one appointments (e.g. the customer and the provider). Since I found that relationships between customers and providers have the power to spill over to other relationships within an organization it would be interesting to see how relationships to the organization itself influence MSE's. For example, future work should consider how a customer's allegiance to a service organization is affected by service failures. It would be interesting to see how organization-initiated service failures (i.e., lost reservation at a restaurant, being bumped off a flight, etc.) influences customer's allegiance to a service organization. Future research should consider extending and building upon this framework to include other service areas that are driven by appointments between individuals and organizations (i.e., restaurants, hotels, transportation services, etc.).

## CHAPTER 3: ESSAY TWO

### THE IMPACT OF NEED FOR SERVICE, INSURANCE AND PRE-DISPOSING CHARACTERISTICS ON CONSUMER USAGE OF HEALTH SERVICES: AN EXPLORATORY ESSAY

#### 3.1 Introduction

Although the United States has witnessed drastic improvements in its overall health, great disparities exist among the population in regards to access to health care services. Access to health care services is defined as the personal use of medical care services and everything that enables or hinders their use (Andersen, Davidson and Baumeister 2013). Individuals who are underutilizing or even over-utilizing health care services present considerable challenges to health care policymakers and other health care customers. A health care customer's failure to access a needed service may lead to an increased risk for morbidity and Emergency Room visits (Deyo and Inui 1980; Mitchell and Selmes 2007). In contrast, when a health care customer over utilizes a service, they incur unnecessary costs (Korenstein et al. 2012). By and large, these disparities in access can affect lives and dollars. Recognizing and addressing this challenge affords management and marketers alike the opportunity to positively influence change and improve health care customers' outcomes.

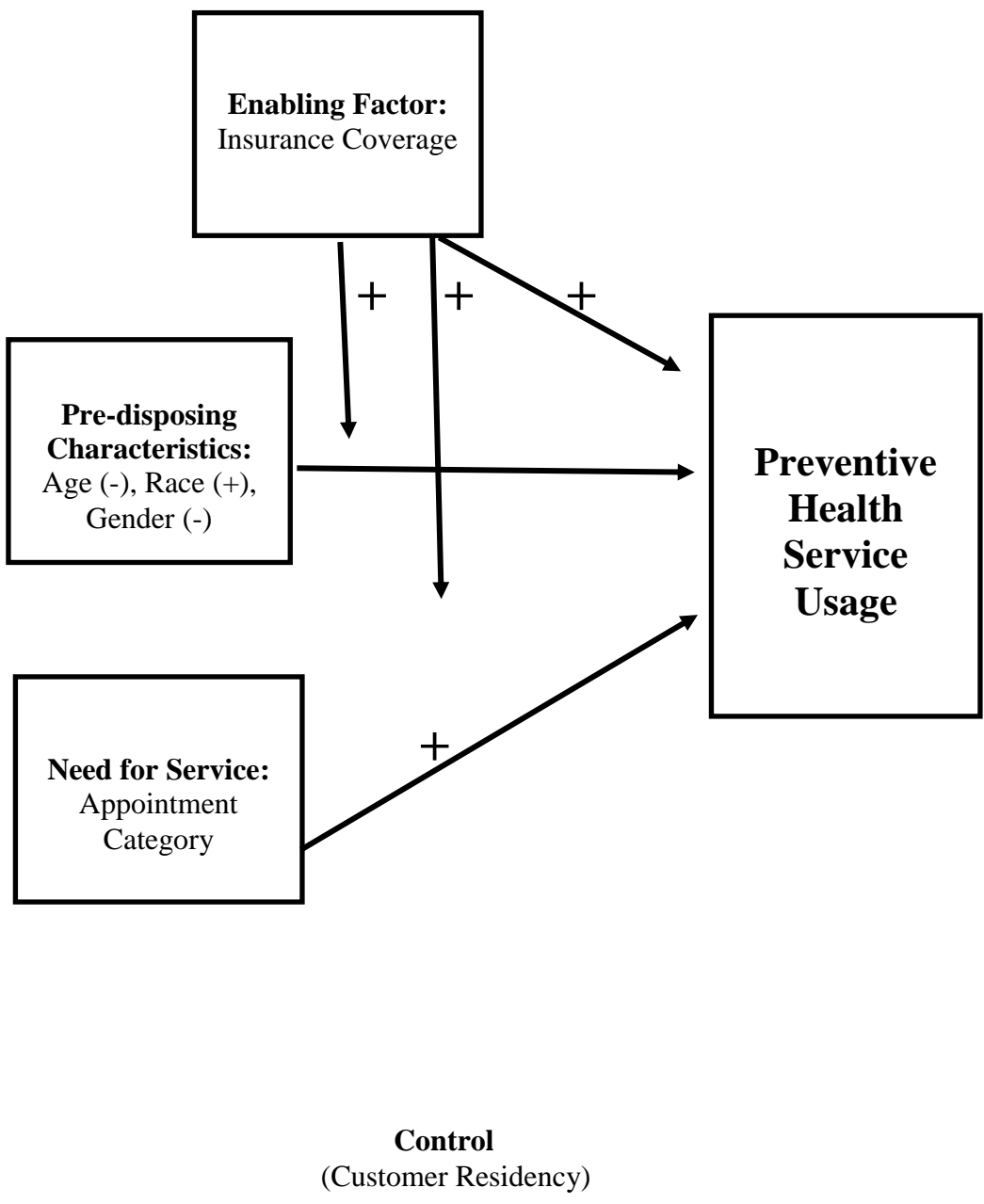
There is a plethora of research that investigates access to health care services. However, the bulk of this research is limited to attitudes and perceptions; behavioral mechanisms have been largely overlooked. Further, use of existing theories in health behavior research is relatively limited. In a systematic review of the health behavior literature, Patineter et al. (2005) found that theory was predominantly used to inform

studies (68%). Further, Patineter et al. (2005) found that very little research applies (18%), tests (4%) and builds theory (9%). By applying models of health service use, researchers can help better identify challenges related to access, as well as gain insights into maintaining and improving overall health (Gelberg, Andersen and Leake 2000). To help fill this gap in health behavior research and to help move the field forward I apply the behavioral model of health service use (Andersen 1968; 1995) to identify and address barriers related to health service access.

As depicted in Figure 3.1 (Model 1a), I use the behavioral model of health service use as the foundation for my analytical framework. I examine how a health care customer's need for service (degree of service demand based on appointment category), enabling factors (circumstances that facilitate usage), and pre-disposing characteristics (individual demographic characteristics that cannot be changed) drive preventive health service usage. I further examine how the relationship between pre-disposing characteristics (e.g., age, gender, and race) and preventive health service usage is moderated by enabling factors (e.g., insurance coverage). In addition, I examine how the relationship between need for service (e.g., primary care appointment) and preventive health service usage is moderated by enabling factors (e.g., insurance coverage).



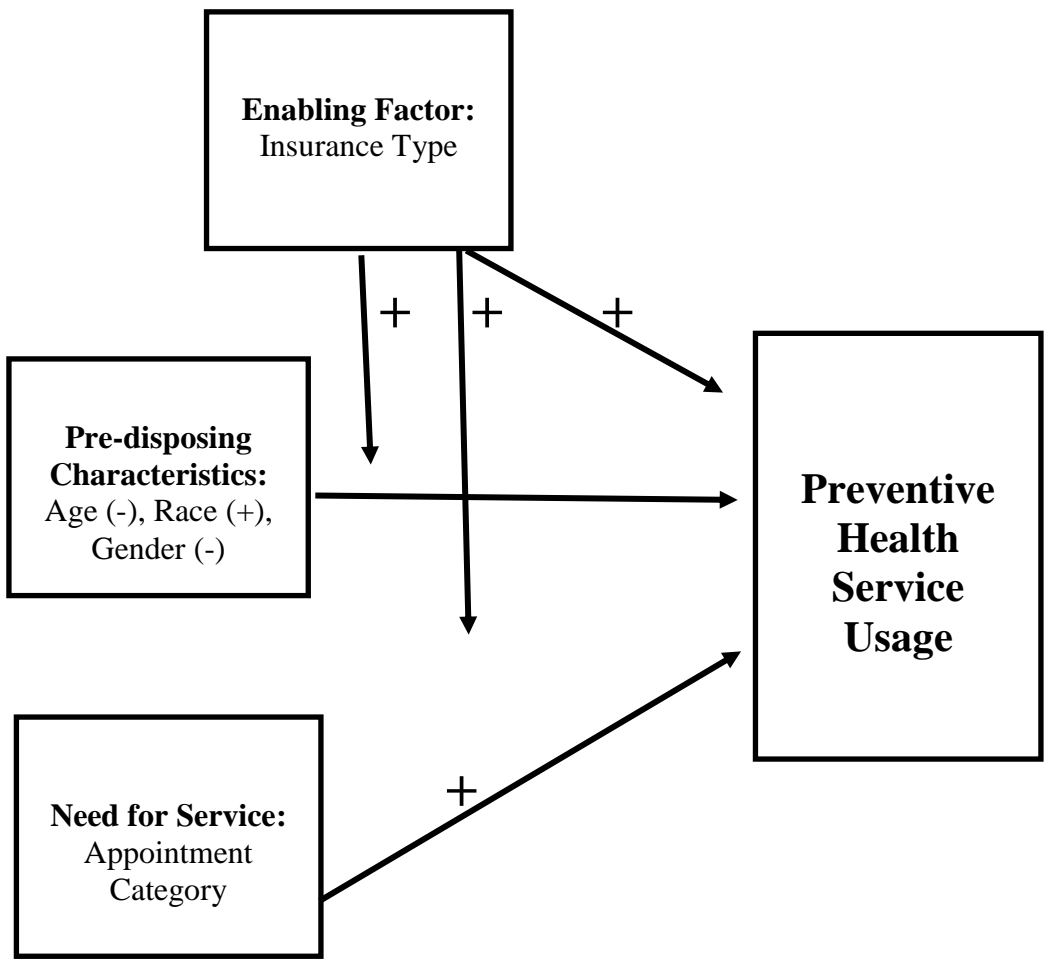
Figure 3.1. Conceptual framework for the Proposed Model (1a) in Essay Two



