IS LEGITIMACY CONTAGIOUS?

THE COLLECTIVE LEGITIMATION OF ALTERNATIVE THERAPIES

IN THE U.S. HOSPITAL INDUSTRY

A Dissertation

Presented to the Faculty of the Graduate School

of Cornell University

In Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

by

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August 2008

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Cornell University 2008

This dissertation research examines the rise and spread of alternative medicine in the U.S. health care field. Alternative medicine includes a variety of treatment therapies (e.g., acupuncture, therapeutic touch, acupressure, etc.) whose underlying principles rest uneasily with those of dominant mainstream medicine. Although their efficacy is still subject to challenge by the medical establishment, these therapies have enjoyed increasing public acceptance in the last two decades, and recently a number of hospitals have begun to incorporate them into their formal structure.

In this context, I explore an under-theorized process, the contagion of legitimacy among practices – how the adoption of one or more therapies by a given hospital affects the adoption of other alternative therapies by other hospitals. I suggest that the spread of one practice can be regarded as an informational cue on which potential adopters rely in deciding whether to adopt other associated practices. As long as the informational cue enhances the familiarity and acceptability of new practices, this type of influence may be understood as the process in which the legitimacy of some practices is transferred to other associated practices. As an underpinning process of such association, I focus on categorization which lumps similar practices into a common category and thus creates a common identity for the

grouped practices. I argue that a categorical scheme serves as a cognitive basis for association between practices that would otherwise be viewed as disconnected.

I empirically examine if the adoption of members of one group of alternative therapies accounts for variation in adoption rates of other therapies which are also in the same group. The findings of analyses strongly support my argument that prior adoptions of alternative therapies by hospitals enhance diffusion rates of other therapies, especially when the therapies present a coherent categorical identity. This study concludes with theoretical implications of the empirical findings and directions for future research.

BIOGRAPHICAL SKETCH

Sangchan Park received his undergraduate degrees in sociology and psychology from Yonsei University, South Korea in 1999. He continued his studies at the Graduate School of Yonsei and received a Masters of Business Administration in 2001. After graduation, he spent two years working at the Korea Development Institute. Sangchan began his doctoral studies at Cornell in 2003, graduating with a Ph.D. in Industrial and Labor Relations in 2008. At Cornell, he developed his interests in organization theory, entrepreneurship, and strategy. Within these general areas, his work focused primarily on the legitimation of non-legitimate ideas and practices, such as alternative medicine, non-tenure systems for faculty appointments, and information withholding by scientists. Sangchan recently accepted a position at the National University of Singapore as an assistant professor. He is married to Jinkyung and has a two year old son, Daniel Chanhee, and a two week old daughter, Julia Joohee.

ACKNOWLEDGMENTS

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CHAPTER 1

INTRODUCTION

1.1 Overview

  Researchers from various disciplines have long investigated the spread of new ideas and practices in populations of individuals and organizations. In this view, the diffusion processes are shaped not only by individual attributes of adopters, but by linkages between members of the population who have and have not yet adopted innovations (Karshenas and Stoneman 1993; Rogers 2003; Strang and Soule 1998). Research has often regarded diffusion through linkages as contagion in which adoption decisions of potential adopters are driven by their exposure to prior adopters especially when decisions are made in highly ambiguous contexts. This concept of contagion has been illustrated by a variety of studies, including the diffusion of technical innovations, such as hybrid corn, telephones, and prescription drugs (Ryan and Gross 1943; Coleman, Katz, and Menzel 1966; Rogers 2003), and the spread of formal structures and management practices across organizations, such as civil service reform, multidivisional forms, poison pills, and audit firm defections (Tolbert and Zucker 1983; Fligstein 1985; Davis 1991; Jensen 2006). Stated generally, these studies provide relational models which posit that contagion occurs between prior and potential adopters embedded in social linkages.

  My dissertation research extends the concept of contagion to explain whether and how the acceptance of some non-legitimate practices by a set of actors influences the adoption of similar practices by other actors. This is a significant departure from previous research on diffusion, which has almost exclusively focused on the introduction and spread of a single practice. In my research, contagion is not simply understood as a relational source of diffusion of a single practice; it is a process in which some practices accepted by prior adopters infect other non-legitimate practices

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such that the diffusion of some practices increases the likelihood of other associated practices being accepted by potential adopters. Put differently, prior adoptions of a practice are not only relevant to the spread of the same practice, but they are also relevant because they can affect some potential adopter's perceptions of other associated practices. Insofar as an accepted practice A positively affects perceptions of the other practice B, B is more likely to be adopted. Raised to a level of symbolic abstraction, this involves contagion in which A infects B.

Central to this process is the question of whether and how association occurs between multiple practices. As an underpinning process of such association, I focus on categorization which lumps similar practices into a distinct category. In particular, I emphasize one consequence of such categorization—the construction of shared understandings about similarities among categorized practices (Rosch 1978; Barsalou 1999; Lounsbury and Rao 2004). These similarities may serve as a cognitive basis for association between practices that would otherwise be viewed as disconnected (Strang and Meyer 1993; Hamilton 2007).

Given the presence of association, the adoption of one practice is likely to become an informational cue on which potential adopters rely in deciding whether to adopt other associated practices. Especially when adoption decisions are made in the context where a new practice involves high uncertainty but no direct social cues are available due to the absence of prior adopters of the same practice, those who adopted associated practices can be regarded as alternative sources of social cues that guide potential adopters under uncertainty. Moreover, as long as the informational cues enhance the familiarity and acceptability of new practices, this type of contagion may also be understood as the process in which the legitimacy of some practices is transferred to other practices in the same category (Zucker 1987; Dobrev, Ozdemir and Teo 2006).

Using the emerging niche of alternative medicine in the conventional healthcare field as an empirical setting, I ask if a categorical group of alternative therapies already adopted by hospitals account for differences in adoption rates of other alternative therapies in the same category. Alternative medicine affords a useful context in which to examine my theoretical arguments. First of all, alternative medicine includes a wide range of multiple medical practices, such as acupuncture, therapeutic touch, acupressure, and others whose underlying principles rest uneasily with those of dominant mainstream medicine. Moreover, these therapies entail higher uncertainty in part because conclusive biomedical evidence for their therapeutic efficacy is not available yet. Most importantly, there exists a formal categorization scheme that provides perceptions of similarity and association between diverse alternative therapies, as shown in Figure 1.1. Table 1.1 provides brief descriptions of the nine therapies in the categorical scheme.

