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Value cocreation as a double-edged sword in customers' quality of life and service outcomes

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VALUE COCREATION AS A DOUBLE-EDGED SWORD IN CUSTOMERS' QUALITY OF LIFE AND SERVICE OUTCOMES

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by

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ABSTRACT

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Both Service Dominant (SD) logic and transformative service research have received attention from marketing managers and scholars as a result of the expansion of the service sector. However, the SD logic perspective on "the growth of human wellbeing needs more explanation and attention" (Vargo & Lusch, 2016, p. 20). Healthcare is particularly relevant to both streams of research and enables customers to contribute to their wellbeing through cocreation of value. The marketing literature indicates customer value cocreation (CVCC) in healthcare activities enhances service perceptions and quality of life (QoL). However, the healthcare literature demonstrates that cocreation may damage patients' psychological health and wellbeing. Thus, this research explores the mechanism and conditions to determine when and how CVCC may have positive/negative consequences on firms and patients. I study CVCC in the four areas of adherence, communication, goal setting, and decision making, and highlight the roles that anxiety, service quality, and disease severity play in explaining the relationship between CVCC and QoL. The conceptual model of this research is tested in two empirical studies, including a field study among pregnant women and an online survey among individuals with chronic diseases. Furthermore, the model was explored and confirmed using two analytical approaches: partial least square and covariance-based structural equation modeling. The results support in

general the proposed conceptual model and reveal the double-edged character of CVCC as capable of producing both positive and negative consequences. Even though anxiety declines with increased CVCC in the areas of adherence, communication, and goal setting, customers feel greater anxiety when they cocreate in decision making, since the latter is perceived as an effortful and difficult activity. Subsequently, anxiety reduces QoL and satisfaction with service through service quality. Disease severity moderates the effect of CVCC on anxiety as well as the effects of service quality and satisfaction on QoL. More specifically, the mitigating effects of adherence, communication, and goal setting on anxiety heighten when disease is highly severe. Interestingly, disease severity flips the escalating effect of decision making on anxiety to a mitigating effect, indicating that in highly severe situations cocreation in decision making reduces anxiety.

DEDICATION

I dedicate my dissertation to my family, advisors, and friends who wholeheartedly inspired, motivated, and supported me to reach where I am. A special feeling of gratitude to my loving parents, Aliakbar Hosseinzadeh and Nosrat Yousefi, two brothers, Khosrow and Parviz, and my sister, Sara, who have always supported me and never left my side. I also dedicate this dissertation to my best friend, Jocelyn Gonzalez, who never lost faith in me and helped me by all means to accomplish this degree. A special thanks to my advisors, Dr. Mohammadali Zolfagharian, Dr. Yany Grégoire, and Dr. Michael Brady, who have contributed to my education and supported me throughout the process. Thank you all for your support and patience.

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CHAPTER I

INTRODUCTION

The US economy is a service economy. The service sector forms 84% of US employment and constitutes 82% of GDP, while all other industries, such as mining, agriculture, and goods production, create 18% of GDP (Bureau of Economic Analysis, 2012). It is noteworthy that healthcare services per se—"the most personal and important service" (Berry & Bendapudi, 2007, p. 111)—generated more than one fourth of the service sector's GDP and 17.9% of the US GDP in 2010 (Martin et al., 2012). Total US health spending reached $2.7 trillion, or $8,680 per person, in 2011 and was estimated to form 22% of the US GDP in 2015 (Hartman et al., 2013). Aside from the economic impact, the predominant contribution of healthcare services is to enhance individuals' wellbeing through the provision of various treatments/activities as well as empowering them for cocreation in those activities (Ostrom et al., 2010; Sweeney et al., 2015).

Service encounters contain dyadic interactions between service providers and customers (Solomon, Surprenant, Czepiel, & Gutman, 1985). Such interactions, when aggregated, serve as an important contributor to a firm's success, especially in healthcare as a "pure service", where there is a high degree of person-to-person interaction (Solomon et al., 1985). Accordingly, since customer value cocreation (CVCC) is a central element within customer-provider interactions, it qualifies as one of the key determinants of service encounter processes and outcomes, especially in the healthcare industry (Gallan et al., 2013).

Statement of the Problem

The marketing literature indicates that the lack of CVCC—the integration of resources among the customer and other actors in a value network— in the health treatment process dramatically lessens quality of care and subsequently QoL (McColl-Kennedy, Vargo, Dagger, Sweeney, & van Kasteren, 2012). Cocreation is patients' *legal* right and many institutions, such as the National Health Service, National Association for Patient Participation, World Health Organization, and World Alliance for Patient Safety, strongly emphasize its vital role in patients' wellbeing (Longtin et al., 2010). In spite of the importance of cocreation in patients' wellbeing, only one-third of patients cocreate in healthcare activities, partly in consequence of the anxiety-producing situations and significant uncertainty (Gallan, Jarvis, Brown, & Bitner, 2013). Thus, Vargo and Lusch (2016) recently called for more research for the improvement of CVCC and service dominant logic perspectives on human wellbeing.

The extant marketing literature demonstrates the positive role of cocreation in customers'[1] wellbeing (McColl-Kennedy et al., 2012; Mende & van Doorn, 2015; Ostrom et al., 2010; Sweeney et al., 2015). In this vein, McColl-Kennedy et al. (2012) conceptually ground cocreation in healthcare services and indicate various practice styles and influences on QoL. Building upon that, Sweeney et al. (2015) explore the contribution of cocreation on satisfaction and quality of life. However, the conditions under which, and how, CVCC enhances QoL have not been scrutinized. As Table 1 demonstrates and I further discuss in chapter II, the healthcare literature reveals mixed findings, such as positive, negative, and no effect of cocreation on individuals' psychological health and QoL (Guadagnoli & Ward, 1998; Joosten et al., 2008; A. Robinson & Thomson, 2001). Laboratory results, too, indicate two-thirds of patients do not wish

[1] The terms 'customer' and 'patient' are used interchangeably in this dissertation as much as they have similar applications and definitions in the healthcare context.

to cocreate in some healthcare activities because of the psychological burden involved (Gallan et al. 2013). In spite of the discrepancies among the literatures, a clear recommendation has not been suggested regarding when and how cocreation may increase/decrease QoL and service perceptions.

Statement of Purpose

This research aims to answer three main questions:

Question 1: In which activities may CVCC enhance customers' QoL?

In order to provide responses for the first research question, we build our framework upon four well-established healthcare activities, including a) adherence; b) communication; c) goal setting; and d) decision making in order to investigate the main areas of cocreation in healthcare encounters. a) Adherence[2] is a patient's choice of (not) following the suggested instructions of the physician and a key factor for achieving a higher level of health status. b) Communication is the most effective tool for information exchange in healthcare service encounters (Ong et al. 1995). c) Goal setting is the identifying of problems, formalizing roles, and establishing treatment milestones (Northern et al. 1995). d) Decision making underscores patients' control over decisions and enables requesting changes in treatment plans or any other health-related activities (Sweeney et al. 2015). By definition, decision making indicates "the physician's treatment preferences do not count (are excluded). The only treatment preferences that matter are those of the patient" (Charles et al. 1999, p. 684). Decision making underscores patients' control over decisions and enables requesting changes in treatment plans or any other health-related activities (Sweeney et al. 2015).

[2] Adherence and compliance have been interchangeably used and similarly defined in the literature as the patient's effort to pursue healthcare instructions (Dellande et al. 2004; Gill et al. 2014; Seiders et al. 2015). Adherence underscores the patient's *active* role and highlights her autonomy, engagement, and cooperation with the physician in the enhancement of health conditions (Robinson et al. 2008). Conversely, compliance bounds patients to obey the treatment plan *passively* (Lutfey and Wishner, 1999). Given the context of value cocreation, we heed the difference between these terms and hereafter use the term 'adherence'.

These four activities are chosen as the fertile areas of CVCC activities for several reasons: First, patient participation in these activities is known as the focal tenet of patient-centered care, the leading healthcare paradigm (Poleshuck & Woods, 2014; Robinson et al. 2008; Rosewilliam et al. 2011). Second, as Table 1 indicates, these activities are well-established in both marketing and healthcare literatures, which provide a robust foundation for our framework. Third, these activities are focal-firm based and are executed between patients and physicians throughout treatments, and as such are in line with the focus of this study regarding interpersonal cocreation.

Sweeney et al. (2015) introduce the hierarchy of effort in value cocreation activities, indicating adherence, communication, goal setting, and decision making as four primary layers of hierarchy with the level of task difficulty and effort increasing in that order. Their research findings indicate that when easier value cocreation activities are executed (i.e. adherence, communication, goal setting), there will be fewer resources for performing harder activities (decision making) due to the depletion of resources. According to the theory of conservation of resources (Hobfoll et al., 1990) the depletion of resources engenders psychological burdens for individuals, such as anxiety and stress. Moreover, the marketing and healthcare literatures, too, indicate decision making under uncertainty could result in anxiety (see Table 1).

Question 2: Through which mechanism may CVCC enhance customers' QoL?

In order to provide responses for the second research question, we introduce a mechanism that indicates the positive/negative effect of CVCC on QoL. Anxiety, service quality, and satisfaction are the key constructs of the mechanism that carries the effect of CVCC on QoL. Our conceptual framework originates from empowerment theory (Perkins & Zimmerman, 1995), which explains both anxiety and wellbeing as the outcomes of value cocreation. On the one

hand, anxiety is often a ubiquitous and threatening phenomenon in contemporary life that can play a crucial role in people's wellbeing (Van Dam et al. 2011). On the other hand, people's QoL and experiences are dominated by quality of and satisfaction with services (Dagger & Sweeney, 2006). Given the context of healthcare, the significance of anxiety, service quality, and satisfaction is heightened and is capable of a notably dramatic influence on customers' psychological and physical wellbeing.

Question 3: In what condition may the effects of CVCC and service perceptions on QoL vary?

Finally, in order to provide responses for the third research question, we propose disease severity as a pivotal moderator of the mechanism, for it boosts the effect of CVCC on anxiety as well as the effects of service quality and satisfaction on QoL. The examination of disease severity is important because it is interwoven with anxiety and patients' wellbeing (Di Marco et al., 2006; Van Dam et al., 2011).

The theoretical framework is tested with two empirical studies. First, we test our model with 258 pregnant women in an obstetrics/gynecology clinic. Then we retest and expand the generalizability of the model, using 190 patients who are suffering from chronic diseases (i.e. cardiovascular, cancer, diabetes, and respiratory). We draw on the advantages of survey research because it provides "novel and revelatory insights into both the minds of individuals and the practices of organizations" (Hulland et al., 2017, p. 2). Our findings explicitly introduce CVCC as a double-edged sword, which results in *both* positive and negative consequences for customers as well as firms.

The results indicate that CVCC in activities requiring a low-to-medium level of effort/difficulty reduces patients' anxiety. Whereas, CVCC in excessive task-related effort/difficulty, such as decision making, could elevate patients' anxiety. Thus, on the one hand,

CVCC in adherence, communication, and goal setting reduces patient's anxiety; and the effects are stronger when dealing with high-severity diseases relative to low-severity diseases. On the other hand, CVCC in decision making elevates patients' anxiety. Surprisingly, the results indicate that in high-severity diseases, CVCC in decision making reduces anxiety, whereas it increases anxiety in low-severity diseases. This finding corroborates Sweeney et al.'s (2015) proposal of a dynamic theory of action (Atkinson & Birch, 1970), which posits that when easier tasks are accomplished, individuals shift to more difficult tasks, as they perceive the probability of success is increasing.

The mediation effects reveal that service quality carries the negative effect of anxiety on QoL and satisfaction. Eventually, disease severity emerges as the intensifier of the interplay between service quality, satisfaction, and QoL. The moderating effects indicate that service quality and satisfaction have higher impacts on QoL in severe diseases as compared to mild diseases.

Our study contributes to service research, particularly the SD logic and the transformative service paradigm, which are geared toward enhancement of value creation and customers' quality of life. Both SD logic and transformative service emphasize the positive influence of CVCC on QoL without providing an explanatory mechanism for the effect. Our research reveals the double-edged influence of cocreation on QoL and explains the underlying mechanisms for both negative and positive effects. It also highlights the discrepancies between the marketing and healthcare literatures regarding the consequences of value creation (e.g., Guadagnoli & Ward, 1998 versus Sweeney et al., 2015) and attempts to reduce this gap by providing theoretical reasoning and empirical evidence.

First, this study puts forward a mechanism for the effect of CVCC on QoL in healthcare services to deepen the understanding of the relationship and extend the extant literature (McColl-Kennedy et al., 2012; Ostrom et al., 2010; Sweeney et al., 2015). We build upon empowerment theory and introduce anxiety, service quality, and satisfaction as the key constructs for bridging the conceptual gap between CVCC and QoL.

This study makes contributions by demonstrating CVCC as a double-edged sword and thus responds to the call for empirical work (Chan, Yim, & Lam, 2010; Heidenreich, Wittkowski, Handrich, & Falk, 2014). On the bright side of value cocreation, CVCC in low-to-moderate effortful/difficult tasks, such as adherence, communication, and goal setting, lessens anxiety, which in turn elevates service quality, satisfaction, and QoL. Whereas, on the dark side, CVCC in high effortful/difficult tasks, such as decision making, heightens anxiety and diminishes service quality, satisfaction, and QoL. Previous research has focused mostly on the general effect of cocreation on service quality (e.g. Gallan et al., 2013), satisfaction, and QoL (e.g., Mende & Van Doorn, 2014). This research, however, captures the cocreation of each patient in four areas of activities (i.e. adherence, communication, goal setting, and decision making) and investigates the effects of each area on service outcome and QoL perceptions.

The elevating effect of CVCC in decision making supports Belschak, Verbeke, and Bagozzi's (2006) proposition that anxiety coping tactics might be "less efficient or even backfire when particular components of the emotional system intensify" (p. 404). Moreover, these findings respond to Sweeney et al.'s (2015) call for future research concerning "whether there are thresholds of effort beyond which the incremental effects of customer EVCA [Effort in Value Cocreation Activities] diminish" (p. 13).

As the third contribution, this study introduces disease severity as a pivotal modifier of

the mechanism. Using disease severity, this study scrutinizes the effect of CVCC on anxiety as well as service quality and satisfaction on QoL. The moderating effect of disease severity provides further explanation for the discrepancies between the marketing and healthcare literatures regarding the effect of CVCC on anxiety and QoL (e.g. Guadagnoli & Ward, 1998). While disease severity heightens the negative effects of adherence, communication, and goal setting on anxiety, it flips the effect of decision making. These findings provide an explanation for the mixed findings of the healthcare literature that has reported no/positive/negative outcomes of decision making (e.g., Joosten et al., 2008). Furthermore, our research extends the extant literature in the area of service quality, satisfaction, and QoL (e.g. Dagger & Sweeney, 2006; Sweeney et al., 2015) and demonstrates that disease severity intensifies the escalating effects of service quality and satisfaction on QoL. In other words, in high-severity diseases, customers perceive the role of service—in terms of quality and satisfaction—as more salient to their QoL. In mild diseases, the positive role of service providers in QoL is perceived as less prominent. Finally, our data covers the empirical limitation of Sweeney et al.'s (2015) research, which asked for further empirical support from non-chronic and more chronic diseases.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter 1) defines value cocreation and explains CVCC in four health-related activities: adherence, communication, goal setting, and decision making; 2) conceptualizes the interplay between CVCC, anxiety, and wellbeing, using empowerment theory; 3) reviews the marketing and healthcare literatures about CVCC activities in healthcare services; 4) hypothesizes the relationships between the four CVCC activities and anxiety; 5) hypothesizes the moderating role of disease severity in the relationships between CVCC activities and anxiety; 6) conceptualizes the relationship between anxiety and service quality; and 7) hypothesizes the moderating role of disease severity in the interplay among service quality, satisfaction, and QoL.

Customer Value Cocreation

CVCC is "the benefit realized from integration of resources through activities and interactions with collaborators in the customer's service network" (McColl-Kennedy et al., 2012, p. 375). The understanding of cocreation has been formed in the light of studies by Prahalad and Ramaswamy (2000, 2004), and research on CVCC has maintained a steady pace since those seminal studies were conducted. Vargo and Lusch (2004) evolved the cocreation concept by proposing the concept of SD logic. Before the study of Prahalad and Ramaswamy (2000, 2004), CVCC was addressed by constructs such as participation (e.g. Chan et al., 2010) and co-production (e.g. Bendapudi & Leone, 2003), which thereafter were positioned as subordinate to the CVCC construct (Lusch & Vargo, 2006).

The rapid growth of the service sector in the 1990s changed the "good-centered" dominant logic of marketing to SD logic (Vargo & Lusch, 2004). SD logic defines services as the use of one's resources or competence for the benefit of another entity (Lusch, Vargo, & Tanniru, 2010) and focuses not only on the service provision *per se* but also on the customer value creation process. Interest in this area surged after 2008, as several journals presented special issues in this field (e.g., *Journal of the Academy of Marketing Science* in 2008, *Marketing Theory* in 2011, and *MIS Quarterly* in 2012).

SD logic pioneers new perspectives in value networks, including creation, exchange, and distribution of value (Vargo & Lusch, 2008; 2015). This logic introduces customers as the active entities in value networks who are inherently involved in value creation (Payne, Storbacka, & Frow, 2008). Customers cocreate value by integrating their resources, such as effort (i.e. energy and time), information, knowledge, and skills, with the firm's or other actors' resources through a variety of actions and interactions (Edvardsson et al., 2011).