The behavioral model of health service use is applied in another specification of the model (see Figure 3.2, Model 1b). To better understand how type of insurance

coverage held influences preventive health service usage, I replace insurance coverage (Model 1a) with insurance coverage type (Model 1b). Insurance coverage type refers to insurance plans that qualify as either government sponsored or private insurance plans. The remaining aforementioned variables in the initial specification of the model are included in the model.

**Figure 3.2 Conceptual framework for the Proposed Model (1b) in Essay Two**



**Control**  
(Customer Residency)

Through this enquiry, I hope to afford management and policymakers tactical tools to diminish disparities related to access to care. This research offers a practical framework for management to segment customer groups to improve access to care and ultimately health care customer outcome. Research has shown that when organizations effectively segment customer groups they have the power to secure a competitive advantage in the market (Harrison 1994).

This research offers three major contributions to academia. The primary contribution of this work is an enhanced understanding of how need for service, enabling factors and socio-demographic factors and in particular insurance coverage and type influence service usage. In this essay, I extend the behavioral model framework by examining the moderating effect of insurance on the relationship between health service usage and pre-disposing characteristics, as well as the moderating effect of insurance on the relationship between health service usage and need for service. Second, this essay extends research surrounding access to care by partitioning health service utilization into preventive care and acute care. Finally, less has been written on the role insurance plays in access to services (Robson and Sekhon 2011). Through this research, I help fill the gap in insurance literature.

Using proprietary data from a major metropolitan hospital in the United States, I explore the role of need for care, enabling factors and predisposing characteristics on preventive health service usage. The results show that preventive service usage is

influenced by category of appointment, insurance coverage and type, and demographic variables. Of key interest are the findings that 1) the degree to which insurance coverage matters and type of insurance held is varied amongst different demographic cohorts and 2) the customer's need for services is affected by the type of insurance they carry. I conclude by offering implication for policymakers and marketers.

### **3.2. Theoretical Development**

Service usage is detrimentally affected by barriers to access. Of particular interest is the finding that preventive care in the United States is highly underutilized; with usage at about half of the recommended rate (McGlynn et al. 2003). Janz and Becker (1984) found that health care customers are influenced by a variety of factors regarding taking preventive action to reduce the risk of disease or even comply with prescribed medical regimens. Although numerous models and theories, such as the health belief model (Rosenstock 1974; Becker et al. 1977; Janz and Becker 1984), theory of reasoned action/planned behavior (Ajzen and Fishbein 1980), social cognitive theory (Bandura 1998), and the transtheoretical model (Mittler et al. 2013) have been used to better understand health service usage, these frameworks have primarily been applied to capture health care customer attitudes and perceptions regarding their health care. I hope to extend the literature by exploring customer's behavior, specifically in the presence of modifying variables through an application of the behavioral model of health service use.

Developed by Andersen (1968; 1995), the behavioral model of health service use affirms that health service usage is driven by need for service, enabling factors and pre-disposing characteristics. I apply the behavioral model to examine types of health care customer appointments scheduled over the course of one year in a major metropolitan

hospital that treats a diverse array of health care customers. Based on a review of the literature, I conceptualize the effects of need for service as department category (e.g., primary care appointment or specialty care appointment), enabling factors as insurance coverage and insurance type, and pre-disposing characteristics as gender, age and race. A detailed description of the model and research questions are described below.

### **3.2.1. Preventive Health Service Usage**

Rather than evaluate total health service utilization, I believe it is important to partition health service usage into two distinct categories based on a health care customer's motivation for a health care appointment. A health care customer who schedules their routine (preventive) medical exam has a different motivation than a health care customer who schedules a one-off medical procedure. Therefore, I examine health service usage through the lens of preventive care appointments compared to acute care appointments.

The adoption of preventive health services has the power to substantially improve health outcomes and reduce morbidity (Mokdad et al. 2004). Health care customers who schedule preventive care appointments seek services that help stave off injuries or diseases rather than cure or treat them. Albeit preventive service were found to enhance patient outcomes, these services have largely been underutilized by health care customers. One study found that only 54.9 percent of health care customers in the United States receive preventive care (McGlynn et al. 2003). Based on the behavioral model framework, I believe circumstances exist which affect a health care customer's ability to gain access to service. Therefore I examine the three main drivers of health service usage below; need for service, enabling factors and pre-disposing characteristics.

### **3.2.2. Need for Service**

The ability to attain a service is affected by the degree of need for a service. Genberg et al. (2000) found that the greater the need for a service, the greater the use of health services. Specifically, the type of health care provider that health care customers schedule their appointment with is likely to be linked to the health care customer's value of the service relationship.

Specialty services, each derived from a different division of medicine, are designed to deliver specific, often complex, diagnoses and treatments (Gupta and Denton 2008). Specialty appointments are primarily scheduled for a need the primary care provider cannot meet. Further, it is important to note that although some specialty appointments are initiated by the health care customer, the vast majority of specialty care is driven by a referral from the health care customer's primary care physician.

A health care customer's primary care physician (PCP) is commonly seen as the gatekeeper of the health delivery system. They are usually the first point of contact for a patient. In addition to providing diagnoses, treatments, and making referrals for specialty appointments, PCP's are responsible for conducting health screenings, conducting comprehensive physical exams, and providing primary, wellness, and preventative health services. As PCP's are primarily responsible for engaging health care customers in preventive health services, the likelihood of scheduling preventive appointments compared to acute appointments will likely be higher for primary care patients.

### **3.2.3. Enabling Factors**

A critical enabling factor for access to health services is medical insurance coverage (Zuvekas and Taliaferro 2003). However, unlike carriers of home insurance,

auto insurance and especially life insurance policies, carriers of medical insurance have cause to want to utilize specific services and interact with their providers. Research has found that customers of other insurance carriers rarely interact with their providers and prefer to not fully utilize the product (Gidhagen and Persson 2011). In contrast, health insurance customers have the opportunity to enhance their lives by utilizing preventive services through insurance coverage. Therefore, I believe insurance coverage will serve as an enabler to service access and help promote preventive service usage.

On the other hand, due to the sheer cost of care, individuals without health insurance are less likely to use medical service (Curie and Gruber 1996). Unless health care customers receive charity care, uninsured individuals have a greater financial responsibility to their health care provider than insured individuals. Further, certain providers may deny access to individuals based on lack of insurance coverage alone.

Previous research has found that uninsured health care customers receive less preventive and acute services than health care customers who are insured (Thorpe 2004) and are at the greatest risk for increased mortality (Hadley, Steinberg and Feder 1991). Uninsured health care customers are more likely to schedule appointments that are considered urgent in nature; specifically where the need is greater. I expect the likelihood of scheduling a preventive care appointment (compared to an acute care appointment) will be lower for uninsured health care customers than it is for insured health care customers.