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┌─────────────────────── Alternative Medicine ──────────────────────┐
│  ┌─Alternative Systems of Medical Practice─┐                       │
│  │  Acupuncture                            │                       │
│  │  Homeopathy                             │                       │
│  │  Naturopathy                            │                       │
│  │              ┌──────────────────────────┼────────────────────┐ │
│  │              │  Acupressure             │                    │ │
│  │              │  Massage therapies       │                    │ │
│  │              │  Tai Chi/Qi Gong         │                    │ │
│  └──────────────┼──────────────────────────┘                    │ │
│                 │                         Therapeutic touch      │ │
│                 │                         Reflexology            │ │
│                 │                         Chiropractic           │ │
│                 └──── Manual Healing Methods ────────────────────┘ │
└────────────────────────────────────────────────────────────────────┘
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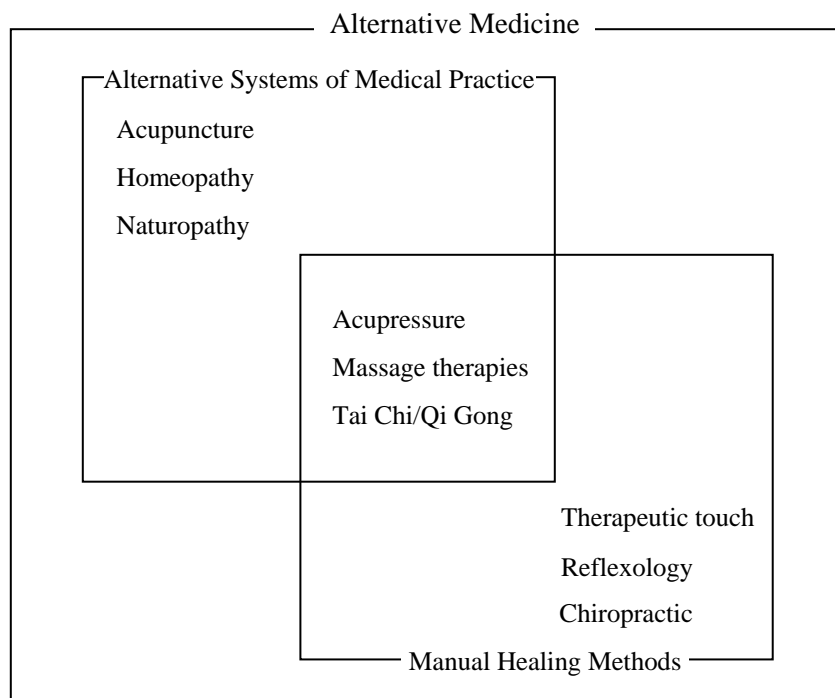
Source: Adapted from Workshop on Alternative Medicine 1995.

Figure 1.1 Categories of Alternative Therapies

Table 1.1 Definitions of Selected Alternative Therapies

Definition	Specific therapies
Acupuncture	A family of procedures involving stimulation of anatomical points on the body by a variety of techniques. The acupuncture technique that has been most studied scientifically involves penetrating the skin with thin, solid, metallic needles that are manipulated by the hands or by electrical stimulation.
Acupressure	Acupressure involves placing physical pressure by hand, elbow, or with the aid of various devices on different energy points on the surface of the body.
Chiropractic	Chiropractic medicine focuses on the relationship between bodily structure (primarily that of the spine) and function, and how that relationship affects the preservation and restoration of health.
Homeopathy	Small, highly diluted quantities of medicinal substances are given to reduce or eliminate symptoms. This therapy is based on the principle that a substance that can cause certain symptoms when given to a healthy person can cure those same symptoms in someone who is sick.
Massage therapies	Massage therapists manipulate muscle and connective tissue to enhance function of those tissues and promote relaxation and well-being.
Naturopathy	Practitioners work with the patient with a goal of supporting a healing power in the body that establishes, maintains, and restores health, through treatments such as nutrition and lifestyle counseling, dietary supplements, medicinal plants, exercise, homeopathy, and treatments from traditional Chinese medicine.
Reflexology	Reflexology therapists use finger pressure on specific zones on the feet that are believed to affect specific organs.
Tai chi/Qi Gong	Taichi is a noncompetitive, self-paced system of gentle physical exercise, involving a series of postures or movements in a slow manner. Qi gong combines movement, meditation, and regulation of breathing to enhance the flow of qi, or vital energy in the body.
Therapeutic touch	Therapeutic touch is based on the premise that it is the healing force of the therapist that affects the patient's recovery; healing is promoted when the body's energies are in balance; and, by passing their hands over the patient, healers can identify energy imbalances.

According to the scheme, the term "alternative medicine" per se represents a distinct category of medical treatments that broadly applies to a collection of disparate alternative therapies. Within this broad category, there are a series of subcategories, each of which includes a number of specific therapies. For instance, the subcategory of manual healing methods consists of diverse therapies such as chiropractic, reflexology, and therapeutic touch, among others. Note that the categories are not always mutually exclusive (e.g., acupressure, massage therapies and Tai Chi/Qi Gong). As shown in Figure 1.1, this study focuses on two subcategories – alternative systems of medical practice and manual healing methods, and nine of the member therapies.

The categorization scheme was first proposed in 1992 by both alternative practitioners and conventional medical professionals who participated in the first conference on alternative medicine sponsored by the National Institute of Health (NIH), and was then officially adopted by the Office of Alternative Medicine (OAM), a government agency within the NIH. The OAM used the proposed categories when providing funding to universities and individual researchers and documenting fact sheets, thereby making the categorization scheme widely available. For instance, this scheme has been used by nationwide surveys (e.g., Barnes et al. 2004), government reports (e.g., WHCCAM 2002), clinical trials (www.clinicaltrials.gov), and popular journals and newspapers.

