

ABSTRACT

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U.S. businesses have overwhelmingly approached employee health from a cost management, rather than investment, perspective. This singular focus on costs is likely due to lack of clarity regarding the potential of employee health to be a value *creating* organizational resource and the underlying mechanisms by which health may be subject to organizational influence. In this dissertation, I outline the ‘resource potential’ of employee health from an organizational perspective.

First, I draw upon the resource-based view and past research on health promotion and health care cost management to outline the significant organizational performance implications of employee health as a source of value generation in organizations. In so doing, I propose a model that explains the process by which employees’ health risks, health motivations, and healthy behaviors impact organizational outcomes. Next, I develop a model that explains how two distinct

categories of healthy behaviors – ‘healthy consumption’ and ‘physical/mental fitness’ uniquely impact medical costs and organizational productivity.

To test these models, I employ structural equation modeling to examine a dataset of 152 and 149 organizational level outcomes regarding models 1 and 2, respectively. I find support for my assertions that employee health is a value *creating* organizational resource and that health motivations are an important means by which this resource may be built. I also find that healthy consumption behaviors have a stronger relative impact on costs whereas physical/mental fitness behaviors strongly promote productivity.

Based on these findings, I argue that minimalistic cost management approaches to employee health are unwise from both organizational social and financial performance perspectives. In particular, this research demonstrates the crucial importance, and potential, of employee health and its components as value creating resources from a strategic organizational management perspective. Further, this research suggests that employee healthcare may be ‘strategic’ social performance as organizational health promotion can simultaneously address both financial and social performance interests. Implications and areas for future research are discussed.

EMPLOYEE HEALTH:
A VALUE CREATING ORGANIZATIONAL RESOURCE

By

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FOREWORD

Dr. Lori Kiyatkin's dissertation, *Employee Health: A Value Creating Organizational Resource*, identifies and confirms a triadic relationship among components of human health that reduce health care cost and raise worker efficiency. This important study draws upon data that were collected from 152 organizations that employ various types and degrees of employee wellness programs. It is the first quantitative study to explore the impact of employee health upon cost *and* productivity from a macro-organizational strategic management perspective.

The findings are important because unaffordable health care costs are crushing U.S. international competitiveness, even as consumers learn that the U.S. healthcare system fails to provide better healthcare than countries that spend far less. It is shocking that Americans spend twice as much per person for health care than do citizens in countries with government run systems that deliver better life expectancy and infant mortality. Indeed, nearly 50 million uninsured individuals and thousands of struggling businesses point to the wastefulness and cruelty of the hodge podge U.S. healthcare system. The situation is so unsettling that patients, doctors, hospitals, and legislators are finally in agreement that the system is broken.

With strong support, President Obama launched an ambitious effort to overhaul the U.S. healthcare system. While the intentions and prospects for enactment are good, unless the underlying cause of poor health in the United States is addressed, the plans to mandate health care coverage through a new structure of private and public programs will simply cost more and yield little improvement in the nation's health. Plans for health care reform point to benefits from medical records

coordination, care rationing, and additional research about the efficacy of health procedures. These movements may reduce costs in the long term, but Dr. Kiyatkin explores the most promising and responsive approach to better health *and* reduced cost: *organization-based programs that improve health motivation and incent healthy behaviors.*

Dr. Kiyatkin's dissertation describes theoretical relationships among health, motivation, and behavior. The proposed relationships are supported with rigorous statistical methods, including structural equation modeling. An additional analysis of healthy behaviors explores the relationships of smoking, alcohol, exercise, eating disorders, and stress with cost and productivity.

Dr. Kiyatkin's work provides rigorous scientific support for those who promote organization based wellness programs. It offers a fresh look at the possibilities for interorganizational cooperation to reduce the burden of employee health upon employer costs, and it offers a reminder for health policy officials that incentives to support wellness programs should be included in U.S. health care reform proposals.

J. Robert Baum

DEDICATION

I dedicate this work to all my family and friends. Especially, I dedicate the completion of this dissertation and my graduate studies to my mother, Sharon Ellison, for always believing that I should be a professor; my father, Donald Ellison, for instilling in me the crucial virtue of tenacity; my grandparents, Mayme Helen Pate and Elmer Elwood Pate, for deeply valuing and adamantly encouraging my education; my sister, Stacy Elaine Duke for reminding me to be a trailblazer, my friend Ann Lasocki for long ago inspiring my interest in health; and my entire Baltimore Kiyatkin Family, for caring for me as their own. Finally, to my husband, Dmitry Kiyatkin - my best teacher, best student, and best friend.

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I would also like to thank each member of my dissertation committee for supporting this research and offering expert feedback as these ideas took shape. Namely, I thank Alan Neustadt for fielding my many questions about statistics. I thank Lee Preston and Rhonda Reger for offering comments on drafts of this dissertation and helping me frame the social and strategic management implications. I also thank Susan Taylor for offering comments on drafts of this research and guiding my treatment of levels issues and the theoretical grounding of this research.

I also wish to express my deep appreciation to the insurance company that allowed me to collect data. I particularly wish to acknowledge the team of wellness professionals at the insurance company that served as expert guides throughout each process of this study. Although I cannot list their names here for reasons of business propriety, their input was the invaluable link between research and practice.

I am also appreciative of the input of many others who contributed to this research. I thank Min Liu for introducing me to the Mplus statistical programming package and addressing many of my early questions about structural equation modeling. I must also express my gratitude to the medical doctors that have inspired

my research interest in human health in the organizational context and fielded my many medical questions; namely, my husband, Dmitry Kiyatkin, Romsai Boonyasai, and Lipika Samal.

I am also truly indebted to each member of the University of Maryland Robert H. Smith School of Business Department of Management and Organization and the Dingman Center for Entrepreneurship for offering me so many wonderful learning opportunities during these last five years.

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EXECUTIVE SUMMARY

Strategic management research to date has not articulated the performance implications of employee health, or the potential of health to be a value creating resource in organizations. As outlined in Table 1, health is comprised of health risk, health motivation, and healthy behaviors.

Table 1 Health: A Multifaceted State of Being & Acting		
Health Risk <i>•Likelihood of present/future illness/diseases</i>	Health Motivation <i>•Ambitions & corresponding determinations to engage in healthy behaviors</i>	Healthy Behaviors <i>•Capability enhancing actions & routines</i>

As outlined in Table 2, healthy behaviors consist of healthy consumption behaviors and physical/mental behaviors.

Table 2 Healthy Behaviors: Capability Enhancing Actions & Routines	
Healthy Consumption <i>•Health promoting eating & drinking; avoidance of harmful substances</i>	Physical/Mental Fitness <i>•Health promoting mind/ body actions and routines</i>

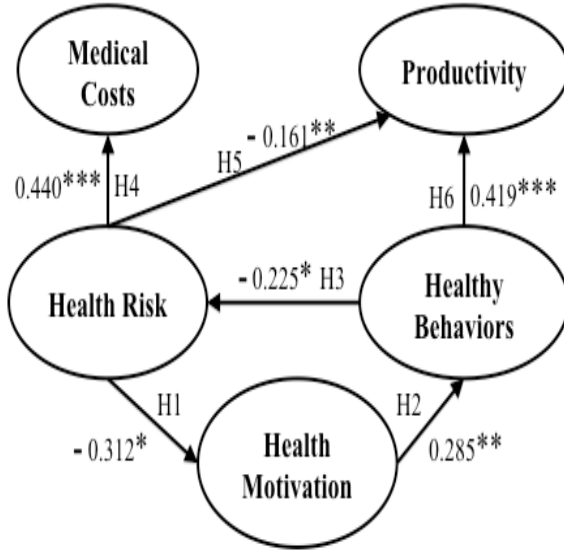
This research examines the impact of employees' health risk, health motivation, and healthy behaviors on the organizational outcomes medical costs and productivity. The hypotheses and resultant two models are outlined and depicted below.

The data for empirical analysis were drawn from insurance company client records for 152 and 149 companies, regarding models 1 and 2, respectively. Preliminary analysis was conducted in SPSS. Structural equation modeling analysis was conducted in Mplus. As depicted below, I find empirical support for each of the hypotheses.

I argue that minimalistic approaches to employee health management are unwise from both organizational performance and social health promotion perspectives. Rather, this research suggests that employee health and its components - health motivations, healthy behaviors, and health risk, are important, value-creating organizational resources. The relationships demonstrated in this research further

suggest that organizations may simultaneously promote their bottom-line and social performance by promoting employees' health via occupational health programming that is targeted toward increasing health motivations and resultant healthy behaviors.

Model 1 Results
The Performance Implications of Employee Health



Hypothesis 1: Health risk decreases health motivation.

Hypothesis 2: Health motivation increases healthy behaviors.

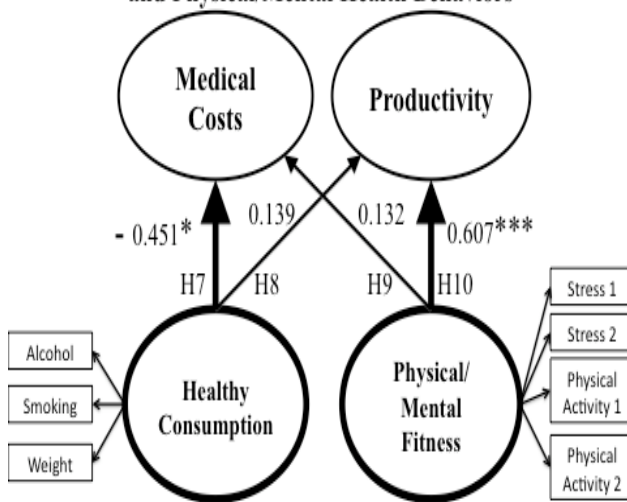
Hypothesis 3: Healthy behaviors decrease health risk.

Hypothesis 4: Health risk increases medical costs.

Hypothesis 5: Health risk decreases productivity.

Hypothesis 6: Healthy behaviors increase productivity.

Model 2 Results
The Performance Implications of Employee Consumption and Physical/Mental Health Behaviors



Hypothesis 7: Healthy consumption decreases medical costs.

Hypothesis 8: Healthy consumption increases productivity.

Hypothesis 9: Physical/mental fitness decreases medical costs, but less significantly than does healthy consumption.

Hypothesis 10: Physical/mental fitness increases productivity more significantly than does healthy consumption.

CHAPTER 1

PROBLEM STATEMENT

The cost of employer-sponsored health insurance premiums has more than doubled since 2000. This rate of increase has exceeded the comparable cumulative rate of inflation by approximately 75 percent (National Coalition on Health Care, 2008; The Kaiser Family Foundation and Health Research and Educational Trust, 2007; Towers Perrin, 2005, 2007). Despite on-going efforts to thwart these rising costs, employers' expenditures on health care rose by nearly 40 percent during the last five years alone. The rise in employees' expenditures was even more drastic, at 61 percent, while the comparable rate of increase in the consumer price index was much lower, at only 17 percent (Towers Perrin, 2005, 2007).

As these costs continue to rise, it is increasingly unclear to what extent, and in what manner, firms should continue to provide employee health care. Currently, 99 percent of large firms and 60 percent of all firms offer health benefits to, on average, 79 percent of their workforce. The remaining 21 percent of workers are deemed 'ineligible' for coverage. Although the number of small firms (defined as 3 – 9 employees) offering health coverage has declined by 12 percent since 2000, the percentage of firms with 50 or more employees offering health benefits appears stable at 95 percent (The Kaiser Family Foundation and Health Research and Educational Trust, 2007).

In fact, although healthcare reform is the topic of national debate, and nearly 60 percent of the nations' physicians prefer a federally administered single-payer

system (Carroll & Ackerman, 2008), it appears that employers will continue to play a significant role in the U.S. healthcare system and, for at least the foreseeable future, the system will remain employee-based (Porter & Teisberg, 2006b). Notably, employers themselves indicate a clear preference for maintaining a primary role in employees' pre-Medicare coverage (Towers Perrin, 2007). This suggests that organizational leaders perceive some degree of their involvement in employees' health to be either cost minimizing, or, net value generating.

Interestingly, relatively few organizations have approached healthcare management as a source of net value generation. Rather, organizations have tended to delegate health care planning and implementation authority to human resource (HR) departments that often have little to no healthcare management specific expertise and are also responsible for other diverse benefit options, such as pensions, sick leave, vacation leave, life and disability insurance, unemployment insurance, and severance pay. HR departments, lacking any other clear directive or plan, have commonly addressed employee healthcare from a cost management, rather than a long-term return from investment, perspective (Porter et al., 2006b).

For example, HR departments have typically selected the lowest cost plans and providers. Their constant search for lowest cost has prompted frequent switching between providers, while far less attention has been paid to the development of long-term synergistic relationships with providers or differences in the quality and breadth of service offered (Porter et al., 2006b). For example, a recent survey reports that, of respondent employers that offer healthcare to employees, 65 percent recently shopped

for a new plan or provider (The Kaiser Family Foundation and Health Research and Educational Trust, 2007).

Additionally, employers have increasingly shifted health care costs to their workforce via changes in premiums, deductibles, co-pays, and service plans (Porter et al., 2006b). Recently, 73 percent of large firms and 45 percent of small firms reported that they are ‘somewhat likely’ or ‘very likely’ to increase employees’ contributions to health insurance within the next year (The Kaiser Family Foundation and Health Research and Educational Trust, 2007). Similarly, another recent study reports that 38 percent of employers expect to increase cost sharing in the near future (PricewaterhouseCoopers Health Research Institute, 2008).