To further investigate the effect of having insurance coverage on preventive health service usage I partition insured health care consumers into two groups; government sponsored coverage or private insurance coverage. This distinction is based

on how U.S. citizens respond to the Current Population Survey Annual Social and Economic Supplement (CPS ASEC). Following guidelines outlined by the CPS ASEC, government health insurance programs include Medicare, Medicaid, and other federal programs (e.g., military, etc.). It is important to note that unlike private insurance, individuals need to qualify for these government programs based on various criteria such as disability, age, income and type of employment. Private health insurance plans are generally offered to the public either through employers or by private acquisition. They include any type of fee for service or managed care plan that is provided by a private company. These plans include HMO insurance, PPO insurance, and POS Insurance.

I expect to find differences in usage between the two groups due to the different financial responsibilities regarding payment of care and eligibility for care. When considering the varying effects of insurance types, I expect privately insured customers may be more apt to utilize preventive health service as private plans tend to be less restrictive in nature (i.e., eligibility is not typically determined by disability, age, income and type of employment).

#### **3.2.4.. Pre-Disposing Characteristics**

Certain groups of individuals may be more prone to adopt a service based on pre-disposing characteristics (Yousafzai and Yani-de-Soriano 2012). In terms of health service usage, demographic factors play a considerable role in a health care customer access to care (Zuvekas and Taliaferro 2003). Numerous studies have found that in addition to insurance coverage, factors such as age, race and gender (Hayward et al. 1998; Lasser, Himmelstein and Woolhandler 2006) have a direct influence on a health care customer access to care. Specifically, racial and ethnic minorities have been found



to face greater barriers to access care than their counterparts (Shi 1999; Shi and Stevens 2005). Solis et al. (1990) found that whites are more apt to use preventive care.

Regarding gender, females have traditionally been found to use more medical services (Coustasse et al. 2008) and are more likely to schedule preventive care services (Bertakis et al. 2000). Finally, according to a report published by the Center of Disease Control (2011) many preventive services are highly underutilized by older adults (65 and older). According to the report, adults aged 65 and older receive fewer preventive treatment options and reduced access to care. Based on the discussion above, significant variation can be expected amongst different groups and their usage of preventive services.

### **3.2.5. Interaction Effects**

The presence of insurance has routinely been found to influence care. However, the degree to which insurance coverage matters is varied. Minorities are less likely to have insurance coverage or use preventive or routine care compared to whites (Zuvekas and Taliaferro 2003). According to a report by the Kaiser Foundation, women are less likely than men to be insured (Kaiser 2014). Regarding age, individuals automatically qualify for Medicare at the age of 65. Further, according to the 2012 Census, older adults (ages 35 to 64) are more apt to have insurance coverage than younger adults (aged 19 to 34) (DeNavas-Walt, Proctor and Smith 2013). Based on the discussions above, I expect that preventive health service usage with respect to appointment making behavior will vary across demographic groups based on insurance coverage status and type of insurance plan.

As discussed, health care customers underutilize preventive care. Health care customers may view preventive health services as auxiliary services rather than required

care. For example, Dutton (1978) suggests that a health care customer is more likely to pay the rent than seek preventive health services. Although a health care customer may need a preventive service, the cost of the service may deter the customer from using the service. Recognizing that insurance has been identified as an enabling factor to service usage (Zuvekas 1992), I believe insurance will facilitate usage of preventive care services. Thus, I believe that the relationship between scheduling a primary care appointment and preventive health service usage depends on insurance coverage as well as type of insurance coverage.

### **3.3. Empirical Investigation**

The proposed relationships are conceptualized in one model with two specifications. To examine the effects of need for service (i.e., primary care appointment versus specialty care appointment), insurance coverage status, age, race, and gender on preventive health service usage, I examine 112,672 appointments between hospital providers and health care customers (Figure 3.1, Model 1a). In Model 1b (Figure 3.2) the same relationships are tested except I limit the analyses of service usage to health care customers who have insurance. Therefore, I examine 110,399 appointments to compare the effects of need for service, insurance type and demographic covariates on preventive health service usage. The unit of analysis in both models is the health care customer's appointment with a provider. Hospital billing records from April 1, 2010 – March 31, 2011 are used to explore the aforementioned relationships.

The overwhelming majority of the population studied carry health care insurance (98%), and seek acute care appointments (91%). In terms of demographics, the population is heterogenous across insurance groups and appointment types. Females and

whites schedule more appointments than their counterparts. The average health care customer is approximately 55 years old, however there is variation in age, with a standard deviation of about 17 years.

### **3.3.1. Measurement of the Dependent Variable**

As depicted in Table 3.1, the dependent variable is the type of health service scheduled; preventive health service (acute care appointment = 0, preventive service appointment =1). Acute care appointments serve as the reference category for the model and are defined as appointments that are more urgent in nature such as procedures and sick visits. Preventive service appointments are described as a health care customer's annual exam (i.e., well visits), monitoring (i.e., blood pressure checks), disease prevention (i.e., immunizations), or educational visits (i.e., insulin instruction).

Table 3.1. Operationalizations of Variables for Model

<u>Variables</u>	<u>Operationalization</u>
Dependent Variable:	
<b>PrevHealth</b>	Dichotomous dummy variable for service usage choice, Acute care is reference category. Acute Care = 0, Preventive Care = 1
Independent Variables:	
<b>Appointment Category</b> (Primary Care)	Dichotomous dummy variable for service need, Specialty care appointment is reference category. Specialty appointment = 0, Primary care appointment = 1
<b>Ins (Insurance)</b> (Model 1a only)	Dichotomous dummy variable for enabling factor, No insurance is reference category. No insurance = 0, Insurance = 1
<b>InsType (Private)</b> (Model 1b only)	Dichotomous dummy variable for enabling factor, Government insurance is reference category. Government plan = 0, Private plan = 1
<b>Age</b>	Continuous variable representing customer's age at appointment.
<b>Race (White)</b>	Dichotomous dummy variable for race, Non-white is reference category. Non-white = 0, White = 1
<b>Gender (Male)</b>	Dichotomous dummy variable for gender, Female is reference category. Female = 0, Male = 1
<b>Ins X Age</b> (Model 1a only)	Interaction Variable, Insurance moderates the causal effect of age on health service usage.
<b>Ins X Race</b> (Model 1a only)	Interaction Variable, Insurance moderates the causal effect of race on health service usage.
<b>Ins X Gender</b> (Model 1a only)	Interaction Variable, Insurance moderates the causal effect of gender on health service usage.
<b>Ins X Appt. Category</b> (Model 1a only)	Interaction Variable, Insurance moderates the causal effect of service need on health service usage.
<b>InsType X Age</b> (Model 1b only)	Interaction Variable, Age moderates the causal effect of having private insurance on health service usage.
<b>InsType X Race</b> (Model 1b only)	Interaction Variable, Race moderates the causal effect of having private insurance on health service usage.
<b>InsType X Gender</b> (Model 1b only)	Interaction Variable, Gender moderates the causal effect of having private insurance on health service usage.
<b>InsType X Appt. Category</b> (Model 1b only)	Interaction Variable, Insurance moderates the causal effect of need on health service usage.
<b>Res (In-state)</b>	Dichotomous dummy variable for residency, Out of state is reference category. Out of state = 0, In-state = 1

### **3.3.2. Measurement of the Independent Variables**

Continuous and dummy variables are operationalized to predict the likelihood of scheduling a preventive service appointment.

#### **Need for Service**

Need for service is operationalized by a health care customer's degree of need for an appointment. Need for service (Appt. category) is a dichotomous dummy variable and is coded as primary care appointment (1) or specialty care appointment (0).

#### **Enabling Factor**

Insurance (Ins) is a dichotomous dummy variable and is coded as insured (1) or uninsured (0). Type of insurance (InsType) is a dichotomous dummy variable and is coded as private insurance (1) or government insurance (0).

#### **Pre-disposing Characteristics**

Age at appointment (Age) is treated as a continuous variable and is calculated in years as the difference between the health care customer's date of birth and date of appointment. Extreme outliers, age 121 and 122 years are re-coded as missing. Gender is treated as a dichotomous variable and dummy coded as male (1) or female (0). Race is treated as a dichotomous dummy variable and is classified as white (1) or nonwhite (0). Declined to answer is treated as missing.

#### **Interaction Variables**

To detect differences of preventive service usage between whites and nonwhites, males and females and across age groups in the presence of insurance coverage (as compared to no coverage) I included interaction terms between pre-disposing variables and insurance as well as need for care and insurance. In Model 1a (Figure 3.1) the

interaction terms are: Ins X Age, Ins X Race, Ins X Gender, and Ins X Appt. Category. In the second specification of the model (Model 1b, Figure 3.2) I examine disparities of preventive service usage amongst the different demographics in the presence of private insurance (compared to government insurance). The interaction terms are: InsType X Age, InsType X Race, InsType X Gender, and InsType X Appt. Category.