Cocreation of value signifies that value is created at "the intersection of the offerer, the customer, … and other value creation partners" (Lusch, Vargo, & O'Brien, 2007, p. 11). SD logic considers organizations as the primary integrators and transformers of micro-specialized competences into services desired by consumers (Lusch & Vargo, 2006), it considers customers as "co-producers" or "co-creators" of value (Vargo & Lusch, 2004, 2008), and it is an "endogenous" entity of the value network (Lusch et al., 2010). Theoretically, this is also implied as the coming together of two main resources, operand (i.e. physical resources, such as raw materials or physical products) and operant resources (i.e. effort, information and relational resources, such as skills, knowledge, cultures, and relationships), integrated by individual customers and enabled by firms in a value creation process.

Value Cocreation as Customer Empowerment: Anxiety and Quality of life

CVCC has been recognized and emphasized in the healthcare literature, especially under such healthcare paradigms as collaborative care and patient-centered care (Sweeney et al., 2015). These paradigms underscore and are built upon the patient's role, and they advocate patient empowerment and authority (Leach, Cornwell, Fleming, & Haines, 2010; Northen, Rust, Nelson, & Watts, 1995; Salmon & Hall, 2004). Akin to CVCC, these paradigms involve empowering the customer and giving him/her control over production and resource integration processes (Awa & Eze, 2010; Bonsu & Darmody, 2008; Cova & Pace, 2006; Dujarier, 2014; Etgar, 2008; Hoyer, Chandy, Dorotic, Krafft, & Singh, 2010; Prentice, Han, & Li, 2016). Theoretical work on empowerment defines it as "a process by which people *gain control* over their lives and resources, *democratic participation* in the life of their community and a critical understanding of their environment" (Perkins & Zimmerman, 1995, p. 570). The CVCC and empowerment literatures are both concerned with issues of control and mastery over activities, involving cognitive and affective processes leading to the individual's wellbeing (Gutierrez, 1994; Sweeney et al., 2015; Vargo, Maglio, & Akaka, 2008).

From the standpoint of the individual's wellbeing, empowerment theory and related research suggest that the outcome of stressful life events can be less debilitating when individuals are encouraged and authorized to develop their skills in order to better comprehend the problems they face and participate in resolving them (Gutierrez, 1994). Similarly, the value cocreation literature holds that providing customers with access to resources and opportunities will result in "the improvement of system well-being" (Vargo et al., 2008, p. 149). W*ellbeing* at the level of the system is pertinent to the system's capability to adapt to its environment (Vargo et al., 2008). However, *wellbeing* at the individual level is related to the stress and anxiety

pertinent to the individual's relationship with the *environment* in which his/her resources are obstructed or overcome (Folkman & Lazarus, 1985).

Unpleasant effects such as anxiety, stress, sadness, and anger dominate global judgment of satisfaction with life and subjective wellbeing (Diener, Larsen, Levine, & Emmons, 1985; M. Smith, 2013). Emotion theorists as diverse as Izard, Lazarus, Mandler, and Hallam view "anxiety" as a mixture of various emotions emanating from *uncontrollability* over the *environment* (Barlow, 1991; Strongman, 1995).

According to the National Institute of Mental Health (NIMH), anxiety disorder is the most prevalent mental illness in the United States, affecting 20% of the population at any given time (www.nimh.nih.gov). About 23% of the US adult population experiences severe anxiety, resulting in a staggering $46.6 billion cost per year (Mendlowicz & Stein, 2014). In medical practices, anxiety is the most common disorder among patients (DiMatteo, Lepper, & Croghan, 2000). Anxiety disorders manifest in different forms, including panic disorder (10.6%–62.5%), social anxiety disorder (7.8%–47.2%), and generalized anxiety disorder (7%–32%) (Simon et al., 2004). Anxiety is "a loose cognitive-affective structure composed primarily of high negative affect, a sense of *uncontrollability*, and a shift in attention primarily to a self-focus or a state of self-preoccupation" (Barlow, 1991, p. 60).

Empowerment and CVCC as its vehicle can boost the individual's *control* over service tasks and environments (Chebat & Kollias, 2000; Etgar, 2008), which in turn can enhance his/her psychological and emotional well-being (Gutierrez, 1994). Through encouraging healthy responses to negative stimuli, empowerment and control mitigate stressful life experiences, which reduces aversive incentives and anxiety (Belschak et al., 2006; Gutierrez, 1994; Zimmerman, 1990). In the context of healthcare services, psychological states, particularly

treatment-related anxiety, should be incorporated in the assessment of patients' quality of life (Di Marco et al., 2006; McCathie, Spence, & Tate, 2002; Prigatano, Wright, & Levin, 1984).

Anxiety reduces patients' quality of life, their sense of wellbeing and their functionality (Alhama et al., 1996; Johnson, Jones, Seidenberg, & Hermann, 2004; Osborn, Demoncada, & Feuerstein, 2006). We argue that value cocreation may backfire through the intensification of customer anxiety due to engagement in activities characterized by high levels of effort/difficulty. Heidenreich et al. (2014) have recently demonstrated that customers who make more effort in value cocreation activities are more likely than customers who make less effort to make internal attributions of failures and perceive higher levels of guilt for negative consequences of co-created services. Additionally, according to the power-responsibility equilibrium (Emerson, 1962), power and responsibility go hand in hand (Lwin, Wirtz, & Williams, 2007).

Invoking ego depletion, Sweeney et al. (2015, p. 3) indicate that "as easier, less effortful value cocreation activities are undertaken [adherence], resource depletion occurs and there are fewer available resources for conducting more effortful activities [decision making]." Accordingly, we further explain that, on the basis of the conservation of resource theory, the loss of the valued resources (i.e., strength or energy) results in the elevation of anxiety in customers and degrades service quality perceptions (Hobfoll et al., 1990). Since healthcare services are high on credence properties and outcomes of treatments often remain uncertain to patients, engaging customers in consequential and risky activities such as decision making, which is inherently a difficult and effortful task (McColl-Kennedy et al., 2012; Sweeney et al., 2015), may escalate anxiety in line with increased responsibility and concerns about anticipated negative outcomes. Subsequently, anxiety, as a tightly entrenched contributor to psychological discomfort, diminishes customer quality of life (Di Marco et al., 2006; Elwyn, Edwards, & Kinnersley,

1999a).

Value Cocreation Activities in Healthcare Service Encounters

McColl-Kennedy et al. (2012) identify eight different types of customer value cocreation activities (i.e. doing or performing) in healthcare: 1) cooperating (i.e. being compliant with basic requirements); 2) collating information (i.e. sorting and assorting of information); 3) combining complementary therapies (e.g., diet, exercise, vitamins); 4) co-learning (vigorously seeking and sharing information and providing feedback); 5) changing ways of doing things (e.g. managing long-term adaptive changes); 6) connecting with physicians, other health professionals and important others; 7) co-production (e.g., assisting with administering treatments); and 8) cerebral activities (i.e. positive thinking and reframing).

Drawing on these activities, McColl-Kennedy et al. (2012) explore what healthcare customers do to cocreate the value in service encounters. The authors categorize the activities within five practice styles: 1) team management to assemble and manage teams, in which the interaction is relatively high and deep; 2) insular controlling or controlling the situation from a distance, in which the interaction is low and usually superficial; 3) partnering to collaborate with the doctors, in which the interactions are medium level with different individuals; 4) pragmatic adapting to adjust to conditions, in which interactions are high with different individuals; and 5) passive compliance with the procedures, in which interpersonal interactions are low.

Sweeney et al. (2015) evaluate these eight activities as well as the five practice styles according to the level of task difficulty and the effort each requires of the customer, and they propose a four-layer hierarchy of activities ranging from "complying with basic requirements (less effort and easier tasks) to extensive decision making (more effort and more difficult tasks)" (p. 1). These authors also introduce the concept of "Effort in Value Cocreation Activities"

(EVCA), defined as "the degree of effort that customers exert to integrate resources through a range of activities involving varying levels of perceived difficulty" (p. 2).

The EVCA hierarchy represents different levels of effort/difficulty of cocreation activities for customers. Two theoretical frameworks, including dynamic theory of action (Atkinson & Birch, 1970) and ego depletion (e.g., Baumeister et al., 1998) conceptualize the EVCA hierarchy. However, these frameworks are contradictory. According to the dynamic theory of action, when easier tasks are accomplished, individuals shift to more difficult tasks as they perceive the probability of success is increasing. Thus, individuals are inspired to move from easy to more difficult tasks (Sweeney et al., 2015). Therefore, these authors believe that when customers perform the less effortful activities in the EVCA hierarchy, only a few will undertake those activities that demand greater effort (p. 3). However, according to the ego depletion literature, "as easier, less effortful value cocreation activities are undertaken, resource depletion occurs and there are less available resources for conducting more effortful activities" (p. 3).

Ego depletion considers a person's limited resources (energy and time), which are depleted as activities are performed. According to this concept:

> An individual's acts of volition, such as making decisions, considering alternatives, taking responsibility, initiating and inhibiting behavior, and making plans of action and carrying out these plans, draws on the individual's resources (strength or energy) that are limited. Moreover, ego depletion suggests that undertaking one activity will have a damaging effect on the conduct of subsequent activities. The initial act depletes the amount of resources left for dealing with subsequent acts especially those that are seen as more challenging. (Sweeney et al., 2015, p. 3)

The results of Sweeney et al.'s (2015) study support the framework provided by the ego depletion literature and indicate that individuals are less likely to conduct effortful/difficult tasks, such as decision making, rather than less effortful/difficult activities, such as adherence.

Using the EVCA hierarchy, we focus on four value cocreation activities: adherence,[3] communication, goal setting and decision making, with the level of task difficulty and effort increasing in that order. Table 1 exhibits a short summary of the research regarding the four activities in the marketing, healthcare, and health psychology literatures.

1) The first layer includes less effort/difficulty tasks, such as adherence with requirements, representing the "anchor point" of the EVCA hierarchy (Sweeney et al., 2015). Patients are more likely to adhere to requirements as adherence-related tasks involve relatively lower levels of difficulty/effort (McColl-Kennedy et al., 2012).

2) The second layer includes patients' efforts in the creation of relationships with caregivers as well as their families/friends. Relative to adherence, communication involves greater levels of difficulty/effort as the patient engages in informational and emotional exchanges through interaction with staff and significant others (Sweeney et al., 2015).

3) The third level includes activities that enable patients to adopt, change, and implement certain behaviors conducive to improved health status and wellbeing. According to the healthcare literature, collaborative goal setting is the *superior* behavior-change method (Bodenheimer & Handley, 2009). When service providers and customers collaborate to set treatment goals, patients are better motivated and equipped to alter and improve their health status (Estabrooks et al., 2005).

4) The fourth level includes participation in decision making and emotional regulation, which top the hierarchy as it involves the greatest degree of difficulty/effort (Sweeney et al., 2015). Proactive decision making is least likely to be agreed to and undertaken by customers due to the high level of required effort/difficulty.

[3]Hereafter, I use the term 'adherence' to refer to the patient's effort to follow instructions.

Table 1 Marketing, Chronic Health, and Health Psychology Literatures about CVCC activities and its consequences.

Marketing Literature	Chronic Health and Health Psychology Literature
ADHERENCE	
Gallan et al. (2013) Functional and technical service quality and satisfaction are influenced by patient compliance to the treatment plan.	**Salmon, (2001)** Adherence to instructions reduces patients' stress and enhances the retrieval of positive thoughts and moods.
Sweeney et al. (2015) Compliance with basics as a part of EVCA results in a higher quality of life, satisfaction with service and behavioral intentions.	**Bastani et al. (2005)** Adherence diminishes anxiety and panic disorders in pregnant women.
Gill et al. (2014) Five key customer adherence behaviors (i.e. motivation, participation, relationship with therapist, trust, and the value of service) have a positive relationship with the outcome of the service.	**Doan et al., (1995)** Adherence to instructions enhances physical and psychological health and curtails anxiety in patients.
Seiders et al. (2015) Non-adherence to experts negatively affects customer wellbeing and firm resource utilization, including time and monetary costs.	**Vermeire et al. (2001)** A review of literature on adherence indicates that adherence is a key factor for enhancing the quality of care and satisfaction.
	Rosenstock et al. (1959) Nonadherence results in considerable negative influences on healthcare service quality and health-related outcome.
	Verdoux et al. (2000) Poor medication adherence results in increasing the episodic course of psychosis illness.
	Wing et al. (2002) Adherence decreases anxiety and depression as mood states and enhances health outcome.
	Simpson et al., (2011) Adherence significantly improves the outcomes of behavioral therapy.
	Cameron et al., (2013)12-month study of patients' adherence indicated that greater levels of adherence result in better psychological and physical outcomes.
COMMUNICATION	
Auh et al. (2007) Communicating with the financial advisor enhances attitudinal and behavioral loyalty through value coproduction.	**Stewart (1995)** Patient-physician communication enhances emotional health, symptom resolution, function and physiological status, and pain control in patients.
Bitner et al. (1997) Customer effort to share information in a "useful fashion" improves service outcomes.	**Ong et al. (1995)** Communication reduces psychiatric comorbidity and increases information recall, and health status and wellbeing.
Prahalad & Ramaswamy (2004) High quality firm-customer dialog creates unique and positive experiences.	**Roter (2000)** Communication boosts patients' motivation, trust, feeling of being involved, satisfaction, and emotional wellbeing.
Kinard & Capella (2006) Involving customers in an effective relationship results in greater perceived benefits.	**Street et al. (2009)** Communication boosts patients' motivation, understanding, trust, feeling of being involved, satisfaction, and subsequently increases survival and emotional wellbeing.
Fyrberg & Jüriado (2009) Patient-physician quality of interactions positively influences service outcomes.	**Holman et al. (2000)** Collaborative patient-physician interactions enhance management of chronic disease.
GOAL SETTING	
Bagozzi and Dholakia (1999) indicate the process of consumer behavior goal setting and goal pursuit from the two approaches of cognitive and discursive psychology.	**Arnetz et al. (2004)** Patient engagement in goal setting results in patient satisfaction with treatment, goal achievement, and higher perception of care quality.
Epp & Price (2011) Considering customers' collective goals, four customer network integration processes are conceivable: offerings assembled around prioritized goals, alternate participation, concurrent participation, and offerings assembled around separate coalitions.	**Baker et al. (2001)** Shared goal setting reduces distress and enhances goal attainment and satisfaction in patients.
	Playford et al. (2009) Patient-centered goal setting gives patients the chance of mastery and diminishes anxiety.
	Cott & Finch (1990) investigate various factors including using valid, sensitive and reliable measures as well as setting measureable goals to involve patients more

Markley & Davis (2006) A typology of customer participation strategies geared to achieving service goals.

effectively in the goal setting process.

DECISION MAKING

Sweeney et al. (2015) Patient value cocreation in decision making positively influences patients' satisfaction with service and quality of life.

McColl-Kennedy et al. (2012) Joint decision making belonging to partnering practice style increases quality of life, satisfaction with service, and favorable behavioral intention.

Isen (2001) Positive affect enhances decision making, which leads to improvement of social interaction (i.e. helping, generosity, and interpersonal understanding) and a patient's decision making and his/her satisfaction with service.

Guadagnoli & Ward (1998) There are mixed findings regarding the effect of shared decision making on patients' anxiety, quality of the care, and QoL.

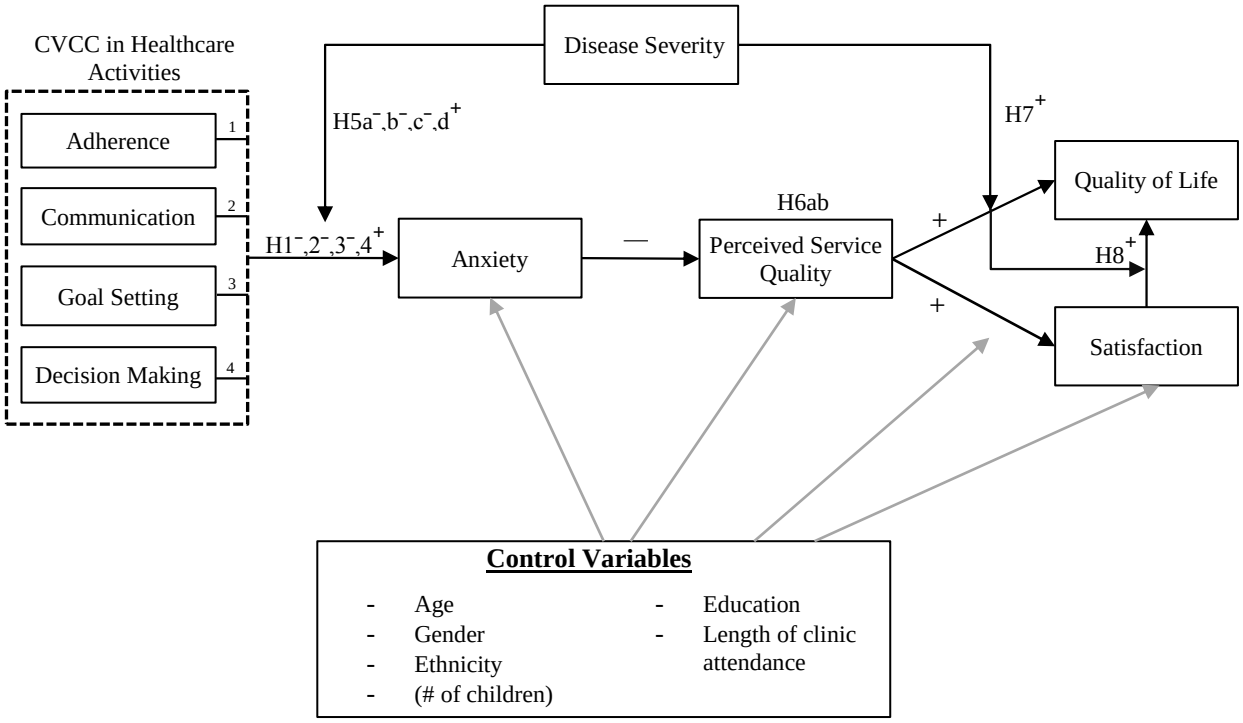
A. Robinson & Thomson (2001) There is no consensus in the extant literature about the influence of decision making on healthcare outcomes. Numerous patients, who vary on the basis of age, illness experience, and severity of condition, wish not to be involved in decision making.