These common HR approaches to healthcare management have “failed miserably” and proven “self-defeating” largely because, “rather than managing health, employers have attempted to manage costs” (Porter et al., 2006b: 305, 308). Recognizing the limitations of a pure cost management approach, many progressive organizations are increasingly assuming a more proactive role in employee health by incorporating ‘wellness’ programming into their employee healthcare plans (Business Roundtable, 2007), and there is increasing sentiment among both small and large employers that ‘disease management’ is a ‘very effective’ means of controlling growth costs (The Kaiser Family Foundation and Health Research and Educational Trust, 2007). Similarly, the U.S. government now encourages businesses to better incorporate disease prevention into existing healthcare coverage (U.S. Department of Health and Human Services, 2003).

Although comprehensive wellness promotion appears to be a growing trend among many leading, progressive companies, there remains uncertainty regarding the strategic implications of employee health and organizational healthcare programs. From an organization perspective, too little is known regarding what underlying factors and conditions determine the relative organizational costs and benefits associated with employee health and organizational wellness promotion. From a broader social perspective, it is increasingly unclear how, by what means, and to what extent, employers are even suited to tackle employees' health care concerns.

Without clear answers to these questions, the majority of businesses are unlikely to fully embrace employee health as an organizational priority. Especially in light of current economic crises, trends toward the shifting of costs and limiting of employee health coverage are likely to continue.

Research in the business literature on the topic of employee health from a strategic management perspective is lacking. It is widely accepted that human resource (HR) practices may promote firm performance by building and strengthening valuable, socially complex firm resources. However, it is unclear which HR issues should be organized from a resource investment, rather than a cost management perspective. This is particularly true regarding organizations' management of employees' health. Amid the health care cost crisis, relatively few U.S. organizations have approached healthcare management as a source of net value generation. Similarly, sparse research to date has examined the role, or potential, of employee health as an organizational *resource*.

Management researchers are taking note of this topic, and are calling for greater attention to this issue. Porter and Teisberg recently criticized U.S businesses, asserting that common HR approaches to healthcare management have “failed miserably” and proven “self-defeating” largely because, “rather than managing health, employers have attempted to manage costs” (2006b: 305, 308). Additionally, Heaphy and Dutton recently asserted that human physiology “deserves greater attention in organizational research” (2008: 137).

Previous research on the topic of the health in the workplace has been conducted primarily in the field of public health and has focused on health outcomes and the prevalence and impact of certain diseases in the workplace. Recently, occupational health researchers offered compelling evidence that organizational health promotion is a cost effective means of managing employees’ health care costs (Naydeck, Pearson, Ozminkowski, Day, & Goetzel, 2008). Other occupational health researchers have demonstrated that certain illnesses in the workplace negatively impact employees’ productivity (Ricci & Chee, 2005; Ricci, Chee, Lorandean, & Berger, 2007).

Although this public health research indicates that employee health is an important firm resource, questions remain regarding the methodological rigor and limitations of many of these studies (Esola, 2008). Importantly, no organizational research to date has examined employee health from a macro-level, strategic management perspective.

The crucial gap in our understanding of employee health is increasingly apparent, especially when viewed through the lens of the resource-based view of the

firm (RBV). RBV suggests that resources that are valuable, rare, and costly to imitate or substitute (due to social complexity, causal ambiguity, and/or path dependence) may be sources of sustainable competitive advantage (Barney, 1991; Barney, 1986b; Conner, 1991; Dierickx & Cool, 1989; Peteraf, 1993; Rumelt, 1984; Wernerfelt, 1984, 1995). As outlined below, employee health, especially when considered as an organizational level construct, meets all of these conditions. It is therefore important to understand the mechanisms underlying *how* and *why* health may be a value creating firm resource – and that is the topic of this dissertation.

RESEARCH PURPOSE

The overarching purpose of this dissertation is to consider how, and why, employee health impacts organizational outcomes and whether it may be a source of value generation to firms. The theoretical and empirical analyses presented in this dissertation builds on the RBV, and past health promotion and health care cost research to outline how employee health may be a value *creating* organizational resource. First, in this chapter, I outline health as an organizational level construct that may promote sustainable competitive advantage consistent with the logic of RBV. Next, I define and describe the multifaceted constructs of interest in this study. I then summarize the ten hypothesized relationships and provide depictions of the respective two hypothesized models (see models 1 and 2 below, in Figures 1a and 2a, respectively) that are explored in the following chapters.

In Chapters 2 and 3, I explicate the theoretical motivations underlying each of the ten hypothesized relationships in this study. In Chapter 2 (model 1), I explore the

value of employee health from the organizational perspective. I demonstrate that employee health is not a simple, stagnant, profit eroding liability; but rather, it is a multifaceted, interactive, highly dynamic aspect of employees' potentials. Indeed, employees' health 'risks' are costly liabilities to firms and, left unaddressed, they are increasingly detrimental to organizations. I also demonstrate, however, that health in the positive is a value *creating* organizational resource to firms. I outline the positive impact of health motivation, healthy behaviors, and low health risk.

In Chapter 3 (model 2), I explore the nuanced organizational performance implications of two categories of employee healthy behaviors - 'healthy consumption' and 'physical/mental fitness.' I draw upon medical and health promotion research to offer the novel perspective that employee health consumption behaviors are more directly linked to the onset of costly diseases. As such, they are direct predictors of medical costs. Conversely, employees' physical/mental fitness behaviors are value creating in the sense that they are much more strongly predictive of productivity outcomes.

In Chapters 4 and 5, I describe the empirical analysis of models 1 and 2 and the results. These findings are discussed in detail in Chapter 6. I summarize the limitations, strategic, and public policy implications of this study. I also outline many important areas for future empirical analysis. In the conclusion of Chapter 6, I argue that minimalistic approaches to employee health management are unwise from both organizational performance and social health promotion perspectives. I discuss our current knowledge regarding the aspect of employees' health, 'health motivation,' which is the appropriate focus of organizational efforts to build employee health as a

firm resource. Finally, I discuss the potentially important role of business in social health promotion.

Health as an Organizational Level Construct

In this research, I am focused on the macro-organizational level strategic implications of employee health. In adopting an analytical level of focus, it is important to consider and specify group members' relative homogeneity, heterogeneity, and independence, with respect to each construct such that appropriate conclusions and assumptions may be drawn (Klein, Dansereau, & Hall, 1994). As outlined below, this study examines the amassed, *homogeneous health of the heterogeneous employees and groups of employees within firms* – in other words, organizational 'collective' employee health. Correspondingly, each measure outlined in Chapter 4 is designed to capture as fully as possible the amassed organizational level, collective health experiences of organizational members and groups.

As outlined below, the collective health experience is in fact the outcome of dynamic inter- and intra- individual and group member interactions over time.¹ Although management researchers and U.S. businesses have traditionally conceived of and approached employee health as an individual level, human resource concept, *health by its very nature is also a group level, collective phenomenon from which no individual is fully independent.* From the earliest stages of human development,

¹ As detailed in Chapter 4, the empirical analyses are based on aggregated organizational averages regarding each construct that have been derived from individual level data in each respective organization. As outlined in Chapter 6 under 'Limitations,' organizational averages are not perfect measures of organizational level phenomena but are the best available observable proxies for the nuanced inter and intra individual and group level exchanges that amass as organizational level collective experiences.

health risks are genetically transferred among family members. As children grow, they adopt the health behaviors of their elders and their cultural environment. Throughout individuals' lives many health concerns such as communicable diseases and exposure to toxins occur among and across grouped populations. Recent research additionally indicates that, even throughout adulthood, individuals' actions and behaviors continue to be connected to social networks and cultures. For example, there are strong network effects in the spread of obesity, smoking behaviors, and state of wellbeing (happiness) (Christakis & Fowler, 2007, 2008; Fowler & Christakis, 2009).

Clearly, health is a multilevel concept. Here, I argue that at the organizational level of analysis, macro-level health is so palpable that it actually impacts organizational outcomes. Although researchers have not yet explored *between organization* health heterogeneity, there is good practical reason to believe it exists. At the between group level within organizations, researchers have previously linked between group differences to heterogeneous medical costs and absenteeism outcomes within firms. For example, medical costs differences are observable between wellness program participants versus nonparticipants (Naydeck et al., 2008) and between groups of employees suffering from different types of health problems (Ricci et al., 2005; Ricci et al., 2007).

Just as health amasses at the group level of analysis within firms, it also clusters at the organizational level. Considering the impact of social and network environment on health, it is quite logical to assume that individuals and groups within firms are subject to the influence of other groups and individuals within that same

organizational environment. Further, the health of groups and individuals is likely subject to the organization itself. For example, the organizations' climate may involve varying exposure to toxins, unhealthy cafeteria food choices, stress provoking management behaviors, etc.

It is important to note that no employee is completely independent from the influence of within organization groups or the organizational level group itself. Although some employees may be less susceptible than others, generally speaking, greater exposure to poorer health risks, motivations, and behaviors is likely to negatively impact the health of each individual. Similarly, greater relative exposure to better health is likely to promote, or at least not harm individuals' health. Certainly, some employees are likely to be outliers from the organizational collective and each employee's experience is unique/heterogeneous. However, all employees share in common the collective 'health environment' of the organization in which they observe, and are impacted by, other employees' diverse health risks, motivations, and behaviors and the organizations' overall health climate.

It is in fact the *combined manifestation of the interaction of individuals' and groups' health* that impacts total organizational outcomes. As such, this research examines whether health may be a heterogeneous resource *between firms* that impacts firms' medical costs and productivity.

A Resource-Based View of Organizational Level Health

RBV indicates that organizations derive advantages from resources that are *valuable* and *rare*. These advantages may be sustainable if the resources are also

effectively utilized by the firm and costly for other firms to imitate (Barney, 1991; Dierickx et al., 1989; Peteraf, 1993; Rumelt, 1984; Wernerfelt, 1984, 1995). In turn, these advantages promote firm performance outcomes (Newbert, 2008).

As described below, health and each of its components at the organizational level of analysis is likely quite valuable to organizations. Namely, organizations' average degree of employee illness likely impacts organizational costs and productivity. For example, an organization with optimally healthy employees is likely to experience much lower medical costs and rates of absenteeism/presenteeism than is an organization with relatively less healthy employees. As such, *an optimally healthy workforce is valuable*.

Optimal health among and across a workforce is also *rare* because optimal health is scarce even at the individual level of analysis. At the organizational level, it is unlikely that an entire workforce would be free of any illness or disease. Just one employee suffering from the flu can precipitously expose an entire workforce to illness.

Good health at the organizational level is also rare not only because it is quite costly to obtain and maintain, but also because it is quite costly to imitate/substitute. This is because organizational level health, perhaps more than any other firm resource, is fundamentally *causally ambiguous, path dependent, and socially complex*. As described in the definitions of health and its components below, health and its components are rooted not just in individuals' unique histories from the moment of their conception but also in ongoing nuanced interactions of social exchange and individual development.

For these reasons, it is the assertion and empirical focus of this research that, consistent with the logic of the RBV, health and its underlying dimensions at the organizational level of analysis may be heterogeneous across firms and, where present, they may be important sources of sustainable competitive advantage.

The Constructs of Interest

Medical Costs include all the direct dollars expended by all employees, insurance providers, governments, and employers to maintain and/or improve employee health risk and the associated opportunity costs of those expenditures. For example, employers' medical costs include all its direct dollar payments related to preventing or attenuating employees' current and future health risks and the foregone value of the next best alternative use of those monies. Importantly, employers' medical costs include not just their direct payments in dollars but also their foregone opportunities to invest in alternative aspects of their business.

Productivity at the organizational level of analysis is employees' average rate of work output/performance. It is a continuum from no work output (e.g., employees are absent from work or not performing any tasks) to employees' optimal contribution to the organization. Importantly, optimal productivity is not just on-site attendance at work (lack of absenteeism). Rather, it involves ideal employee functioning such that employee performance is sustainable, optimally efficient, and most valuable to the organization.

Employee Health is a continuum that ranges from the presence of illness/disability to "health enhancing attitudes and behaviors" that elicit "harmonious

interaction” between the “spiritual, social, emotional, intellectual, and physical aspects of one’s life ...” Included along this continuum are, “signs/symptoms” of disease, “lack of/ignoring health knowledge,” lack of “discernable illness,” “correct health knowledge,” and “positive health environment” (Anspaugh, Dignan, & Anspaugh, 2000: 3-4). The Joint Committee on Health Education Terminology specifically defined health as “... an integrated method of functioning which is oriented toward maximizing the potential of which the individual is capable.” The Joint Committee further noted that health “requires that the individual maintain a continuum of balance and purposeful direction with the environment where he (she) is functioning” (Joint Committee on Health Education Terminology, 1991: 102).

Importantly, health is not just the absence of illness. Rather, the concept of ‘optimal’ health is not only a condition or status at a point in time, but also an *interactive mode of engaging in capability enhancing behaviors*. As outlined in Table 1 below, health is comprised of health *risk* (present and future illnesses), *motivation* (such as ambitions to eat healthier and exercise), and actual *behavior* (such as whether one follows-up with a physician, takes medicine as prescribed, adheres to recommended health guidelines, etc.). At the organizational level of analysis, health is the aggregated degree of wellbeing across and within individuals that impacts organizations’ overall functioning.