### **3.3.3. Measurement of Control Variables**

In terms of location, geographical proximity to care has long been found to influence access to service. The closer the health care customer is to the service facility, the more likely they are to utilize the service (Padgett and Brodsky 1992). This predisposing factor is controlled for in the model. Geographical residency (Res) is a dichotomous variable and dummy coded as in state resident (1) or out of state resident (0). Residencies outside the United States are treated as missing.

This proprietary dataset includes a large heterogeneous population that has appointments in both urban and suburban residencies. Due to the diverse population studied, the results will likely be generalizable to other service industries.

### **3.4. Statistical Analyses**

To determine if multicollinearity is present, I examine the relationship between independent variables by analyzing multicollinearity diagnostic statistics. As depicted in Table 3.2 (Model 1a) and Table 3.3 (Model 1b), there is little evidence to suggest that the independent variables are correlated with preventive health service usage since all of the correlations with this outcome are less than 0.6. Further, each condition index is less than 30, indicating multicollinearity is not creating problems in the estimates.

**Table 3.2. Correlation Matrix (Model 1a)**

	1	2	3	4	5	6	7
1 PrevHealth	1.000						
2 Appointment Category	0.526 ***	1.000					
3 Ins(Insurance)	0.013 ***	-0.005 *	1.000				
4 Age	-0.174 ***	-0.178 ***	0.079 ***	1.000			
5 Race (White)	-0.059 ***	-0.033 ***	0.071 ***	0.192 ***	1.000		
6 Gender (Male)	-0.008 **	-0.016 ***	-0.033 ***	0.050 ***	0.001 ***	1.000	
7 Res (In-state)	-0.005	0.010	*** -0.002	0.021 ***	0.036 ***	*** -0.012 ***	1.000

\*p< .05, \*\* p< .01, \*\*\*p < .001

**Table 3.3. Correlation Matrix (Model 1b)**

	1	2	3	4	5	6	7
1 PrevHealth	1.000						
2 Appointment Category	0.528 ***	1.000					
3 InsType(Private)	0.118 ***	0.088 ***	1.000				
4 Age	-0.176 ***	-0.179 ***	-0.340 ***	1.000			
5 Race (White)	-0.060 ***	-0.035 ***	0.063 ***	0.190 ***	1.000		
6 Gender (Male)	-0.007 *	-0.015 ***	-0.022 ***	0.055 ***	0.011 ***	1.000	
7 Res (In-state)	-0.006	0.012 ***	-0.052 ***	0.021 ***	0.036 ***	*** -0.013 ***	1.000

\*p< .05, \*\* p<.01, \*\*\*p < .001

### 3.4.1. Research Methodology

Basic descriptive analysis and logistic regression analyses are conducted to study the relationships between need for service, enabling factors and pre-disposing characteristics related to preventive health service usage. Logistic regression is used to estimate the effects of the explanatory variables on the probability of scheduling a preventive health service appointment. The unit of analysis is the individual health care customer's appointment with the provider and a logistic regression model is used to test the relationships. Logistic regression is an appropriate model to test the relationships as the dependent variable, preventive health service usage, is a binary dependent variable. Using logistic regression, I estimate a model of preventive health service usage for the

total sample of 112,672 scheduled appointments (Model 1a) and for the total sample 110,399 of scheduled appointments (Model 1b). In the logistic regression analysis the data are arranged so that there is one observation for each scheduled appointment. Model 1a and Model 1b express the probability of scheduling a preventive health service appointment as a function of a series of explanatory variables. The model can be expressed as follows:

$$E \{ Y_i \} = \exp (X_i' \beta) / 1 + \exp (X_i' \beta)$$

where Y denotes preventive health service usage, X is the vector of independent variables and E stands for the likelihood of choosing one of the response outcomes (preventive care appointment or acute care appointment). Subscript i refers to the ith appointment ( $X_i, Y_i$ ) (Kutner et al. 2005). Logistic transformation applied to this model bounds the value of the dependent variable by 0 and 1, and the coefficient estimates for the independent variables represent the change in log-odds for a one unit increase in the independent variables. Acute care appointments are chosen as the reference category and thereby set to zero as our primary interest is to understand a customer's preventive health service usage. The parameter vectors  $\beta$  are estimated by the maximum likelihood method. In addition to reporting the estimated multinomial logit coefficients, it is necessary to compute the magnitude of the effect of the independent variables (Petersen 1985) and therefore the percent change in odds are also reported.

### **3.4.2. Analyses and Results**

Table 3.4 and Table 3.5 present the results from the logistic regression analyses of preventive health service usage.. The findings demonstrate that the models fit the data, with a  $\chi^2$  statistic of 23289.66 (10) significant at 0.001 confidence level in Model 1a



(Table 3.4) and a  $\chi^2$  statistic of 23393.67 (10) significant at 0.001 confidence level in Model 1b (Table 3.5). The results from Model 1a will be discussed followed by a brief discussion on Model 1b. Further, as seen in Tables 3.4 and 3.5, both specifications of the model achieve a high degree of fit, as reflected by an  $R^2$  of 0.348 in Model 1a (Table 3.4) and an  $R^2$  of 0.350 in Model 1b (Table 3.5).

Table 3.4. Model 1a Logistic Regression Results for Predicting Preventive Service Usage by Need, Insurance and Pre-disposing Variables.

Constructs	Independent Variables	Base Model		Full Model	
		b (se)	% Change in Odds	b (se)	% Change in Odds
<b>Need for Service</b>	Appt. Category (Primary Care)	3.365 *** (0.027)	2793.8%	3.215*** (0.212)	2389.50%
<b>Enabling Factor</b>	Ins (Insured)	0.474*** (0.098)	60.6%	-0.537 (0.366)	-41.5%
<b>Pre-Disposing Variables</b>	Age	-0.019*** (0.001)	-1.9%	-0.042*** (0.007)	-4.1%
	Gender (Male)	0.165*** (0.026)	17.9%	0.619** (0.213)	85.7%
	Race (White)	-0.232*** (0.026)	-20.7%	-0.695** (0.221)	-50.1%
<b>Interaction Variables</b>	Ins X Age			0.023** (0.007)	2.3%
	Ins X Gender			-0.463* (0.214)	-37.1%
	Ins X Race			0.468* (0.223)	59.7%
	Ins X Appt. Category			0.157 (0.219)	17.1%
<b>Control</b>	Res (In-state)	-0.318 (0.078)	-27.2%	-0.326*** (0.078)	-27.80%
	Constant	-2.762		-1.757	
<b>Model Fit</b>	Log-Likelihood	-22388.882		-22376.777	
	Wald Chi-Square (d.f.)	23265.45 (6)		23289.66 (10)	
	Pseudo R2	0.342		0.342	
	AIC	44791.76		44775.55	
	BIC	44859.19		44881.51	
	N	112,672		112,672	

Entries are unstandardized (b) with standard errors in parentheses.

\*p<.05, \*\* p< .01, \*\*\*p <.001

Table 3.5. Model 1b Logistic Regression Results for Predicting Preventive Service Usage by Need, Insurance Type and Pre-disposing Variables.

Constructs	Independent Variables	Base Model		Full Model	
		b (se)	% Change in Odds	b (se)	% Change in Odds
<b>Need for Service</b>	Appt. Category (Primary Care)	3.363*** (0.027)	2787.2%	3.177*** (0.037)	2297.00%
<b>Enabling Factor</b>	InsType (Private)	0.489*** (0.026)	63.0%	0.642*** (0.095)	90.0%
<b>Pre-Disposing Variables</b>	Age	-0.015*** (0.001)	-1.5%	-0.014*** (0.001)	-1.4%
	Gender (Male)	0.157*** (0.026)	17.0%	0.185*** (0.036)	20.3%
	Race (White)	-0.276*** (0.026)	-24.1%	-0.256*** (0.037)	-22.5%
<b>Interaction</b>	InsType X Age			-0.007*** (0.002)	-0.7%
	InsType X Gender			-0.063 (0.052)	-6.1%
	InsType X Race			-0.041 (0.052)	-4.1%
	InsType X Appt. Category			0.377*** (0.055)	45.8%
<b>Control</b>	Res (In-state)	-0.292 (0.080)	-25.3%	-0.281 (0.081)	-24.50%
	Constant	-2.724		-2.740	
<b>Model Fit</b>	Log-Likelihood	-21811.054		-21770.296	
	Wald Chi-Square (d.f.)	23312.15 (6)		23393.67 (10)	
	Pseudo R2	0.348		0.350	
	AIC	43636.11		43562.59	
	BIC	43703.39		43668.32	
	N	110,399		110,399	

Entries are unstandardized (b) with standard errors in parentheses.

