LINKING INNOVATION ORIENTATION, SUPPLY CHAIN MANAGEMENT, AND CUSTOMER CENTERED OUTCOMES: A STUDY OF USA HOSPITALS

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ABSTRACT

Organizations often struggle to translate their innovation orientation into customer centered outcomes. This study tests a model explaining a potential pathway from innovation orientation to customer centered outcomes conceptualized using RBV and SDL. SEM results of data collected from 302 USA acute care hospitals supports seven of eight hypothesized relationships.

Keywords: Innovation, Culture, Supply Chain Management

INTRODUCTION

Service-dominant logic (SDL) presents an important paradigm for understanding value creation and customer value, and argues that service is an essential and true basis for understanding customer value co-creation (Vargo and Lusch 2004; 2008; Vargo and Akaka 2009; Schmenner et al., 2009). In this way, SDL advocates that real value (value in use) is not created in discrete, linear value chain stages which epitomize nominal value (value in exchange) (Porter 1985), but is instead co-created during networked interactions among customers, suppliers, and employees of the focal organization (Normann and Ramirez 1993; Vargo and Akaka 2009).

This service-centered perspective advocates that market exchange is the *process* of stakeholders using their specialized knowledge for mutual benefit (Vargo and Lusch, 2004; Vargo and Akaka 2009; Vargo and Lusch 2008). Moreover, organizations do not actually create value; they simply propose value and consequently may co-created it (such as with customers and/or other stakeholders). SDL, therefore, has been posed as the theoretical foundation for the study of service systems (Maglio and Spohrer 2008; Lusch, Vargo and Wessels 2008; Vargo and Akaka

2009). Service systems are defined as "value co-creation configurations of people, technology, value propositions connecting internal and external service systems, and shared information," (Maglio and Spohrer 2008, p. 18).

Similarly, value creation is at the heart of entrepreneurship (Drucker 1985). That is, entrepreneurship is fundamentally about shifting economic resources from lower to higher productivity areas in search of improved yield (Drucker, 1985). Entrepreneurs add value to scarce resources (Mariotti and Glackin 2007) have the goal of finding new ways of creating value for customers (Drucker 1985). In this way, it reflects a key way in which service-oriented organizations approach new opportunities, in other words, the way in which these firms address innovation (Jambulingam et al., 2005). In an organization, corporate entrepreneurship refers to an organizational process that encourages innovation, constructive risk-taking, and the pursuit of new opportunities (Miller and Friesen, 1982). In this context, administrators utilizing an SDL centered view of entrepreneurship, referred to herein as *service-oriented entrepreneurship*, may find it useful to unlock new opportunities previously unnoticed through a traditional goods dominant lens (Callaway and Dobrzykowski, 2009). Thus, service science (see Maglio and Spohrer 2008; Spohrer et al. 2008; Vargo and Akaka 2009) and entrepreneurship (see Drucker 1985) examine the nature of value creation for customers, and both are important nowadays as sources for such value creation.

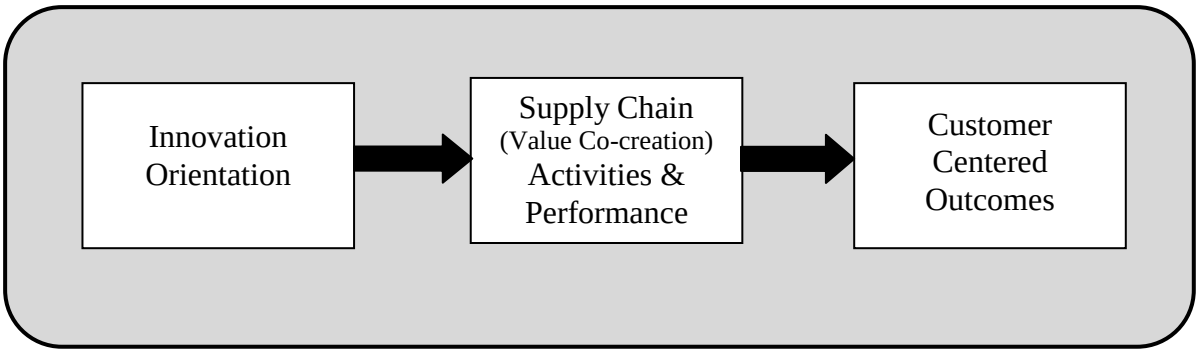
At the intersection of corporate entrepreneurship and service science exists the possibility that SDL may help administrators within traditional organizations to recognize opportunities that may not have been apparent otherwise. In short, thinking in terms of SDL likely presents new opportunities for value creation (Callaway and Dobrzykowski, 2009). As such, service oriented entrepreneurship is a critical process for many administrators within traditional organizations. In short, service oriented entrepreneurship requires adopting a service dominant logic, as described above, as well as creating the capacity for greater innovation and customer value creation through interactions with supply chain partners. In order to achieve this, service oriented entrepreneurship comprises three key components: 1) possessing an innovation orientation, 2) focusing on value co-creation, and 3) a steady pursuit of customer centered outcomes. That is, administrators at traditional organizations must be creative, finding new ways of creating value; they must include economic actors within and beyond firm boundaries as an integral part of this orientation toward new value creation; and all of these processes are centered around the customer and are derived from understanding customer outcomes.