Miller (1995) Engagement in decision making escalates patients' anxiety and reduces satisfaction with the quality of care.

Elwyn et al. (1999ab) Shared decision making increases perceived uncertainty/responsibility about the treatment/outcomes and anxiety.

Parascandola et al. (2002) Patient involvement in decision making leads to strong anxiety reactions, due to the uncertain nature of clinical outcomes.

Figure 1 Proposed Conceptual Model



Adherence

The ultimate aim of healthcare professionals is to enable patients to achieve a higher level of health status. However, this goal is not achievable without customers' adherence to instructions. Nonadherence comprises an ever-present issue ranging from 25% to 50% among patients (Gill et al., 2014). Nonadherence is a major public health problem, costing $100 to $300 billion in the US annually (Iuga & McGuire, 2014).

Adherence and compliance have been interchangeably used and similarly defined in the literature as the patient's effort to pursue healthcare instructions (Dellande, Gilly, & Graham, 2004; Dellande & Nyer, 2007; Gill et al., 2014; Seiders, Flynn, Berry, & Haws, 2014). However, the two terms differ on one point that should be taken into consideration when researching cocreation. Defined as the extent to which the "recommendations" provided by healthcare professionals are followed by patients, adherence underscores the patient's active role in the enhancement of health conditions (Robinson, Callister, Berry, & Dearing, 2008). In this way, adherence highlights the patient's autonomy and engagement in health-related issues (Barry & Edgman-Levitan, 2012; Kahn & Sarin, 1988; Oates, Weston, & Jordan, 2000). Adherence requires a close relationship and cooperation between patients and physicians, which form the centerpiece of patient-centered approaches to healthcare (Robinson et al., 2008).

Compliance, on the other hand, is "the extent to which a person's behavior (in terms of taking medications, following diets, or executing lifestyle changes) coincides with the clinical advice" (Sackett & Haynes, 1976, p. 11). It requires patients to obey and follow the provider's treatment plan "passively" without considering their independence and active roles (Lutfey & Wishner, 1999; Osterberg & Blaschke, 2005). Compliance implies the sense of physician domination and control over patients, which censures patients for not conforming to instructions

(Robinson et al., 2008). Luftey and Wishner (1999) believe that adherence lies beyond compliance because "compliance suggests a restricted medical-centered model of behavior, while the alternative 'adherence' implies that patients have more autonomy in defining and following their medical treatments" (p. 635).

A patient is labeled as "noncompliant" when the physician's instruction is not obeyed by him/her, whereas a "nonadherent" patient is one who does not follow mutually agreed-upon instructions (Robinson et al., 2008). Since value cocreation is based upon customer-provider cooperation and mutual integration of resources through dyadic interactions (Baron & Harris, 2008; Edvardsson et al., 2011; Prahalad & Ramaswamy, 2004), we incorporate the notion of adherence.

In line with empowerment theory, adherence provides patients with autonomy over their actions, which reduces negative affects, such as helplessness and anxiety by enhancing control (Barlow, 1991). Laboratory results, too, indicate that adherence to instructions reduces customer anxiety through enhancing physical and psychological health (e.g. Brawley & Rodgers, 1993; Doan, Plante, Digregorio, & Manuel, 1995). Using cognitive-behavioral therapy, Abramowitz, Franklin, Zoellner, and Dibernardo, (2002) report that adherence to instructions reduces anxiety and panic disorders among patients with obsessive-compulsive disorders. Similarly, adherence to exercise plans decreases patients' anxiety through such psychological mechanisms as boosting self-esteem (Folkins & Sime, 1981), averting negative feelings (Morgan, 1985a, 1985b), enhancing retrieval of positive thoughts (cf. Salmon, 2001), and reducing stress and dysphonic mood (Boutcher & Landers, 1988; Carney et al., 1987; Carney et al., 1983; Dishman, 1994; Mi Rye Suh et al., 2002; Morris et al., 1990; Salmon, 2001).

Following exercise plans can improve physical conditions such as body temperature,

heart rate, and cerebral blood flow, which in turn reduce anxiety (Calvo, Szabo, & Capafons, 1996; Dishman, 1995; Garvin, Koltyn, & Morgan, 1997). Bastani et al. (2005) conducted an experiment on one hundred pregnant women and found that participating in training significantly reduced anxiety and stress among pregnant women. On the basis of these findings in the healthcare literature, we posit that:

H1 CVCC in the area of adherence to instructions reduces anxiety.

Communication

Interpersonal patient-physician communication remains the most effective tool for information exchange in healthcare service encounters (Ong, De Haes, Hoos, & Lammes, 1995). "Effective communication between doctor and patient is a central clinical function that cannot be delegated" (Stewart 1995, p. 1424). Communication is defined as “the formal and informal sharing of meaningful and timely information between the client and advisor in an empathetic manner” (Auh, Bell, McLeod, & Shih, 2007, p. 361). Patient-physician communication has three purposes: (1) creating a close interpersonal relationship; (2) sharing information; and (3) facilitating health-related decision making (Ong et al., 1995).

Effective communication enhances satisfaction with service, loyalty, quality of life, and even health status (Auh et al., 2007; Beck, Daughtridge, & Sloane, 2002; Stewart, 1995). Customer-provider interaction facilitates the information sharing process and task clarity, which in turn increase customer readiness for cocreation of value (Bettencourt, 1997; Lengnick-Hall, Claycomb, & Inks, 2000).

Communication helps customers understand what is required of them and how they are able to contribute to their own care (Cooper et al., 2003; Kripalani et al., 2007). In addition to the quantity of cocreation, which indicates the level of EVCA, the quality of customer input is

increased via communication with the service provider during service encounters (Bitner, Faranda, Hubbert, & Zeithaml, 1997). On the other hand, a clear communication and definition of roles from the service provider's side could result in an effective CVCC (Kelley, Donnelly, & Skinner, 1990). Ong et al. (1995) emphasize the unequal division of responsibility and authority between the physician and the patient and identify patient-physician communication as an "emotionally laden" task that requires a high level of contribution from both parties. Communication familiarizes customers with cocreation norms and enhances task clarity (Auh et al. 2007), which in turn reduces their anxiety (Mills & Morris, 1986).

Theories and laboratory findings in the clinical psychology literature illustrate that "emotional venting" or "social sharing" of emotions is relieving (Kennedy-Moore & Watson, 1999; Zech, 2000). Verbalizing a negative emotion or "getting it off the chest" softens the undesirable effects and results in emotional recovery (Lepore, Fernandez-Berrocal, Ragan, & Ramos, 2004; Lepore, Ragan, & Jones, 2000; Zech, 2000). Sharing information, thoughts and concerns and conversing about health-related issues serve as an emotional venting mechanism that reduces distress (Kurtz et al., 2005) and anxiety (Evans, Kiellerup, Stanley, Burrows, & Sweet, 1987; Greenfield, Kaplan, & Ware, 1985; Roter, 2000).

Inadequate communication during primary care visits could result in depression and anxiety (Sleath & Rubin, 2002). Moreover, patient value cocreation in the area of communication helps physicians explore patients' concerns and reduce their anxiety during the treatment (Fogarty, Curbow, Wingard, McDonnell, & Somerfield, 1999; Takayama, Yamazaki, & Katsumata, 2001; Zachariae et al., 2003). Rimé (2009) suggests a model that specifies the situations in which emotional venting is beneficial and the types of benefit likely to ensue.

Despite the many benefits of communication, only 20-30% of patients with emotional

distress have the tendency to communicate their issues to physicians (Good, Good, & Cleary, 1987). Indeed, patients need encouragement to share information with physicians (Suchman, Markakis, Beckman, & Frankel, 1997). Therefore, we posit:

H2 CVCC in the area of communication with physicians reduces anxiety.

Goal Setting

The healthcare literature defines goal setting as a process of discussion and negotiation between the patient and the physician that determines the key treatment priorities and clarifies the role of each party involved (Playford et al., 2009). Involving the patient in identifying problems, exploring concerns, establishing goals, and formalizing the patient's role comprises the "patient-centered goal setting" paradigm, known as the process of "consumerism", "self-care", and "patient autonomy" (Leach et al., 2010; Northen et al., 1995).

The healthcare literature offers a clear case for patient involvement in goal setting, citing such health-related outcomes as goal achievement, satisfaction with treatment, and quality of care (Arnetz et al., 2004; Baker et al., 2001; Langford et al., 2007; Levack et al., 2006; Lund, Tamm, & Bränholm, 2001; Nelson & Payton, 1991; Playford et al., 2000). In marketing, Bagozzi and Dholakia (1999) outline a conceptual framework that underscores goal setting and goal pursuit processes. Goal-directed consumer behavior begins with goal setting triggered by two questions: "What goals can customers pursue?" and "Why do they pursue or suspend those goals?" The goal-setting stage will be followed by consumer goal pursuit, including formation of a goal intention, action planning, action initiation and control, and goal attainment/failure. Goal-setting theory proposes three goal characteristics: goal participation, goal difficulty, and goal specificity (Locke & Latham, 2004). Goal participation is defined as the degree of involvement in the goal-setting process. While goal specificity addresses the transparency of goals, goal

difficulty captures the attainability of objectives (Fang, Evans, & Zou, 2005).

Rosewilliam, Roskell, & Pandyan (2011) review the literature in patient-centered goal setting and conclude that past studies explicitly determine the positive psychological outcomes of patient involvement in goal setting, including anxiety reduction, self-efficacy, self-assurance, self-autonomy, and motivation enhancement. In one of the earliest experiments, McGrath and Adams (1999) found that patient-centered goal planning is beneficial to patients in the form of reducing anxiety and distress without requiring other specific interventions. Capturing the psychological consequences, these authors draw on Carver and Scheier's (1990) self-regulation model and view goals as reference values for patients. Patients who participate in setting treatment goals will accordingly regulate their behaviors through the feedback loop (i.e. comparator, behavior, impact on environment, and perception; see Siegert, McPherson, & Taylor, 2004). These findings are also confirmed by Post and Collins (1982) who show how lack of modifications in patient goals may lead to chronic anxiety and attribution of responsibility to external factors. Almborg et al. (2009) recommend that physicians involve patients in realistic goal setting by giving them a chance to express their feelings and concerns, thereby mitigating their anxiety and distress.

H3 CVCC in the area of treatment goal setting reduces anxiety.

Decision Making

Patient engagement in treatment decisions has increasingly received attention by healthcare researchers and practitioners during recent decades (Say & Thomson, 2003). Notions of physician-patient partnership (Charles, Whelan, & Gafni, 1999); patient-centered care (Epstein & Street, 2007); and patient autonomy (Entwistle et al., 2010) have explicitly addressed the importance of patient involvement in the decision making process.

Joosten et al. (2008) recognize three well-established models of treatment decision making: the paternalistic, shared decision making, and informed medical models. In the paternalistic model, physicians make decisions and patients are passive parties in this process. The shared decision making model requires active roles of both physicians and patients, while in the informed medical model decisions are made by patients per se without physicians' interference. Among these three models, cocreation and integration of value between patient and physician are embedded in the shared decision making model. Shared decision making is defined as a process through which both physician and patient "participate" in sharing information and preferences and which results in a decision based upon their mutual agreement (Charles et al., 1999).

Research on customer decision making has a long history in the marketing literature (Cox & Rich, 1964; Shiv & Fedorikhin, 1999); however, shared decision making between service providers and customers is mainly conceptualized within healthcare marketing research (McColl-Kennedy et al., 2012; Sweeney et al., 2015).

Unlike the unanimity of previous research regarding the positive outcomes of adherence, communication, and goal setting, evidence for the benefits of patient involvement in treatment decision making is "sparse" (Robinson & Thomson, 2001). The marketing literature indicates the

positive role of CVCC in decision making on patients' QoL (McColl-Kennedy et al., 2010; Sweeney et al., 2015). However, the healthcare literature contains conflicting findings regarding the consequences of shared decision making (Guadagnoli & Ward, 1998; Robinson & Thomson, 2001). Some studies show positive consequences of patient participation in the decision-making process, such as satisfaction (e.g. Ludman et al., 2003), but others do not find any difference in outcomes (e.g. Joosten et al., 2008), and numerous studies demonstrate negative outcomes, such as patient anxiety (e.g. Elwyn et al., 1999ab; Miller, 1995; Parascandola, Hawkins, & Danis, 2002) and a sense of uncertainty and abandonment (e.g. Brashers, 2001).

Sweeney et al. (2015) draw on the notion of ego depletion and indicate that more healthcare customers cocreate easier activities (e.g. adherence and communication), while fewer participate in effortful/difficult activities, such as decision making. The ego depletion literature (e.g. Baumeister, Bratslavsky, Muraven, & Tice, 1998) addresses the self by focusing on individuals' limited resources (strength or energy), which are depleted subsequent to an action. Self-involved volitions, such as "making decisions and taking responsibility…, as self exerts control over itself and over the external world" are self-expenditure of limited resources (Baumeister et al., 1998, p. 1252). When easier value cocreation activities are executed, there will be fewer resources for performing harder activities. Thus, insisting on the integration of resources in effortful activities, such as decision making, may result in the depletion of available resources.

In this vein, the conservation of resources theory and its literature demonstrate that the loss of resources engenders stress and anxiety (e.g. Halbesleben, 2006; Hobfoll & Freedy, 1993). This theory proposes that resources (i.e. energy, personal characteristics, or objects) are paramount and that stress will occur where resources are lost, believed to be unstable, or

threatened (Hobfoll, 2001). The focal tenet of the conservation of resources theory is that "individuals are active participants in the process of gaining resources and avoiding their loss. They do not wait passively until stressful circumstances occur, but rather are motivated to enhance resources and buttress these resources against possible future loss" (Hobfoll et al., 1990, p. 466-467). In much the same way, Chan, Yim, and Lam (2010) argue that "increasing customer involvement in decision making may also generate greater anxiety. Customers tend to prefer and respect a more decisive and nonconsultative service approach" (p. 53). A majority of clinical customers are not willing to participate in decision making, a sign that "too much emphasis on autonomy" in this area may actually backfire (Parascandola, Hawkins, & Danis, 2002, p. 251).

Laboratory results also show that shared decision making results in patients' anxiety and distress in three ways: 1) high level of *information exposure*; 2) *uncertainty* of the physician; and 3) added *responsibility* (Elwyn et al., 1999b). More *awareness* and vigilance about health-related risks can raise patient anxiety. According to the emotional theories, "*uncertainty* is the core part of anxiety" (Strongman, 1995, p. 8). The *uncertainty of the physician* causes anxiety in the patient and, in the case of health threats, leads to fear, panic, or torment (Brashers, 2001). Risk is an inherent element of decision making under uncertainty and may lead to anxiety and distress in the decision maker (Locander & Hermann, 1979). Since healthcare outcomes are inherently uncertain, patients prefer to *surrender the responsibility* to physicians in order to reduce the distress and rumination following the decision-making process.

H4 CVCC in the area of treatment decision making increases anxiety.

CVCC and Anxiety: Disease Severity as a Moderator

Disease severity is a striking factor in the assessment of patients' behaviors and emotions (Gallan et al., 2013). In order to understand the emotions and evaluate patients' perceived satisfaction with healthcare services, disease severity should be considered in health-related research contexts (Dube, Belanger, & Trudeau, 1996). More specifically, disease severity is proposed as a momentous factor, adversely affecting the individual's psychological wellbeing through anxiety escalation (Diener et al., 1985; Di Marco et al., 2006; Van Dam et al., 2011).

Disease severity is defined as the significance of a disease to one's health status and wellbeing, which entails a high level of medical care (Dube et al., 1996). A severe disease involves the presence of multiple medical diagnoses, requiring high levels of nursing care (Dube et al., 1996). In high disease severity situations, CVCC in healthcare activities such as adherence to training plans, communication with the physician and others, and collaborative goal setting may considerably mitigate the level of anxiety. However, if the patient does not consider the disease to be severe and life threating, the mitigating effect of CVCC on anxiety will be weaker.

Disease severity is the measure of uncertainty and lack of control in health outcomes, which "affect the level of a customer's participation in their service experience, as well as their emotional response during an experience" (Gallan et al., 2013, p. 346). High-severity diseases involve a lower level of patients' internal locus of control and a higher level of external locus of control, relative to low-severity diseases (Burish et al., 1984). Internal locus of control is an individual's expectation about the contingency of outcomes on his/her own behavior. External locus of control, on the other hand, is the individual's expectation of outcomes as unpredictable, a function of chance or fate, or under the control of powerful others (Roter, 1990).

According to Health Locus of Control (HLC), individuals with "health-externals"

presume that factors such as luck or the actions of a caregiver determine their health, while those with "health-internals" believe one becomes healthy or sick as a result of one's behavior (Wallston et al.,1978). In severe health problems, because of the uncertainty of outcomes, patients are more likely to hold an external locus of control position. Accordingly, cocreation considerably reduces anxiety through the elevation of internal locus of control over the process and outcomes. In mild diseases, however, value cocreation slightly elevates the internal control and diminishes anxiety as a result of the patient's pre-existing internal locus of control. More specifically, in high disease severity situations, CVCC in healthcare activities, such as adherence to training plans, communication with the physician and others, and collaborative goal setting, may substantially mitigate the level of anxiety as a consequence of the elevation of internal control. Moreover, the escalating influence of CVCC on anxiety in the area of decision making will be stronger when the patient views the disease as a severe condition. Under such circumstances, the individual is likely to exhibit loss and regret aversion because of the elevation of internal locus of control and felt responsibilities for unfavorable consequences, which lower the tendency to collaborate in decision making (Tom, Fox, Trepel, & Poldrack, 2007).