\*p< .05, \*\*\* p<.01, \*\*\*\*p< .001



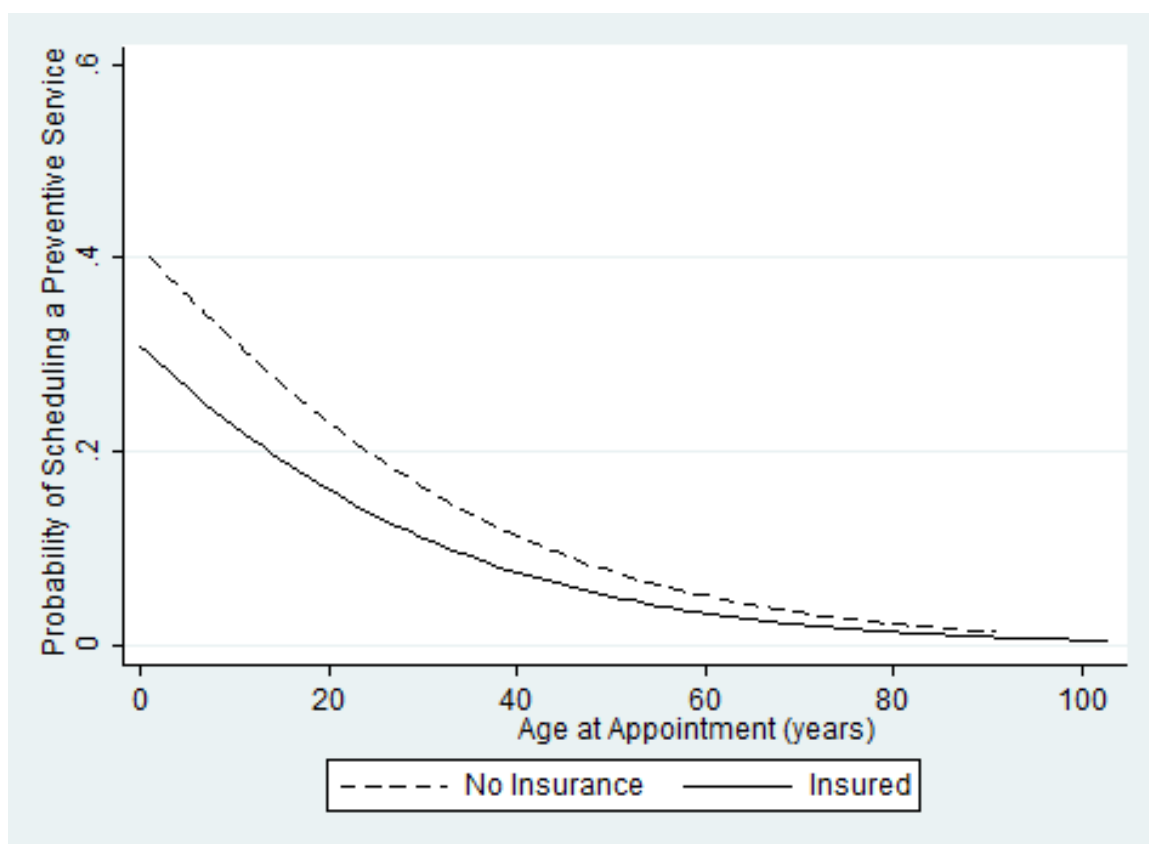
**Results: Model 1a**

As depicted in Table 3.4, the main effect for need for service is in the expected direction. Health care customers who schedule primary care appointments are 2,389.5% more likely to schedule preventive care appointments than acute care appointments ( $b=3.215$ ,  $p < .001$ ). The size of this effect is most likely due to the nature of a primary care appointment. Although primary care appointments treat a broad array of disorders, a key goal for providers is to teach healthy lifestyle choices and engage their health care customers in preventive care.

As anticipated, I find a positive effect for insurance serving as an enabler for preventive health service usage in the base model ( $b=0.474$ ,  $p < .001$ ). However, when I account for the heterogeneity across different groups I find that the main effect of having insurance is no longer significant on preventive service access ( $b=-0.537$ , n.s.) (Table 3.4, Full Model).

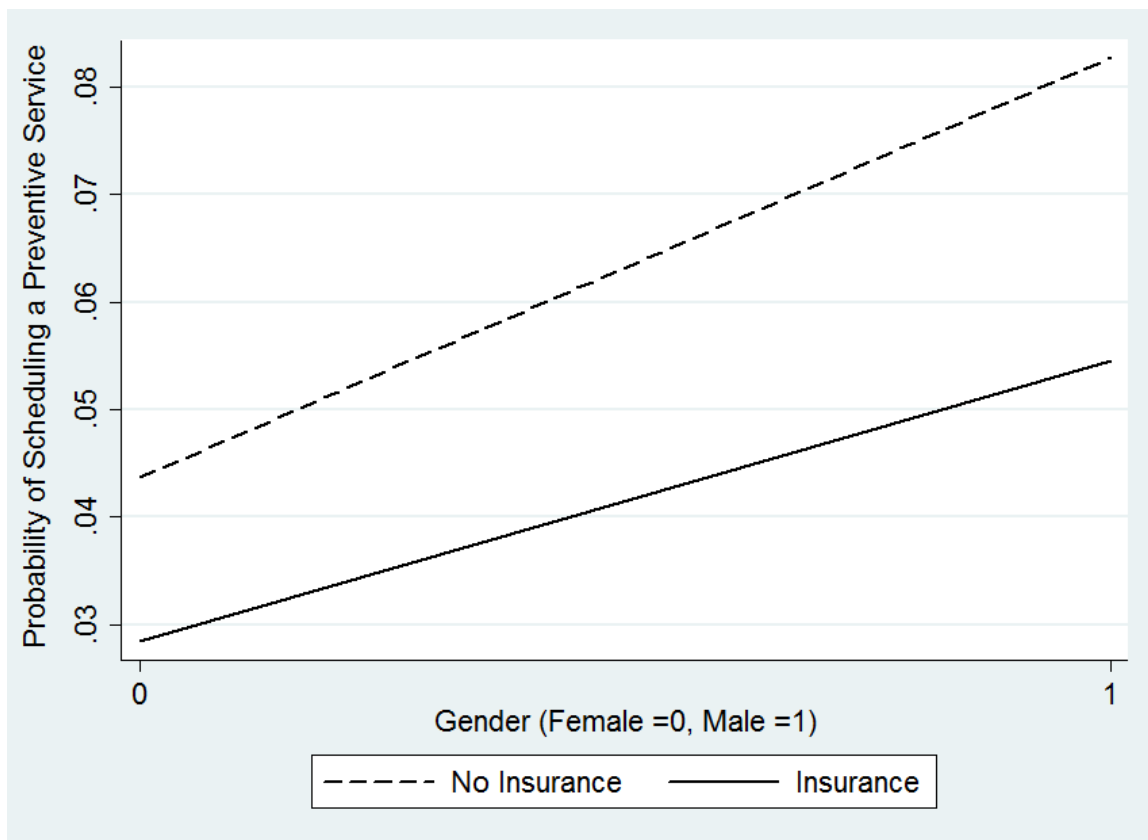
As seen in the full model, the main effects for age, gender and race are significant ( $p < .001$ ). Interestingly, males are found to be 85.7 % more likely to schedule preventive health service appointments than females ( $b=0.619$ ,  $p < .01$ ). As anticipated, age at appointment is found to be associated with less preventive service appointments ( $b=-0.042$ ,  $p < .001$ ). For each additional year in age, the likelihood of a health care customer scheduling a preventive care appointment decreases by 4.1%. As discussed, research has found that minorities face many challenges in terms of access to care. However, the results show that whites are 50.1% less likely to schedule preventive care appointments compared to nonwhites ( $b=-0.695$ ,  $p < .01$ ). Further research regarding these unexpected findings is necessary.

Of chief importance is the finding that the age effect, gender effect, and race effect on the probability of using preventive health service depends on the customer's insurance coverage status. I find the effect of age on preventive health service usage varies by insurance coverage status ( $b = 0.023$ ,  $p < .01$ ). As depicted in Figure 3.3 the predicted probability of scheduling a preventive health service is higher for uninsured customers than insured customers regardless of age. However, due to the age effect, the disparity between uninsured customers and insured customer on service usage diminishes as patients get older.