This study explores this nascent research area by conceptualizing model using RBV and SDL which links a firm's innovative orientation to its supply chain activities which ultimately drive customer centered outcomes. Following previous scholars (see Metters and Vergas, 2000; Menor et al., 2002; and Jambulingam et al., 2005) this study examines a single service industry, that of acute care hospitals. Data were collected from 302 acute care hospitals in 47 states in the U.S.A. and analyzed using Structural Equation Modeling (SEM). Results reveal key linkages among a hospital's innovation orientation, physician partnership activities, customer relationship management programs, physician performance, customer responsiveness, and customer centered outcomes. A key finding reveals that in general, the relationship between physician performance and customer centered outcomes is fully mediated by customer responsiveness.

BACKGROUND

Given that sustaining competitive advantage is difficult and rests in an organization's ability to develop resources and actor interactions that are valuable, rare, inimitable, and non-substitutable (Barney, 1991; Grant, 1991), firms benefit from an innovation orientation which drives customer centered outcomes. Such an orientation requires organizations to foster generative learning as opposed to adaptive learning, and such learning must be proactive rather than reactive (Senge, 1990; Slater & Narver, 1999). For example, Read, et al. (2009) and Sarasvathy (2008) described the cognitive science-based logic of entrepreneurial expertise termed "effectuation". Effectuation describes non-predictive control, meaning that if administrators can influence the future, they do not need to predict it. In short, administrators should not be overly focused on efficiency, stability, and traditional analysis; but should instead focus more on improvisation, creativity, and risk-taking. Such an approach balances efficiency and creativity, and it should be applied not only to the organization but to the entire value chain network, influencing supply chain activities or the co-creation of value. This is illustrated in the research framework in figure 1.

Figure 1. Research framework.



Value co-creation is critical and as a result, the focal organization encourages partnership activities throughout the supply chain (Lambert and Garcia-Dastugue, 2006). In particular, partnerships with the customer are essential. A critical approach for creating value with available resources, termed value co-creation, places the customer inside the value creation network as a co-producer of value, as opposed to their more conventional role as a consumer or destroyer of value (see Normann and Ramirez 1993; and Vargo and Akaka 2009). Partnerships with the customer helps ensure that the entire value chain process leads to customer centered outcomes. Therefore, the centrality of the customer, is critical for service oriented entrepreneurship. Administrators must look downstream at the customer-provider interaction, to redefine this interaction and find new opportunities for value co-creation (Case 2004). That is, the entire value chain network, and how it is managed, is all driven by customer centered outcomes. See figure 1.

VARIABLES AND HYPOTHESES

Innovation Culture, Physician Partnership, and Patient Relationship

Organizational culture (or orientation) is the fundamental tacit set of assumptions about the world and organization that a group of people share, and that determines their thoughts, perceptions, feelings, and their outward-facing behaviors (Schein, 1996; Roh et al., 2008). When considering supply chain management, cultures or orientations can be unique to a firm (Min and Mentzer, 2004) and should be contextually specific to the firm's situation (Roh et al., 2008). Cultures are evident in the various behavior patterns of firms and show differences in terms of focus, the management of employees, criteria for success, criteria for effectiveness, and organizational glue (Cameron and Quinn, 1999). Roh et al. (2008: p. 365) point out that "it should be noted, however, that these patterns of culture are not mutually exclusive (Al-Khalifa and Aspinwall, 2001). [In other words,] no organization may show only one cultural pattern." Rather cultural types provide general classifications to assist in understanding a firm's orientation.