Insofar as the categorization scheme provides the shared understanding that multiple practices belong to a common category of "alternative medicine," the therapies will likely be perceived as similar and associated with each other. The perceptions of similarity and association serve as a critical condition that makes a focal hospital sensitive to the spread of other associated practices. My main argument is that given the perceived similarity and association, prior adoptions of individual therapies may enhance diffusion rates of other associated therapies. Take acupuncture

as an example. As prior research on diffusion suggests, a focal hospital's adoption of acupuncture may be driven, in part, by prior adoptions of the same practice – i.e., the number of other hospitals that already adopted acupuncture. However, my research significantly departs from the traditional approach by suggesting that prior adoptions of other practices (other than acupuncture) by other hospitals may have an impact on a focal hospital's adoption of acupuncture when the focal hospital attends to the spread of other associated therapies in the same category to guide its adoption behavior.

It is worth noting that alternative therapies may not have the same chance of affecting and being affected by one another. Consideration of this possibility in turn gives rise to other hypotheses regarding factors that explain differential influences that some alternative therapies may have on adoption rates of other therapies. In particular, I examine two general factors: categorical characteristics of therapies that are subject to adoption by hospitals and relational characteristics of hospitals that adopt therapies.

Categorical characteristics of therapies refer to unique positions of individual therapies relative to other therapies in the categorization scheme as shown in Figure 1.1. I focus on two key characteristics: categorical similarity and ambiguity. Therapies are regarded as more similar when they are in the same subcategories, whereas therapies lie in an ambiguous categorical position if they are members of more than one subcategory. For instance, acupuncture is more similar to homeopathy than to chiropractic, since acupuncture and homeopathy are located in the same subcategory. Acupressure, massage therapies and Tai Chi/Qi Gong are categorically similar to acupuncture, but categorically ambiguous since they are organized into two subcategories simultaneously (see Figure 1.1). I argue that these categorical characteristics of alternative therapies may account for differences in adoption rates. Specifically I ask (1) if prior adoptions of therapies that are part of the same subcategory as a focal therapy are more predictive of the adoption of the focal therapy

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by a potential adopter (categorical similarity) and (2) if prior adoptions of therapies that are members of more than one subcategory have a weaker effect on the adoption of the focal therapy by a potential adopter (categorical ambiguity).

By relational characteristics of hospitals, I mean unique positions of individual hospitals relative to other hospitals in the social linkages. I concentrate on three relational properties: network ties, structural equivalence, and status. The thrust of prior research on social contagion between prior and potential adopters is that the behavior of potential adopters is driven by their exposure to prior adopters and that such exposure is largely shaped by social structural positions of prior and potential adopters. Drawing on this argument, I suggest that if a focal hospital is exposed to other hospitals that adopted one therapy (for instance, chiropractic) through relational linkages, the focal hospital attends to the spread of other associated therapies (such as therapeutic touch) in the same category. This is not to reiterate the traditional argument that prior adoptions of chiropractic lead to additional adoptions of chiropractic; instead, it is to emphasize that relational linkages of hospitals can increase the awareness of chiropractic, which eventually influences the adoption of therapeutic touch on the basis of categorical association. I empirically examine if other therapies are influential for the adoption of a focal therapy (1) when prior adopters of other therapies have network ties to potential adopters of the focal therapy, (2) when prior and potential adopters are structurally equivalent, and (3) when prior adopters are high-status hospitals.

1.2 Chapter outline

In Chapter 2, I describe the empirical context of this research in more detail, answering questions such as: What is alternative medicine's general approach to treatment and how is it different from conventional care (Section 2.1)? How are

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specific alternative therapies different from each other (Section 2.2)? How has alternative medicine historically evolved and what affected the evolution (Section 2.3)? Finally, how are hospitals – the main focus of this research – situated in the recent acceptance of alternative medicine and other broader changes in the health care field (Section 2.4)?

In Chapter 3, I develop a theory of contagion across multiple practices to explain how the diffusion of some practices influences the diffusion of other practices. I begin by providing an introductory discussion of prior work on contagion between actors (Section 3.1). I then discuss the limitations of the prior research in its ability to explain the diffusion patterns in my empirical setting and many other emerging market niches (Section 3.2). This provides a theoretical justification for a new approach fully detailed in the remaining two sections of Chapter 3. In Section 3.3, I examine categorization as a general condition under which contagion across practices can emerge. In Section 3.4, I further present causal mechanisms for the contagion process. The chapter concludes with a general proposition: Given the presence of perceived association between practices, the diffusion of some practices increases the likelihood of other practices being accepted by potential adopters.

These general theoretical accounts for contagion across practices are followed by specific hypotheses in Chapter 4. In Section 4.1, I present hypotheses that examine the formal incorporation of alternative therapies into hospitals' array of conventional treatment services. I focus on nine of the most widely used alternative therapies, as shown in Figure 1.1, and ask if prior adoptions of eight alternative therapies already adopted by hospitals increase adoption rates of the other alternative therapy. Since alternative therapies are unlikely to have the same chance of affecting and being affected by one another, I also develop other hypotheses regarding factors that explain differential influences that alternative therapies may have on adoption rates of other

therapies. The first set of hypotheses focuses on categorical characteristics of therapies (Section 4.2), while the second set of hypotheses primarily relates to relational characteristics of hospitals (Section 4.3).

In Chapter 5, I describe sample (Section 5.1), empirical setting (Section 5.2), analytic procedures (Section 5.3), and measurement of variables and data sources (Section 5.4).

Chapter 6 provides my empirical findings. For simplicity, I concentrate on the adoption of acupuncture as a focal therapy when I report results of various analyses, including categorical characteristics hypotheses (Section 6.1) and relational characteristics hypotheses (Section 6.2). In Section 6.3, I report results of additional analyses to show comparisons across therapies, such as acupuncture, therapeutic touch, and acupressure – the three therapies that represent three different categorical positions in Figure 1.1. The section also provides other results of analyses to show whether contagion across practices operates even among conventional therapies and whether the main results reported in Sections 6.1 and 6.2 are robust.

Chapter 7 summarizes this research (Section 7.1), discusses alternative explanations and generalization issues (Section 7.2), and provides the implications of this research and directions for future research (Section 7.3).

CHAPTER 2

CONTEXT

A Short History of Medicine

(Author unknown)

I have an earache.
2000 B.C. Here, eat this <u>root</u>.
1000 A.D. That root is heathen. Here, say this prayer.
1850 A.D. That prayer is superstition. Here, drink this potion.
1940 A.D. That potion is snake oil. Here, swallow this pill.
1985 A.D. That pill is ineffective. Here, take this antibiotic.
2000 A.D. That antibiotic is artificial. Here, eat this <u>root</u>.