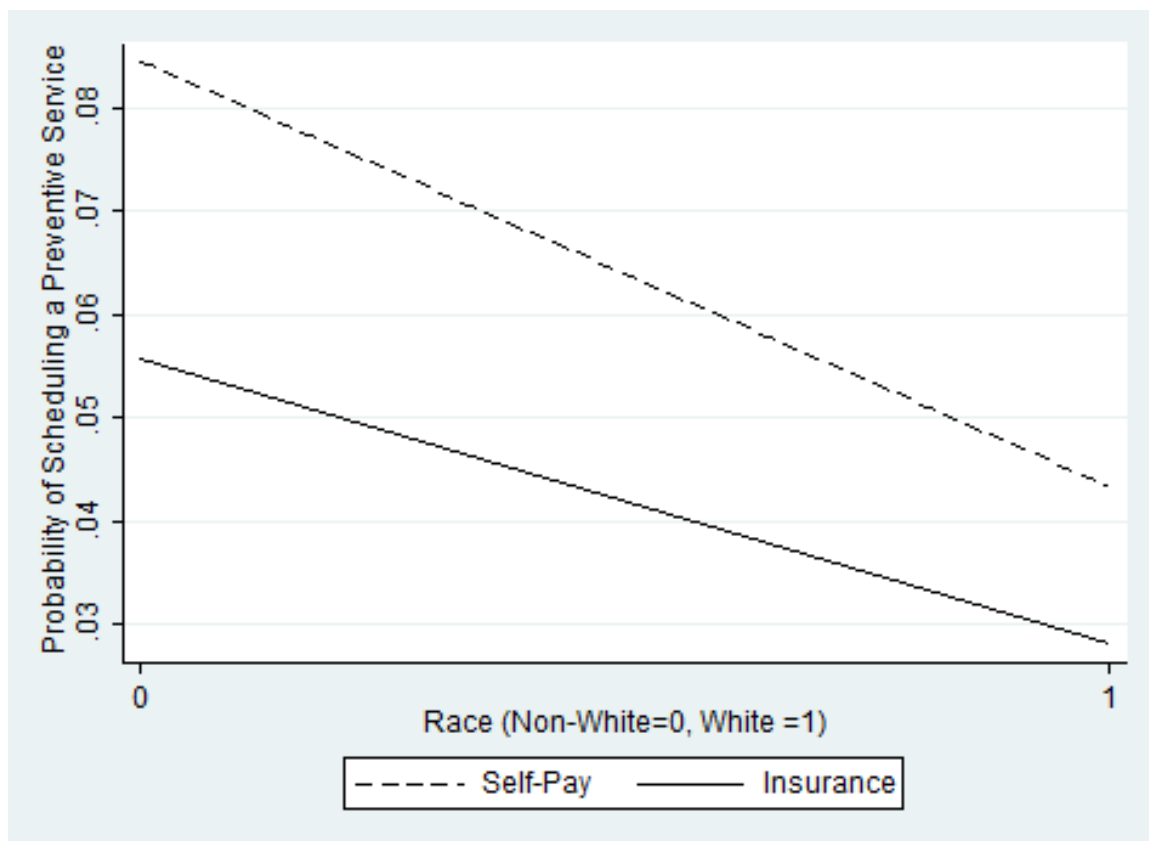
**Figure 3.3. The Relationship between Age and Insurance on Preventive Service Usage (Essay Two).**

Regarding the gender effect, I find that insurance plays an important role (Figure 3.4). I find the effect of gender on preventive health service usage varies by insurance coverage status ( $b = -0.463$ ,  $p < .05$ ). As depicted in Figure 3.4, the moderating effect of insurance on gender is larger for males than it is for females.



**Figure 3.4. The Relationship between Gender and Insurance on Preventive Service Usage (Essay Two)**

I find the effect of race on preventive health service usage varies by insurance coverage status ( $b = 0.468$ ,  $p < .05$ ). As depicted in Figure 3.5, the moderating effect of insurance on race is larger for nonwhites than whites.



**Figure 3.5. The Relationship between Insurance and Race on Preventive Service Usage (Essay Two)**

Interestingly, the interaction between need for service and insurance on preventive health service usage is insignificant. This finding leads me to surmise that health care customers in a primary care setting may be unaffected by the presence of insurance coverage when seeking preventive services. Further research regarding this finding is necessary.

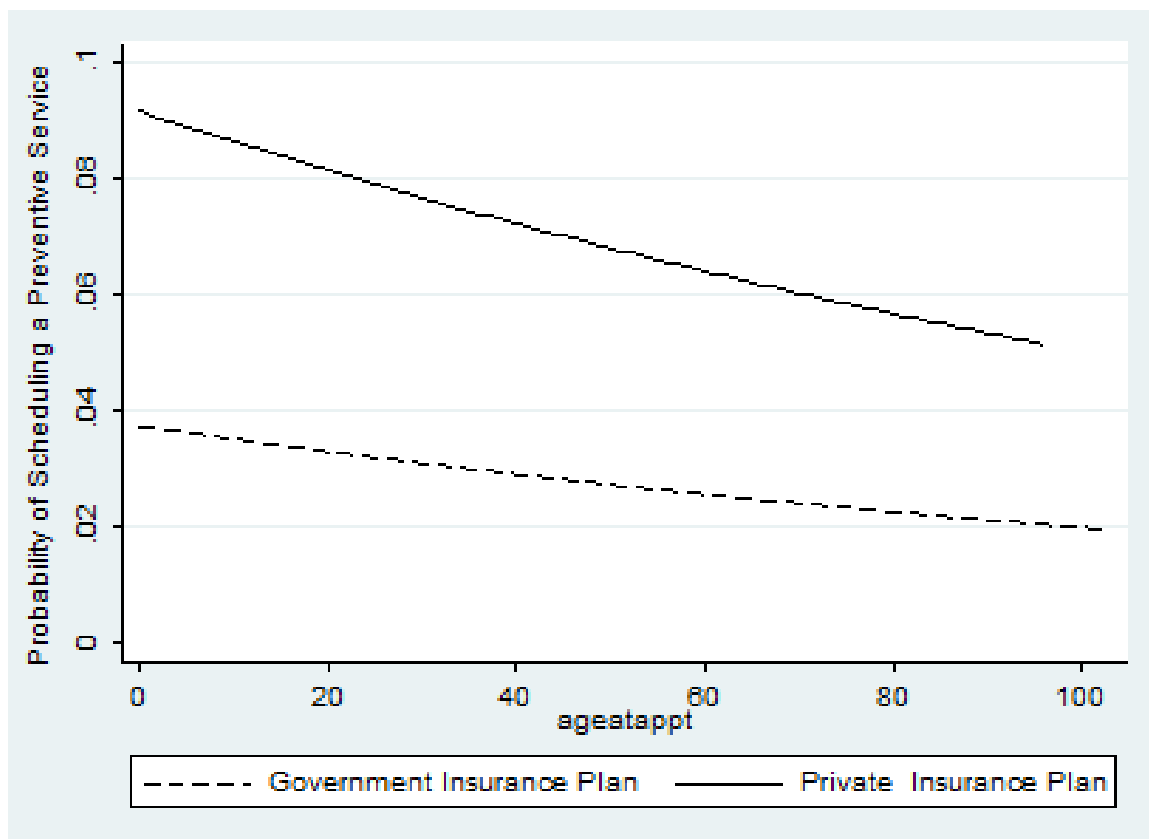
### **Results: Model 1b**

As depicted in Table 3.5 (Model 1b), differences in service usage amongst the two insurance groups are as expected. When considering the varying effects of insurance types, I find that health care customers covered by private insurance are more likely to



schedule preventive care services than health care customers covered by government plans. Specifically, health care customers covered by HMOs, PPOs and POS plans are 90.0% ( $b= 0.642$ ,  $p<.001$ ) more likely to schedule preventive services than health care customers covered by Medicare, Medicaid and other federal programs. This finding is consistent with the expectation that private plans appear considerably less restrictive than government plans. Further research exploring the difference of the effect of private and government insurance on access to care is necessary.

Interestingly, I find the effect of age on preventive health service usage varies by type of insurance coverage ( $b= 0.023$ ,  $p<.01$ ). As depicted in Figure 3.6, due to the age effect, the disparity in preventive service usage based on private or government insurance is greater at an early age as compared to older age. Based on my findings (Model 1a and Model 1b) it is important to note that the size of the effect of age on preventive service usage depends on insurance coverage status and type. Specifically, the age effect will be greater earlier in life than later in life when considering insurance coverage and type. This result may be influenced by the customer's eligibility of attaining government insurance when they reach the minimum age requirement.