Entrepreneurship is a relevant cultural orientation in the supply chain management context (see Jambulingam et al., 2005). An entrepreneurial focus is a strategic orientation that involves the way in which the firm commits and controls resources, including how it forms networks (relationships) (Kuratko and Hornsby, 2009). Entrepreneurial hospitals can be thought of as those which encourage patient care actors to shift efforts and assets from unproductive to productive activities (Drucker, 1985). Jambulingam et al. (2005) provide useful and relevant insights into the cultural orientations of another service shop type of business (from Schmenner, 1986), that of retail pharmacies, describing the importance of innovation as a culture or organizational orientation. The present study defines innovation culture as *the extent to which those involved in healthcare delivery engage in and support new ideas, experimentation, novelty, and creativity, some of which that may result in new services* (Lumpkin and Dess, 1996; Jambulingam et al., 2005). See table 1.

An orientation for innovation will lead the firm to work closely, or partner with key economic actors in the firm's value network or supply chain (Callaway and Dobrzykowski, 2009). The management of these supply chain partnerships is aimed at transforming the firm's innovative orientation into improved performance and ultimately customer-centered outcomes. Min and Mentzer (2004: p. 63) state that "supply chain management extends the concept of functional integration (i.e., the integration of traditional business functions, departments, and processes) beyond a firm to all the firms in the supply chain (Cooper and Ellram, 1993; Cooper et al., 1997: Ellram and Cooper, 1990; Greene. 1991) and, thus, individual members of a supply chain help each other improve the competitiveness of the supply chain, which should improve competitiveness for all supply chain members (Bowersox and Closs, 1996; Cavinato, 1992; Cooper and Ellram, 1993; Lee and Billington. 1992)." While general consensus exists regarding the concept of supply chain management, much less is known about the specific practices required to maximize the potential benefits (Li et al., 2006). This is particularly the case when considering value co-creation in the healthcare context. This study explores a specific supply chain practice, that of physician partnership activities.

Table 1. Variable definitions.

Variable	Definition	Literature
Innovation Orientation	the extent to which those involved in healthcare delivery engage in and support new ideas, experimentation, novelty, and creativity, some of which that may result in new services.	Lumpkin and Dess, 1996; Jambulingam, 2005.
Physician Partnership	the extent to which the hospital has long-term relationships with its key physicians intended to leverage the strategic and operational capabilities of both parties to help them achieve significant ongoing benefits.	Balsmeier and Voisin, 1996; Gunasekaran et al., 2001; Lamming, 1996; Monczka et al, 1998; Stuart, 1997; Li et al 2005; 2006.
Customer Relationship Management	the extent to which the hospital employs practices for the purposes of managing patient complaints, building long-term relationships with patients, and improving patient satisfaction.	Aggarwal, 1997; Claycomb et al., 1999; Magretta, 1998; Noble, 1997; Tan et al., 1998; Wines, 1996; Li et al., 2005; 2006; Chopra and Meindl, 2004; Schneller and Smeltzer, 2006.
Physician Performance	the extent to which admitting/attending physicians provide dependable, timely, and appropriate services to patients.	Beamon, 1998; Davis, 1993; Levy, 1997; Shin et al., 2000; Tan et al., 1998; Vonderembse and Tracey, 1999; Carr and Pearson, 1999; Stevens, 1990; Gunesakaran et al., 2001; Li, 2002.
Customer Responsiveness	the extent to which a hospital can provide prompt attention to a patient's needs.	Narasimhan and Jayaram, 1998; Beamon, 1998; Lee and Billington, 1992; Stevens, 1990; Kiefer and Novack, 1999; Spekman et al., 1998; Gunasekaran et al., 2001; Li, 2002.
Customer Centered Outcomes	the extent to which patients judge the overall hospital experience favorably and would return for a future visit.	Marley et al., 2004; Kane, Maceijewski, and Finch, 1997.

Physician Partnership is defined as *the extent to which the hospital has long-term relationships with its key physicians intended to leverage the strategic and operational capabilities of both parties to help them achieve significant ongoing benefits. A strategic partnership involves long-term, direct relations that promote collaboration such as mutual planning or problem solving* (Gunasekaran et al., 2001). See table 1. Such relationships enable a firm to work closely with a smaller number of partners who are amenable to sharing responsibility for the success of the firm's offerings (Li et al., 2005). Partners involved in product/service design for example can provide valuable insights into cost effective design choices and technologies (Monczka et al., 1993). Strategically aligned partners are also able to work very closely, therefore eliminating wasteful effort and time (Balsmeier and Voisin, 1996). As such, Noble (1997) suggests that effective partnerships such as these can be a critical aspect in the development of a high performance supply chain (Li et al., 2005).