Table 1 Health: A Multifaceted State of Being & Acting		
Health Risk	Health Motivation	Healthy Behaviors
<i>•Likelihood of present/future illness/diseases</i>	<i>•Ambitions & corresponding determinations to engage in healthy behaviors</i>	<i>•Capability enhancing actions & routines</i>

Health risks, motivations, and behaviors are highly dynamic, interdependent, complex, and multifaceted concepts. They are causally ambiguous, path dependent, and socially complex because they are rooted in individuals' genetics, backgrounds, cultural and environmental influencers, social networks, and dynamic lifestyle behaviors. Health and each of its components have been developed and honed by individuals over the course of their lifetimes. At the same time, individuals' health motivations, risks, and behaviors are not stagnant, but rather are highly dynamic and continually susceptible to social network and environmental influence. As such, the precursors and interrelationships of employee health components from aggregated macro-organizational perspectives are inherently socially complex, causally ambiguous, and path dependent.

Health Risks are the likelihoods of illness/disease in the present and/or future. Conceptually, health risks range on a continuum from the complete lack of likely

present/future illness/disease to the complete manifestation of serious illness/disease. Health risks are rooted in personal and family medical history, environment, and health behaviors.

At the organizational level of analysis, health risk is the aggregated degree of present and forthcoming illness/disease across and within individuals. Indicators include the extent to which employees generally tend to suffer from and expose other group members to disease, the flu, etc.

Health Motivations are one's ambitions and corresponding determinations to engage in healthy behaviors. Conceptually, health motivations range on a continuum from the complete lack of interest in a healthy behavior to the ambition and determination to fully instate a healthy behavior as a lifestyle routine.

Health motivations are directed toward maximizing one's optimal health and abilities. In their most basic form, they are fundamentally natural and instinctual because they are self-promoting. However, the underpinnings of healthy motivations are complex. They are rooted in multiple factors that drive health ambitions and determination; namely, accurate health knowledge, abilities, perceived value of longer-term health at the sacrifice of short-term indulgences, and self-efficacy to successfully engage in healthy behaviors.

At the organizational level of analysis, health motivation is the aggregate degree of ambition and determination to enact healthy behaviors across and within individuals. Indicators include the extent to which employees generally internally feel and/or outwardly express sentiments that are directed toward ambitions and/or determinations to engage in healthy eating and exercise routines. For example, a

workforce may have several employees that commonly confide in each other regarding hopes for a healthier life. These employees may encourage and support each other such that collective ambitions and determinations for good health increase.

Healthy Behaviors are the capability enhancing actions and routines that impact one's present and future risk of poor health. They include consumption behaviors and mind/body actions and routines. They exist on a continuum that ranges from health promoting (healthy) to health demoting (unhealthy) actions/routines. Unhealthy behaviors include, for example, poor eating/drinking habits, the use of tobacco products, lack of physical activity, and poor stress management. Healthy behaviors are the opposite of unhealthy behaviors in the sense that they are self-promoting and capability enhancing. As outlined in Table 2, healthy behaviors include healthy consumption and physical/mental fitness actions and routines.

At the organizational level of analysis, healthy behaviors are the aggregate degree of health enhancing actions/routines across and within individuals. Indicators include the extent to which employees generally engage in and encourage/support healthy eating and exercise routines.

Table 2 Healthy Behaviors: Capability Enhancing Actions & Routines	
Healthy Consumption <i>•Health promoting eating & drinking; avoidance of harmful substances</i>	Physical/Mental Fitness <i>•Health promoting mind/body actions and routines</i>

Healthy Consumption is the degree to which one's consumption promotes, rather than harms, oneself. It is a continuum that ranges from health promoting intake of optimally nutritious substances (healthy consumption) to health demoting intake of harmful substances (unhealthy consumption). Health promoting intake is optimally nutritious and promotes a healthy weight; examples include eating and drinking within nutritional and caloric guidelines. Health demoting intake includes excessive/inadequate caloric intake, poor nutrition, excessive alcohol intake, smoking, and use of illegal drugs.

At the organizational level of analysis, healthy consumption is the aggregate degree of health promoting intake across and within individuals. Indicators include whether employees consume and share nutritious (rather than unhealthy) food at organization parties and lunches and engage in smoking breaks and/or after work excessive alcohol consumption.

Physical/Mental Fitness is the degree of engagement in health promoting physical and mental behaviors. Physical/mental fitness behaviors exist on a continuum that ranges from complete lack of physical activity and/or poor stress management behaviors to optimally health promoting physical activity and other positive mental actions and routines.

At the organizational level of analysis, physical/mental fitness is the aggregate degree of engagement in health promoting physical/mental activities across and within individuals. Indicators include the degree to which employees engage in and encourage daily exercise and other stress management techniques.

The Relationships of Interest

The below hypotheses are theoretically and empirically explored in this dissertation. The resultant models are depicted below in Figures 1a and 2a.

Model 1 Hypotheses

Hypothesis 1: Health risk decreases health motivation.

Hypothesis 2: Health motivation increases healthy behaviors.

Hypothesis 3: Healthy behaviors decrease health risk.

Hypothesis 4: Health risk increases medical costs.

Hypothesis 5: Health risk decreases productivity.

Hypothesis 6: Healthy behaviors increase productivity.

Model 2 Hypotheses

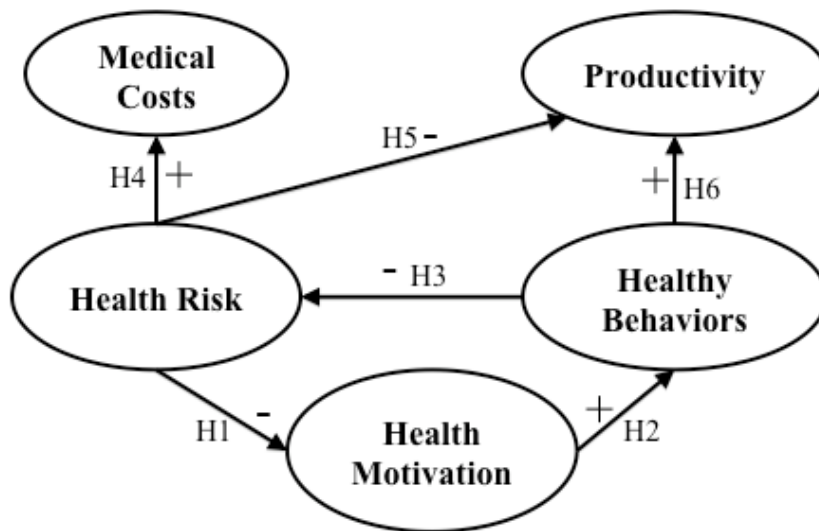
Hypothesis 7: Healthy consumption decreases medical costs.

Hypothesis 8: Healthy consumption increases productivity.

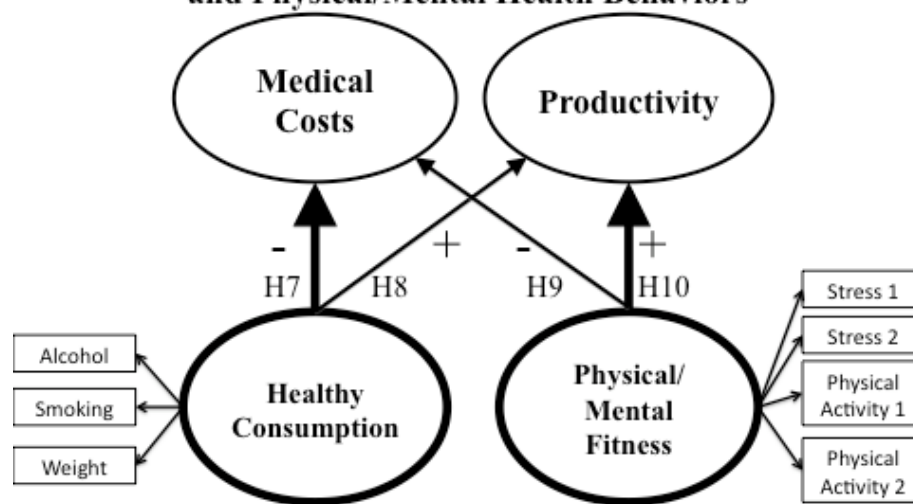
Hypothesis 9: Physical/mental fitness decreases medical costs, but less significantly than does healthy consumption.

Hypothesis 10: Physical/mental fitness increases productivity more significantly than does healthy consumption.

**Figure 1a:
The Performance Implications of Employee Health**



**Figure 2a:
The Performance Implications of Employee Consumption and Physical/Mental Health Behaviors**



Contribution

This dissertation research bridges an important gap in management knowledge regarding the potential of employee health to be a value *creating* organizational resource. I outline health as a multifaceted construct and examine how its multiple

components differently impact organizational outcomes. In so doing, I build on the resource-based view of the firm (Barney, 1991; Barney, 1986a), and past health promotion and health care cost research and offer insight as to how, and why, employee healthcare management is an important means by which organizations may simultaneously promote their financial and social performance.

Chapter Summary

Strategic Management research has not articulated the cost and productivity implications of employee health. Importantly, little is known regarding the potential of health to be a value creating resource in organizations. This research will build upon the resource-based view of the firm, health promotion, and health care cost research to examine the impact of employees' health risks, health motivations, and healthy behaviors on the organizational outcomes medical costs and productivity.

CHAPTER 2

THE PERFORMANCE IMPLICATIONS OF EMPLOYEE HEALTH

In this Chapter, I introduce a model that explains the potential of health to be a source of value generation from a macro-organizational perspective. I specifically examine the relationship between three interdependent aspects of employee health: *health risk*, *health motivation*, and *healthy behaviors* and their opposing affects on the organizational outcomes *medical costs* and *productivity*. The proposed relationships are stated and depicted below in Hypotheses 1 - 6 and in Figure 1a and Table 3.

Figure 1a:
The Performance Implications of Employee Health

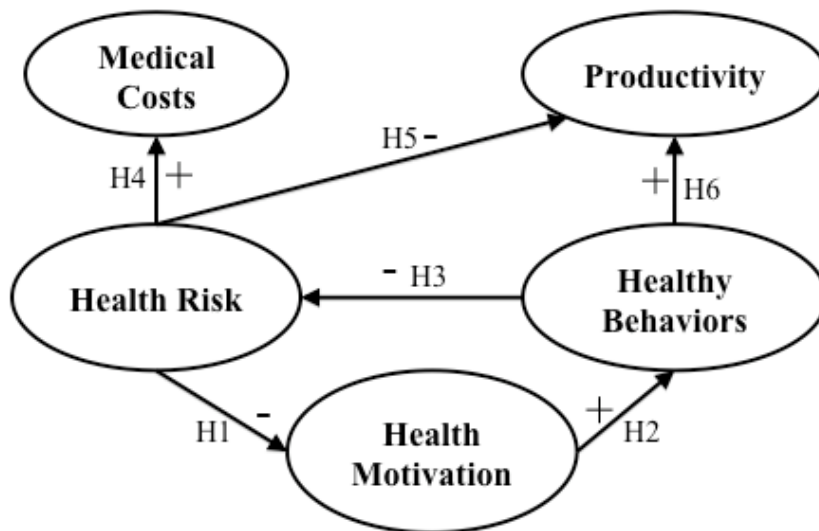


Table 3 Summary of Model 1 Hypotheses
Hypothesis 1: Health risk decreases health motivation.
Hypothesis 2: Health motivation increases healthy behaviors.
Hypothesis 3: Healthy behaviors decrease health risk.
Hypothesis 4: Health risk increases medical costs.
Hypothesis 5: Health risk decreases productivity.
Hypothesis 6: Healthy behaviors increase productivity.

THEORETICAL BACKGROUND

As outlined in-depth in Chapter 1 and in Table 1, health is a multifaceted state of being and acting. It consists of health risk, health motivations, and healthy behaviors. In this research, I focus on the unique role of each of these health components from an organizational performance perspective.

<p style="text-align: center;">Table 1 Health: A Multifaceted State of Being & Acting</p>		
<p>Health Risks</p> <p><i>•Likelihood of current/future illness/disease</i></p>	<p>Health Motivations</p> <p><i>•Ambitions & self-perceived abilities to engage in healthy behaviors</i></p>	<p>Healthy Behaviors</p> <p><i>•Capability enhancing actions & routines</i></p>

Health Risk and Health Motivation

Little is known regarding the strategic importance of employees’ underlying *motivation* to engage in healthy behaviors. Health motivations are one’s ambitions and corresponding determinations to engage in healthy behaviors. Conceptually, health motivations range on a continuum from the complete lack of interest in a healthy behavior to the ambition and determination to fully instate a healthy behavior as a lifestyle routine.

Health motivation may be thought of as what Ryan and Deci have called “inherent actualizing” (2000: 76) in the sense that it is a sentiment that is directed toward maximizing one’s optimal health and abilities. In their most basic form, healthy motivations are fundamentally natural and instinctual because they are self-promoting. However, the underpinnings of healthy motivations are complex. They are rooted in multiple factors that drive health ambitions and determination; namely,

accurate health knowledge, abilities, value for longer-term health at the sacrifice of short-term indulgences, and self-efficacy to successfully engage in healthy behaviors.