H5 Disease severity moderates the relationship between CVCC and anxiety. The mitigating effect of CVCC on anxiety in the areas of (a) adherence, (b) communication, and (c) goal setting, as well as the escalating effect of CVCC on anxiety in the area of decision making (d) is stronger for high-severity diseases than for low-severity diseases.

Service Quality: Mediator of Anxiety-Satisfaction and Anxiety-QoL Relationships

According to Zajonc's (1980) theory of feeling and thinking, *affect generates cognition* through pure sensory input and the transformation of mental work. Heeding opposite theoretical perspectives (i.e. cognition creates emotions [Lazarus, 1982]) and the "long-standing and unlikely to be resolved" Lazarus-Zajonc debate (Swaminathan & Schellenberg, 2015, p. 192), we follow Zajonc's theory and his perspective on patient anxiety. Zajonc believes that patient anxiety is "a state in which the source and target are not accessible to the patient's awareness. The more an affective state [anxiety] is accompanied by cognitive correlates or appraisals [e.g. service quality], the clearer its origin and address" (Murphy & Zajonc, 1993, p. 736). From this perspective, we conceptualize the primacy of anxiety in relation to service quality in our model. The Zajonc perspective is also recommended in a recent review of current research and theories on the topic of perpetual cognition and emotion (Wang & Saudino, 2013).

Perceived service quality is "a global judgment, or attitude, relating to the superiority of the service" (Parasuraman, Zeithaml, & Berry, 1988, p. 15). Service quality is an important, if not the most important, criterion for managers, scholars, and customers to evaluate a service experience. Numerous marketing scholars have focused on extending our understanding of this construct (e.g. Brady & Cronin, 2001; Cronin & Taylor, 1992; Parasuraman, Zeithaml, & Berry, 1988; Sivakumar, Li, & Dong, 2014). Service quality plays a pivotal role in the healthcare industry because it directly impacts healthcare outcomes at the individual level and public health and economic prosperity at the aggregate level (Berry & Bendapudi, 2007).

The heterogeneity that is inherent in healthcare services makes health-related outcomes quite uncertain for customers, thereby rendering the judgment of service quality a more difficult and complex task. Although the crucial goal of enhancing healthcare service quality is

challenging and pervasive, it is "rarely discussed in the nonmedical service quality literature" (Berry & Bendapudi, 2007, p.12). In addition, to the best of our knowledge, there is no research indicating the psychological process through which CVCC influences service quality, and this inspires the importance of this present work.

Marketing theorists have identified two sets of outcomes for service quality. First, service quality rewards firms with additional gains through customer satisfaction with service, loyalty, and so forth (e.g. Cronin & Taylor, 1992; Zeithaml, Berry, & Parasuraman, 1996). Second, service quality and customer satisfaction elevate customer QoL (Dagger & Sweeney, 2006). We propose that service quality mediates the anxiety relationships with (a) satisfaction and (b) QoL:

(a) Enhancing quality of care is the ultimate purpose of healthcare services (Zineldin, 2006). As such, reducing the psychological distress during service encounters is critical to augmenting perceived healthcare service quality and customer satisfaction (Greenley, Young, & Schoenherr, 1982). Conversely, the broaden-and-build theory of positive emotions (Fredrickson, 2001) posits that negative emotions, as opposed to positive emotions, narrow peoples' attention and instigate local biases. Drawing on this theory, Gallan et al. (2013) indicate that customer positive affect increases service quality directly and indirectly through customer participation. Moreover, contrary to comfort, anxiety as the sense of psychological discomfort could curtail customers' trust, commitment, and service evaluations, such as satisfaction (Spake, Beatty, Brockman, & Crutchfield, 2003).

Bitner (1990) posits that satisfaction is the "customer's general *attitude* toward the service. The key to distinguishing satisfaction from attitude is that satisfaction assessments relate to individual transactions whereas attitudes are more general" (Bitner, 1990, p. 70). Attitude is positive or negative feeling toward an exchange or behavior (Fishbein & Ajzen, 1997). Thus,

experiencing anxiety throughout the service could adversely affect a customer's attitude toward the service in terms of satisfaction, especially if it is accompanied by a perceived low service quality. In this vein, according to the "general-dissatisfaction hypothesis" (Greenley et al., 1982, p. 374) patients who are psychologically distressed are generally dissatisfied with the healthcare services; and reducing their distress during service encounters is critical to augmenting perceived service quality.

(b) QoL is the "conscious cognitive judgment of satisfaction with one's life" (Rejeski & Mihalko, 2001, p. 24). Subjective wellbeing is a "general area of scientific interest rather than a single specific construct" (Diener et al., 1999, p. 277); it encompasses individuals' positive affects, negative affects, and life satisfaction (Diener et al.. 1985), which rules out its inclusion in the current study.

QoL is presented as both a multidimensional and a unidimensional notion; however, there is no consensus among the past research regarding the dimensions. Some studies identified physical, social, and emotional components of QoL, while others proposed five categories of physical and material well-being; relationships with others; social, community and civic activities; reformation; and self-development (Ferrell et al., 1989). Calman's (1984) expectation model indicates that QoL is a measure of discrepancies between individuals' hopes/expectations and their real-life experiences. Accordingly, personal wellbeing and satisfaction with life are also indicators of QoL (Fayers & Machin, 2013). However, it is generally agreed that health (physical and mental) is one of the main indicators of QoL along with other factors, such as role functioning, social wellbeing and functioning, sexual functioning, and existential issues (Fayers & Machin, 2013). However, according to Diener and Suh (1997), quality of life contains three indicators of social conditions (i.e. health and levels of crime), subjective wellbeing (people's

assessments of their lives and societies), and economic indices that are based on three philosophical perspectives on wellbeing, respectively, "normative ideals, subjective experiences, and the ability to select goods and services that one desires" (p. 189).

"Numerous conceptual and methodological limitations are evident in many QoL scales because of unresolved controversies surrounding the QOL construct. Measuring QoL in clinical settings adds complexity because clinical environments often are chaotic" (Fox, 2004, p. 160). In order to reduce the complexity of QoL measurement in the healthcare context, numerous research studies have presented a short version of general QoL. For instance, Aaronson et al. (1993) and Vickrey et al. (1995) present a single-item measurement of quality of life, which correlated with service quality and satisfaction and showed reliable results (Dagger & Sweeney, 2006).

Similarly, Fox (2004) presents a short version of a QoL scale, which is adapted by Sweeney et al. (2015) and correlated with satisfaction with service; it exhibits reliable results. Furthermore, multidimensional measurement of QoL is mainly considered in the formative manner (e.g. Fayers & Hand, 1997; Fayers et al., 1997; Fayers & Machin 2013). Since QoL is considered an endogenous variable in our conceptual model, using this construct as a multidimensional formative construct is improper (Cadogan & Lee, 2013): "Models containing endogenous formative latent variables are potentially useful conceptual tools, but they cannot be tested empirically" (Cadogan & Lee, 2013, p. 236).Thus, in order to reduce the theoretical and empirical complexity, we follow the marketing literature's approach/measurement regarding the QoL construct presented by Dagger and Sweeney (2006) and Sweeney et al. (2015).

According to the healthcare literature, "Anxiety" regarding illness outcome—as a detriment to psychological wellbeing—is the "most important construct" defining quality of life

(Ferrell et al., 1989,p. 2325). However, previous marketing studies indicated that service quality and satisfaction are the most important service outcomes influencing customers' QoL (Dagger & Sweeney, 2006). Thus, considering the adverse influence of anxiety on service quality and the augmenting role of healthcare service quality on patients' QoL, we hypothesize that:

H6: Perceived service quality mediates relationships of (a) satisfaction and (b) QoL with anxiety.

Service Quality, Satisfaction, and QoL: Disease Severity as a Moderator

Dagger and Sweeney (2006) state that service quality drives customer satisfaction and influences QoL. In this line, other studies also hold that satisfaction drives QoL (e.g. Sweeney et al., 2015). However, there are still gaps in our understanding of service quality and satisfaction with QoL (Dagger, Sweeney, & Johnson, 2007). Extending this knowledge, we highlight the momentous impact of disease severity in the relationships between service quality and satisfaction with QoL.

Amir, Roziner, Knoll, and Neufeld (1999) claim the adverse influence of disease severity on patients' QoL and suggest that social mastery (i.e. locus of control and self-efficacy) and support are the mediators of this relationship. Mastery is related to the internal locus of control and social support is pertinent to the external locus of control. In severe disease situations, patients attribute the control more externally; thus, they consider the care provider's role, such as service quality and satisfying service, as greatly influential on their QoL. In low-severity situations, patients assume higher internal control over the process and outcomes. Consequently, they would consider the service provider's role to influence their QoL less effectively and to a lesser extent.

In the case of not dealing with a life-threatening illness, such as gastritis (i.e. irritation or

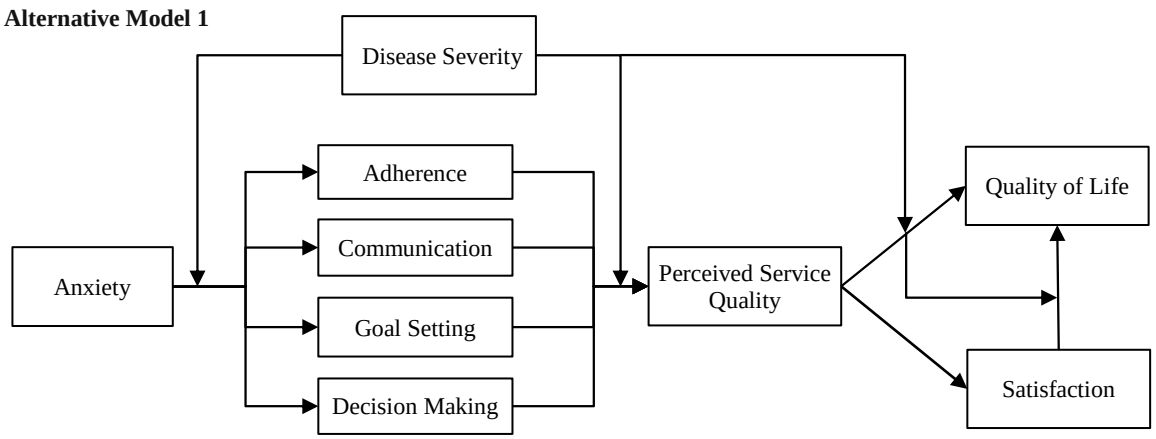
inflammation of the stomach), service quality and, similarly, satisfaction affect a patient's QoL to some extent. However, in severe health problems, such as cancer and AIDS, the role of service quality and satisfaction with the patient's health status would rise to a higher level of importance that might entirely alter the patient's QoL. Thus, consistent with and in addition to previous research, we postulate that:

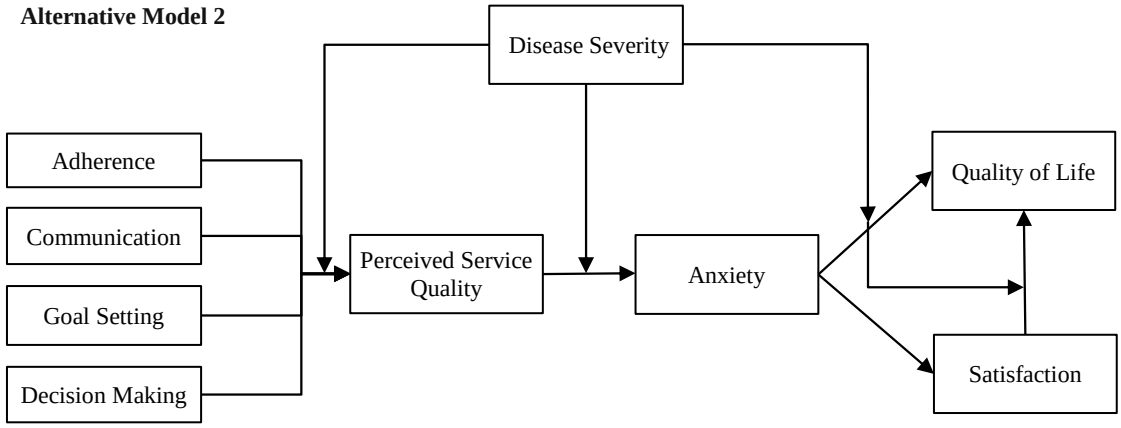
H7 Disease severity moderates the positive relationship between service quality and QoL. The effect of service quality on QoL is stronger for high-severity diseases than for low-severity diseases.

H8 Disease severity moderates the relationship between satisfaction and QoL. The effect of satisfaction on QoL is stronger for high-severity diseases than for low-severity diseases.

Using rival models to verify the power and validity of the proposed model is considered the best practice (Kelloway, 1998). We acknowledge that there are alternative conceptual frameworks that should be investigated along with the model proposed here. Drawing on extant research, we propose two alternative models in Figure 2 and formally test them along with our proposed model to determine whether and to what extent the rival models differ in terms of fitting the data and explaining the criterion variable(s). Testing rival models enables us to identify the "best approximating model" (Burnham & Anderson, 2003, p. 133). Alternative Model 1 examines the effect of anxiety on CVCC, as we believe anxiety may obstruct individuals' performance in activities and lead to harmful consequences. It could also be plausible that CVCC increases service quality and subsequently reduces anxiety; thus, Alternative Model 2 investigates this framework.

Figure 2 Alternative Models





CHAPTER III

METHODOLOGY AND FINDINGS

We follow the method of previous research regarding CVCC in healthcare and measure patients' perceptions through cross-sectional surveys in different service settings (e.g. Bolton, Reed, Volpp, & Armstrong, 2008; Camacho, De Jong, & Stremersch, 2014; Dellande et al., 2004; Gallan et al., 2013). The Health Insurance Portability and Accountability Act (HIPAA) was passed in 1996 and modified in 2013; it imposed restrictions over the privacy and security of health data and limited the use of medical information (Solove, 2013). Patients' medical records are only available to authorized persons, who are usually family members. Following Vermont legislation on constraints over the disclosure of health information for marketing purposes in 2006, the US Court of Appeals upheld similar statutes in more than 20 states (Woodward, 2011). Thus,

We conducted a pretest and two studies to test and validate the theoretical model. The pretest assesses the properties of the measures and was conducted among students of a public school. Students who had experienced a significant medical treatment were eligible to participate in the pretest. A significant medical treatment is considered to be a treatment requiring visiting a physician in a clinic or hospital at least four times. It could be related to any type of problem in body parts or organs, surgery, physiotherapy, rehabilitation, and various types of diseases. Study 1 surveys pregnant women to establish the theoretical foundation of our model and to answer the call of Sweeney et al. (2015) for empirical evidence in non-chronic contexts. Previous research

indicates that patient participation in medical care is influenced by clinical settings and the types of disease (Street et al., 2005). The clinical context is complex and consists of numerous nuances, such as standards of care, type of healthcare facility, type and specialty of physician, and so forth, all influencing patient participation (Bensing, van Dulmen, & Tates, 2003). Therefore, in study 2 we surveyed individuals who had experienced one chronic disease (i.e. cardiovascular, cancer, diabetes, and respiratory) and had received medical care from a clinic in the US. Doing this corroborates the previous findings in a cross-sectional fashion.

Pretest

We assessed the properties of our measures through an online survey among 143 students of a public school who had experienced a significant medical treatment, defined as a treatment requiring multiple visits to a physician (at least four times) in a clinic or hospital for a relatively long period of time. These visits were related to experiences, such as problems and surgery in various body parts or organs, cancer, diabetes, or pregnancy. Students were at least 18 years of age and had suffered from any of the above-mentioned health problems. Research information sheets were distributed among students of a public school. The research information sheet contains detailed information about the purpose of the research, researchers' information, respondents' characteristics (18 old years or older), whether they had experienced a significant medical treatment, voluntary nature and anonymity of participation, and the online survey link. The recruitment procedure was approved by the IRB.

Study 1

This study collected data from pregnant women during their pregnancy in an obstetrics and gynecology clinic (Ob-Gyn) located in the US. Obstetrics refers to the branch of medicine and surgery concerned with the care of women before, during, and after child birth; and

genecology involves diagnosis and treatment of disorders of the female reproductive system (Poleshuck & Woods, 2014). Pregnancy was chosen as a suitable context for the first study because of the intensity of anxiety, its serious consequences, and the importance of mothers' participation in their own and their babies' QoL (Young & Klingle, 1996). Anxiety disorders are common among patients, but female patients are more exposed to psychological impairment (Di Marco et al., 2006). The Anxiety and Depression Association of America finds that anxiety disorders are more likely to affect women than men, with the symptoms intensified during pregnancy. Among women who had been pregnant, 52% reported escalation of anxiety disorder during their pregnancy (http://www.adaa.org). Anxiety in pregnant woman is associated with severe consequences, such as not meeting daily responsibilities, not accepting the pregnancy, rejecting parenthood and the baby, and adverse pregnancy outcomes such as low birth weight and prematurity (Bastani et al., 2005).