Innovation orientation motivates the desire to develop close relationships in the downstream portion of the supply chain as well (Callaway and Dobrzykowski, 2009). Patient Relationship is defined as *the extent to which the hospital employs practices for the purposes of managing patient complaints, building long-term relationships with patients, and improving patient*

satisfaction (adapted from Aggarwal, 1997; Claycomb et al., 1999; Tan et al., 1998). See table 1. Many scholars consider customer (or in the case of this study patient) relationship management to be a critical aspect of supply chain management (see Noble, 1997; and Tan et al., 1998). In healthcare delivery, customer relationship management (CRM) is considered to be one of the three primary supply chain management processes, next to internal supply management (ISM), and supplier relationship management (SRM) (Chopra and Meindl, 2004; Schneller and Smeltzer, 2006). Close relationships with customers/patients enables a firm to differentiate its service offerings from the competition and extend the value provided to its customers (Magretta, 1998; Li et al., 2005).

An entrepreneurial culture or innovation orientation promotes 'working together' with other individuals involved in healthcare delivery, and in doing so clinicians can effectuate or influence the nature of their work practices (Sarasvathy, 2001). As such, a culture can promote the development of long-term, mutually beneficial relationships with physicians as well as the sharing of timely, accurate, adequate, and credible information. Further, quality, a supply chain management practice, is at the heart of an entrepreneurial culture focused on shifting efforts and assets from unproductive to productive activities (Drucker, 1985). For example, in order for a quality process to function effectively, it must have a complete focus on the customer. If a company postpones initiatives awaiting customer complaints before initiating improvements, it has most likely waited too long, (Kuratko and Hornsby, 2009). Additionally, Hwang and Christensen (2008) suggest the frequent need for increased involvement (proactiveness) of the non-physician clinical staff in healthcare delivery in an effort to reduce cost. Considering SDL, an entrepreneurial (innovation) culture can inspire the clinical staff to work closely with other willful agents (e.g., physicians with high Partner Relationship) to co-create the future (value) (Read et al., 2009). This collaboration or physician partnership involves partnering to solve problems and improve quality, as well as planning and goal setting aimed at the creation of customer centered outcomes. As such, an understanding of the needs of the customer is essential to these activities. Thus, physician partnerships are fueled by customer relationship management programs which capture customer complaints and manage satisfaction. Therefore, the present study postulates:

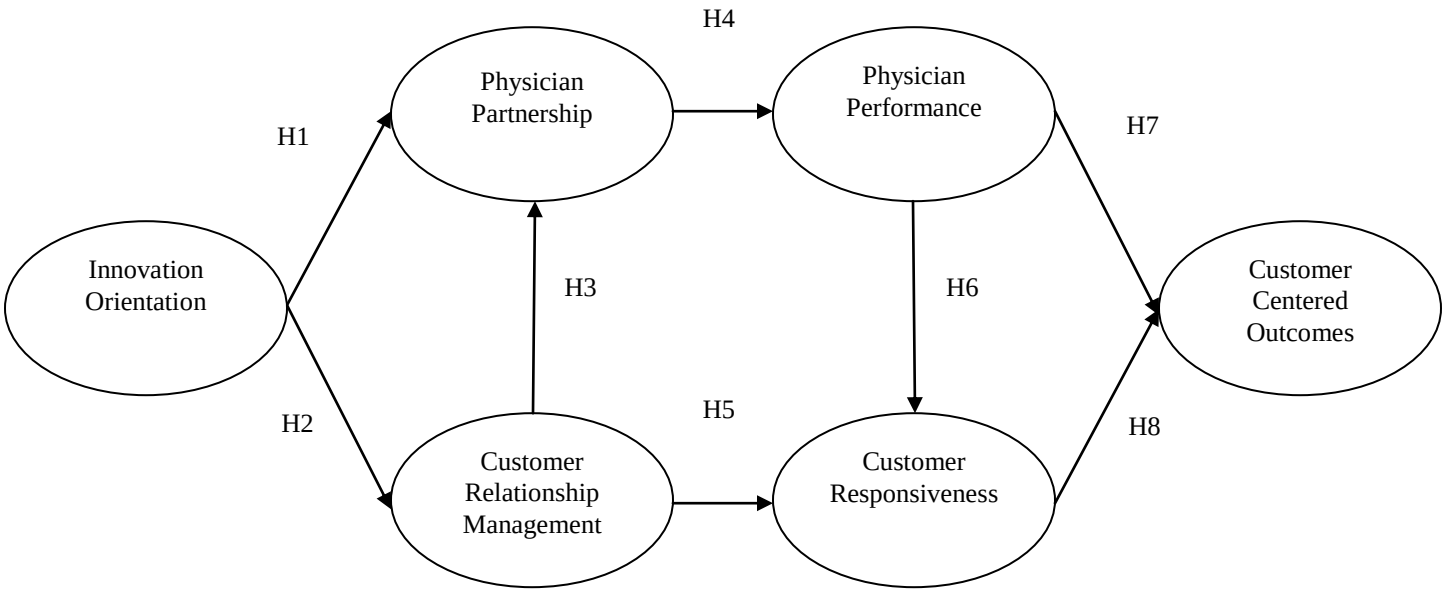
H1: Innovation Orientation is positively associated with Physician Partnership.