Impaired abilities, short-term perspectives, poor health knowledge, and low self-efficacy to successfully engage in healthy behaviors are quite likely to hinder health motivations. Impaired abilities are often the outcome of a poor health condition. As such, it is important to consider how health risk may impact health motivation.

Health risk is an aspect of health that is influenced by multiple other aspects of health, including personal and family medical history, environment, and health behaviors. Although health risks can often be minimized or even mitigated via engagement in healthy behaviors, they also likely serve as barriers to the very health behaviors that are recommended as treatment. This is because health risks tend to significantly increase the real and perceived difficulties associated with engaging in healthy behaviors. As such, they importantly inhibit one's ability and/or motivation to initiate health behavior improvements. That is, the presence of disease or illness is likely to increase the difficulty of task performance because individuals in poor health often must first *disengage* from unhealthy behaviors before they may begin to pursue a new behavior.

This logic is consistent with the theory of planned behavior, which suggests that one's perception of the difficulty associated with a particular behavior ('behavioral belief') is an important determinant of one's intention, and in turn actual propensity, to engage in that behavior (Ajzen, Albarracin, & Hornik, 2007; Ajzen,

2005). Similarly, reactance theory holds that individuals will resist changes that are particularly threatening to them (Brehm, 1966).

Also consistent with these logics, it is important to note that, in certain situations, the onset of some extreme illness may serve as an important source of external motivation to initiate healthy behaviors. That is, individuals who are diagnosed with certain serious or more concerning illnesses may be motivated to engage in wellness (despite perceived and actual difficulty of doing so) because the perceived and actual risks of inaction begin to outweigh the perceived and actual difficulty of engaging in wellness. For example, an individual suffering from cardiovascular disease may not exercise or eat well until prompted to do so by the onset of a heart attack or other more serious or noticeable condition.

Although the onset of more extreme health problems may motivate engagement in healthy behaviors, this phenomenon is likely difficult to observe from a macro-organizational level unless a significant portion of the employee population simultaneously suffers from similar increased health risks. Rather, from a macro-organizational perspective, the overarching tendency will be for health risk to deter healthy behaviors and vice versa. I assert that, at the organizational level of analysis, employee health risk decreases health motivation.

Hypothesis 1: Health risk decreases health motivation.

Health Motivation and Healthy Behaviors

Research in the psychology and health promotion literatures has linked individuals' health perceptions to their behaviors. For example, the theory of planned

behavior suggests that one's perception of the difficulty associated with a particular behavior is an important determinant of one's propensity (and underlying desire) to engage in that behavior (Ajzen, 2005). Building on this conception, the health belief model outlines the important role of individuals' perceptions of the multiple diverse factors that differently impact their conceptions regarding healthy behaviors and disease. Based on these logics, I propose that health motivation promotes healthy behaviors.

Hypothesis 2: Health motivation increases healthy behaviors.

Healthy Behaviors and Health Risk

Research indicates that healthy behaviors are crucially important determinants of many immediate and future aspects of human physiological and psychological status, including for example, illness or disease, energy level, and mental and emotional status. For example, there is growing evidence that healthy behaviors are positively associated, and likely promote, highly dynamic aspects of human existence, such as self-perceived health (Kaleta, Makowiec-Dabrowska, Dziankowska-Zaborszczyk, & Jegier, 2006), occupational energy expenditure (Kaleta & Jegier, 2005), mental balance (Wallace & Shapiro, 2006), and emotions (Salovey, Rothman, Detweiler, & Steward, 2000).

From a longer-term perspective, healthy behaviors significantly influence future health risk by delaying and/or preventing the onset of chronic disease (Willett, 2003) and in doing so, extend life, promote quality of life, and decrease the duration of the reduced quality of health that precedes death (Aldana, 2005). Given the

prevalence of chronic disease, the implications of healthy behavior improvements may be profound. Heart disease and cancer alone account for nearly 50 percent of all deaths in the U.S. (Kung, Hoyert, Xu, & Murphy, 2008) and the total of all chronic diseases account for some 70 percent of deaths in the U.S (Aldana, 2005). These figures are particularly striking considering that chronic diseases are “among the most common and costly health problems to treat, but they are also among the most preventable” (Aldana, 2005: 4).

Hypothesis 3: Healthy behaviors decrease health risk.

Impact on Medical Costs

Studies clearly indicate that poor health may be blamed for *increased* relative medical costs. In one study, modifiable risk factors were found to account for 25 percent of organizations’ average total health care costs (Anderson et al., 2000). Increased medical expenditures have been attributed to, for example, workforce obesity (Finkelstein, Fiebelkorn, & Wang, 2005) and depression (Druss, Rosenheck, & Sledge, 2000). Employees that suffer from bipolar disorder are particularly costly, incurring on average nearly \$7000 more in benefit costs (Gardner et al., 2006).

Multiple other studies indicate that improved employee health likely *decreases* medical claims costs. Specifically, findings indicate that healthier individuals report lower levels of health care use (Keyes & Grzywacz, 2005). Importantly, there is also clear evidence that employees who participate in worksite health promotion programs have lower relative healthcare costs than those that do not (Chapman, 2005; Naydeck et al., 2008; Pelletier, 2005; Serxner, Gold, Grossmeier, &

Anderson, 2003). Given clear evidence that healthier employees incur less medical costs, I propose that organizations' average employee health risk is highly predictive of organizations' average level of medical claims costs.

Hypothesis 4: Health risk increases medical costs.

Impact on Productivity

The negative impact of employee health risk is likely not limited to medical costs. That is, poor health in organizations likely also hinders organizational productivity. Research in the health promotion literature has generally indicated that medical costs and productivity outcomes are correlated. However, given that productivity is a difficult concept to measure, the full and precise impact of different levels and types of health on different types of organizational productivity outcomes has not yet been clearly demonstrated (Collins et al., 2005).

In general, when trying to capture productivity, researchers have relied upon measures of organizational absenteeism, disability, and presenteeism (work performance impairment that is attributable to health concerns). These studies are limited, however, by a heavy reliance on self-reported indicators of productivity and a lack of consistency across research studies in the specific productivity metric employed (Goetzel et al., 2004). For example, presenteeism is often measured in different ways, such as: the speed of work, the ability to concentrate, or the quality or quantity of the work output, thus making it difficult to generalize findings.

Despite these limitations, multiple studies have demonstrated support for a causal relationship between modifiable health risks and increased absenteeism.

Increased absenteeism has been linked to, for example, obesity (Finkelstein et al., 2005), and mental health (Druss et al., 2000; Gardner et al., 2006).

More recently, research has begun to explore the complex impact of health on presenteeism. Early findings indicate that the costs of presenteeism due to health are enormous and constitute a substantial percent of the total organizational costs associated with poor employee health. One study found that the costs of presenteeism accounts for 61 percent of the total organizational cost burden that is due to certain chronic health conditions (hypertension, depression/sadness/mental illness, heart disease, arthritis, allergy, diabetes, migraine, headaches, any cancer, respiratory disorders, and asthma). This finding is somewhat conservative because it is based upon average, rather than high, estimates of presenteeism costs.

Even when the most conservative estimates of presenteeism costs were employed, the cost of presenteeism in most cases was higher than the direct costs of medical care for the respective illness (Goetzel et al., 2004). Another study offered further support for these findings by demonstrating that the presenteeism costs of ten different chronic conditions exceeded the combined costs of absenteeism and medical care, and in fact constitute almost two thirds of total organizational 'health and productivity management costs'(Collins et al., 2005).

Research has also begun to examine the unique productivity implications of specific chronic illnesses. Obesity has been shown to significantly increase absenteeism due to illness or injury (Finkelstein et al., 2005) and health-related lost productive time (Ricci et al., 2005) and significantly limit employees' abilities to complete tasks on time and to complete tasks requiring physical effort (Gates,

Succop, Brehm, Gillespie, & Sommers, 2008). The latter of these studies controlled for differences in job type and multiple other potential explanatory factors and also found that obese workers had increased levels of absence from work due to personal health reasons (Gates et al., 2008).

Employees' mental health may be particularly important from an organizational perspective. Research findings indicate that employees suffering from depression display significantly higher rates of absenteeism (Druss et al., 2000) while employees that suffer from bipolar disorder display drastically high rates of absenteeism (an average of 18.9 days per year) (Gardner et al., 2006).

Whereas poor health likely "erodes human capital," research increasingly indicates that *better* health may build human capital and thus be a source of value generation (Lynch, 2002: 18). Studies have demonstrated that better disease management improves organizational productivity outcomes. For example, Rizzo, Abbot, and Pashko found that the initiation of prescription treatment for hypertension, heart disease, depression, or type II diabetes decreases absenteeism (1996).

Recently, in the management literature, Heaphy and Dutton asserted that physical health may be an important determinant of work role engagement (2008). Although work role engagement has not specifically been studied as a construct in this regard, social health promotion research offers initial support for this assertion. Healthier individuals report higher levels of productivity (Keyes et al., 2005). Specifically, individuals with lower relative health risks display lower rates of absenteeism and the reduction of certain health risks promotes the reduction of absenteeism (Serxner, Gold, & Bultman, 2001).

Based on this mounting evidence at the individual level of analysis, I propose these relationships hold true at the organizational level of analysis. That is, employee health risk promotes productivity at the organizational level of analysis.

H5: Health risk decreases productivity.

Although health risk appears to be a costly firm liability that increases medical costs and productivity, research increasingly indicates that *better* health may build human capital and thus be a source of value generation. As discussed above, healthy behaviors are “oriented toward maximizing the potential of which the individual is capable” (Joint Committee on Health Education Terminology, 1991: 102). As such, employee healthy behaviors may be important sources of value creation in organizations.

Although previous studies have not directly studied the aggregated impact of employee health behaviors on organizational outcomes, studies have clearly demonstrated that higher enrollment in worksite health promotion programming is associated with lower relative claims costs (Chapman, 2005; Naydeck et al., 2008; Pelletier, 2005; Serxner et al., 2003). Similarly, there is growing evidence that healthy behaviors are positively associated with, and likely promote, highly dynamic aspects of human existence, such as self-perceived health (Kaleta et al., 2006), occupational energy expenditure (Kaleta et al., 2005), mental balance (Wallace et al., 2006), and emotions (Salovey et al., 2000). Studies have also demonstrated that better disease management improves organizational outcomes. For example, Rizzo,

Abbot, and Pashko found that the initiation of prescription treatment for hypertension, heart disease, depression, or type II diabetes decreases absenteeism (1996).

Given this mounting evidence that healthier employees display higher rates of productivity and that certain healthy behaviors promote productivity, I propose that employee healthy behaviors increase productivity.

Hypothesis 6: Healthy behaviors increase productivity.

Contribution

In this Chapter, I have offered initial insight regarding the resource potential of employee health. I also identified three crucial aspects of employee health (health risk, health motivation, and healthy behaviors) and outlined their unique, and opposing interrelationships and influences on organizational outcomes. This chapter offers the initial insight that health, and its complex components, matter from an organizational performance perspective.

Chapter Summary

In this Chapter, I introduced a model that explains the potential for health to be a source of value generation from a macro-organizational perspective. I proposed that health risk increases medical costs while simultaneously decreasing productivity. Conversely, I proposed that healthy behaviors increase productivity while simultaneously driving health risk down. Importantly, I assert that health motivations underlie healthy behaviors and health risk acts to impede employees' health motivations.

CHAPTER 3

THE PERFORMANCE IMPLICATIONS OF HEALTHY BEHAVIORS

In this Chapter, I elaborate upon hypotheses 3 and 6 in Chapter 2 that employees' healthy behaviors impact organizational outcomes by increasing productivity and decreasing employee health risk (which in turn impacts medical costs). Certain healthy behaviors, however, may have an observably direct and immediate impact on costs because they are particularly associated with costly disease. Conversely, other healthy behaviors may have an observably direct and immediate impact on productivity because they are particularly associated with energy expenditure and capability enhancement.

In this chapter, I introduce and empirically examine a model that explains the unique implications of two distinct sets of healthy behaviors – *consumption behaviors* and *physical/mental behaviors* and their opposing affects on the organizational outcomes *medical costs* and *productivity*. The proposed relationships are stated and depicted below in Hypotheses 1 - 3 and in Figure 2a and Table 4.

**Figure 2a:
The Performance Implications of Employee Consumption
and Physical/Mental Health Behaviors**

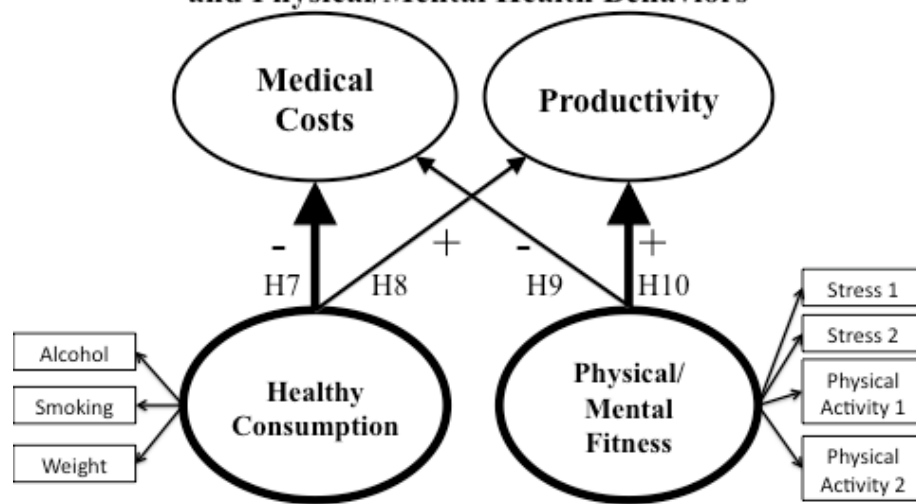


Table 4 Summary of Model 2 Hypotheses
Hypothesis 7: Healthy consumption decreases medical costs.
Hypothesis 8: Healthy consumption increases productivity.
Hypothesis 9: Physical/mental fitness decreases medical costs, but less significantly than does healthy consumption.
Hypothesis 10: Physical/mental fitness increases productivity more significantly than does healthy consumption.