This dissertation is a timely exploration into the emerging industry niche of alternative medicine in the United States. The most widely cited national study of alternative medicine's magnitude (Eisenberg et al. 1998) estimated that there were 629 million visits to alternative medicine practitioners in 1997. Total 1997 out-of-pocket expenditures relating to alternative therapies were estimated at $27 billion – more than those for all U.S. physician services. According to various estimates, Americans are currently spending more than $20 billion on dietary supplements alone (Ruggie 2004).[1]

Alternative medicine is not a name of a specific medical therapy but an

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[1] There have been a number of national surveys whose results are different. In a survey by Astin (1998), 40% of the respondents used alternative medicine. A Landmark Healthcare Inc. (1998) survey found that 42% of respondents used alternative medicine. A secondary analysis of the 1996 Medical Expenditure Panel Survey (n=16,038) found that only 9% of the population used alternative medicine. The last survey gave respondents a list of 10 alternative therapies, whereas the Eisenberg et al. (1993, 1998) and Astin (1998) surveys gave them a list of 16 therapies. Because the Eisenberg et al. and Astin surveys included megavitamins, commercial diet, and lifestyle diet, they have been criticized for overestimating unconventional use. Recently the most comprehensive findings on Americans' use of alternative medicine were released in May 2004 by the National Center for Complementary and Alternative Medicine (NCCAM) and the National Center for Health Statistics (NCHS, part of the Centers for Disease Control and Prevention) (Barnes et al. 2004). According to this survey, 36% of adults are using some form of CAM. When megavitamin therapy and prayer specifically for health reasons are included in the definition of CAM, that number rises to 62%. These statistics came from the 2002 edition of the NCHS's National Health Interview Survey (NHIS), an annual study in which tens of thousands of Americans are interviewed about their health- and illness-related experiences. It was completed by 31,044 adults aged 18 years or older from the U.S. civilian population.

umbrella term given to a collection of multiple medical practices, such as acupuncture, chiropractic, homeopathy, naturopathy, and herbal remedies, among many others. As acknowledged by the term "alternative," these therapies are often argued to embody a number of techniques and perspectives that do not conform to the conventional Western standards of biomedicine and potentially challenge the commonly assumed viewpoints of dominant professionalized systems of the U.S. healthcare (Eisenberg et al. 1993; Winnick 2005). Indeed, alternative medical practices are typically referred to as those that are not widely accepted by the dominant medical establishment, such as hospitals or medical schools. For instance, the National Center for Complementary and Alternative Medicine (formerly the Office of Alternative Medicine), the Federal Government's lead agency for scientific research on alternative medicine, defines alternative medicine as:

> a group of diverse medical and health care systems, practices, and products that are not presently regarded as part of conventional medicine, practiced by holders of M.D. (medical doctor) or D.O. (doctor of osteopathy) degrees and by their allied health professionals, such as physical therapists, psychologists, and registered nurses (NCCAM, retrieved on April 10, 2008 from http://nccam.nih.gov/health/).

This definition implies that alternative medicine is defined by its residual nature. A natural consequence is then a high level of heterogeneity among alternative therapies. Therefore, the use of an umbrella term may gloss over the diversity of specific alternative therapies and may not reflect the substantial difference that exists among a wide array of practices. "[S]ome of the practices are so different that one risks committing a fundamental error by lumping them all under the same rubric" (Ruggie 2004: 3).

Despite the risk associated with the use of an umbrella term, alternative medicine has been widely used as a representative name for multiple therapies for the

last two decades. Figure 2.1 presents the count of a term, "alternative medicine," used by popular news articles and medical research journals between 1970 and 2006. I used LexisNexis® Academic and MEDLINE, respectively. LexisNexis® Academic provides access to full text resources on topics including current and general news searchable online. MEDLINE covers over all major journals in all areas of medicine, 1965 to the present. The figure shows that the term, "alternative medicine," is relatively a new invention; it was not widely employed by popular news articles and medical journals in the 1970-80's, but has rapidly gained public and academic acceptance since the early 1990's.
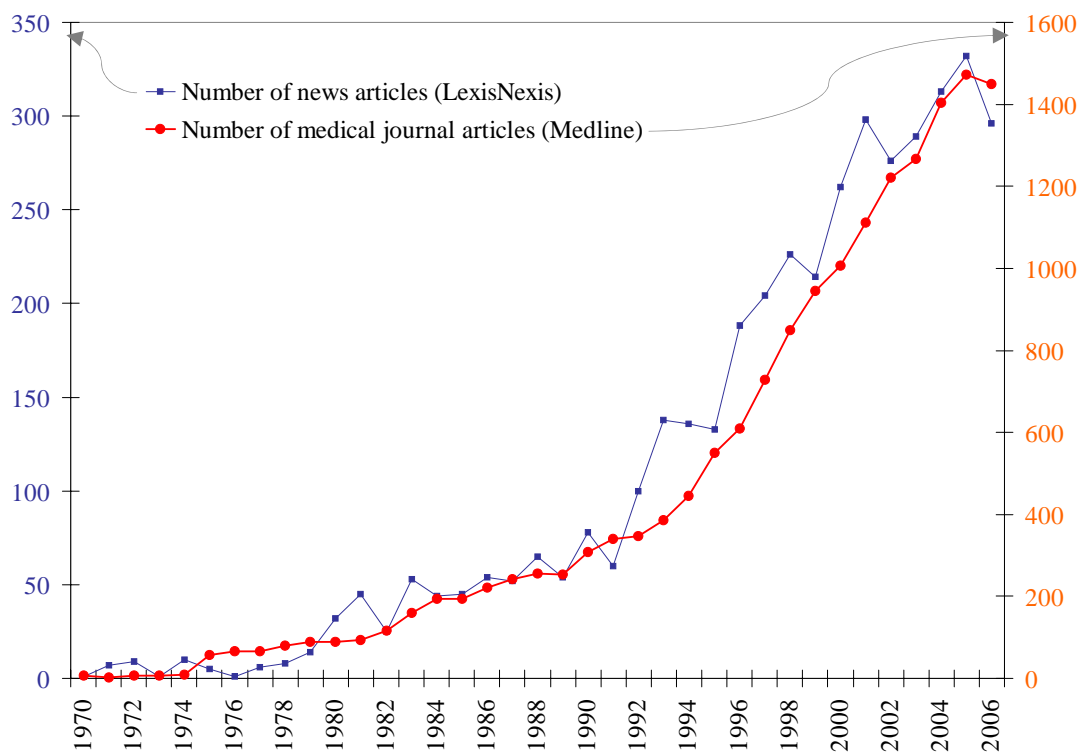
Figure 2.1 Number of Articles on Alternative Medicine

Acknowledging the diversity of procedures classified as alternative medicine, I first describe common characteristics and logics that differentiate many alternative

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therapies from the mainstream biomedical medicine, such as the healing power of nature, holism, balance, and energy (Section 2.1). I then provide a more nuanced description of alternative therapies by explaining how specific therapies are substantially different in terms of historical origins, actual delivery of treatments, diagnostic procedures, clinical evidence, and legal status (Section 2.2).