H2: Innovation Orientation is positively associated with Customer Relationship Management.

H3: Customer Relationship Management is positively associated with Strategic Physician Relationship.

These relationships are illustrated in figure 2.

Figure 2. Hypothesized path model.



Physician Performance and Customer Responsiveness

Performance measurement is a key concept in managing any endeavor. According to Beamon (1998) a set of performance measures are valuable to the firm as they can be used to assess a system's efficiency and/or effectiveness or to benchmark competing systems. A significant challenge in measuring supply chain management performance is the extant disconnect between strategy and measurement (Holmberg, 2000). It follows that just as strategy is contextually specific to the firm (Roh et al., 2008), so should be the firm's performance measurements. Holmberg (2000) also suggests that measures should account for activities which span the entire supply chain. Considering these insights, the current study adapts the supply chain management performance measures of Li (2002) related to supplier (physician) performance and customer responsiveness. Physician Performance is defined as *the extent to which admitting/attending physicians provide dependable, timely, and appropriate services to patients.* While, Patient Responsiveness is defined as *the extent to which a hospital can provide prompt attention to a patient's needs.* See table 1.

The collaborative supply chain activities examined in this study (physician partnership and customer relationship management) can result in many performance benefits. For example, a long term partnership orientation enables exchange partners to develop greater confidence in one another, display cooperative and trusting behaviors, and increase investments in relationship-specific assets in order to accomplish mutual goals (Paulraj et al., 2008: p. 57). This is consistent with the notion put forth by Operations Management as well as healthcare scholars who have found that the performance of a new procedure or technology improves with increased experience (Ramsay, et al., 2000). This provides support to the experience curve or learning curve experience notion that firms 'learn by doing,' or that 'practice makes perfect' (Pisano,

1996). This supports the notion that physician partnership can positive influence performance. Therefore, the present study postulates:

H4: Physician Partnership is positively associated with Physician Performance.

H5: Customer Relationship Management is positively associated with Customer Responsiveness.

H6: Physician Performance is positively associated with Customer Responsiveness.

Physician Performance, Customer Responsiveness, and Customer Centered Outcomes

The empirical literature in supply chain is reasonably consistent regarding the key capabilities that represent competitive advantage: price/cost, quality, delivery, and flexibility (White, 1996; Skinner, 1985; Roth and Miller, 1990; Tracey et al., 1999) all of which are intended to achieve customer centered outcomes. In the study of healthcare operations, "attention typically comes in the form of focus on costs of services, quality and length of stay," (McDermott and Stock, 2007: p. 1020). Similarly, Butler et al. (1996) suggest that a hospital's operational capabilities should consist of foci on cost, quality, service delivery, and flexibility. These create competitive advantage in that they are customer centered in nature. In a more specific sense, the Institute of Medicine 2001 report, *Crossing the Quality Chasm* (IOM, 2001) states that healthcare delivery should be *safe, effective, patient-centered, timely, efficient*, and *equitable* (IOM, 2009). Placing emphasis on customer (patient) centered outcomes, the report continues to define Patient-centered outcomes as providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions.