The current study collected information directly from patients who had been involved in the service experience and had the ability to report on emotions, perceptions, and behaviors. Patients over the age of 18 who were in their first six months of pregnancy and had been referred to the clinic at least four times were eligible for inclusion in the study. Following IRB recommendations, I recruited those patients who were in the relatively earlier stages of pregnancy in an attempt to reduce risks. These selection criteria enabled us to create a homogenous sample of respondents who sufficiently visited their physician and had informed perceptions of service quality at the clinic. Moreover, with four visits, patients had more opportunities to cocreate with their physician.

The clinic receptionist gave the research information sheets to the patients as they signed in. The patient had ample time to review the sheet before being called in for a meeting with the

healthcare professionals. The sheet contained information about the research's purpose, the online survey, the voluntary nature and anonymity of the study, and guidance for completion of the survey. The patients were taken to private rooms while they were waiting to be seen by a medical professional or to be released. Two iPads were located in the private rooms; they were dedicated to the administration of this study and provided patients with access to the online survey. A patient stayed in the private room for an average of 15 to 20 minutes before meeting with the healthcare professional. Patients who decided to participate first reviewed the recruitment script and then used the iPads to complete the survey. The research information sheet and recruitment script identically guided respondents on how to get access to the consent page and the survey. The anonymity and voluntary nature of the survey as well as the privacy of participation and the data collection procedure were approved by the IRB. In sum, 283 pregnant women agreed to participate in the study, and there were 258 fully completed surveys.

Study 2

The purpose of this study is to confirm the theoretical model, proposed and tested in study 1. The study design employs an online survey that collected data from patients who are suffering from the leading chronic (non-communicable) diseases, including cardiovascular (i.e. heart and blood vessel disease), cancer, respiratory diseases, and diabetes, and who had received medical care from healthcare service providers in the US. These four chronic diseases, as the largest causes of death, led to 35 million deaths worldwide between 2005 and 2015 (Abegunde et al., 2007). After the disease types as well as the hospital/clinic names had been validated, the respondents were allowed to continue completing the survey. Only individuals over 18 years of age who had one or more of the illnesses, had attended a clinic at least four times by the time of the survey, and could verify the clinic's name and other basic information were eligible for

inclusion. The respondents were introduced by students of a large public school in the US. The students handed the research information sheets—containing the research information and online survey link—to their relatives/friends who were suffering from a chronic disease. A total of 190 complete questionnaires from individuals over 18 years of age who had one or more of the illnesses, had attended a clinic by the time of the survey at least four times, and could indicate the disease type, clinic name, and other basic information were received. The data collection procedure was approved by the IRB. The sample profile for the studies is provided in Table 2.

Table 2 Sample Profile

Characteristic	Pretest	Study1	Study 2			
	% (n=173)	Ob-Gyn % (n=258)	Cardiovascular % (n=53)	Cancer % (n=37)	Respiratory % (n= 41)	Diabetes % (n=59)
Gender						
Male	49.6	–	52.8	59.5	46.3	47.46
Female	50.4	258	47.2	40.5	53.7	50.85
Age (year)						
19-25	16.3	31	5.7	5.4	2.4	3.39
26-34	34.5	29.8	9.4	10.8	7.3	5.09
35-44	23.2	24	17.0	27.0	22.0	27.12
45-54	14.6	8.5	28.3	18.9	24.4	27.12
55-64	11.4	6.7	30.2	27.1	29.3	25.42
65+	–	–	9.4	10.8	14.6	11.86
Education						
Below high school	1.4	3.4	5.7	10.8	4.9	8.47
High school	15.1	20.9	17.0	16.2	14.6	16.95
Some college	43.2	22.3	22.1	27.0	23.9	17.29
Bachelor's degree	22.3	24.9	29.5	35.2	34.4	30.34
Graduate school	18	28.5	25.7	10.8	22.2	26.95
Ethnicity						
White	14.5	24.3	22.6	20.5	45.4	36.17
Hispanic	56	58.9	71.7	61	44.8	38.66
Pacific Islander	6.7	11.6	0.0	3.7	0.0	16.69
Asian	14.2	4.1	1.9	12.1	4.9	1.69
African-American	.7	1.1	0.0	0.0	.7	0.0
Other	7.9	–	3.8	2.7	4.2	6.79
Length of clinic attendance						
> 4 months	4.3	11.9	1.9	3.1	1.4	1.17
5-6 months	6.5	29.5	5.7	5.7	7.3	4.86
7-8 months	15.1	30.3	15.1	10.8	19.5	6.34
9+ months	10.1	28.3	17.0	21.6	12.7	13.56
1-3 years	38.2	–	16.4	23.9	17.3	27.87
4-6 years	14.1	–	22.6	24.5	19.8	29.25
7+ years	11.7	–	21.3	10.4	22.0	16.95
# Children						
0		13.9				
1		20.5				
2		14.7	–	–	–	–
3		23.2				
4		14.3				
5		8.5				

Measures

I relied on the extant marketing and healthcare literatures as the source of measures. Items are listed in the Table 3. All scales were captured on a 7-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (7) with the exception of service quality and disease severity, which were measured using 7-point semantic differential scales.

Exogenous variables The four-item *adherence* scale was adapted from Morisky, Green, and Levine (1986). The *communication* scale consisting of four items was adapted from the patient-physician interpersonal and partnership communication scales (Flocke, 1997; Little et al., 2001). The *goal setting* scale consisting of five items was operationalized through a five-item scale using a patient participant evaluation form in a goal setting process (Northen et al., 1995). *Decision making* was measured using four items adapted from the scale of patients' perceived involvement in care (Lerman et al., 1990).

Endogenous variables The scale for *anxiety* was adopted from the widely used Hospital Anxiety and Depression Scale (HADS) of Zigmond and Snaith (1983). HADS contains two subscales for anxiety and depression, each measured with 7 items, which are separately tested and shown to enjoy acceptable properties in non/chronic illnesses (Bjelland et al., 2002). *Service quality* was measured by the overall service quality scale proposed by Cronin, Brady, and Hult (2000). This scale has been tested in different contexts, particularly in healthcare services and has produced reliable and valid results (e.g. Brady, Cronin, & Brand, 2002). The three-item scale for *satisfaction* was adopted from Gotlieb, Grewal, and Brown (1994), and *QoL* was operationalized using three items from Sweeney et al. (2015).

"Patients are the best judge of the severity of their disease" (Smith et al., 1991, p. 231). Thus I captured disease severity perceptions using two items adapted from Dube et al. (1996).

The content and wording of all scales were validated and improved by two marketing and three medical faculty members in a public university, as well as a psychologist and two medical doctors specializing in obstetrics and gynecology.

Considering the context of study 1 (pregnancy), one item from the anxiety scale was dropped—"I get a sort of frightened feeling like 'butterflies in my stomach'"—following feedback from the above professionals as well as a recommendation in prior research (Karimova & Martin, 2003). The sense of butterflies in the stomach could be felt in pregnant women more often since they are carrying babies. Therefore, this item misrepresents anxiety in the context of pregnancy and might create confusion for respondents and affect other measurement items as well. Keeping the wording of items as similar as possible, item 4 of the adherence and item 1 of the goal setting scales were slightly modified to accommodate the contexts of all studies.

Table 3 Measures

Construct	Items
Adherence	I always follow the plan given by my physician.
	I strictly adhered to my course of treatment.
	Since my last visit, I have done exactly what my physician told me to do.
	I always show up for my appointments.
	I maintain compliance throughout the pregnancy/treatment duration.
Communication	I communicate with my physician frequently.
	My physician and I discuss almost everything related to my pregnancy/treatment.
	My physician and I talk about my health-related issues.
	My physician and I share our thoughts openly.
	I generally feel comfortable asking questions from my physician.
Goal Setting	My physician and I collaborate to establish goals of medical care during the pregnancy/treatment duration.
	My physician and I outline the goals in a language acceptable for both of us.
	I cooperate with my physician to explore my concerns in the goal setting process.
	My physician and I incorporate my concerns in setting the goals.
	My physician explains my role in identifying the goals.
Decision Making	I suggest a particular kind of test or treatment for my symptoms.
	I express my doubts to my physician about the tests or treatment that he/she recommends.
	I let my physician know what kind of medical treatment I prefer.
	I give my opinion about the types of tests or medical care that my physician ordered.
Anxiety	I feel tense or wound up during my pregnancy/treatment duration.
	I get sort of frightened, feeling as if something awful was about to happen.
	Worrying thoughts go through my mind during the pregnancy/treatment.
	I sit at ease and feel relaxed during the visits. (reversed)
	I feel restless as if I have to be on the move.
	I get sudden feelings of panic.
Satisfaction	I am happy with the services of this clinic.
	I believe I did the right thing when I chose this clinic.
	Overall, I am satisfied with choosing that health center.
Quality of Life	I am satisfied with the quality of my life.
	I am happy with the quality of my life.
	I have a sense of wellbeing.
Service Quality	Poor - Excellent
	Inferior - Superior
	Low Standards - High Standards
Disease Severity	Not Significant at All - Extremely Significant
	Not Serious at All - Extremely Serious

"/" separates the difference in wording of items across the studies.

Control Variables

Given the sensitivity of healthcare contexts, I controlled for several demographic and situational variables. Previous research indicates that age, gender, education, and ethnicity should be considered when dealing with anxiety and QoL (Daig et al., 2009). I controlled the length of attendance in the clinic as the measure of expertise/familiarity with the disease, since it may influence QoL (Sweeney et al., 2015) and patients' anxiety. Finally, I controlled the number of previous children in study 1, which may influence a pregnant women's anxiety and QoL.

Measurement Validation

Using pretest data, I followed Bolton (1993) to verify the underlying structure of variables through exploratory (EFA) and confirmatory factor analysis (CFA). Using SPSS, the varimax rotation results indicated the Kaiser-Meyer-Olkin (KMO) of .783 and significant Bartlett's χ^2 (p = .000), suggesting homogeneity of variance (Hair et al., 2006). Items loaded on the respective factors, except four items related to the four areas of CVCC (see Appendix A). Following the suggestion of Hair et al. (2006) for measurement validation, I evaluated the reliability of factors in two steps. All Cronbach's alphas (α) were above the threshold of .7. However, the assessment of "scale if item deleted" indicated that removing the four problematic CVCC items would considerably increase the scale's reliabilities. Moreover, item-to-total correlations indicated that all but the four problematic items lie above the threshold of .5. Therefore, the four items were excluded from the analysis. Removed items are indicated with "*" in Table 4.

All constructs were included in the CFA models to confirm the high item loadings on the corresponding constructs and to obtain the most precise fit indices. Following Hair et al. (2006), thresholds of fit indices for a model with more than 30 observed variables and fewer than 250

observations, the results exhibited good fits to the corresponding three datasets (see Table 5).

Table 4 Measures and loadings

Construct	Items	Pretest	Study 1	Study 2
Adherence	I always follow the plan given by my physician.	.91	.88	.94
	I strictly adhered to my course of treatment.	.88	.86	.87
	I always show up for my appointments.	.84	.72	.90
	I maintain compliance throughout the pregnancy/treatment duration.	.84	.80	.93
	Since my last visit, I have done exactly what my physician told me to do.*			
Communication	I communicate with my physician frequently.	.67	.86	.93
	My physician and I talk about my health-related issues.	.80	.91	.87
	My physician and I share our thoughts openly.	.90	.89	.90
	I generally feel comfortable asking questions from my physician.	.78	.71	.87
	My physician and I discuss almost everything related to my pregnancy/treatment.*			
Goal Setting	My physician and I collaborate to establish goals of medical care during the pregnancy/treatment duration.	.92	.84	.91
	My physician and I outline the goals in a language acceptable for both of us.	.82	.86	.94
	I cooperate with my physician to explore my concerns in the goal setting process.	.87	.89	.91
	My physician and I incorporate my concerns in setting the goals.	.90	.85	.87
	My physician explains my role in identifying the goals.*			
Decision Making	I suggest a particular kind of test or treatment for my symptoms.	.83	.90	.89
	I express my doubts to my physician about the tests or treatment that he/she recommends.	.61	.75	.88
	I give my opinion about the types of tests or medical care that my physician ordered.	.64	.86	.83
	I let my physician know what kind of medical treatment I prefer.*			
Anxiety	I feel tense or wound up during my pregnancy/treatment duration.	.78	.90	.92
	I get sort of frightened, feeling as if something awful was about to happen.	.84	.95	.93
	Worrying thoughts go through my mind during the pregnancy/treatment.	.85	.91	.91
	I sit at ease and feel relaxed during the visits. (reversed)	.70	.92	.86
	I feel restless as if I have to be on the move.	.58	.90	.91
	I get sudden feelings of panic.	.80	.95	.90
Satisfaction	I am happy with the services of this clinic.	.94	.98	.97
	I believe I did the right thing when I chose this clinic.	.94	.97	.95
	Overall, I am satisfied with choosing that health center.	.96	.97	.98
Quality of Life	I am satisfied with the quality of my life.	.87	.88	.95
	I am happy with the quality of my life.	.85	.90	.92
	I have a sense of wellbeing.	.93	.89	.89
Service Quality	Poor - Excellent	.83	.95	.96
	Inferior - Superior	.88	.95	.98
	Low Standards - High Standards	.83	.87	.91
Disease Severity	Not Significant at - Extremely Significant	.96	.98	.97
	Not Serious at All - Extremely Serious	.97	.98	.98

Note: *Items dropped as they had low factor loadings on respective constructs. The remaining factor loadings were significant at 95% confidence level
"/" separates the difference in wording of items across the studies.

Table 5 Fit indices of CFA models

Model	χ^2	*df*	Significance	SRMR	CFI	RMSEA	TLI	IFI
Pretest	560.36	412	$p < .00$	.06	.934	.059	.921	.935
Study 1	843.16	412	$p < .00$	.071	.941	.073	.927	.942
Study 2	872.91	412	$p < .00$	.038	.940	.076	.926	.937

χ2: Chi-squared; *df:* degree of freedom; SRMR: standard root mean square residual; CFI: comparative fit index
RMSEA: Standardized root mean square error of approximation; TLI: Tucker–Lewis index; IFI: Incremental fit index

The validity of all measures was also assessed using the PLS approach (e.g. Chin, 1998). I evaluated the convergent validity of all constructs using the following three criteria: First, as it is exhibited in Appendix A, all items loaded significantly on the respective constructs (loadings >.5, p >.01). Second, composite reliabilities exceeded the threshold of .7. Third, all the average variance extracted (AVE) surpassed .5 (Table 6). The discriminant validity of the scales was supported because for all constructs the squared correlation between each pair of constructs was lower than the corresponding AVE (Fornell & Larcker, 1981).

Table 6 Descriptive statistics and validity.

	Variables		Study 1						Study 2						Squared Correlations/Discriminant Validity								
		Range	*M*	*SD*	AVE	CR	CA	R^2	*M*	*SD*	AVE	CR	CA	R^2	1	2	3	4	5	6	7	8	9
1	Adherence	1–7	6.48	.66	.67	.89	.84	.00	5.65	1.25	.82	.95	.95	.00		-.54	.42	.00	.39	.27	.40	-.30	.36
2	Anxiety	1–7	1.90	1.20	.85	.97	.97	.54	2.04	1.09	.82	.96	.96	.77	-.14		-.52	.01	-.32	-.28	-.51	.34	-.48
3	Communication	1–7	6.24	.88	.72	.91	.87	.00	5.78	1.17	.79	.94	.95	.00	.26	-.18		-.00	.30	.35	.40	-.24	.39
4	Decision making	1–7	5.68	1.36	.71	.88	.82	.00	4.16	1.22	.75	.90	.84	.00	.10	.02	.23		.00	.01	.00	.00	.00
5	Goal setting	1–7	6.36	.78	.74	.92	.88	.00	5.28	1.43	.83	.95	.93	.00	.28	-.20	.55	.22		.23	.42	-.15	.44
6	QoL	1–7	6.48	1.10	.86	.95	.92	.38	5.67	1.22	.84	.94	.91	.51	.08	-.09	.13	.02	.17		.47	-.15	.37
7	Satisfaction	1–7	6.63	.80	.95	.98	.98	.56	5.83	1.25	.93	.97	.98	.54	.17	-.29	.34	.05	.42	.35		-.21	.56
8	Disease severity	1–7	2.50	1.43	.95	.98	.95	.00	2.65	1.42	.95	.97	.98	.00	-.04	.43	-.04	-.00	-.07	-.02	-.10		-.20
9	Service quality	1–7	6.66	.70	.85	.95	.92	.22	5.77	1.32	.90	.97	.95	.45	.08	-.22	.25	.04	.28	.20	.57	-.07	

1) AVE = average variance extracted; CA = Cronbach's a; CR = composite reliability; *M* = Mean; SD = standard deviation; R^2 = R square of CFA models.
2) The correlations of Study 1 (Study 2) are presented in the lower (upper) diagonal triangle.
3) Given the difference in the contexts, we observed many mean differences across samples. Study 1 involves pregnant women during their pregnancy, which exhibit higher levels of cocreation in adherence, communication, goal setting, and decision making and higher service quality, satisfaction, and QoL than study 2 (p<.001). Subsequently, the level of anxiety in Study 1 is lower than study 2, which investigates patients who suffer from chronic diseases (i.e. cancer, diabetes, heart disease). However, interestingly the means difference is not significant (p= .149). In study 2, respondents perceived higher level of disease severity than respondents in Study 1. Even though the means may differ between samples, the entire key constructs are expected to be covaried correspondingly across studies, presented in Figure 1.