In Section 2.3, I describe the history of alternative medicine. I begin with the nineteenth century when the health and healing landscape was characterized by a diversity of healing traditions and practices, and then move to the mid-19th century when the health landscape with multiple healing traditions began to change. In particular I concentrate on the role of American Medical Association (AMA) in the establishment of exclusive jurisdictional boundaries. The AMA often adopted labels such as irregular and quackery to ostracize competing practices and practitioners (Whorton 2002). The capability to define what is regular and culturally sanctioned as normative is a profound power, indicating professional dominance. I also emphasize the release of a report by Abraham Flexner in 1910, because the Flexner report was not only a manifesto to reform and consolidate the medical profession but also an important force that pushed alternative therapies to the margins of American healthcare field. If alternative medicine was delegitimized as stereotypical quackery and marginalized, then how can we explain the impressive change from limited use of alternative medicine to the rapid dissemination and public popularity? I draw on extant lines of research to suggest multiple explanations, including the widespread interest in counterculture that emerged in the 1960s (Berliner and Salmon 1980; Whorton 2002), the inability of conventional medicine to cure chronic illness (e.g.,Spencer and Jacobs 1999; Bloom et al. 2000), the professionalization of alternative practitioners and the decrease in organized power of conventional medical professions (e.g., Scott et al. 2000; c.f., Abbott 1988; Welsh et al 2004; Wailoo et al.

2004), and the increasing role of major market actors, such as pharmaceutical manufacturers, managed care organizations, insurance firms, the media, and government agencies (Goldstein 2000).

Finally, Section 2.4 examines how hospitals are situated in the recent acceptance of alternative medicine and other broader changes in the healthcare field. Drawing upon the data collected by the American Hospital Association, I first examine general trends in the spread of alternative therapies among hospitals. I then summarize results of interviews and observations that I conducted to understand sources of increased acceptance by hospitals and conditions that affect adoption decisions made by hospitals.

2.1 Unifying principles of alternative medicine

Most alternative therapies are argued to share the overarching belief that humans have built-in recuperative powers (Dossey and Swyers 1995; Whorton 2002; Ruggie 2004). This is often referred to as *vis medicatrix naturae* – the healing power of nature – the Latin phrase that has been used for centuries to signify the inborn ability of the human body to respond to the insult of illness or injury and restore itself to health in most episodes of disease or trauma (Whorton 2002). According to this view, the most appropriate foundation of medical practices lies in the natural healing process and thus therapies should focus on stimulating the patient's internal ability to recover (Dossey and Swyers 1995).

Whorton (2002) succinctly describes the emphasis of alternative medicine on self-healing as "Hippocratic heresy" (p. 3). For conventional doctors, Hippocrates is the father of medicine; for alternative medicine's heretics, Hippocrates is more important for his advocacy that echoes alternative medicine's worldview – e.g., trust in the sick person's power to recover, without aggressive medication, and avoidance

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of treatments that might inhibit the *vis medicatrix*. In general, alternative therapists claim that their approaches better reflect Hippocratic injunction – i.e., first do no harm, since they emphasize prevention rather than intervention, rely on the least harmful treatments, and tend to avoid suppressing symptoms which are understood as a manifestation of a more profound underlying cause of problems that must be addressed (Dossey and Swyers 1995; Whorton 2002).

Other unifying principles shared by most alternative therapies include holism, balance, and energy (Workshop on Alternative Medicine 1995: xxxix-xl; WHCCAMP 2002: II 3). Holism is the principle that all aspects of the person are interrelated and must be addressed in treatment, not just the specific disease or specific body part that is affected. The principle of balance refers to harmony among organ systems in the body and between the body and its environments. Imbalance in any of the systems is understood to affect other part of the systems. Thus, alternative practitioners often suggest that to achieve balance, energy must be equalized between the imbalanced parts (Dossey and Swyers 1995). For instance, in traditional Chinese medicine, an organ is imbalanced when it is too yang or too yin. To restore harmony among the organs, *qi* (the Chinese term for energy) must be transferred from the yang organ to the yin organ, and the balance can then extend into physical and mental aspects of the person (Kaptchuk, 2000).

In addition to the differences in philosophical underpinnings and types of therapies offered by conventional and alternative medicine, there are also other differences in how therapies are administered and how the practitioners and patients interact. For instance, conventional medical practitioners tend to provide standardized treatments and medical advice based on a number of broadly defined symptomatic categories. In this view, the physician is the authoritative expert and the patient is a passive participant, indicating physician-centered interactions (WHCCAMP 2002). In

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contrast, alternative medical practitioners claim that they view each patient as unique and therefore provide individualized treatment to fully address patient needs (Goldstein 2000, 2002), emphasizing a patient-centered relationship.

It is worth noting that some differences between conventional and alternative medicine could be a matter of emphasis, although there are substantial differences in historical origins and philosophical underpinnings (WHCCAMP 2002). As conventional medicine developed effective treatments for many of the infections and severe injuries based on biomedical and technological advances, prevention and wellness promotion through diet, foods, and life styles have been underemphasized (e.g., Cooksey et al 2000; Adams et al 2006). In contrast, alternative practitioners have come to be identified with self-care, relaxation, exercise, diet, and nutrition, possibly reflecting the lack of effective treatments for the types of disease and illness treated by conventional health care.