Patient-centered care (PCC) is an increasingly prevalent alternative approach to patient care delivery. It entails a shift from institutional- and physician-focused care, emphasizing professional roles and hierarchies, to patient-centered care emphasizing clients' needs and preferences (Wolf et al. 2008; Bergeson and Dean 2006; Epstein et al. 2005; Flach et al. 2004). Thus, customer (patient) centered outcomes result from activities which occur in the healthcare delivery supply chain. Customer centered outcomes can be measured by patient satisfaction. Therefore, the present study defines customer centered outcomes as *the extent to which patients judge the overall hospital experience favorably and would return for a future visit* (Marley et al., 2004). See table 1.

Various studies have provided evidence that a well-managed supply chain will directly and positively influence organizational performance (Shin et al. 2000; Prasad and Tata, 2000). More specifically, supply chain performance has been linked to a firm's competitive advantage and capabilities by a number of Operations Management researchers (Li, 2002). Consider Vonderembse and Tracey (1999) who found that supplier performance is associated with firm capabilities related to cost, quality, and delivery (customer centered outcomes). Frohlich and Westbrook (2001) provide another relevant example in their findings that supplier and customer integration is related to cost, time (speed), and dependability among other firm capabilities again customer centered outcomes.

Shah et al (2008: p. 778) in a case study of a decentralized healthcare deliver supply chain in the ER, suggest that characteristics of lean such as the use of "standardized and highly specific protocol[s] and involving, empowering, and training all [supply chain] process members" can influence healthcare delivery supply chain quality outcomes such as process cycle times and patient mortality. This infers that better collaboration in the healthcare delivery supply chain (conceptualized as value co-creation activities and performance in this study) can improve customer centered outcomes. These outcomes represent healthcare delivery capability. Therefore, the present study postulates:

H7: Physician Performance is positively associated with Customer Centered Outcomes.

H8: Customer Responsiveness is positively associated with Patient Centered Outcomes.

METHODOLOGY AND RESULTS

A cross-sectional self-administered internet-based survey was conducted. The sample frame was created from a random list of acute care facilities in the membership of the American Hospital Association (AHA). The sample frame included hospital executives holding the titles of Vice President (VP) of Patient Care Services, Chief Nursing Officer (CNO) or VP of Nursing, Director of Nursing, VP of Case Management, Director of Case Management, VP of Quality Initiatives, Director of Quality Initiatives or an equivalent substitute (see Meyer and Collier, 2001; Goldstein and Naor, 2005; Gowen III et al., 2006; McFadden et al., 2009; Li et al., 2002; Li and Benton, 2006). The sample frame consisted of 671 hospital executives from 644 acute care facilities. 312 responses were received, generating a response rate of 46.5% (312/671). After screening, two of the surveys were deleted from the analysis database due to excessive missing values, leaving 310 responses in the sample (Qi et al., 2009). Next, responses received from multiple raters from eight hospitals were averaged for each item (McFadden et al., 2009). This resulted in a final sample for analysis of 302 hospitals. The characteristics of the final respondents and their acute care hospitals will be reported at the conference.

Confirmatory factor analysis was employed to examine the variables and path relationships hypothesized in this study. Specifically, structural equation modeling (SEM) in AMOS was used to test the data following the Anderson and Gerbing (1988) two-step process for assessment of the measurement and structural models. All measurement model statistics meet commonly acceptable thresholds for X^2/df, GFI, AGFI, CFI, and RMR. These results were produced following a purification process that resulted in deleted three items. In addition, convergent and discriminant validities have been verified from the analysis. Finally, all of the variables meet commonly held threshold for reliability. All of the hypothesized relationships are statistically significant at a $p < 0.05$ level, with the exception of hypothesis seven. The data shows that while physician performance does influence customer centered outcomes, the relationship is fully mediated by customer responsiveness. The statistical results from the structural equation model will be presented at the conference.

DISCUSSION AND CONCLUSION

This study makes a number of important contributions of both the scholarly and practical varieties. This study conceptualizes a research model grounded in resource based view and explained using SDL. As such, this research represents an early attempt to apply SDL in the field of Operations Management, an effort scholars believe is important in advancing the extant understanding of OM phenomena (Schmenner et al., 2009). Next, in addition to conceptualizing the model, the study has collected data and provided empirical results from a large sample (*n*=302) of USA acute hospitals. By doing so, the extant understanding of SDL as well as operations of USA Hospitals has been advanced. In this way, these results should be of interest to both scholars and hospital leaders. It is also important to emphasize the interdisciplinary nature of this study; linking entrepreneurship, SDL, and SCM. By doing so, this study has unpacked how organizations might translate their innovative orientation into customer centered outcomes through key supply chain activities. Additional insights will be presented in November at the DSI conference.

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