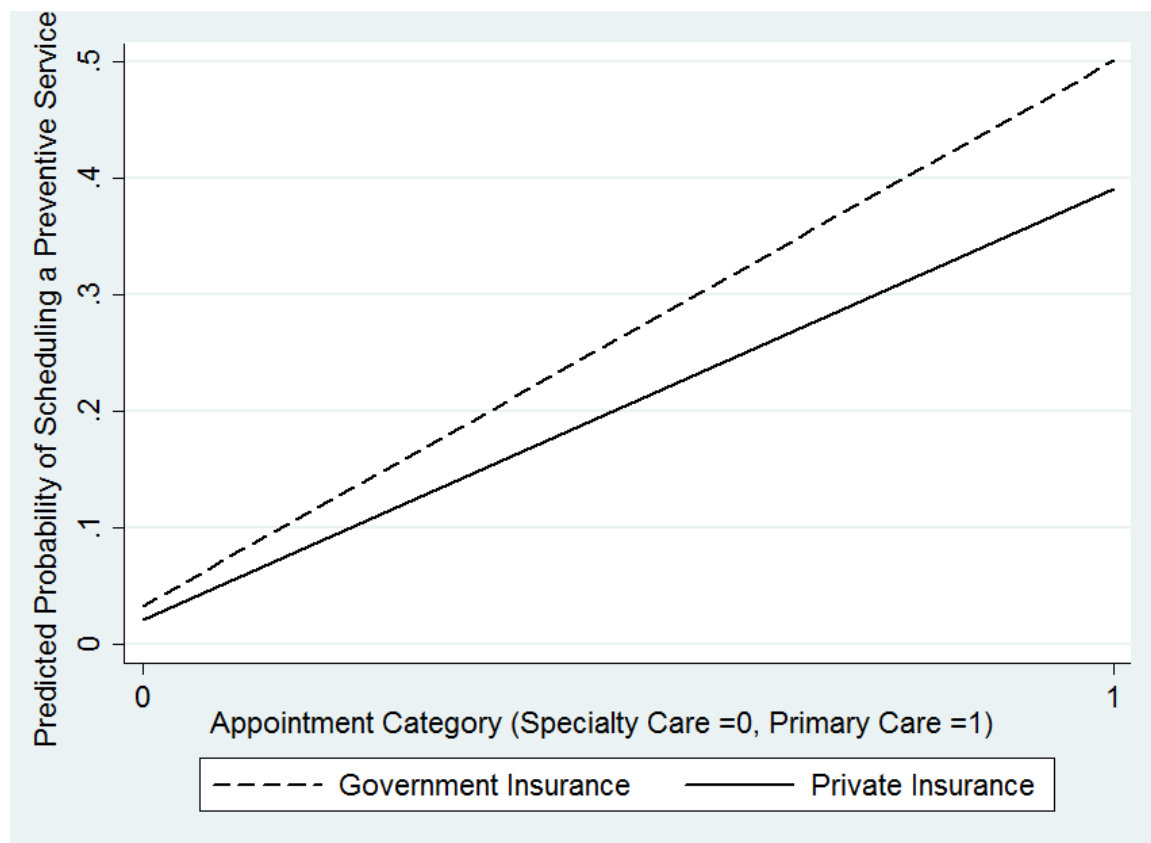


**Figure 3.6. The Relationship between Age and Insurance Type on Preventive Service Usage (Essay Two)**

Interestingly, the interaction between race and private insurance and between gender and private insurance is not found to be significant. This finding is surprising as the interaction effect between insurance coverage and gender and insurance coverage and race is found to be significant in Model 1a. Thus, we see that different demographic groups are more responsive to the presence of insurance coverage rather than the type of coverage. Further research regarding these findings are necessary.

Finally, the effect of need on service usage was found to vary by insurance type ( $b = 0.377$ ,  $p < .001$ ). As depicted in Figure 3.7, due to the need for service effect, the discrepancy between government insurance and private insurance on preventive service

usage is greater when there is a greater need for service (e.g., preventive care appointment).



**Figure 2.7. The Relationship between Insurance Type and Appointment Type on Preventive Service Usage (Essay Two)**

### 3.5. Discussion

Engaging in sustainable preventive health care has long been found to enrich an individual's social well-being and decrease health care costs (Roth 1994; Center of Disease Control 2011). By applying the behavioral model of health service use, I am able to identify the effects of need for care, enabling factors and demographic covariates on preventive health service usage. I find that primary care customers have a greater need

for preventive services than customers seeking specialty care. This finding is expected as logic suggests that rational health care customers would typically engage in preventive health services in a primary care setting in attempt to ward off future diseases or ailments that could require them to seek specialty care. Future research should consider how need for preventive care varies amongst different provider specialities.

Interestingly, before I account for the heterogeneity across the different demographic groups, I find that having insurance is an enabler to care (Table 3.4, Base Model) however the effect becomes insignificant when I account for the heterogeneity amongst groups (Table 3.4, Full Model). However, when I consider the interaction effects between insurance and pre-disposing characteristics, I recognize that service usage does depend on insurance coverage between different demographic groups. In addition, I found that the type of health plan a health care customer carries is found to play an important role in preventive service usage when considering age and need for service. Based on the results, it is clear that insurance can serve as an enabler to service, but the degree to which care is sought is affected by the type of insurance plan held and the customer's pre-disposing characteristics and need for service.

### **3.6. Managerial Implications**

Understanding service access is a fundamental concern for policymakers and management. In particular, the health care industry struggles to improve access to services by effectively marketing services. Although health care customers are increasingly becoming more educated about their health, well-being and types of treatments available, they are still limited in their health care knowledge and of the services available to them (Roth 1994). Further contributing to the challenges

surrounding access is insurance coverage. Although insurance is typically regarded as an enabler to services, customers find insurance products complex and convoluted (Gidhagen and Persson 2011). Whether customers are acquiring insurance in the financial sector or medical sector, availability and types of coverage can be confusing and overwhelming to a customer. To empower consumers, management and policy makers need to build and foster consumer knowledge to reduce barriers to access.

Identifying drivers of service access affords management the opportunity to develop and target programs more effectively (Zuvekas and Taliaferro 2003). It is my intent that this research offers a deeper understanding into the underlying factors associated with access to services. Through this framework, health care management will have the requisite knowledge to target segmented populations based on need, insurance, and pre-disposing variables which will help improve access to care and ultimately health care customer's outcome.

By identifying segments of the population that are more prone to schedule preventive service appointments, management can employ targeting mechanisms to appropriately meet the needs of the desired population. In addition, by exploring how preventive service appointments scheduled vary by need for service, insurance coverage and type, as well as by pre-disposing demographic characteristics offers deeper insight into the possible underlying mechanisms driving preventive service usage. A key takeaway for management is the ability to target programs more effectively by understanding the profiles of health care customers who schedule appointments and the possible interactions between variables on access to care.

### **3.7. Caveats & Future Research**

The weight customer's place on the value of a service is typically assessed by attitudinal measures. However, the way customers think and the way they act may not always be harmonious. Therefore, it is important to examine the way a customer acts—the manner in which they behave to better understand their desire to schedule an appointment. Although behavioral measures offer key insight into drivers of preventive health service usage, I recognize that the type of service a customer schedules may be influenced by their pre-conceived expectations regarding the encounter. In addition, I recognize that customer satisfaction in any service industry is a key focus of research practitioners (Robson and Sekhon 2011) and should be considered in future work. Therefore, to help fill the gap in access research, future work can incorporate both attitudinal and behavioral measures.

In each specification of the model, it is clear that need for service, enabling factors and pre-disposing characteristics play an important role in preventive service usage. Of particular interest is the findings that the effect of age, gender, race and need on preventive service usage can be affected by insurance coverage and/or type of coverage. Future research should further investigate how different types of coverage influence customer access to service.

Finally, I would like to highlight the fact that although the number of uninsured individuals will continue to dwindle due to the Affordable Care Act (DeParle 2010) it is important to recognize that increased eligibility for insurance does not necessarily increase the efficiency with which care is delivered (Currie and Gruber 1996). Future research should therefore consider the impact of preventive health service usage on health

care customer's overall health outcomes and delve deeper into the varying types of insurance coverage as it relates to service access.

**CHAPTER 4:**  
**DISCUSSION, THEORETICAL IMPLICATIONS,**  
**MANAGERIAL IMPLICATIONS, LIMITATIONS & FUTURE RESEARCH**

**4.1. Discussion**

Across the globe, organizations continue to search for ways to increase service usage. The primary goal of this research is to improve service usage by identifying variables that affect customer access to services. Two studies are conducted to identify the effect of a customer's service history, service failure history, need for service, enabling factors and pre-disposing characteristics on service usage. Based on my results, I find that service usage is influenced by a customer's value of his or her relationship with the scheduled service provider and other providers within the service organization as well as need, enabling factors and pre-disposing characteristics.