THEORETICAL BACKGROUND

As outlined in Chapter 1, healthy behaviors are the actions and routines that impact one’s capabilities and present/future risk of poor health. They include

consumption behaviors and mind/body actions and routines. They exist on a continuum that ranges from health promoting (healthy) to health demoting (unhealthy) actions/routines. Unhealthy behaviors include, for example, poor eating/drinking habits, the use of tobacco products, lack of physical activity, and poor stress management. Healthy behaviors are the opposite of unhealthy behaviors in the sense that they are self-promoting and capability enhancing. As outlined in Table 2, healthy behaviors consist of two distinct subset categories: ‘healthy consumption’ and ‘physical/mental fitness’ behaviors.

<p style="text-align: center;">Table 2 Healthy Behaviors: Capability Enhancing Actions & Routines</p>	
<p>Healthy Consumption</p> <p><i>•Health promoting eating & drinking; avoidance of harmful substances</i></p>	<p>Physical/Mental Fitness</p> <p><i>•Healthy promoting mind/body actions and routines</i></p>

Healthy Consumption Behaviors

Healthy consumption is the degree to which one’s consumption promotes, rather than harms, oneself. It is a continuum that ranges from health promoting intake of optimally nutritious substances (healthy consumption) to health demoting intake of

harmful substances or excessive/insufficient calories and nutrients (unhealthy consumption). Health promoting intake is optimally nutritious and promotes a healthy weight; examples include eating and drinking within nutritional and caloric guidelines. Unhealthy intake includes excessive/inadequate caloric intake, poor nutrition, excessive alcohol intake, smoking, and use of illegal drugs.

Consumption behaviors likely have a relatively direct and immediate impact on costs because they are highly associated with costly diseases and accidents. For example, excessive caloric intake behaviors cause a corresponding onset of excessive weight that is highly associated with cardiovascular disease, diabetes, and metabolic syndrome. Finkelstein and colleagues have directly linked obesity to higher medical costs (2005). Excessive alcohol consumption is highly associated with mental illness (including depression), sleep disorders, and car accidents. This is particularly significant as Druss and colleagues have asserted that depression is particularly costly from an organizational perspective (2000). Tobacco consumption is also costly, as it is highly associated with cardiovascular disease, cancer, emphysema, and other lung diseases.

Given the high direct costs associated with these serious diseases, and given that consumption behaviors are highly associated with (and often predictive of) those diseases, I propose that healthier consumption behaviors promote cost savings.

Hypothesis 7: Healthy consumption decreases medical costs.

As discussed and hypothesized in Chapter 2, healthy behaviors likely impact employees' productivity. Consistent with Hypothesis 6, consumption behaviors

likely also impact productivity, namely because their closely associated diseases are in turn associated with suboptimal functioning. Specifically, obesity has been shown to significantly increase absenteeism due to illness or injury (Finkelstein et al., 2005) and health-related lost productive time (Ricci et al., 2005) and significantly limit employees' abilities to complete tasks on time and to complete tasks requiring physical effort (Gates et al., 2008). The latter of these studies controlled for differences in job type and multiple other potential explanatory factors and also found that obese workers had increased levels of absence from work due to personal health reasons (Gates et al., 2008).

As discussed above, unhealthy alcohol behaviors are linked to mental illnesses and accidents. Clearly, injuries incurred in accidents will likely limit employee productivity. Similarly, research has outlined that employees suffering from depression display significantly higher rates of absenteeism (Druss et al., 2000) while employees that suffer from bipolar disorder display drastically high rates of absenteeism (an average of 18.9 days per year) (Gardner et al., 2006).

Given the high likelihood of impaired functioning due to serious illness, and given that consumption behaviors are highly associated with (and often predictive of) the above listed diseases, I propose that healthier consumption behaviors promote productivity.

Hypothesis 8: Healthy consumption increases productivity.

Physical/Mental Fitness

Physical/mental fitness is the degree of engagement in health promoting mind/body behaviors. Physical/mental fitness behaviors exist on a continuum that ranges from complete lack of physical activity and/or poor stress management behaviors to optimally health promoting physical activity and other stress management actions and routines. Examples of physical/mental fitness behaviors include sleeping the recommended number of hours; engagement in physical activity, which consists of movements that increase one's heart rate such as brisk walking, aerobic dance/movement, running, stretching, yoga, active gardening/cleaning, stretching, etc; and engagement in other relaxation/stress management techniques such as deep breathing and time management.

It is widely accepted that adequate sleep is essentially linked to health and optimal functioning. Although more conclusive research on the direct health implications of sleep is still needed, recent research indicates that poor sleep behaviors may contribute to the on-set of certain chronic diseases/disorders (U.S. Department of Health and Human Services, National Institutes of Health, & National Heart, 2003).

Research on physical activity indicates that regular physical activity is associated with decreased risk factors regarding cardiovascular disease and other chronic illnesses (Lichtenstein et al., 2006; Maron et al., 2004; NIH Consensus Development Panel on Physical Activity and Cardiovascular Health, 1996) and that it moderates life stress. Similarly, research on psychological management indicates that stress management may play an important role in the management of chronic disease,

particularly cardiovascular disease (Brown, 1991; Chida & Steptoe, 2008, 2009; Forcier et al., 2006).

Because physical/mental fitness behaviors play a role in the prevention and treatment of some costly diseases, they are likely also predictive of lower medical costs. However, as compared to consumption behaviors, the relationships between poor physical/mental fitness and costly diseases are less direct than are the relationships between consumption behaviors and costly disease. As such, I propose that physical/mental fitness negatively predicts medical costs, but less strongly than does healthy consumption.

Hypothesis 9: Physical/mental fitness decreases medical costs less significantly than does healthy consumption.

Physical/mental fitness may have an especially strong impact on productivity not just because it delays/prevents the onset of physically inhibiting diseases but also because it is particularly associated with the *optimization* of capabilities.

Specifically, research increasingly points to a strong, immediate and longer-term association between physical/mental fitness behaviors and improved energy levels, cognitive functioning, and mood/well-being (Bernacki & Baun, 1984; Brown, 1991; Colcombe et al., 2006; Eggermont, Swaab, Luiten, & Scherder, 2006; Fox, 1999; Fox, Stathi, McKenna, & Davis, 2007; U.S. Department of Health and Human Services et al., 2003; U.S. Surgeon General, 1996).

Scholars are increasingly attributing these positive outcomes to the positive impact that physical exertion has on the brain. Early research on mice indicated that exercise reduced unhealthy plaque in the brain while simultaneously improving the

rate of learning. In human research, exercise has been shown to have positive effects on the brain (Ainslie et al., 2008; Ide, Horn, & Secher, 1999; Ide & Secher, 2000). Recently, researchers have argued that exercise increases cerebral blood vessels (and the flow of blood/oxygen to the brain) (Rahman, Smith, Bullitt, Katz, & Bonita, 2008).

A recent study conducted by the Cooper Institute illustrates this perspective and offers additional insight. The Cooper Institute analyzed the cardiovascular health, body mass indexes (BMI), and school performance of more than 2.4 million Texas elementary, middle, and high school students. The study found that both heart health and healthy weight are associated with improved student performance. Interestingly, the study found a stronger correlation between student performance and cardiovascular health than between student performance and BMI (The Cooper Institute, 2009). This suggests that physical activity (and a resultant healthier heart) may impact individual performance in spite of the presence of other health risk factors, in this case, excess weight.

Physical/mental fitness behaviors are fundamentally capability enhancing in both the immediate and longer-term. Conversely, consumption behaviors are linked more directly to diseases that require longer-term treatments. As such, the impact of consumption behaviors on productivity is likely less immediate and strong. Rather, research increasingly points to a strong, direct positive impact of physical/mental fitness behaviors on human performance (of particular relevance here, energy levels). As such, I propose that physical/mental fitness behaviors promote organizational

productivity, even more so than do consumption behaviors.

Hypothesis 10: Physical/mental fitness increases productivity more significantly than does healthy consumption.

Contribution

This chapter draws upon health promotion and medical research to explore the impact of healthy behaviors in the organizational context. I described two distinct subsets of healthy behaviors and how they impact the organizational outcomes medical costs and productivity in varying degrees. I also offered insight regarding how and why physical/mental fitness is a relatively more important source of productivity whereas consumption behaviors have a relatively stronger impact on medical costs.

Chapter Summary

The proposed relationships in Model 2 suggest that physical/mental fitness plays an especially important role in organizational value creation whereas consumption behaviors more significantly impact medical costs. This is because physical/mental fitness behaviors are more directly associated with the optimization of human functioning whereas poor consumption behaviors are more directly associated with the onset of costly disease.

CHAPTER 4

METHODOLOGY

Data and Samples

The data for this study are based on client records at a major health insurance company that operates in the Mid-Atlantic region of the United States. Data are regarding wellness program participants that completed an annually generated 2007 ‘Health Media Succeed Health Risk Assessment’ survey. HealthMedia is an outside consultancy contracted by the insurance company as a provider of commercial web-based interventions to promote employee health. HealthMedia states on its website that its products are “backed by 30+ years of behavioral science research born out of the Health Media Research Laboratory (HMRL) at the University of Michigan” (HealthMedia, 2008).

The data regarding each client’s wellness program participants are aggregated at the organizational level of analysis. These company level data are derived from the individual employee HealthMedia surveys and from insurance company records regarding each client’s enrollment and 2007 medical claims costs. Due to missing data in some measures, the sample size for Model 1 is 152 organizations; the sample size regarding Model 2 is 149 organizations.

Organizational Performance Measures

Medical Costs are indicated by the insurance company’s records of ‘total average payments’ per participating employee at each organization. This average was calculated by the insurance company as the sum of each organization’s medical and

prescription claims submitted and paid by the insurance company plus the subscriber portion (including the subscribers' co-pay and deductible), divided by the number of continuously-enrolled wellness participant members at each organization.

Productivity is indicated by average responses among participants in each organization to the question:

During the past four weeks, how much did your health problems affect your productivity while you were working? Think about the days you were limited in the amount or kind of work you could do, days you accomplished less than you would like, or days you could not do your work as carefully as usual. If health problems affected your work only a little, choose a low number. Choose a high number if health problems affected your activities a great deal. (On a scale of 0, Health problems had no effect on my work – 10, Health problems completely prevented me from working)

Employee Health Component Measures

Health Risk is indicated by the DxCG RiskSmart commercial health insurance model Version 2.1.1 concurrent risk score. Higher average risk score indicates poorer health in the organization. The concurrent risk score model “uses diagnosis or pharmacy claims information to calculate the relative risk for the time period during which the claims were incurred. These results can be used to compare actual costs to the costs predicted by the predictive model to determine the efficiency of service delivery” (DxCG, 2005: 2).

The DxCG RiskSmart model is marketed by Boston based DxCG, Inc., which was established by DCG researchers Arlene Ash, Randall Ellis, and Gregory Pope. Risksmart is DxCG, Inc.'s “new suite of Web-based products that combine DxCG DCG and RxGroups models for more predictive power” (DxCG, 2005: 8). The DCG “modeling framework characterizes individual health status and the disease burden of

populations, as well as predicting future levels of resource need.” The DCG models have been validated on privately insured, Medicaid, and Medicare databases with sample sizes in each database in excess of 1 million people (Ash et al., 2000: 25).

Health Motivations are indicated by three subscales:

Physical Activity Motivation:

Currently, how motivated are you to follow the recommended physical activity guidelines? Select one number. (On a scale of 0 Not At All Motivated – 10 Extremely Motivated)

Nutrition Motivation:

Currently, how motivated are you to follow the recommended dietary guidelines? Select one number. (On a scale of 0 Not At All Motivated – 10 Extremely Motivated)

Stress Management Motivation:

Currently, how motivated are you to practice stress management techniques? Select one number. (On a scale of 0 Not At All Motivated – 10 Extremely Motivated)

Healthy Behaviors are indicated by each organization’s HealthMedia

‘Lifestyle Score.’ The organization’s average Lifestyle Score is a scaled summary measure (on a scale of 0 to 100) of participants’ adherence to assessed recommended health behaviors. HealthMedia’s behavioral recommendations and guidelines are based on the United States Preventive Services Task Force Report, 3rd edition 2005; USDA Dietary Guidelines for Americans, 2000: and Centers for Disease Control and Prevention, Division of HIV/AIDS Prevention, 2003. Higher average scores indicate better adherence to health behavior guidelines among the organization’s population. The average lifestyle score calculated regarding each of the insurance company’s clients reflects adherence to recommended healthy behaviors regarding alcohol use, depression management, stress management, injury prevention, nutrition, physical activity, skin protection, tobacco use, and weight management.

Physical/mental Fitness is indicated by four subscales, Physical Activity 1, Physical Activity 2, Stress 1, Stress 2, which are described below.