Common Method Bias and Multicollinearity

To reduce common method bias, I followed Podsakoff, MacKenzie, Lee, and Podsakoff's (2003) recommendations. First, predictor and criterion variables were distanced, using other instrument items. Second, scales were carefully adapted and improved, using experts in the marketing, healthcare, and psychology areas. Third, I refined items through the pretest, as discussed previously, and recognized the potential difficulties that may arise during the survey administration (Hulland et al., 2007). Furthermore, the members of the research team explained the purpose of the study to the participants and informed them about the anonymity of the surveys in the questionnaire's cover letter and arranged the items randomly to reduce common method bias (Hulland et al., 2017).

Post-hoc evaluation of common method bias was performed in three steps. First, I conducted unrotated factor solution, as suggested by Chin, Thatcher, and Wright (2012). Eight factors resulting from EFA indicated 76.71% and 77.57% of the variance respectively in the corresponding models of study 1 and study 2, which rejected the presence of one general factor. Second, I applied Harman's single factor test (Hulland et al., 2017). I extracted the variables with a single fix factor without the rotation. The result of the test indicated that the single factor explains 30% in study 1 and 32% in study 2 of the total variance, which is below the common threshold of 50% (Podsakoff et al., 2003). Third, I assessed the unmeasured latent method factor, as suggested by Podsakoff et al. (2003) and Hulland et al. (2017). Analysis demonstrated that bias attributed to method is 25.8%, which is not sufficient for engendering biases in the results (Williams, Cote, & Buckley, 1989). We further conducted the partial correlation procedure to rule out common method bias. In line with the unrotated factor solution, we obtained the first unrotated factor (which is assumed to be the approximate evaluation of common method bias),

excluded the items loaded on the factor, and examined the relationships between exogenous and endogenous variables. The results indicated that the relationships still remain meaningful (Podsakoff & Organ, 1986; Hulland et al., 2017).

Three further analyses indicated that multicollinearity among the independent variables was not an issue in either of the studies. First, the composite reliabilities and AVEs were relatively high (see Table 6; Hajli et al., 2017). Second, variance inflation factors, ranging from 1.10 to 2.77 in study 1 and 1.01 to 3.64 in study 2 were below the common cutoffs of 5 (Hair et al., 2012). Finally, comparing the correlation matrices of variables with the corresponding path coefficients, I observed similar patterns (Kaplan, 1994).

Structural Equation Modeling (SEM): Partial Least Square (PLS) and Covariance-Based (CB) Models: To evaluate the measurement properties and analyze the paths, I draw on the advantages of two main SME methods that have become quasi-standard in marketing research (Hair et al., 2012): PLS and CB. Depending on the context, it is generally agreed that both approaches are acceptable and have the potential to complement rather than oppose each other (Chin, 1998). PLS-SEM is a suitable method for theory development, while CB-SEM is appropriate for theory confirmation (Fornell & Bookstein, 1982; Joireman, Grégoire, Devezer, & Tripp, 2013).

PLS-SEM explains variances of individual constructs by estimating partial model relationships in an iterative sequence of ordinary least squares regression (Fornell & Bookstein, 1982). Compared to CB, PLS-SEM has greater statistical power and is thus appropriate for research emphasizing prediction with complex models (Hair et al., 2012). However, R^2 as the goodness-of-fit index in PLS models "does not represent a true global fit measure" (Hair et al., 2012, p. 427). Conversely, CB-SEM offers measures of overall fit through comparing the

reproduced observed covariance matrices (Grégoire, Laufer, & Tripp, 2010).

CB-SEM evaluates the discrepancy between the estimated and sample covariance matrices. Because of this merit, it is specifically suitable for comparing rival models and theory testing (Fornell & Bookstein, 1982). Since both studies are survey based, using CB-SEM will provide us with procedures to elucidate the existence of common method bias (Podsakoff et al., 2003). As study 1 focuses on predication rather than confirmation, I use SmartPLS (5000 bootstrap samples and 300 iterations; Hair et al., 2012) to *develop* the foundation of our model. In Study 2, I *confirm* the proposed model, using the more theory-driven AMOS.

Hypothesis Testing

To test the conceptual model, following Aiken, West, and Reno's (1991) recommendation, I first incorporated the control variables in the regression analyses and followed the hypothesized main effects. Since the control variables, except age, did not have an effect on the endogenous variables—education (all *p*'s > .37), gender (all *p*'s > .09), ethnicity (all *p*'s > .18), length of attendance (all *p*'s > .52), and # of children (all *p*'s > .12)—I removed them to enhance the presentation of our results.

Model Test Table 7 displays the results, and the theoretical model receives support in both studies. The structural models fit the data quite well: 1) Study 1: $\frac{\chi 2}{df}$ =2.39, $p < .001$, CFI=.936, TLI=.923, RMSEA=.076, SRMR=.075; 2) Study 2: $\frac{\chi 2}{df}$ =2.15, $p< .001$, CFI=.941, TLI=.932, RMSEA=.068, SRMR=.047. The exploratory results of Study 1 are confirmed in Study 2, indicating consistency and generalizability across healthcare settings. In particular, the analysis of R^2, ranging from .23 to .58 in study 1 and .59 to .66 in study 2, indicates that the model explains considerable portions of the variance in the endogenous variables. Moreover, I considered the Stone-Geisser Q^2 value per endogenous variable through the blindfolding

procedure to assess the predictive quality of our model. Following Hair et al.'s (2012) rule of thumb, Q^2 values ranging from .18 to .55 in study 1 and from .46 to .65 in study 2 represent generally a strong degree of predictive relevance of the exogenous variables and a high level of the model's quality (see Table 7).

Direct paths The results indicate a significant negative effect of adherence on anxiety (β_{s1}[4] = -.18, p<.01; β_{s2} = -.41, p<.001), supporting H1. In line with H2, I found a significant negative effect of communication on anxiety (β_{s1} =-.20, p<.05; β_{s2} =-.31, p< .001). I also found support for H3 in both studies, indicating the negative effect of CVCC in goal setting on anxiety (β_{s1} =-.28, p<.05; β_{s2} = -.27, p<.001). H4 posits that CVCC in decision making positively influences anxiety, which was supported in both studies (β_{s1} =.14, p<.05; β_{s2} =.17, p<.001). Goal setting in study 1 and adherence in study 2 had the strongest reducing effects on anxiety. This inconsistency could be accounted for by the diversity in the disease types and the treatment plans across the studies.

Mediation Effect Mediation was analyzed using model 4 with all control and independent variables as covariates in PROCESS (Hayes, 2013). As Table 8 indicates, service quality plays mediation roles in the negative effects of anxiety on satisfaction (Indirect effect$_{s1}$: -28, LLCI: -.421, ULCI; -.181; Indirect effect$_{s2}$: -.40, LLCI: -.532, ULCI: -.294) and on QoL (Indirect effect$_{s1}$: -15, LLCI: -.191, ULCI; -.051; Indirect effect$_{s2}$: -.35, LLCI: -.463, ULCI: .241), thus confirming H6a and H6b, respectively. In order to provide additional information for the key roles of anxiety and service quality in the model, I tested the entire potential mediation effects, using model 4 of PROCESS. I also tested the serial/parallel mediation of anxiety and service quality on the relationships between CVCC activates and satisfaction and QoL, using model 6 of PROCESS. Results are reported in Table 8. In all models, I incorporated the control

[4] S1: Study 1; S2: Study 2

variables and other exogenous variables—which are included in the corresponding relationship—as covariates.

Interaction Effects Following the analysis of the direct and mediation paths, I followed Pedhazur (1997) and used SEM to test the moderating effect of disease severity. SEM is the proper way to do a moderation test in models that meet any of the following criteria: (1) models that have multiple indicators per latent variable; (2) nonrecursive models[5]; and (3) models consisting of correlated residuals. In order to keep the consistency in the hypothesis testing process, I used PLS-SEM in Study 1 and CB-SEM in Study 2 to test the moderation effects (see Table 7). However, I retested the moderation effects in both studies, using model 1 with other IVs and control variables as covariates with PROCESS for SPSS developed by Hayes (2013), and this demonstrated similar results.[6]

Following Chin et al. (2003), I compared a model not including interaction terms (baseline model) with a model including the terms (theoretical model). Adding interactions considerably augments the variances explained in anxiety ($_{s1}\Delta R^2$=.34, $_{s2}\Delta R^2$=.17) and QoL ($_{s1}\Delta R^2$=.15, $_{s2}\Delta R^2$=.10). Consistent with H5a, anxiety was positively associated with disease severity (β_{s1} =.56, p<.001; β_{s2} =.16, p<.001) and negatively with adherence (β_{s1} =-.20, p<.001; β_{s2} =-.54, p<.001) and their interaction (β_{s1} =-.31, p<.001; β_{s2} =-.33, p<.001). The moderating effect posited in H5b was also supported as anxiety was positively associated with disease severity (β_{s1} =.56, p<.001; β_{s2} =.19, p<.001) and negatively with communication (β_{s1} =-.22, p<.001; β_{s2} =-.47, p<.001) and their interaction (β_{s1} =-.16, p<.001; β_{s2} =-.39, p<.001). As predicted in H5c, anxiety was positively associated with disease severity (β_{s1} =.54, p<.001; β_{s2} =.31, p<.001) and negatively with participation in goal setting (β_{s1} =-.17, p<.001; β_{s2} =-.40, p<.001) and their interaction (β_{s1} =-

[5] Nonrecursive models contain reciprocal relationships, while recursive models consist of casual relationships which go in one direction, e.g. if X affects Y, then Y does not directly or indirectly affect X (Sobel, 1982).

.19, p<.001; β_{s2} =-.39, p<.001). Interestingly, consistent with the definition of a moderator—a qualitative or quantitative variable that affects the *direction* and/or *strength* of the relation between an independent variable and a dependent variable (Baron & Kenny, 1986)— the incorporation of disease severity flips the direction of the association between decision-making and anxiety from positive to negative and affects the magnitude of the relationship. While anxiety was positively associated with disease severity (β_{s1} =.61, p<.001; β_{s2} =.37, p<.001), contrary to H5d, it was negatively associated with participation in decision making (β_{s1} =-.16, p<.001; β_{s2} =-.28, p<.001) and their interaction (β_{s1} =-.15, p<.01; β_{s2} =-.58, p<.001).

Consistent with H7, QoL was associated negatively with disease severity (β_{s1} =-.30, p<.001; β_{s2} =-.64, p<.001) and positively with service quality (β_{s1} =.28, p<.001; β_{s2} =.14, p<.001) and their interaction (β_{s1} =.18, p<.05; β_{s2} =.55, p<.001). H8 proposes that disease severity moderates the relationship between satisfaction and QoL. While this supposition is confirmed in study 2, in does not hold true in study 1 (β_{s1} =.02, p=.38; β_{s2} =.40, p<.001). However, I found a significant positive association between satisfaction and QoL (β_{s1} =.44, p<.001; β_{s2} =.47, p<.001) and a negative association between disease severity and QoL across the studies (β_{s1} =-.25, p<.001; β_{s2} =-.48, p<.001).

To better understand the interaction patterns, in Appendix I plot the predicted values of anxiety and QoL on two levels of disease severity (i.e. high versus low) for different levels of exogenous variables (i.e. standardized values of "-1" and "1"). The interaction patterns generally support our contention about the moderating role of disease severity in the model.

Control Variable Age minimally changed the predictability power of the model. The variation of endogenous variables explained by age ranged from R^2 = 0-2% in study 1 and R^2 = 0-4% in study 2 (see Table 7). While age does not influence anxiety, it positively affects QoL in

study 1 (β_{s1} =2.92, p>.001; β_{s2} = .00, p>.05), service quality in study 2 (β_{s1} =.01, p>.05; β_{s2} =-.10, p<.05), and satisfaction in both studies (β_{s1} =.09, p<.05; β_{s2} =.17, p<.001). I also checked the association among the key constructs of the model with/without age, but no significant difference was found across the studies. It may also be plausible that length of attendance moderates the CVCC-Anxiety relationship; however, I could not find any significant effect.

Table 7 Results of Model Estimation

Path	Hypothesis	Study 1		Study 2	
		Path Coefficient	(*t*-value)	Path Coefficient	(*t*-value)
Direct paths					
Anxiety		**R^2=.26**	**Q^2=.22**	**R^2=.66**	**Q^2=.62**
Adherence ⟶ Anxiety	✓H1	-.18	(2.50)**	-.41	(4.70)***
Communication ⟶ Anxiety	✓H2	-.20	(2.02)*	-.31	(4.89)***
Goal setting ⟶ Anxiety	✓H3	-.28	(2.42)*	-.27	(3.31)***
Decision Making ⟶ Anxiety	✓H4	.14	(2.12)*	.17	(4.27)***
Interactions					
Adherence ⟶ Anxiety		-.20	(3.90)***	-.54	(5.58)***
Disease severity ⟶ Anxiety		.56	(11.23)***	.16	(3.47)***
Adherence × Disease severity ⟶ Anxiety	✓H5a	-.31	(3.60)***	-.33	(6.55)***
Communication ⟶ Anxiety		-.22	(5.36)***	-.47	(7.88)***
Disease severity ⟶ Anxiety		.56	(11.64)***	.19	(3.40)***
Communication × Disease severity ⟶ Anxiety	✓H5b	-.16	(3.80)***	-.39	(7.70)***
Goal setting ⟶ Anxiety		-.17	(4.14)***	-.40	(6.60)***
Disease severity ⟶ Anxiety		.54	(10.32)***	.31	(6.82)***
Goal setting × Disease severity ⟶ Anxiety	✓H5c	-.19	(4.20)***	-.39	(7.47)***
Decision Making ⟶ Anxiety		-.16	(3.64)**	-.28	(3.72) ***
Disease severity ⟶ Anxiety		.61	(12.4)***	.37	(7.74)***
Decision Making × Disease severity ⟶Anxiety	× H5d	-.15	(2.67)**	-.58	(12.37)***
Quality of life		**R^2=.25**	**Q^2=.27**	**R^2=.65**	**Q^2=.50**
Service quality ⟶Quality of life		.28	(4.14)***	.14	(3.82)***
Disease severity ⟶ Quality of life		-.30	(3.71)***	-.67	(12.42)***
Service quality × Disease severity ⟶ Quality of life	✓H7	.18	(2.05)*	.55	(10.40)***
Satisfaction ⟶ Quality of life		.44	(5.03)***	.47	(10.7)***
Disease severity ⟶ Quality of life		-.25	(3.25)***	-.48	(10.45)***
Satisfaction × Disease severity ⟶ Quality of life	≈ H8	.02	.38	.40	(8.99)***
Control variable					
Age ⟶ Anxiety (S1**ΔR^2=.01**; S2**ΔR^2=.00**)		.08	1.22	-.06	1.74
Age ⟶ Service quality (S1**ΔR^2=.00**; S2**ΔR^2=.01**)		.01	.26	-.10	(2.02)*
Age ⟶ Satisfaction (S1**ΔR^2=.01**; S2**ΔR^2=.04**)		.09	(2.46)*	.17	(4.05)***
Age ⟶ Quality of life (S1**ΔR^2=.02**; S2**ΔR^2=.00**)		.16	(2.92)***	-.00	.082

✓= Accepted; × = Rejected; ≈ = Partially accepted; *p<0.05, t=1.96; **p<0.01, t=2.56; ***p<0.001, t=3.29.
Test of direct paths: Study 1: df =257; Study 2: df =549); Test of interactions: Study 1: df =257; Study 2: df =10 and 13.

Table 8 Mediation analysis

Path	Path A[a] (X→ M)	Path B (M→ Y_X)	Path C′ (X→ Y_M)	Indirect effect[b] 95% confidence interval			Mediation Type[c]
	B	*B*	*B*	Effect	Lower	Upper	
Anxiety⟶Service quality⟶ Satisfaction(✓H6a)	-.27†	.71†	-.17†	-.28†	-.421	-.181	Partial
	-.85†	**.54**	**-.40†**	**-.40†**	**-.532**	**-.294**	**Partial**
Anxiety⟶ Service quality ⟶ Quality of life (✓H6b)	-.27†	.53†	-.12*	-.15†	-.193	-.051	Partial
	-.85†	**.46**	**-.32†**	**-.35†**	**-.463**	**-.241**	**Partial**
Adherence ⟶ Anxiety ⟶ Service quality	-.31**	-.16†	.08	.05†	.014	.098	Full
	-.42†	**-.29****	**.23****	**.11†**	**.043**	**.206**	**Partial**
Communication ⟶ Anxiety ⟶ Service quality	-.26*	-.16†	.16*	.04†	.002	.092	Partial
	-.29†	**-.30****	**.36†**	**.07†**	**.029**	**.131**	**Partial**
Goal setting ⟶ Anxiety ⟶ Service quality	-.44†	-.16†	.28†	.05†	.019	.125	Partial
	-.14*	**-.30****	**.60†**	**.08†**	**.004**	**.078**	**Partial**
Decision making ⟶ Anxiety ⟶ Service quality	.16**	-.16†	-.02	-.06†	-.100	-.020	Full
	.09†	**-.29†**	**-.03**	**-.07†**	**-.129**	**-.024**	**Full**
Service quality ⟶ Satisfaction ⟶ Quality of life	.84†	.69†	.18	.37†	.179	.483	Full
	.78†	**.53**	**.23†**	**.45†**	**.289**	**.643**	**Partial**
Adherence⟶ Anxiety−[Service quality] ⟶ QoL	-.33†[-.09]	-.06[.44†]	.059	.01†	.004	.032	Full
	-.41†[-.3*]	**-.14[.31†]**	**-.11**	**.032**	**.008**	**.077**	**Full**
Communication ⟶ Anxiety−[Service quality] ⟶ QoL	-.2* [.16*]	-.06[.44†]	.03	.009†	.000	.029	Full
	-.29†[.35†]	**-.14[.31†]**	**.6†**	**.02†**	**.005**	**.049**	**Partial**
Goal setting ⟶ Anxiety−[Service quality] ⟶ QoL	-.5†[.27†]	-.06[.44†]	.39**	.09†	.024	.543	Partial
	-.1*[.6†]	**-.14[.31†]**	**.27****	**.008**	**.000**	**.027**	**Partial**
Decision making ⟶ Anxiety−[Service quality] ⟶ QoL	.17*[-.022]	-.06[.44†]	-.087	-.014†	-.033	-.004	Full
	.08†[.04]	**-.14[.31†]**	**-.04**	**-.01†**	**-.048**	**-.004**	**Full**
Adherence ⟶ Anxiety−[Service quality] ⟶ Satisfaction	-.33**[-.09]	-.09*[.58†]	.08	.03	.009	.068	Full
	-.41†[-.23*]	**-.21*[.43†]**	**.10**	**.05†**	**.01**	**.11**	**Full**
Communication⟶ Anxiety−[Service quality] ⟶ Satisfaction	-.23*[.16*]	-.09*[.58†]	.19**	.02†	.006	.051	Partial
	-.29† [.35†]	**-.21*[.43†]**	**.28†**	**.03†**	**.01**	**.07**	**Partial**
Goal setting ⟶ Anxiety−[Service quality] ⟶ Satisfaction	.50†[.27†]	-.09*[.58†]	.52†	.03†	.013	.078	Partial
	-.10[.6†]	**-.21*[.43†]**	**.21****	**.011†**	**.000**	**.038**	**Partial**
Decision Making⟶ Anxiety−[Service quality] ⟶ Satisfaction	.17**[-.02]	-.09*[.58†]	-.07*	**-.03†**	**.014**	.066	Partial
	.08†[.04]	**-.21*[.43†]**	**.011**	**-.02†**	**-.06**	**-.007**	**Full**

Note: The results of Study 2 are presented in **bold** font. **p*<0.05, *t*=1.96; ***p*<0.01, *t*=2.56; †*p*<0.001. "[]" Indicates the coefficients of the exogenous and endogenous variables linked to Service Quality.