2.2 Different characteristics of specific alternative therapies

Table 2.1 lists a variety of therapies and remedies identified as alternative medicine by participants at the first conference on alternative medicine in 1992, known as the Chantilly Conference. A diverse group of conventional and non-conventional medical researchers and practitioners were invited to the conference, where they elaborated the definition of alternative medicine and clarified the similarity and difference between alternative therapies. This conference provided a basis for categorizing alternative therapies into seven subcategories, often referred to as "fields of practice" (Workshop on Alternative Medicine 1995): alternative systems of medical practice, manual healing methods, mind-body interventions, herbal medicine, bioelectromagnetics, pharmacological and biological treatments, and diet and nutrition in the prevention and treatment of chronic disease.

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Table 2.1 Categories of Alternative Therapies

Subcategories	Examples of specific therapies
Alternative Systems of Medical Practice	Traditional oriental medicine (acupuncture, acupressure, massage, qigong, herbal medicine), Ayurvedic medicine, homeopathy, anthroposophy, naturopathy, and environmental medicine, native American Indian medical systems (sweating and purging, herbal remedies, shamanic healing, and singing), Latin American practices (a humoral model for classifying activity, food, and drugs, and a series of folk illnesses), Alcoholics Anonymous, and other popular health care from informal sources
Manual Healing Methods	Osteopathic medicine, chiropractic medicine, massage therapy, Reflexology, acupressure, Alexander technique, Feldenkrais method, Trager psychosocial integration, and structural integration, healing touch, huna (traditional Hawaiian), mari-el, natural healing, qigong, reiki, specific human energy nexus (SHEN) therapy, and therapeutic touch, applied kinesiology, network chiropractic spinal analysis, polarity therapy, qigong longevity exercises, and craniosacral therapy
Mind-Body Interventions	Support groups, meditation, imagery, hypnosis, biofeedback, yoga, dance therapy, music/art therapy, and prayer and mental healing
Bioelectromagnetics	Use of nonthermal, nonionizing electromagnetics for bone repair, nerve stimulation, wound healing, and treatment of osteoarthritis.
Pharmacological and Biological Treatments	Antineoplastons, cartilage products, ethylene dialing tetraacetic acid (EDTA) chelation therapy, ozone, immunoaugmentative therapy, 7I4-X, Hoxsey method, Essiac, Coley's toxins, MTH-68, neural therapy, apitherapy
Herbal Medicine	Ginkgo, ginseng, menthol, mint, horehound, camphor, eucalyptus
Diet and Nutrition	Vitamins, nutritional supplements, alternative dietary lifestyles (e.g., vegetarian diets)

Source: Workshop on Alternative Medicine. 1995. Alternative Medicine: Expanding Medical Horizons. A Report to National Institute of Health on Alternative Systems and Practices in the United States. Washington, DC: U.S. Government Printing office.

The presence of fields of practice within the overarching category of alternative medicine implies that specific therapies are different across their subcategories. To further exemplify substantial differences within alternative medicine, I concentrate on two fields of practice – alternative systems of medical practice and manual healing methods. The first subcategory, alternative systems of medical practice, broadly refers to self-care according to folk principles and care given in an organized health care system based on an alternative tradition, such as traditional oriental medicine (Workshop on Alternative Medicine 1995). Among the nine therapies shown in Figure 1.1, acupuncture, acupressure, homeopathy, massage, naturopathy, and Taichi/Qigong are categorized into the subcategory of alternative systems of medical practice field of practice. The second subcategory, manual healing methods, includes therapies that focus on manipulating soft tissues or realigning body parts. This approach is based on the claim that the dysfunction of bodies can be resolved by correcting misalignments and manipulating soft tissues (Workshop on Alternative Medicine 1995). Chiropractic, reflexology, therapeutic touch, acupressure, massage, and Taichi/Qigong are organized into the subcategory of manual healing methods.

It is notable that the analytic basis of seven subcategories is not clear (Ruggie 2004). The Chantilly Conference participants did not specify how they categorized alternative therapies to distinguish fields of practice. Rather it seems that they simply drew on existing categories that they identified as "traditional." According to the committee that organized the conference, "traditionally, alternative medical disciplines often have been divided into four categories," which include mind-body, diet and nutrition, biologics and pharmacologics, and manual healing (Workshop on Alternative Medicine 1995: xlvi). It appears that these categories are based on the major techniques and types of treatment employed by practitioners. For example, the

mind-body category includes practitioners who use psychological techniques such as mental imaging, whereas therapists in the manual healing category typically draw on physical forces. Later, the committee decided to deviate from the traditional scheme by adding two new sub-categories, alternative systems of medicine and herbal medicine, without presenting any justification. One speculation about the underlying rationale for the new sub-category of alternative systems is that therapies in the category may involve specific ethnic groups (e.g., Ayurvedic medicine and India).

Yet there are some analytical problems with the categories. For instance, acupuncture and herb are typically used together within the traditional oriental medicine, but they are categorized into different subcategories. Moreover, alternative systems of medical practices include some therapies already grouped in other subcategories. For example, acupressure, massage, and Taichi/Qigong are organized into two subcategories simultaneously. A criterion that good typologies must meet to be adequate for classification purposes is whether categories are mutually exclusive. Since some therapies fit into more than one category, the categorical scheme violates this criterion. The analytic problems of proposed categories provide additional evidence for how difficult it is to grasp similarities and differences among very different alternative therapies.

Below I describe the nine therapies within two fields of practice to show how they are different in terms of historical origins, actual delivery of treatments, diagnostic procedures, clinical evidence, and legal status.

Acupuncture: Originated from ancient Chinese medicine, acupuncture involves stimulating specific anatomic points in the body as a way of regulating the flow of qi. According to traditional Chinese medicine, an internal imbalance of the body leads to blockage in the flow of qi and ultimately causes disease. Qi can be unblocked by using acupuncture at certain points on the body. Puncturing the skin with fine needles

is the usual method, but practitioners also use heat or suction. A series of controlled studies has shown compelling evidence for the efficacy of acupuncture in the treatment of a variety of conditions, including osteoarthritis, chemotherapy-induced nausea, asthma, back-pain, and migraine headaches (Birch et al 2004).