Physical Activity 1: This physical activity behavior score is calculated by HealthMedia based upon responses to the below six questions regarding physical activity. Healthmedia's precise calculation formula regarding these five questions is proprietary.

1. *Can you answer "Yes" to one or more of the following statements:*
 - *You are over 40 and have not been exercising regularly.*
 - *Your doctor has told you that you have heart trouble or high blood pressure.*
 - *You often feel faint or dizzy.*
 - *You have a bone or joint problem that could be aggravated by physical activity.*
 - *You have experienced chest pain during exercise or at rest.*

The following questions will attempt to assess how many minutes of physical activity you get in a typical week.

Low-intensity: Slow walking, golfing with a cart, dusting, vacuuming, or light stretching. You should be able to sing while doing these activities and may notice a slight increase in your heart rate.

Moderate-intensity: Brisk walking, casual swimming, or mowing with a power motor. You should be able to have a conversation during these activities, but will have an increase in breathing, increase in heart rate, and light sweating.

High-intensity: Running (11-12 min/mile), bicycling >10mph, swimming laps, or weight circuit training. You should be too out of breath to hold a conversation when doing these activities. There will also be a large increase in heart rate and breathing.

Very High-intensity: Running (<10 min/mile), vigorous swimming or bicycling (>20 mph). You should be too out of breath to hold a conversation when doing these activities. There will also be heavy sweating, increased breathing, and increased heart rate.

2. *Based on the descriptions above, on average, how many days per week do you perform ... (on a scale of 0-7)*
 - *Low-intensity*
 - *Moderate-intensity*
 - *High-intensity*
 - *Very High-intensity*
3. *On the days you do physical activity, what is the average amount of time you spend doing (minutes per day)*
 - *Low-intensity*
 - *Moderate-intensity*
 - *High-intensity*
 - *Very High-intensity*
4. *How often do you perform strength exercises such as push-ups, pull-ups, sit-ups, lifting free weights, or using weight machines?*
 - *Rarely or never*
 - *1 or 2 times a week*
 - *3-5 times a week*
 - *6-7 times a week*
5. *How often do you perform flexibility exercises such as stretching, yoga, or tai chi?*
 - *Rarely or never*
 - *1 or 2 times a week*
 - *3-5 times a week*
 - *6-7 times a week*

Physical Activity 2: The insurance company derived this score from the Healthmedia ‘readiness score for the management of stress.’ The Healthmedia readiness score is qualitative, identifying each response as ‘Pre-Contemplator,’ ‘Contemplator,’ ‘Preparator,’ ‘Action,’ or ‘Maintenance.’ The insurance company converted these answers to numeric fields with the values 1-5, respectively, to derive an organizational average for each company. The readiness score was derived from the survey question:

Exercise includes activities such as brisk walking, jogging, swimming, aerobic dancing, biking, rowing, etc. Regular exercise equals at least 30 minutes of activity most days of the week. Based on this definition of regular exercise, which of the following statements best describes your current exercise habits?

- I do not currently exercise regularly and do not intend to start exercising in the next 6 months.*
- I do not exercise regularly but am thinking about starting to exercise in the next 6 months.*
- I have recently (within 30 days) begun to exercise but do so inconsistently.*
- I currently exercise regularly but have only begun doing so in the last 6 months.*
- I currently exercise regularly and have done so for 6 months or more.*

Stress 1: This score is calculated by HealthMedia based upon responses to the below five questions regarding stress and well-being. Healthmedia's precise calculation formula is proprietary.

- 1. In the last month, how often have you felt nervous and stressed?*
 - Never*
 - Almost never*
 - Sometimes*
 - Fairly often*
 - Very often*
- 2. In the last month, how often have you been angered because of things that happened that were outside your control?*
 - Never*
 - Almost never*
 - Sometimes*
 - Fairly often*
 - Very often*
- 3. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?*
 - Never*
 - Almost never*
 - Sometimes*
 - Fairly often*
 - Very often*

4. *In the last month, how often have you felt confident about your ability to handle your personal problems?*
 - *Never*
 - *Almost never*
 - *Sometimes*
 - *Fairly often*
 - *Very often*
5. *In the last month, how often have you felt that you were on top of things?*
 - *Never*
 - *Almost never*
 - *Sometimes*
 - *Fairly often*
 - *Very often*

Stress 2: The insurance company derived this score from the Healthmedia ‘readiness score for the management of stress.’ The Healthmedia readiness score is qualitative, identifying each response as ‘Pre-Contemplator,’ ‘Contemplator,’ ‘Preparator,’ ‘Action,’ or ‘Maintenance.’ The insurance company converted these answers to numeric fields with the values 1-5, respectively, to derive an organizational average for each company. The readiness score was derived from the survey question:

Examples of stress management techniques include relaxation, meditation, yoga, exercise (physical activity), time management, deep breathing, learning coping skills, and tai chi. Which statement best describes your current stress management status?

- *I do not currently attempt to manage my stress and do not intend to do so in the next 6 months.*
- *I do not currently attempt to manage my stress but intend to start in the next 6 months.*
- *I have recently (within the past 30 days) attempted to manage my stress but do so inconsistently.*
- *I consistently attempt to manage my stress but have done so for less than 6 months.*
- *I consistently attempt to manage my stress and have done so for more than 6 months.*

Healthy Consumption is indicated by three subscales:

Alcohol This score is calculated by HealthMedia based upon responses to the below three questions regarding alcohol use. Healthmedia's precise calculation formula is proprietary.

These questions are about drinking alcoholic beverages. Included are beer, wine, and liquor. One drink equals one 12 oz. beer, one 5 oz. glass of wine, or one shot (1.5 oz.) of liquor.

1. *On average, how often do you have a drink containing alcohol?*
 - *Never. I do not drink. ⇒SKIP to the next section (Skin Protection)*
 - *Less than once a month*
 - *Once a month*
 - *2-3 days per month*
 - *1-2 days per week*
 - *3-4 days per week*
 - *Nearly every day*
2. *How many drinks containing alcohol do you have on a typical day when you are drinking?*
 - *Drinks per day _____*
3. *How often do you have 5 or more drinks on one occasion?*
 - *Never.*
 - *Less than once a month*
 - *Once a month*
 - *2-3 days per month*
 - *1-2 days per week*
 - *3-4 days per week*
 - *Nearly every day*

Smoking This score is calculated by HealthMedia based upon responses to the below five questions regarding the use of tobacco. Healthmedia's precise calculation formula is proprietary.

1. *Do you currently use any of the following tobacco products? Select all that apply.*
 - *Cigarettes*
 - *Cigars*
 - *Pipe*
 - *Chewing tobacco*
 - *Snuff*

2. *Which of the following statements best describes your current cigarette smoking status?*
 - *I have never smoked cigarettes. ⇒SKIP to the next section (Stress and Well-being)*
 - *I currently smoke cigarettes and do not intend to quit in the next 6 months.*
 - *I currently smoke cigarettes but am thinking of quitting within the next 6 months.*
 - *I currently smoke cigarettes but intend to quit within the next 30 days and have quit for at least 24 hours in the past year.*
 - *I have not smoked cigarettes within the last 6 months. ⇒SKIP to the question 7*
 - *I have not smoked cigarettes for more than 6 months. ⇒SKIP to the next section (Stress and Well-being)*
3. *On a typical day, how many cigarettes do you smoke?*
 - *10 or fewer*
 - *11-20*
 - *21-30*
 - *31 or more*
4. *How soon after you wake up do you smoke your first cigarette?*
 - *Within 5 minutes*
 - *Within 6-30 minutes*
 - *Within 31-60 minutes*
 - *After 60 minutes*
5. *What is the longest period of time you have quit?*
 - *I have never tried to quit.*
 - *At least 1 day but less than 2 weeks*
 - *At least 2 weeks but less than 3 months*
 - *At least 3 months but less than 1 year*
 - *At least 1 year*

Weight This score is calculated by HealthMedia based upon responses to the below three questions regarding weight management (body mass index).

1. *What is your height (to nearest inch, e.g., 6ft, 00 in)?*
2. *How much do you weigh (to nearest pound)?*
3. *What is your waist measurement (measured between the lowest ribs and the top of the hips to nearest inch)?*

Analysis

To test these hypotheses, I conducted a preliminary descriptive analysis of the variables. The relationships among the variables were explored with Mplus (Muthén

& Muthén, 1998). Preliminary analysis revealed that the data deviate from multivariate normality, so I used maximum likelihood parameter estimates with standard errors that are robust to non-normality and the Satorra-Bentler chi-square test statistic (Huba & Harlow, 1987; Satorra & Bentler, 1988). The results of these analyses are reported in the following chapter.

Contribution

This research draws upon a unique and proprietary insurance company dataset to examine employee health from an organizational level of analysis. The underlying survey questions and construct measures are derived directly from established expert healthcare knowledge.

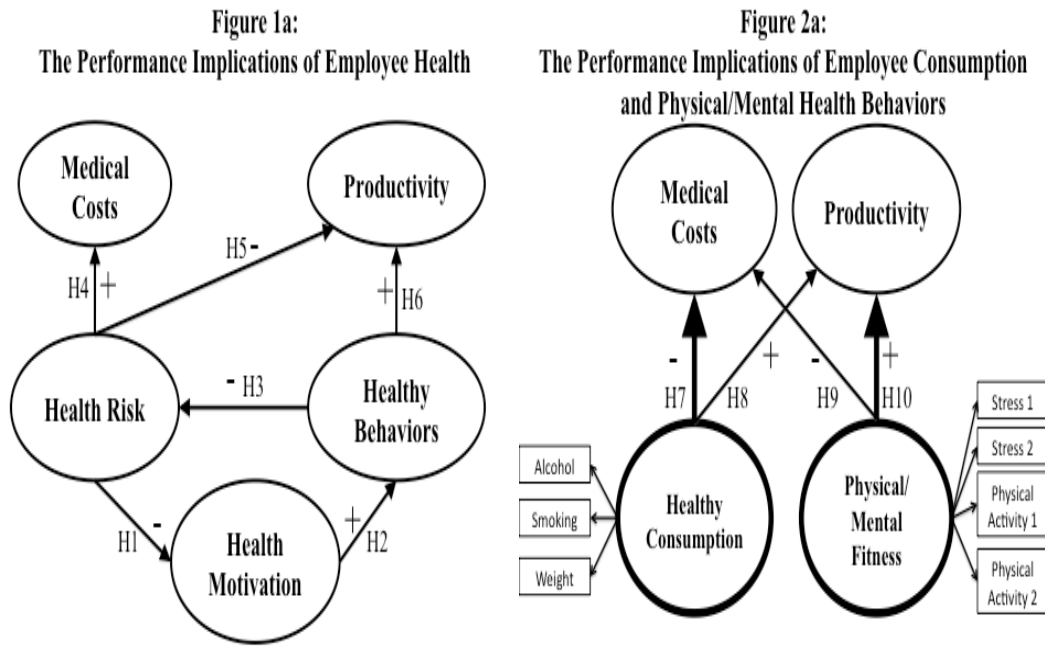
Chapter Summary

This study is conducted at the organizational level of analysis and is based on client data at a major insurance company regarding 152 organizations. The measures were provided and validated by industry experts.

CHAPTER 5

RESULTS

The hypothesized relationships in models 1 and 2 are respectively depicted below in Figures 1a and 2a:



MODEL 1 RESULTS

Preliminary Analysis

The preliminary analysis, summarized below in Table 5, revealed directional correlations consistent with our hypotheses. The preliminary analysis also revealed that the data are obviously not normally distributed. This is likely due to the relatively small sample size and some ceiling and flooring effects regarding the survey questionnaire. A principal component analysis in SPSS revealed that the latent construct 'health motivations' is well indicated by the three factor indicators

‘physical activity motivation,’ ‘nutrition motivation,’ and ‘stress motivation,’ which respectively have high factor loadings of loadings of .930, .879, and .860.

TABLE 5: Model 1 Descriptive Statistics and Correlations

Variables	Mean	s.d.	1	2	3	4	5	6
1. Medical Costs	3601	1801.126						
2. Productivity	1.017	0.878	-.171*					
3. Health Risk	2.040	1.997	.408**	-.297**				
4. Healthy Behaviors	74.190	6.138	-.122	.369**	-.370**			
5. Physical Activity Motivation	6.684	1.361	.015	.183*	-.199**	.360**		
6. Nutrition Motivation	6.035	1.338	.077	.093	-.060	.335**	.778**	
7. Stress Management Motivation	6.351	1.388	-.091	.131	-.273**	.360**	.716**	.588**

* $p \leq .05$ (1-tailed)

** $p \leq .01$ (1-tailed)

SEM Analysis

As depicted in Figure 1a, above, all of the variables in this model are endogenous. ‘Health motivations’ is indicated by ‘physical activity motivation,’ ‘nutrition motivation,’ and ‘stress management motivation’ and is predicted by ‘health risk.’ ‘Healthy behaviors’ is predicted by ‘health motivation.’ ‘Health risk’ is predicted by ‘healthy behaviors.’ ‘Cost’ is predicted by ‘health risk.’ Productivity is predicted by ‘health risk’ and ‘healthy behaviors.’