[a] Path A = relationship between IV and mediator; Path B = relationship between mediator and DV, controlling for IV; Path C′ = direct effect of IV on DV, controlling for mediator.

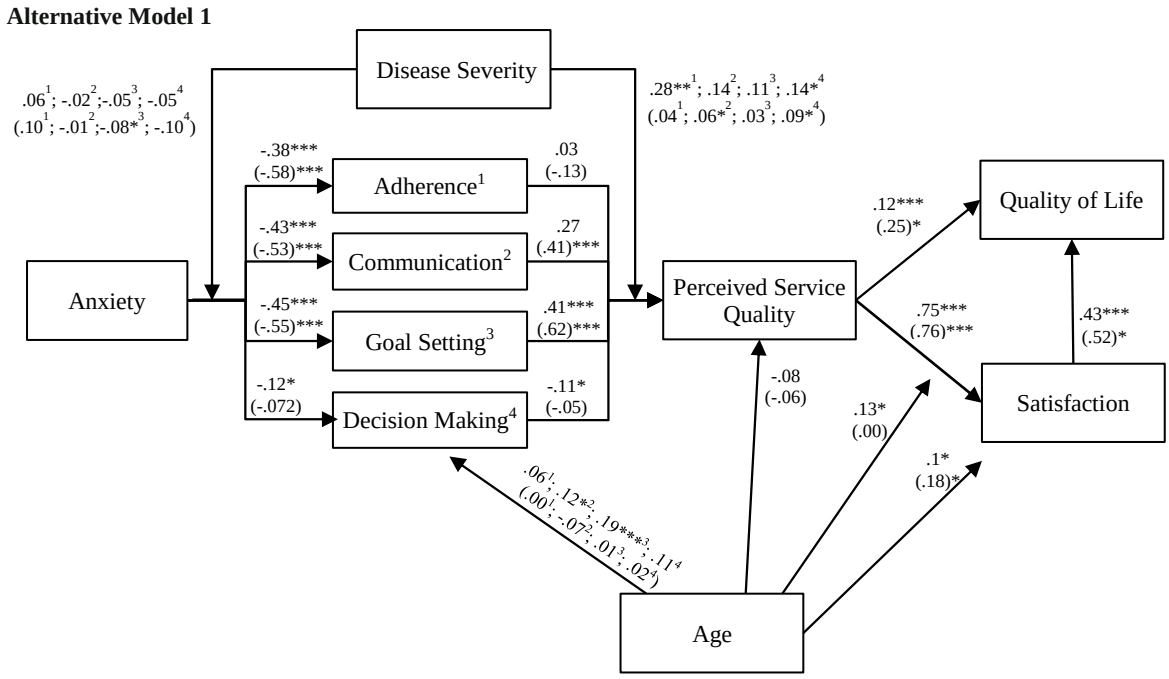
[b] Indirect effect of IV on DV, using Preacher and Hayes' (2008) bootstrapping technique. '†' indicates the significance of the indirect effect due to the absence of 0 in the confidence interval.

[c] Demonstrates full or partial mediation, using Baron and Kenny's (1986) approach.

Alternative Models

Using rival models in SEM analysis for the verification of the power and validity of a proposed model is well established (Kelloway, 1998). Therefore, Figure 3 exhibits fit indices and path analysis of two alternative models. First, the alternative models do not fit the data, as the indices do not fall within the Hair et al. (2006) ranges. Second, I compared the models, using two approaches recommended by Burnham and Anderson (2003): 1) information-theoretic selection based on Kullback-Leibler information loss by calculating Akaike Information Criterion (AIC) and 2) Bayesian model selection based on Bayes factors by Bayesian Information Criterion (BIC). The results indicated that the model in Figure 1 holds the lowest AIC and BIC values in both studies with the exception of alternative model 2 in study 1. These results validate the main model as the best fit for the data among the proposed models (Akaike 1987; study model: AIC_{s1}= 1592.44, AIC_{s2} = 1066.62; BIC_{s1}= 1898; BIC_{s2} = 1381.58; Alternative Model 1: AIC_{s1}= 1901.44, AIC_{s2} = 1145.07; BIC_{s1}= 1917.65; BIC_{s2} = 1437.30; Alternative Model 2: AIC_{s1}= 1341.27, AIC_{s2} = 1163.04; BIC_{s1}= 1664.59; BIC_{s2} =1455.280). Finally, as Figure 3 indicates, alternative models suffer from a lack of consistency in path analysis results across the studies.

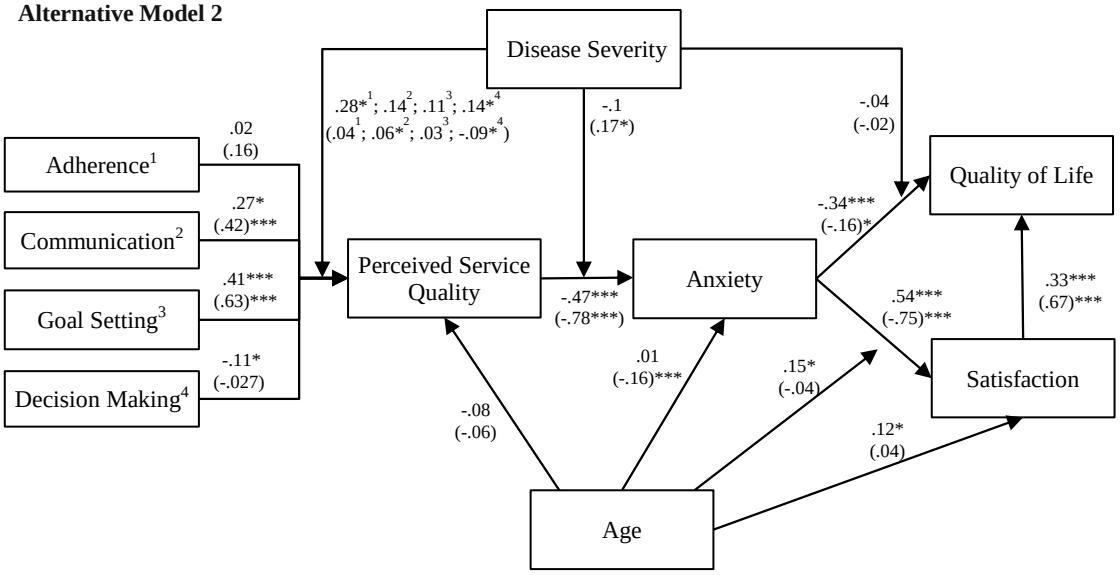
Figure 3 Results of Alternative Models



Fit Index: χ_2 =1423.44; *df* = 416; SRMR = .118; CFI = .880; RMSEA = .099; TLI = .86; IFI = .88; *p* = .00
(Fit Index: χ^2 =1188.60; *df* = 416; SRMR = .075; CFI = .897; RMSEA = .099; TLI = .88; IFI = .89; *p* = .00)

Note: The results of study 2 are presented in parentheses; *p<0.05, t=1.96; **p<0.01, t=2.56; ***p<0.001

Alternative Model 2



Fit Index: χ^2 =1159.27; *df* = 413; SRMR =.097; CFI =.92; RMSEA =.085; TLI =.90; IFI = .91; *p* = .00
(Fit Index: χ^2 =; 983.04; *df* = 413; SRMR =.061; CFI = .91; RMSEA =.087; TLI = .91; IFI = .92; *p* = .00)

Note: The results of study 2 are presented in parentheses; **p*<0.05, *t*=1.96; ***p*<0.01, *t*=2.56; ****p*<0.001

CHAPTER IV

SUMMARY AND CONCLUSION

This research study contributes in several important ways to service research, particularly to SD logic and the transformative service paradigm, by focusing on the gaps in CVCC and customer QoL literatures and responding to the relevant call of Vargo and Lusch (2016).

Our research indicates in which activities, through what mechanism, and in what conditions CVCC could increase or decrease QoL and service perception. I test the proposed model in two different studies across one non-chronic (i.e. pregnancy) and four chronic conditions (i.e. cardiovascular, cancer, respiratory, and diabetes) with two analytical approaches to indicate how and under which conditions CVCC increases QoL. Our data covers the empirical limitation of Sweeney et al.'s (2015) study, which asked for support from non-chronic and more chronic diseases. I respond also to the previous research, which called for more research on both the bright and the dark sides of cocreation (Chan et al., 2010; Heidenreich et al., 2014). This study also finds a reason for the discrepancy of findings between the marketing and healthcare literatures regarding the effect of CVCC in patients' QoL.

The results of the two empirical studies congruently indicate that on the bright side of cocreation, CVCC in activities that are of low-to-moderate levels of effortfulness/difficulty (i.e. adherence, communication, and goal setting) lessens anxiety, which in turn elevates service quality, satisfaction, and QoL perceptions. On the dark side, CVCC in high effortful/difficult tasks (decision making) heightens anxiety, and diminishes service quality, satisfaction, and QoL.

This backfiring effect supports Belschak et al.'s (2006) proposition that anxiety-coping tacticsmight be "less efficient or even backfire when particular components of the emotional system intensify" (p. 404). Moreover, these findings respond to Sweeney et al.'s (2015) call for future research on "whether there are thresholds of effort beyond which the incremental effects of customer EVCA diminish" (p. 13).

Disease severity, the measure of uncertainty and lack of control, is found to be a reason for mixed findings in the healthcare literature regarding the effect of CVCC in decision making on anxiety and satisfaction (e.g. Joosten et al., 2008). The results indicate that in high-severity diseases, patients attribute the locus of control externally, and that CVCC in adherence, communication, and goal setting greatly elevates their control over the treatment process and in turn reduces anxiety. But in low-severity situations, where patients attribute the control more internally, the alleviating effect of CVCC on anxiety is found to be relatively low. Surprisingly, the results indicate that disease severity flips the intensifying effect of decision making on anxiety into a mitigating effect. This means that when the disease is highly severe, CVCC in decision making enhances patients' control and in turn diminishes their anxiety dramatically. This finding also provides evidence for Sweeney et al.'s (2015) proposal of a dynamic theory of action (Atkinson & Birch, 1970), which posits that when easier tasks are accomplished, individuals shift to more difficult tasks, as they perceive the probability of success to be increasing. In this way, in low-severity situations when patients attribute the control more internally, decision making slightly mitigates anxiety, since favorable outcomes seem more achievable.

The results of the mediation test indicate that the effect of anxiety on satisfaction and QoL is partly carried through service quality. Thus, negative emotions, such as anxiety

accompanied by low service quality, could have a more adverse impact on customers' QoL and their satisfaction with service. Moreover, CVCC in decision making is found to reduce perceived service quality only through the elevation of anxiety. Conversely, CVCC in the areas of adherence, communication, and goal setting enhances service quality directly and indirectly through anxiety. The mediation analysis also confirms the primacy of anxiety for service quality in the model, as the effects of CVCC in the four activities on anxiety are much greater than on service quality (see Table 8).

Furthermore, in line with previous research, I found the critical role of service quality and satisfaction in customers' QoL. Our results extend the extant literature further and demonstrate that disease severity intensifies the escalating effects of service quality and satisfaction on QoL. When customers attribute the control more externally (high-severity diseases), they perceive the role of service provider—in terms of providing high quality and satisfying services—to be more salient to their QoL. In mild situations, however, the customers feel more control over the disease/treatment; the positive role of the service provider in QoL is then perceived as less prominent. Accordingly, the mediation analysis indicated that anxiety directly and indirectly through service quality results in detriments to customers' satisfaction and QoL. Some effects of service quality on QoL are carried by satisfaction; however, the results showed inconsistency (i.e. partial versus full mediation effect) across the studies. Moreover, age appears to increase satisfaction and QoL and decrease service quality, but the results are not consistent across the studies.

In addition, our findings confirm the EVCA hierarchy, indicating patients have fewer tendencies to cocreate in the decision making process than with the other three activities (see Table 6). However, I could not find a clear sequential pattern among the three latter activities

across the studies, which could be the result of differences in disease types, the effortful/difficulty nature of treatment activities, or the diversity of service settings. These findings respond to Sweeney et al.'s (2015, p. 13) suggestion that "future research may investigate if there are circumstances in which the order that activities are carried out in differ."

Managerial Implications

The rapid growth of total US health spending reached $2.7 trillion or $8,680 per person in 2011 (Hartman et al., 2013). Considering this expenditure, the Better Life Index places the US far behind Australia, Canada, Israel, Iceland, Switzerland. and many other comparable high-income countries in health and life satisfaction (Organization for Economic Cooperation and Development, 2014). Accordingly, anxiety is as one of the striking factors, damaging Americans' health and QoL and costing more than $50 billion a year, or one third of mental health expenses (Mendlowicz & Stein, 2014). However, leading healthcare models (i.e. affordable care act, collaborative care, and patient-centered models) that emphasize patient-provider collaboration do not consider the role of anxiety for health elevation and cost reduction. Thus, scrutiny through cocreation taking into consideration anxiety and its consequences could help the government/managers to deploy the optimum strategies.

I recommend that healthcare managers and caregivers engage patients in the healthcare activities in order to reduce their anxiety and enhance service quality, satisfaction, and QoL perceptions. However, our findings also warn caregivers about involving patients in effortful/difficult tasks that may jeopardize them by increasing their anxiety and lowering their perceptions of QoL, service quality, and satisfaction. Participation in difficult tasks requires a high level of patient effort, such as sacrificing energy and time as well as taking physical, performance, and social risks (Heidenreich et al., 2014; McColl-Kennedy et al., 2012).

Accordingly, more factors may also intensify the outcomes, such as the consequences of cocreation (i.e. emotional and cognitive responses); and the service conditions (i.e. uncertainty, risk, and criticality of the service in the customer's life) should be taken into consideration when assigning the tasks. Our findings recommend the following precepts to caregivers:

1. Cocreation in adherence to instructions should be motivated (i.e. taking medication, self-exercise, attending training sessions/clinic, modifying habits, etc.), since it reduces patients' anxiety and enhances service quality, satisfaction, and QoL perceptions. Even though adherence requires a low level of effort/difficulty, it is the most influential factor diminishing anxiety during chronic disease treatment, compared to the other three activities. This effect is even greater when patients consider their diseases severe and presume a lower level of control over the situation than with mild health problems. In spite of this, about 50% of patients do not adhere to the treatment procedure, costing $325 billion for the US (Gill et al., 2014). Thus, deploying multi-dimensional interventions, such as education for modifying patients' beliefs, self-monitoring and self-guided courses, and information reminders (e.g. phone messaging or automotive emails) could elevate patients' adherence (Bryant et al., 2013).

2. Communication is the second important activity in reducing patients' anxiety and increasing perceived service quality, satisfaction, and QoL in both chronic and non-chronic contexts. When patients are dealing with a severe health problem and have less control over their diseases, communication has a greater effect on reducing their anxiety than in less severe situations. Thus, caregivers should consider the following to enhance communication quality: (1) patients' perspectives; (2) patients' understanding within their psychosocial context; (3) shared insight about the disease and treatment, reflecting the patient's values; and (4) empowering patients to share concerns/ideas (Ishikawa, Hashimoto, & Kiuchi, 2013). However, patient-

physician communication occurs in non-equal situations and includes vital issues; it is, therefore, "emotionally laden" and entails a contribution from both parties (Ong et al., 1995). Thus, physicians' activities, honest and compassionate conversation, using qualifiers, qualitative estimates, nonverbal cues, as well as training and tools could enhance the effectiveness of communication.