Although acupuncture was initially introduced to some practitioners on the east coast of the United States by the late 19th century (Lytle 1993), it became better known in 1971, when New York Times reporter James Reston published a front-page account of how doctors in China used needles to ease his pain after surgery, along with other cures by Chinese acupuncturists. The first practice act legislation for acupuncture was enacted in 1973 in Maryland, Nevada and Oregon, and as of 2006, forty three states have enacted practice acts. There were an estimated 22,000 acupuncture practitioners in 2004 (Cohen 2005). Among 70 schools of acupuncture, 47 are accredited by Accreditation Commission for Acupuncture and Oriental Medicine (ACAAOM) as of 2006. The National Certification Commission for Acupuncture and Oriental Medicine (NCCAOM) offers certification programs. The 2002 National Health Interview Survey, the most comprehensive survey of acupuncture use by American adults to date, estimated that about eight million adults had ever used acupuncture.

Acupressure: Developed in Japan in the early 1900s, acupressure includes four several methods, including shiatsu, tsubo, jin shin jyutsu, and jin shin do, all of which use the fingers, not needles, to manipulate the oriental meridian points (Rubik and Pavek 1995). Based on traditional oriental medical theory, acupressure practitioners argue that their hands-on methods of stimulating the acupressure points can strengthen weaknesses, relieve common ailments, prevent health disorders and restore the body's vital life force (Teeguarden 1987). Clinical evidence has been reported that acupressure improved a range of conditions, such as nausea, headache, depression, and circulatory problems (Rubik and Pavek 1995). Acupressure is not licensed anywhere

in the U.S., but this practice can be practiced by massage therapists, physical therapists, nurses, and doctors. Currently a national certification program is administered by the NCCAOM.

Therapeutic touch: Developed in the 1970s, therapeutic touch was initially provided by a group of registered nurses as part of general nursing care (Rubik and Pavek 1995). Therapeutic touch practitioners claim that their therapies assist the natural healing process by redirecting and rebalancing the energy fields within the body (Rosa et al. 1998). A practitioner places his or her hands on or close to the body of the patient and redistributes the patient's energy or transmits his or her own energy as appropriate. There is mixed evidence on its efficacy. Some studies support effects of therapeutic touch on conditions such as tension headache reduction (Keller and Bzdek, 1986), while other studies suggest that the claim of therapeutic touch is groundless (Rosa et al. 1998).[2] Although the word "touch" is part of the modality's name, physical touch is not necessary when practitioners offer a treatment. There is no formal licensing or certifying process for therapeutic touch to date.

Chiropractic: Founded in the 1890s by Daniel David Palmer and advanced by Palmer's son Bartlett Joshua, chiropractic medicine has involved the fiercest political contestation against conventional medicine (Winnick 2005). A *Wilk et al. v. the American Medical Association* vividly shows such a political interaction (Wardwell 1992). In 1976, five chiropractors brought a civil anti-trust suit arguing that the AMA had attempted to intentionally harm and eliminate chiropractic as a profession. In 1987, a federal judge found that the AMA and its affiliated organizations had

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[2] Rosa et al. (1998) examined the claim of practitioners of therapeutic touch that they can treat many medical conditions by using their hands to manipulate a "human energy field." To investigate whether therapeutic touch practitioners could reliably detect a human energy field, they designed a study in which twenty-one practitioners were tested under blinded conditions to determine whether they could correctly identify which of their hands was closest to the investigator's hand. The results showed that the practitioners had succeeded in identifying her hand at a rate not significantly different from chance.

conspired to harm the chiropractic profession and thus ruled that they had violated the Sherman Anti-Trust Act. The AMA was ordered to cease and desist its hostile policies against chiropractors.

Chiropractic medicine views biomechanical structures, in particular the spine, as basic to health. Specifically, chiropractic practice emphasizes that the presence of joint dysfunction and subluxation may interfere with the ability to act efficiently and may lead to disease (Kaptchuk, 2000). Chiropractors typically rely on hands-on procedures to determine dysfunctions, and emphasize spinal manipulation as a major type of treatment. Much research has provided compelling evidence on the effectiveness of chiropractic treatment, in particular for low back pain (Dossey and Swyers 1995).

First licensed in 1904 by Illinois, chiropractors had achieved licensing in all 50 states and congress allowed Medicaid/Medicare reimbursement in the early 1970s (Wardwell 1992). Formal education institutes for chiropractors first obtained accreditation from the U.S. Office of Education in 1974. There are now 17 chiropractic institutions accredited by the Council on Chiropractic Education, and an estimated 53,000 chiropractors in the U.S. (Bureau of Labor Statistics 2007). The American Chiropractic Association (ACA), founded in 1930, is the largest professional association representing more than 18,000 doctors of chiropractic.

Homeopathy: Homeopathic medicine focuses on remedies made from naturally occurring plant, animal, or mineral substances to stimulate autoregulatory and self-healing processes (Kaufman 1971). The term homeopathy is derived from the Greek words homeo (similar) and pathos (suffering from disease) (Whorton 2002). The German physician Samuel Hahnemann formulated in the late 1700s the first basic principles of homeopathy such as "like cures like," which indicates that a substance that can cause certain symptoms when given to a healthy person can cure those same

symptoms in the sick person (Kaufman 1971). Following the principle, homeopathy uses small doses of various substances by matching a patient's symptoms with symptoms produced by these substances. Recent clinical trials suggest that homeopathic medicine has a positive effect on allergies, childhood diarrhea, and influenza (Jonas et al. 2003).

Currently there are three states that license homeopaths who are also physicians: Arizona, Connecticut and Nevada. However, some states include homeopathy within the scope of practice of professions such as chiropractic, naturopathy, and physical therapy. There are four schools for homeopathy accredited by Council on Homeopathic Education. The Council for Homeopathic Certification (CHC) provides a national certification program.

Massage: References to massage are found in Chinese medical texts 4,000 years old, and modern massage therapy was introduced in the United States in the 1850s by two physicians who had studied in Sweden (Rubik and Pavek 1995). Massage therapy emphasizes the importance of touch as the fundamental medium for manipulating soft body tissues to return those tissues to their normal state. Massage consists of a group of manual techniques that include applying fixed or movable pressure and holding and causing the body to move (Kaptchuk, 2000). Primarily the hands are used, but sometimes forearms, elbows, and feet are used as well. These techniques can affect the musculoskeletal, circulatory-lymphatic, and nervous systems (Lafferty et al. 2006).