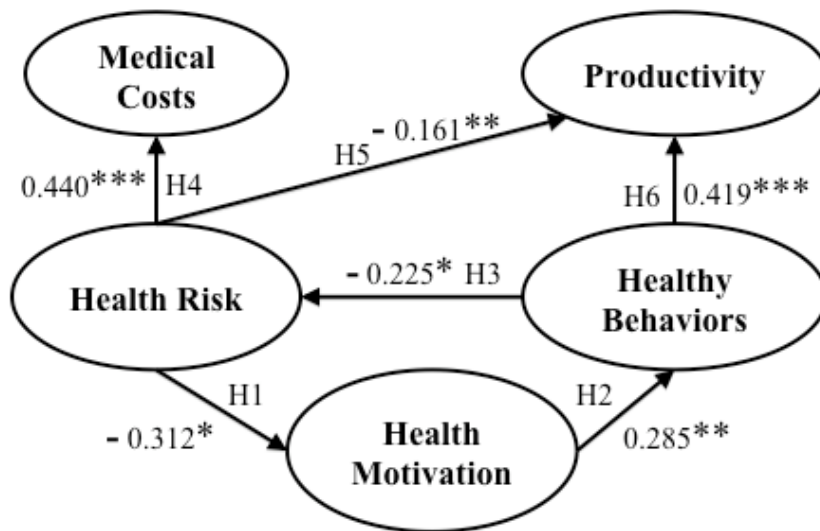
To evaluate model fit, I examined the Root Mean-Square Error of Approximation (RSMEA) and Bentler’s Comparative Fit index (CFI). A nonsignificant Chi-square indicates a good model fit to the data. Also, Hu & Bentler

recommend that a RMSEA value less than .06 and a CFI value greater than .95 indicate a good fit (1999).

The Mplus output indicated a good model fit to the data as indicated by χ^2 (df=11, N=152) = 5.716, p= 0.8916, RMSEA=0, CFI=1. The confirmatory factor analysis revealed that the three indicators of 'health motivations' had highly significant factor loadings of .975, .774, and .768. As depicted below in Figure 1b, all predicted path coefficients are significant and support the hypotheses. That is, health risk decreases health motivation and health motivation increases healthy behaviors. Healthy behaviors in turn drive down health risk while simultaneously promoting productivity. Conversely, health risk simultaneously increases medical costs and decreases productivity.

Overall, the final model indicates that risk explains 19 percent of the variance in medical costs; risk and healthy behaviors explain 24 percent of the variance in productivity; and health motivation explains 12 percent of the variance in healthy behaviors. As such, each of the hypotheses 1 – 6 are supported.

Figure 1b: Results
The Performance Implications of Employee Health



*p ≤ .05 (1-tailed)
 ** p ≤ .01 (1-tailed)
 *** p ≤ .001 (1-tailed)

MODEL 2 RESULTS

Preliminary Analysis

The preliminary analysis, summarized below in Table 6, revealed directional correlations consistent with the hypotheses. Consistent with the analysis regarding Model 1, this preliminary analysis also revealed that the data are obviously not normally distributed. Again, this is likely due to the relatively small sample size and some ceiling and flooring effects regarding the survey questionnaire.

I conducted a principal component analysis in SPSS regarding the latent constructs ‘healthy consumption’ and ‘physical/mental fitness.’ The principal component factor loadings for healthy consumption were acceptable at .48 for weight

behavior, .75 for smoking behavior, and .78 for alcohol behavior. The principal component factor loadings for physical/mental fitness were all above .67.

TABLE 6: Model 2 Descriptive Statistics and Correlations

Variables	Mean	s.d.	1	2	3	4	5	6	7	8
1. Medical Costs	3601	1801.126								
2. Productivity	1.017	0.878	-.171*							
3. Alcohol Behavior	8.951	1.184	-.299**	.010						
4. Smoking Behavior	9.198	1.022	-.197**	.187**	.323**					
5. Weight Behavior	5.926	1.430	-.133*	.213**	.152*	.095				
6. Physical Activity 1	5.829	1.971	.084	.456**	-.097	-.115	.196**			
7. Physical Activity 2	3.232	.602	.034	.400**	.060	.040	.202**	.477**		
8. Stress 1	7.631	.933	-.042	.533**	.020	-.005	.198**	.385**	.235**	
9. Stress 2	3.321	.750	-.080	.327**	.179*	.406**	.201**	.264**	.264**	.428**

* $p \leq .05$ (1-tailed)

** $p \leq .01$ (1-tailed)

SEM Analysis

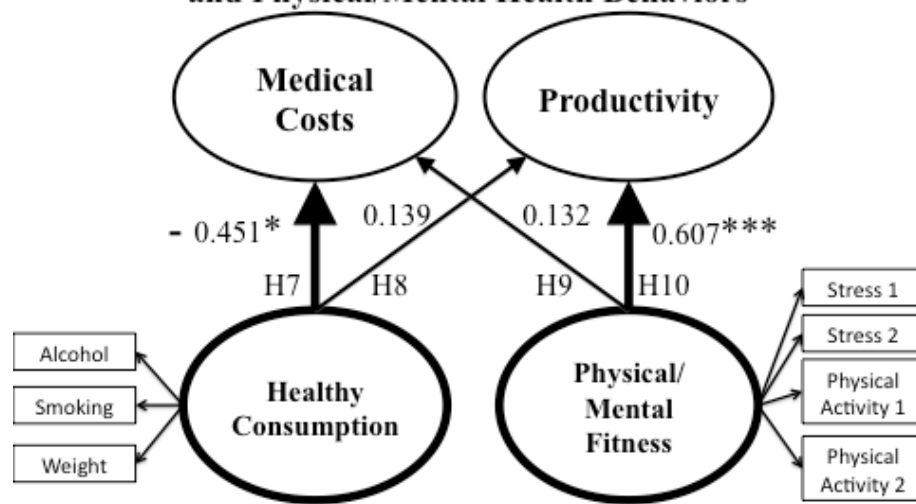
As depicted in Figure 2a, above, ‘healthy consumption’ and ‘physical/mental fitness’ are independent latent variables in this causal model that are indicated by exogenous subscales. ‘Medical costs’ and ‘productivity’ are endogenous variables that are predicted by ‘healthy consumption’ and ‘physical/mental fitness.’

To evaluate model fit, I examined the Root Mean-Square Error of Approximation (RSMEA) and Bentler’s Comparative Fit Index (CFI). A nonsignificant Chi-square indicates a good model fit to the data. Also, Hu & Bentler recommend that a RMSEA value less than .06 and a CFI value greater than .95 indicate a good fit (1999).

The Mplus output indicated a good model fit to the data as indicated by χ^2 (df=23, N=149) = 23.229, p=.4475, RMSEA=0.008, CFI=0.996. The confirmatory factor analysis revealed that the three indicators of 'healthy consumption' had significant factor loadings of .598, .506, and .344. The four indicators of 'physical/mental fitness' also had significant factor loadings of .618, .643, .384, and .657. As depicted below in Figure 2b, the path coefficients regarding hypotheses 7 and 10 are significant. Hypotheses 8 and 9 are not supported.

That is, the model suggests that 'healthy consumption' significantly decreases medical costs and 'physical/mental fitness' significantly increases productivity. Overall, the final model suggests that 'physical/mental fitness' explains 43 percent of the variance in productivity. Although 'healthy consumption' behaviors are a significant predictor of 'medical costs' the model suggests that they do not explain a significant degree of variance.

Figure 2b: Results
The Performance Implications of Employee Consumption and Physical/Mental Health Behaviors



* $p \leq .05$ (1-tailed)
 ** $p \leq .01$ (1-tailed)
 *** $p \leq .001$ (1-tailed)

Contribution

This study employed validated measures provided by major insurance company to examine important questions regarding employee health from an organizational level, strategic management perspective. Structural equation modeling was employed to examine each model. Support was found for hypotheses 1-7 and hypothesis 10. Although I did not find support for hypotheses 8 and 9, I note that, in the context of the overall model, these relationships were predicted to be weaker than hypotheses 7 and 10, respectively. As such, the lack of support for hypotheses 8 and 9 may be interpreted as further support for the hypothesized relative relational strengths.

Chapter Summary

This study is conducted at the organizational level of analysis and is based on client data at a major insurance company. The measures were provided and validated by industry experts. Structural equation modeling was employed to examine all the concurrent relationships in each of the models. Preliminary and SEM analyses revealed support for all of the hypothesized relationships except hypotheses 8 and 9.

Chapter 6

DISCUSSION

The need for a better understanding of employee health from an organizational strategy perspective is clearly long overdue. For example, Porter and Teisberg asserted that U.S. businesses have ‘failed’ in managing employee healthcare (Porter et al., 2006b). Heaphy & Dutton stated that the interactions between human health and the social world are of great importance to organizational research and the implications of these interactions need to be better understood (2008). Researchers have also outlined the need for greater understanding of the organizational implications of specific aspects of employee physiology (Wright & Diamond, 2006). More broadly, researchers have outlined the need to better align, for example, organizations’ and employees’ common developmental needs (Argyris, 1957), and, similarly, the common interests of business and society (Margolis & Walsh, 2003).

As discussed below, this analysis offers initial insight regarding these gaps in strategic management knowledge. First, I outlined employee health and certain of its components as constructs for strategic management research. Additionally, I empirically demonstrated how the components health risk, health motivation, and healthy behaviors interact and uniquely impact the organizational-level outcomes medical costs and productivity. I also explored the implications of two categories of healthy behaviors – healthy consumption and physical/mental fitness. Below, I discuss the limitations and implications of this analysis.

Limitations

The sample size in this study is relatively small. As such, it may be difficult to detect significant effects and the good fit of model 1 (CFI = 1 and RMSEA = 0) may be due to low power. Future research should therefore rely upon a larger sample of organizations to further test the findings that I report regarding hypotheses 1 - 6.

As second limitation of this study is that the data derived from the health risk assessments are self-reported. As such, there may be concerns regarding the under or over reporting of the constructs health motivation, healthy behaviors (including healthy consumption and physical/mental fitness), and productivity. As is the case with all self-reported data, responses may be biased or inaccurate.

Specifically, due to inaccuracies in self-perceptions, the natural conscious and subconscious human desire to maintain consistency in answering similar questions, for reasons of self-serving bias, and/or due to fear of supervisory review, employees may have inaccurately reported their health motivations, healthy behaviors, and productivity (by underreporting work impairment due to health concerns).

Regarding these points, it is important to note that employees likely did not knowingly misreport information. These questions were asked within the context of an insurance company administered health risk assessment within which survey respondents revealed detailed private medical information. Given the private nature of medical records, most respondents likely felt that their answers would not be revealed to their employer. Further, as the health risk assessment was voluntary and designed to aid employees in health improvements, respondents likely felt that it was in their self-interest to be forthright.

More likely, respondent self-reporting inaccuracies were due to improper causal attributions and conceptions of their health. In particular, this could have occurred regarding the measure of productivity, which was the degree of work impairment due to suboptimal health. Respondents may have under or over reported their ‘work impairment due to health conditions’ due to inaccurate conceptions of the degree to which their health concerns impaired their performance. In particular, respondents may have falsely attributed their suboptimal performance to their health because they may have been prompted to make false attributions by the preceding health related survey questions. Although this is a concern, it is important to note that, overall, employees’ self-reported productivity is more than not likely to be *underreported* for reasons of subjective self-serving biases. Namely, employees may be impaired by health concerns more than they realize. For example, employees suffering from chronic conditions may have become adapted to suboptimal health and not realize that they could feel better. This occurs often in individuals suffering from untreated conditions that do not pose obvious symptoms beyond subjective feelings of fatigue.

To the extent that work impairment underreporting occurred, it would actually strengthen the findings of this study. This is because employees’ self-reports of suboptimal performance in the workplace are arguably the most highly reliable indicator of the phenomena of interest in this study - for the very reason that individuals are often reluctant to self-deprecate. As such, the strong findings regarding the impact of health on productivity are arguably conservative.

A third limitation of this study is regarding the use of organizational averages as proxy measures for complex organizational level employee health phenomena. As described in Chapters 1, 2, and 3, the health constructs are theoretically regarding amassed, collective experiences of employees that are fundamentally rooted in and driven by diverse intra- and inter- individual and within and between group interactions.

It is important to note that organizational averages are *not* perfect measures of these complex phenomena. However, they are arguably the best available observable proxies for the nuanced and dynamic interactions that underlie the manifestation of a collective organizational level experience. As noted by Klein and colleagues, “if the level of measurement is the individual, but individual scores are aggregated by using the group means in data analysis, the level of statistical analysis is the group” (Klein et al., 1994). Such is the case in this study.

The average measures are excellent measures of the *manifestation* of the underlying process by which a collective experience occurs. However, average measures do not fully capture the *process* of this manifestation. As such, it is impossible to know based on the data in this analysis how unique groups and individuals uniquely influenced or were impacted by organizational health. Such with-in group effects are important areas for future research. The measures used in this study capture instead the manifestation of common risks, motivations, and behaviors – which in turn indicate that presence of common, overarching organizational health experiences.

The ‘Resource Potential’ of Employee Health

In this dissertation research, I have drawn upon the resource-based view of the firm and past research on health promotion and health care cost management outline and empirically demonstrate the importance of health from a macro-organizational strategy perspective. As outlined in the definition of health and its components in Chapter 1, health may be an important source of sustainable competitive advantage in keeping with the logic of the RBV. Namely, health and each of its components are valuable, rare, and costly to imitate/substitute. They are particularly rare and costly to imitate because they are fundamentally socially complex, causally ambiguous, and path dependent.