3. Patient participation in goal setting should be motivated, since it has the greatest effect on reducing anxiety in a non-chronic context and requires a low-to-medium level of effort/difficulty compared to the other three activities. Moreover, goal setting increases perceived service quality the most in both chronic and non-chronic contexts. It is noteworthy that the role of goal setting in anxiety reduction is even more salient in high severity situations when patients perceive less control over the situation than in mild situations. Accordingly, a goal setting process should be SMARTER: "S", specific, significant, simple, self-managed, self-controlled; "M", measurable, motivational, manageable; "A", agreed, achievable, aligned; "R", realistic, rewarding, resourced; "T", timely, tangible, tactical; "E", engaging, enjoyable, extending; and "R", reviewed, rewarded, and realistic (Wade, 2009).

4. Depending on the severity of the disease, decision making may increase or decrease a patient's anxiety because it requires a high level of effort/difficulty. If the patient considers her disease highly severe, the decision making process reduces her anxiety. If, however, she thinks the disease is not harsh and feels more control over the situation, the decision making may increase her anxiety. In harsh situations, the patient usually develops her knowledge about the illness by using different resources, such as other patients/physicians and relevant websites. Thus, the enhanced knowledge decreases the uncertainty, and decision making would reduce the patients' anxiety since her opinion would also be incorporated in decisions (Guadagnoli & Ward,

1998). In mild situations and in cases in which the patient is not well-educated, she may not be fully aware of the alternatives/outcomes, and decision making may increase her anxiety. Thus, I recommend that caregivers measure patients' perception of the disease's severity or their level of control over the disease and then proceed toward the decision-making process. APACHE II—a severity of disease classification system that applies physiological principles—could also assist caregivers to stratify illness acuteness (Knaus et al., 1985). Moreover, educating patients about diseases, treatment alternatives, and consequences enhances their knowledge as well as their internal locus of control, which reduces the uncertainty of decision making and anxiety (Robinson & Thomson, 2001).

5. The findings congruently demonstrate that *anxiety* reduces patients' perceptions of service quality, satisfaction with service, and QoL. Thus, heeding the conditions (i.e. disease severity), *both* providers and patients can benefit from the decline in anxiety through cooperation in the four above-mentioned activities. Additionally, other strategies, such as informational handouts, training courses, relaxation sessions, pre- and post-operative visits, and cognitive behavioral therapy through interactive mobile applications could elevate the strategies' effectiveness (MacDonald et al., 2015). Furthermore, CVCC may similarly adjust other emotions germane to anxiety, such as stress, depression, discomfort, helplessness, vigilance, and anger (Barlow, 1991; Strongman, 1995).

6. High *service quality* and *satisfaction* enhance a customer's QoL. However, in severe health problems, these uplifting effects are even greater. In severe situations, in which a customer attributes control externally, she gives higher importance to the service provider's role in her QoL, unlike what happens in mild situations. Thus, caregivers should invest in the enhancement of service quality and customers' satisfaction by considering the criticality of

services for patients' QoL. Moreover, the deployment of strategies for enhancing customers' internal control over their diseases could reduce their anxiety and sensitivity about the providers' input, including high quality and satisfying service.

The general findings of this study are also applicable in other contexts in which CVCC is crucial and the service influences customers' QoL and causes an emotional burden, such as self-service technologies, financial/tax, knowledge intensive, and social services. Our findings are also relevant to customer participation in service recovery where customers encounter severe service failures and hold negative emotions toward themselves as well as the firm (Heidenreich et al., 2014).

Limitations and Further Research

Although this research contributes to theory and practice, I acknowledge some limitations.

Theoretical limitations First, I build upon cocreation in the four areas of activities representing four layers of the EVCA hierarchy (Sweeney et al., 2010), but there might be a wider range of cocreative tasks that represent higher/lower levels of effort/difficulty in healthcare activities. I showed that CVCC in an effortful/difficult activity like decision making increases anxiety. However, such cocreation could also lead to customers' perceptions of exploitation and result in emotional/behavioral responses such as anger and retaliatory behavior (Grégoire, Laufer, & Tripp, 2010). Furthermore, because of the interest of this study, I focus mostly on patient-physician cocreation, but value could be cocreated by multiple actors (Vargo & Lusch, 2016), including other patients, relatives, and friends. Therefore, the integration of patient-patient or patient-relative cocreation could expand the theoretical framework of future studies. Second, I rely on anxiety, since it is known as one of the most influential emotional burdens of patients and

their QoL. However, CVCC may also have interesting effects on others' positive (hope, enjoyment, admiration) and negative emotions (anger, hate, dissepiment, helplessness), which can influence greatly service outcomes and customers' wellbeing. Third, by maintaining the parsimony of the model and reducing the questionnaire burden, I did not capture the antecedents and some relevant consequences of CVCC. Future research could investigate the antecedents of CVCC, using the customer readiness concept (Dellande et al., 2004), and investigate numerous concepts related to firms' financial performance, such as willingness to pay and behavioral intentions.

Methodological limitation I draw on the EVCA hierarchy and measure the CVCC in the four areas of healthcare activities. However, future studies could manipulate the effort in CVCC (e.g. Heidenreich et al., 2014) as well as the locus of control and measure customers' emotional and behavioral responses. Moreover, I used a perception-based cross-sectional survey because of the vulnerability of the respondents and limited access to patient information; doing so, even with precautions, enhanced the possibility of common method bias and limited the time-related generalizability of the findings.

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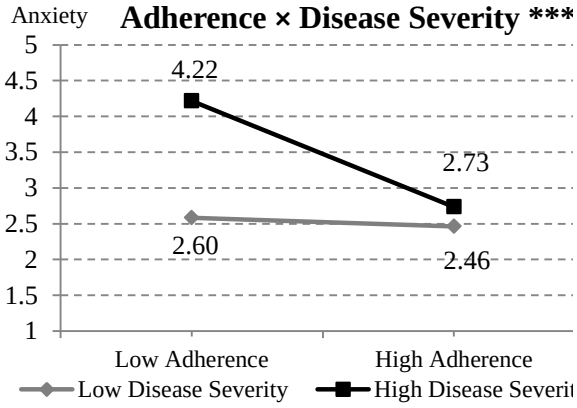
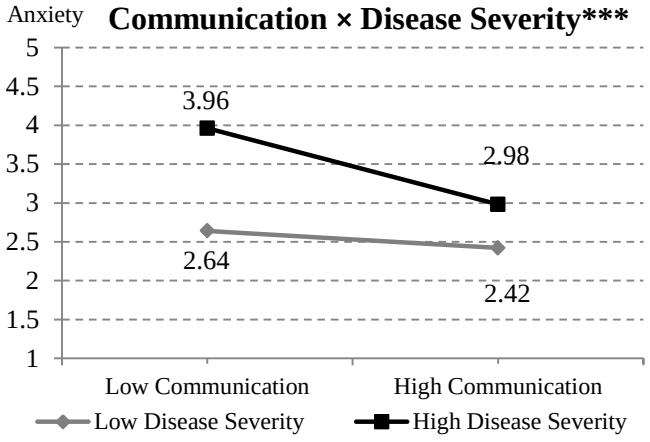
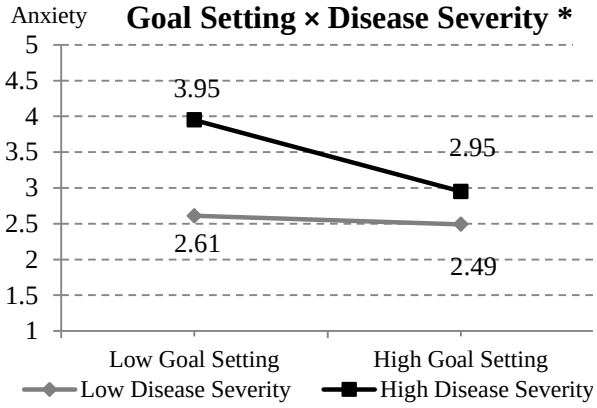
APPENDIX

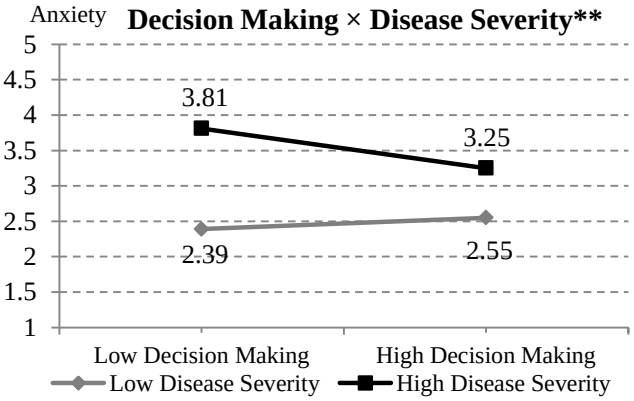
APPENDIX

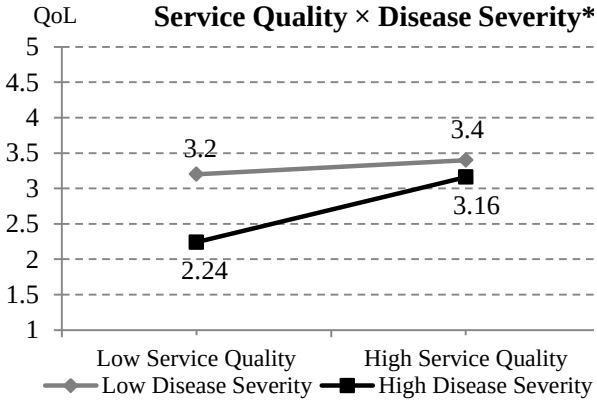
Study 1

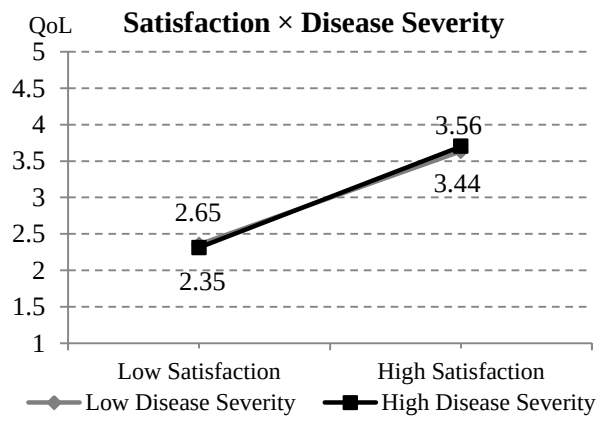






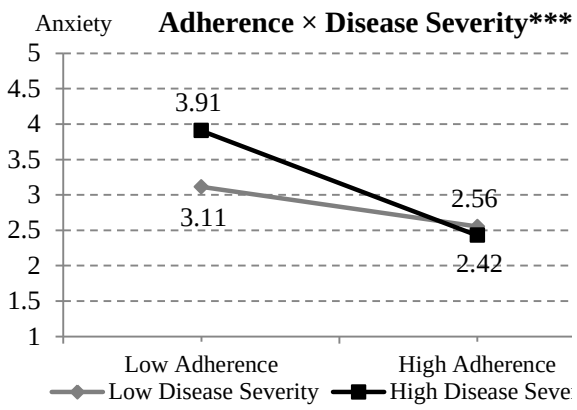


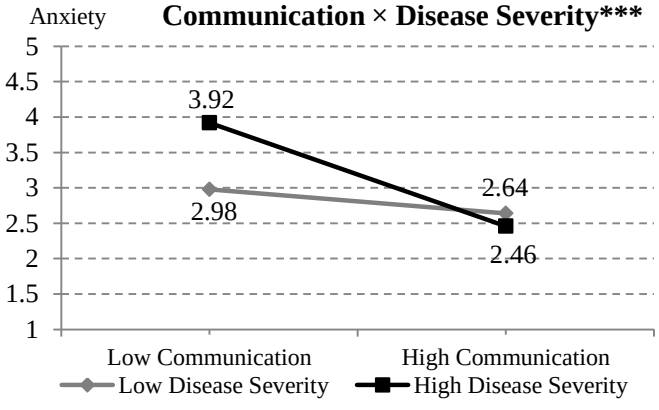


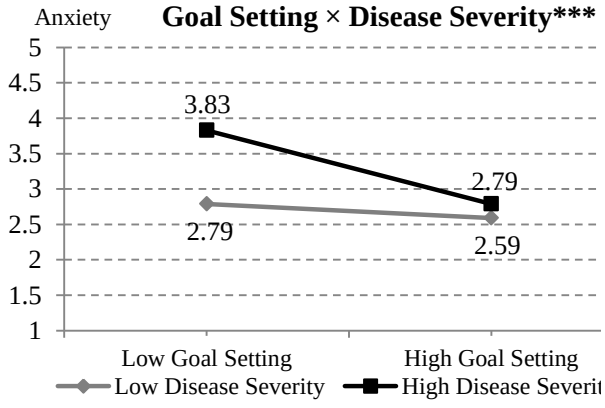


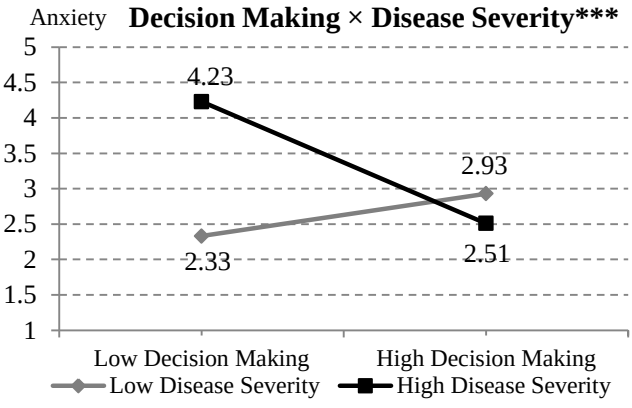
*p<0.05; **p<0.01; ***p<0.001

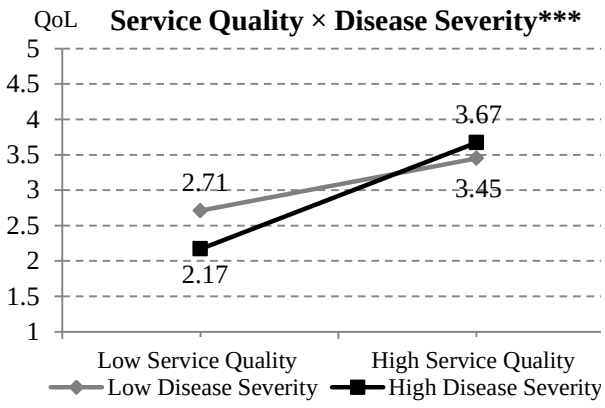
Study 2

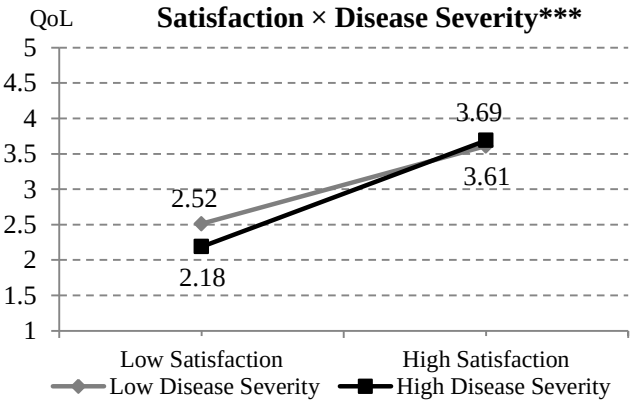

Anxiety
Adherence × Disease Severity***
5
4.5
4
3.5
3
2.5
2
1.5
1
3.91
3.11
2.56
2.42
Low Adherence
High Adherence
Low Disease Severity
High Disease Seve


Anxiety
Communication × Disease Severity***
5
4.5
4
3.5
3
2.5
2
1.5
1
3.92
2.98
2.64
2.46
Low Communication
High Communication
Low Disease Severity
High Disease Severity


Anxiety
Goal Setting × Disease Severity***
5
4.5
4
3.5
3
2.5
2
1.5
1
3.83
2.79
2.79
2.59
Low Goal Setting
High Goal Setting
Low Disease Severity
High Disease Severit


Anxiety
Decision Making × Disease Severity***
5
4.5
4
3.5
3
2.5
2
1.5
1
4.23
2.33
2.93
2.51
Low Decision Making
High Decision Making
Low Disease Severity
High Disease Severity


QoL
Service Quality × Disease Severity***
5
4.5
4
3.5
3
2.5
2
1.5
1
3.67
2.71
3.45
2.17
Low Service Quality
High Service Quality
Low Disease Severity
High Disease Severity


QoL
Satisfaction × Disease Severity***
5
4.5
4
3.5
3
2.5
2
1.5
1
3.69
2.52
3.61
2.18
Low Satisfaction
High Satisfaction
Low Disease Severity
High Disease Severity

BIOGRAPHICAL SKETCH

Arash Hosseinzadeh (H. Zadeh; arashhnz@gmail.com) received his bachelor's degree in industrial engineering and his master's degree in MBA-Marketing concentration. He started his Ph.D. education in Marketing at The University of Texas Rio Grande Valley in September 2013, graduated in July 2017, and was recognized as the Outstanding Ph.D. student. His research has been published in several journals, including the *Journal of Business Research* and the *Journal of Strategic Marketing*. He has presented his research at marketing conferences, such as the *American Marketing Association*, *Association for Consumer Research*, *Academy of Marketing Science*, and *Society for Marketing Advances*. His research has received awards from different institutions, such as the Best Paper Award at the *Academy of Marketing Science conference* and Dissertation Fellowships Award at *UTRGV*. He has research collaborations worldwide with scholars in the US, Europe, and Canada. During his Ph.D. education he visited several schools for research collaborations, including Florida State University and HEC Montréal. Arash also has taught various courses, such as Social Media & eMarketing and International Marketing, at UTRGV.