I find that customers evaluate potential/existing relationships by first, having a need for the relationship and second) by determining the relationship's worth (i.e., evaluating if the benefits of the relationship outweigh the costs). When customers regard the relationship as valuable, they will seek services and continue to patronize the scheduled provider and the organization. Furthermore, the value obtained in the one-to-one relationship between a customer and scheduled provider can influence other relationships within the organization, however it is important to recognize that it is the relationship with the scheduled provider that will insulate the relationship from provider-initiated service failures.

As previously discussed, service usage is also influenced by need, insurance coverage, insurance type, age, gender and race. Based on previous research (Andersen



1968; 1995) and the results in this essay, need for service has a significant effect on service usage. Based on my results, I find that a customer's need for service is influenced by type of insurance. Specifically, the type of insurance coverage held will have a greater effect on need for service when the need for service is greater (e.g., primary care appointment).

Interestingly, I found evidence to support that certain groups are more likely to use preventive services based on their existing characteristics (e.g., younger patients, males, nonwhites). In addition, I found that within certain groups, having insurance will affect the likelihood of using preventive services. For example, due to the gender effect on preventive service usage, the effect of insurance coverage status is larger for males than it is for females.

Identifying the presence and relative impact of each of these drivers on service usage affords managers and marketers alike the ability to reduce barriers to access. This research offers two unique frameworks for analyzing service appointment data. Each framework affords management the ability to improve a customer's access to services by managing customer relationships and service more efficiently. Through this research, I offer tangible tools for an organization to enhance their overall productivity. Although the analyses of the dataset in each essay is limited to the health care sector, the results found are likely to be generalizable across service industries that rely on scheduled appointments with service providers. For example, in Essay One, I predict the likelihood of missed service encounters as a function of customer's service history, and provider-initiated service failures. Similar scenarios can be found in any one-to-one interdependent service relationship. Consider a customer's appointment with an auto-mechanic. The

customer relies on the mechanic to repair their car and the mechanic relies on the customer to help build brand equity through the customer's continued loyalty and word-of-mouth behavior. When the mechanic fails to meet the needs of the customer (i.e., initiates a service failure), the customer's expectations are not met and performance in the encounter suffers. Thus, it is clear that service failures can serve as a deterrent for service usage- especially if the customer-provider relationship history is limited.

The results found in Essay Two can be applicable to other areas within health care. In Essay Two, I predict the likelihood of preventive care use as opposed to acute care use as a function of need, enabling factors and pre-disposing characteristics. This framework could be applied to investigate customer's service usage of various specialties within the hospital. Further, various sub-types of insurance coverage (i.e., HMOs, PPOs, etc.) could further be explored to identify their relative effect on service usage.

#### **4.2. Theoretical Implications**

Through this research, I explore the service encounter phenomenon by investigating missed service encounters and service usage in the health care industry. Three themes emerged: value, reciprocity, and loyalty. First, relationship value is conceptualized as an individual's likelihood to have and to maintain a relationship with a service provider and organization. I add to social exchange theory, relationship marketing and S-D logic by illustrating the interdependency of the one-to-one customer-provider relationship and the importance of the co-creation of value in the relationship. I find that relationships are interdependent- the customer and provider co-create value and rely on each other through the exchange of services. Value must be attained in transactions between the customer and the provider in order for the relationship to exist and persevere.

Before customers access services, the customer needs to be aware of the service. The customer must regard the proposed service relationship with a service provider and organization as having value. In the second essay, I find that service usage is influenced by the degree of need for the service and the ability to attain the service through insurance coverage and type. I add to the behavioral model by raising the argument that the customer's need for the service may be a function of the value they place on the service relationship.

The value customer's place on the relationship, and in turn their desire to maintain the relationship and schedule services, can be detrimentally affected when a provider initiates a service failure. As relationships are reciprocal in nature, when the provider fails to meet their intended obligation by initiating a service failure, overall performance in the service encounter suffers. Service failures force the customer to miss their scheduled appointment, thereby initiating a loss for the customer.

I find evidence to support that one-to-one relationships are a critical component of service encounters. Relationships between a customer and scheduled provider that continue to generate value will have positive spillover effects to other customer-provider relationships within the organization. Interestingly, I did not find evidence of negative spillover effects- the effect of provider-initiated service failures from other providers did not have a significant effect on future missed service encounters. This unexpected result helps highlight the role of customer-provider loyalty. Specifically, positive relationships in which value is co-created will positively influence other relationships within the same organization and decrease the likelihood of missed service encounters. Yet, negative encounters (i.e., service failures from other providers) will have no effect on missed

service encounters. The results illustrate that even if customers incur a service failure from other providers within the organization, their allegiance/loyalty to their scheduled provider is unaffected.

The effect of loyalty between a customer and scheduled provider is clearly evident when the customer's service history and service failure history is considered. These findings have important implications for umbrella branding. Based on the results of this research, I find that a customer's allegiance/loyalty to a provider (brand) can positively influence other services (other brands) within the same organization (umbrella brand). Further, the customer's loyalty to their scheduled provider (one brand) can act as a buffer from the deleterious effects of service failures from their scheduled provider and other providers within the organization. Interestingly, negative effects of other brands will not affect customer's usage with the scheduled provider (brand). Specifically, the effect of service failures from other providers on missed service encounters is found to be insignificant.

### **4.3. Managerial Implications**

Through this research, I hope to offer management frameworks that afford the ability to improve current practices which will improve access to services. My research offers tactical tools for management to segment consumer markets more effectively. In Essay One, management is afforded the requisite knowledge to strengthen relationships between customers and providers and customers and the overall organization. In Essay Two, I offer a framework to target segmented populations based on need, insurance, and pre-disposing variables- which will help improve access to services and clinical outcome.

#### **4.3.1. Public Policy Implications**

In many service sectors, failure to access an appointment can detrimentally effect the well-being of the customer. In the health care market, a health care customer's condition may worsen over time placing them at risk for increased costs and morbidity. Through enhancing access to services, customers will received the benefits of services- thereby improving their overall outcome.

By identifying barriers to access, health care organizations can help health care customers receive preventive and acute care. Through improved access to services, customers can help prevent the likelihood of serious illnesses that require advanced costly medical care. As discussed earlier, to offset the losses due to missed service encounters, many service industries have resorted to raising prices and overbooking appointments to help shield themselves from the lost revenue incurred by cancellations and no-shows. Overbooking may provide a quick fix for the service organization, but may cause the customer to miss their appointments due to the increased wait time and cost.

Implementing a framework such as this will afford management an opportunity to decrease cancellations/ no-shows by first segmenting customers based on their history with the provider and in turn scheduling them at times when they are least likely to impact customer flow. As a result, management will no longer need to resort to such tactics as raising prices or overbooking.

#### **4.4. Limitations & Future Research**

This paper is limited to secondary data from one organization that captures customer appointments for one year. First, I recognize that service usage is influenced by both the behavior and attitude of the customer. Future work will incorporate both attitudinal and behavioral measures to obtain a more comprehensive evaluation of

services access. Second, to add to the robustness of the analyses, future work will include other hospital organizations and longer time periods. Finally, I recognize that this dataset is limited to the health care setting. However, the frameworks generated are likely to be applicable to customer-provider relationships that are dictated by scheduled appointments.

The analysis of this dataset was limited to one-to-one relationships and how these relationships influence other relationships within an organization. It would be interesting to apply this framework to customer-organization relationships. As discussed in essay one, it would be interesting to examine the effect of incurring a service failure by an organization on future service usage. As customer-organization relationships are less personal by design, it would be interesting to study a customer's loyalty to the organization in the presence of service failure.

In Essay One, I found loyalty to be a vital component of customer-provider relationships. Future research could examine the effect of a customer's loyalty to their provider and their loyalty to the overall organization. Such as, future research could compare the effect of loyalty in the customer-provider relationship versus the customer-organization relationship. For example, if the scheduled provider leaves organization A for another organization (organization B) will the customer remain loyal to the scheduled provider or to organization A?

Lastly, preventive health service usage is limited, yet the effect of engaging in preventive care has been found to be beneficial to the health care customer, organization, and society (Maciosek et al. 2010). In Essay Two, I find that preventive service usage is influenced by need, insurance, and socio-demographic characteristics. The findings of

this paper will serve as a basis for future research exploring the influence of type of insurance on access to services as well as degree of need on access to services. Future research should compare the effects of different insurance plans on preventive service usage and investigate how insurance influences need for service. In addition, future research should consider how different specialties (i.e., cardiology, dermatology etc.) influence service usage based on need for care.

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