Next, I outlined theoretically important aspects of health that are of particular strategic importance to organizations. By empirically demonstrating the significant organizational performance implications of employee health, I have offered initial strong support for the overarching assertion of this dissertation that employee health is indeed a value *creating* organizational resource that is heterogeneous across firms. As discussed in Chapter 5, the model 1 results suggest that risk explains 19 percent of the variance in medical costs; risk and healthy behaviors explain 24 percent of the variance in productivity; and health motivation explains 12 percent of the variance in healthy behaviors.

Model 2 indicates that ‘healthy consumption’ significantly decreases medical costs and ‘physical/mental fitness’ significantly increases productivity. Overall, the final model suggests that ‘physical/mental fitness’ explains 43 percent of the variance

in productivity. Although ‘healthy consumption’ behaviors are a significant predictor of ‘medical costs’ the model suggests that they do not explain a significant degree of variance.

Although it is difficult to draw conclusions based just on this analysis regarding the magnitude of the impact of the employee health components on organizational outcomes, the significant findings regarding each relationship indicate clear strategic justifications for the inclusion of employee health as a focus for organizational strategy makers and future strategic management and public policy/health promotion research.

I specifically outlined three distinct aspects of employee health, their interrelationships, and their unique impacts on medicals costs and productivity to which organizational strategy shapers should attend. The findings presented here indicate that although high employee health risk is a costly liability; low health risk, health motivations, and healthy behaviors are sources of value creation that may importantly promote a sustainable competitive advantage. I have shown that each aspect of health has clear organizational performance implications and health indeed may be source of value generation. I also outlined the importance and unique impact of physical/mental fitness behaviors and consumption behaviors on productivity and medical costs, respectively.

Overall, this research demonstrates that health should be approached as an issue of strategic importance to firms. Firms should strive to ‘unlock’ the resource potential of employee health to promote firm outcomes. Minimalistic approaches to

employee health management appear to be unwise – we need to rethink current organizational healthcare management practices.

To unlock the resource potential of employee health to generate firm value, organizations must treat health as a resource that is worthy of investment. Despite increasing evidence regarding the importance of health in organizations, most employers have failed to approach health as a factor that importantly influences employees' capabilities. Rather, as noted by Porter and Teisberg, health in most organizations has been treated as a growing cost burden, and short-term cost minimization strategies to eliminate or reduce health services have been heavily and increasingly employed (2006b). Although leading companies have begun exploring the resource potential of employee health (Business Roundtable, 2007; Watson Wyatt Worldwide and the National Business Group on Health, 2008), relatively few organizations have actively pursued health promotion and disease prevention as an organizational goal.

From a cost management perspective, this is an unwise organizational approach to employee health management. This is particularly true given that poor health management fosters the exacerbation of existing illness and the onset of other, more serious illness. Given that employers have increasingly limited their post retirement healthcare cost burden (Kuttner, 1999), the delay or prevention of costly medical conditions, such as a stroke or a heart attack is very likely *cost saving*.

Untreated health problems likely result in more costly future treatments and hospitalizations that, in turn, harm productivity by causing higher organizational rates of absenteeism and turnover. As such, minimalistic approaches to health

management not only promote higher medical costs, but they also fail to capitalize on the full potential of employees as resources. Further, as outlined in Chapter 3, employee's physical/mental fitness behaviors have a direct impact on their productivity in the sense that physical activity and mental health are associated in many ways with the optimization of individuals' potentials. As discussed above, the model 2 results suggest that 'physical/mental fitness' is an especially strong determinant of productivity that explains 43 percent of its variance.

These findings regarding the important impact of health on organizational outcomes prompt the need for much future research into employee health and its components and additional mechanisms by which they influence organizational outcomes. As discussed below, there is still *much* to be learned regarding each component of health and its underlying drivers. Importantly, we have much to learn regarding how organizations may strategically/cost-effectively approach employee healthcare management. As outlined below, future research on the capability of business to influence employee health will move us towards better understanding what may be the proper role/degree of involvement by organizations in social health promotion. Ultimately, we must determine the extent to which organizations' healthcare management may be strategically in-line not just with their own financial performance objectives but also more generally with the objectives of social health promotion.

The Role of Business in Social Health Promotion

Management scholars have called for greater examination of, and clarification regarding, vital normative questions of business purpose. They have asked, ‘given that the resources and capabilities of organizations are not unlimited, how, and to what extent, ‘should’ business interact with, and address the needs of, each of its diverse stakeholders?’ (Donaldson & Preston, 1995) Subsequently, Margolis and Walsh compellingly argued that the identification of a business’ core *abilities* to improve society is a crucial first step toward the identification of the boundaries that may define that business’ social responsibilities (2003).

More recently, Porter and Kramer asserted that social actions by firms should be ‘strategic.’ They defined ‘strategic’ corporate social responsibility to be social performance by firms that simultaneously improves the competitive positioning of the firm. They specifically assert that firms, and society, stand to benefit the most from social efforts by firms that “transform value chain activities to benefit society while reinforcing” the underlying competitive strategy (Porter & Kramer, 2006a: 89).

As discussed below, this research offers initial insight regarding both the core abilities (capacity) of business to influence health and how such influence efforts may qualify as ‘strategic social responsibility,’ in line with Porter and Kramer’s definition, given above. In so doing, this research also points to the need for future research in each of these regards.

The Capacity of Business to Promote Employee Health

Common U.S. business approaches to employee healthcare management incorrectly view employee wellbeing solely as a stagnant, profit eroding liability,

rather than as a potential resource that may be *cultivated* to promote organizational objectives. As outlined in Chapter 1, employee health is fundamentally path dependent, causally ambiguous, and socially complex. Consistent with the logic of RBV, this research indicates that it may be a value creating organizational resource in which organizations should invest and strive to promote. However, little is known regarding the *underlying costs* of building and maintaining health as an organizational resource.

In Model 1, I introduced and outlined the aspect of employee health, employee ‘health motivation’ that may be an important strategic target for firms. As outlined in Model 1, health motivations importantly underlie employees’ healthy behaviors. Future research should examine whether employee health motivation is a construct that is even under organizational influence. To the extent that it is, research should also examine the degree to which, and the conditions under, employee health promotion efforts may promote organizational outcomes such that the underlying costs of promotion are justified.

Research to date indicates that employees’ *participation* in organizational wellness promotion is highly associated with favorable organizational outcomes, such as reduced medical costs (Naydeck et al., 2008), turnover, and absenteeism (Gebhardt & Crump, 1990). Future research should examine the actual means by which organizational wellness promotion efforts and programs may be strategically wise. An important, as yet unexplored question is whether or to what extent organizational wellness promotion efforts are even capable of influencing employee wellness motivation. Because previous research has focused on outcome related to voluntary

participation in wellness programs, questions remain as to whether health motivation drives participation (and organizational outcomes) or whether organizational health promotion may be an underlying driver.

As outlined in Chapter 1, the underpinnings of healthy motivations are complex. They are rooted in multiple factors that drive health ambitions and determination; namely, accurate health knowledge, abilities, value for longer-term health at the sacrifice of short-term indulgences, and self-efficacy to successfully engage in healthy behaviors. Future organizational research should build upon the health promotion research to better understand how these diverse facts play out in organizations and how organizational leaders may build motivation in a cost effective manner.

Much too is yet to be learned regarding the nuanced implications of employees' diverse healthy behaviors and different types of health risks and whether organizations may build these resources in a cost effective manner. For example, how might different health behaviors relate to other multiple diverse types and forms of trait, state, and behavioral employee engagement recently outlined by Macey and Schneider (i.e., 'positive views of life and work,' 'feelings of energy, absorption,' and 'extra-role behavior') (2008)? For example, in what ways are health behaviors and decreased health risk related to other forms of employee engagement that are directed more intentionally at organizational promotion? How might a culture of wellness produce positive organizational outcomes? For example, does a culture of wellness promote group and team cohesion, positive affect, organizational citizenship behavior, loyalty to the organization, etc?

The findings presented here suggest that organizations possess employee health in varying degrees and in varying ways. Much research is needed to examine how, what type, and what levels of ‘employee health’ differently promote firm outcomes. Of crucial concern is the possibility that organizations that operate with poor employee health suffer from a pre-existing disadvantage in the sense that poor health is hindering productivity while concurrently promoting increased medical claims costs (due to higher premiums and the higher relative costs of treating more serious disease).

An additional important implication of this study is that organizations with different levels of pre-existing employee health likely face different healthcare cost structures and payoff schedules from investing in health as a resource. As outlined in Model 1, pre-existing health risk is an important determinant of underlying health motivations. As such, the pre-existing health risk of the workforce is a determinant of the ease with which organizations’ may achieve desired positive outcomes from wellness investment efforts. This is a crucially important consideration, not just from a strategic management perspective but also, as discussed below, from a public policy perspective.

To explore this topic, future research should investigate how, and when, employee health may be a more or less crucial resource to the organization from both a cost and resource perspective. For example, are there some job types for which productivity outcomes remain constant irrespective of whether employees’ health is ‘baseline’ versus ‘optimal?’ Are there some health concerns that are of more or less direct financial concern to organization in the sense that they are associated with

longer risk/outcome time horizons and or different long-term versus short-term costs of treatment/prevention? More specifically, are some health concerns of greater relative strategic concern to organizations? How does the list of ‘strategic’ health concerns potentially vary across organizations and employees? Are some health concerns therefore likely to go unaddressed by organizational leaders because they are of little immediate threat to the organization? What are the long-term performance implications of a short-term focus on employee health?

Additional questions regarding the implications of organizational health promotion efforts are also important to explore. For example, how might organizational leaders best structure health programming to specifically identify and address health concerns that are relatively more important from a financial performance perspective? Also, are employee health investments an effective means of attracting and retaining high quality employees? To the extent that health benefits are an important mode of employee attraction and retention, how might a culture of wellness versus limited health benefits offerings differently influence a firm’s ability to attract and retain employees? To the extent that health benefits are offered, under what circumstances should organizational leaders shift the burden of premiums to employees? In other words, how wise are the recent trends toward increasing employee premiums²?

It is also important to understand in what ways business may play a unique role in social health promotion that another institution could not. Namely, how might

² Premium increases in recent years have considerably exceeded inflation and increases in employee earnings. The Kaiser Family Foundation and Health Research and Educational Trust. 2007. Employer health benefits 2007 annual survey: 172. Menlo Park, CA: The Kaiser Family Foundation and Health Research and Educational Trust.

organizations uniquely impact employees' health motivations, behaviors, and risks? To what extent are employers, rather than insurance companies or government entities, best suited to promote health motivations?

The worksite setting may indeed be an ideal venue for some degree of social health promotion. Namely, businesses and organizational leaders may be uniquely positioned to empower individuals by offering crucially needed information, guidance, structure, motivation, and social support regarding healthy behavior changes. Future research should continue to explore how, and the extent to which, the unique capabilities of organizational leaders and organizations should be employed to address social health concerns. Do organizational leaders and businesses possess unique resources and capabilities that more efficiently and effectively enable them to promote individuals' health? If organizational leaders indeed are uniquely positioned to influence social health, by what specific means might their involvement best be implemented?

In addition to current wellness programming approaches to health, which include endorsing, enabling, and rewarding positive health behaviors, by what other means might organizational leaders enhance their capability to promote wellness? For example, to what extent do the organizational leaders' personal health habits serve as an important example/guide for employees? Are healthier managers more successful and/or persistent in their efforts to promote healthy behaviors? Additionally, it is important to further explore how, and to what extent, organizational leaders' initiative and capabilities to influence employee health behaviors may vary across organizations, and work environments, and employees.

Finally, it is important to note that this research also prompts many concerns regarding the ethical implications of health as an organizational resource. For example, under what circumstances is discrimination based on health more likely in organizations? How might this concern best be addressed? Conversely, are there some operating environments in which the health of employees is likely to go unaddressed by organizations because the costs of achieving ‘optimal’ employee health are not financially justified?

Employee Healthcare as Strategic Social Performance

Employee health has a potentially enormous impact on multiple aspects of firms’ value chains. As outlined in this research, it directly impacts organizational medical costs and productivity in nuanced ways. Thus, it is important to better understand how healthcare may be designed to support firms’ core strategic interests.

By exposing the value generating potential of employee health, this research has offered new insight into the degree to which, and how, organizations may simultaneously address their moral and financial interests in employees’ health. These findings indicate that attention to employee health may be justified not only normatively, but also financially. Namely, this research offers initial insight into congruence between businesses’ and employees’ common interests in health and the strategic relevance of building, supporting, and developing an employer – employee exchange relationship that addresses this common interest. As such, I assert that organizational efforts to promote employee health may be viewed as *strategic* social performance. Future research should continue to examine the nuanced strategic implications of employee health.

Chapter Summary

This research demonstrates that health is a value creating organizational resource to firms and that it is comprised of three distinct aspects – risk, motivation, and behaviors, which uniquely impact outcomes. Employees’ physical/mental fitness behaviors more significantly impact organizational productivity. Employees’ consumption behaviors more significantly impact medical costs. As such, employers should approach employee health as a strategic management issue. The relationships demonstrated in this research further suggest that organizations may simultaneously promote their bottom-line and social performance by promoting employees’ health via wellness programming that is targeted toward increasing health motivations. Future research should examine the extent to which, and by what means, employers may best promote employee health motivation.

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