Massage therapies are currently licensed by 33 states. A national certification program accredited by the National Commission for Certifying Agencies was inaugurated in 1992, and a national accreditation program for massage education (the Commission on Massage Therapy Accreditation, COMTA) was set up in 1989. There are more than 900 massage schools, but only approximately 85 schools are accredited

by the COMTA. The number of massage therapists has increased from approximately 75,000 in 1995 to more than 250,000 in 2002 (American Massage Therapy Association 2002). The primary sponsor of the national certification and accreditation programs is the American Massage Therapy Association (AMTA).

Naturopathy: Founded as a formal health care system at the turn of the century, naturopathic medicine is a school of medical philosophy and practice that seeks to improve health and treat disease chiefly by assisting the body's innate capacity to recover from illness and injury (Whorton 2002). This practice may include a broad array of different modalities, including herbalism, aromatherapy, and nutritional counseling. Naturopathic physicians are also trained in conventional medical disciplines including anatomy, cell biology, nutrition, among others, and cooperate with other medical professionals, referring patients to allopathic medical doctors (Workshop on Alternative Medicine 1995). An estimate based on data from licensing bodies indicated that in 2000 approximately 1,400 licensed naturopathic physicians were practicing in the U.S. (Boon et al. 2004). There are four accredited naturopathic medical schools.

Reflexology: This practice was introduced into the U.S. in 1913 by William H. Fitzgerald, and further developed by Eunice D. Ingham in the 1930s who mapped the entire body into reflexes on the feet (Rubik and Pavek 1995). Unlike other pressure point therapies such as acupressure that use finger pressure on the meridian points, reflexology focuses on other neurological release points on the feet and hands. Reflexologists apply pressure using their thumbs and fingers on these points of the feet and hands. A national certification program has been offered by the American Reflexology Certification Board (ARCB) since 1991. As of 2006, only two states currently have Reflexology laws at the state level: North Dakota (licensing law) and Tennessee (registration law). Many other states have massage laws, which may or

may not have an exemption for Reflexology.

Taichi/Qigong: Originated from China in the early 12th century, taichi is a noncompetitive, self-paced system of gentle physical exercise, involving a series of postures or movements in a slow manner (Chu 2004). Taichi's health training concentrates on relieving the physical effects of stress on the body and mind. This practice also focuses on meditation and subsequent calmness as a necessary basis to maintain optimum health in the sense of effectively maintaining stress relief. Qigong is a component of traditional Chinese medicine that combines movement, meditation, and regulation of breathing to enhance the flow of qi in the body, improve blood circulation, and enhance immune function (Chu 2004). There is no statewide or national oversight of the credentialing process of qigong.

2.3 Historical evolution of alternative medicine

The presence of multiple healing practices is not new. In the nineteenth century, the health and healing landscape was characterized by a diversity of healing traditions and practices, many of which have been popularized again in recent years. Allopathy, homeopathy, naturopathy, chiropractic, osteopathy, and other folk remedies from African, Native American, and immigrant traditions provided the vast majority of primary medical care throughout most of the 1800's (Starr 1982; Whorton 2002).

Accordingly there was fierce competition among groups of practitioners who often had to distinguish themselves from others in such a way as to gain professional advantages – the process often referred to as boundary work (Gieryn 1999). This is vividly exemplified by the historical use of the word "allopathy" – meaning "other than the disease." This term was first introduced about two hundred years ago by Samuel Hahnemann, the founder of homeopathy, who was critical about the use of calomel, bleeding, purging, and other heroic treatments that many physicians at that

time relied on (Kaufman 1971). He originally intended to indicate that unlike homeopathic medicine, allopathic medicine used methods that were unrelated to the disharmony produced by disease and harmful to their patients. This term was then employed by other alternative therapists and considered highly offensive by those at whom it was directed, although it is now used without explicitly negative connotation (Whorton 2002).

The health landscape with multiple healing traditions and practices began to change in the mid-19th century, when conventional medical professionals also engaged in boundary work. Their boundary work became particularly effective after the founding of their powerful professional association, the American Medical Association (AMA) in 1847. The AMA often adopted labels such as irregular and quackery to ostracize competing practices and practitioners (Whorton 2002). The capability to define what is regular and culturally sanctioned as normative is a profound power, indicating the establishment of exclusive jurisdictional boundaries and subsequent professional dominance (Larson; 1977; Abbott 1988; Ruggie 2004). Sources of the power included not only the development and validation of the germ theory and other scientific advances in surgery, but also a major revolution in medical education that helped medicine to systematically build a distinct body of formal knowledge, dismiss competing practices and treatment as unscientific, and thereby evolve into the dominant health care system (Berlant, 1975; Starr, 1982; Abbott, 1988; Freidson 2001).

In particular, the revolution in medical education advanced with the release of a report by Abraham Flexner in 1910 (Star 1982; Whorton 2002). Commissioned by the Carnegie Foundation, Flexner's report, *Medical Education in the United States and Canada*, assessed the educational status, processes of training, and certification of competency in medical schools. The report called on medical schools to enact higher

admission and graduation standards, and to adhere strictly to the protocols of mainstream science in their teaching and research. Many American medical schools, in particular those that offered courses for alternative therapies, fell short of the standard advocated in the report. All state medical boards gradually adopted and enforced Flexner's recommendations. Accordingly, nearly half of medical schools that did not meet its standards were driven out of business (Edelson 1994); the number of medical schools in the U.S. dropped from 160 in 1904 to 85 by 1920 to 66 by 1935. As biomedicine became the standard and convention and overshadowed rival perspectives, a number of alternative medicine treatments were denigrated as the stereotypical quackery or relegated to fringe status (Dossey and Swyers 1995; Whorton 2002). Thus, the Flexner report was not only a manifesto to reform and consolidate the medical profession but also another force among many that pushed alternative therapies to the margins of American healthcare field.

Although alternative medicine was declared to be either extinct or endangered (Starr 1982), empirical observation reveals that it never really died out and has now become one of the fastest growing fields in health care. A study on long-term trends in the use of alternative medicine in the U.S. reported that 67.6% of respondents had used at least one alternative therapy and suggested that the lifetime prevalence of alternative medicine has increased steadily since the 1950s (Kessler et al. 2001). Moreover, two national surveys conducted by Eisenberg and others (Eisenberg et al. 1993, 1998) provide evidence for substantial increases in popularity in more recent years. The percentage of respondents who used alternative medicine increased from 33.8% in 1990 to 42.1% in 1997. The surveys also indicate a 47.3% increase in total visits to alternative therapies, from 427 million in 1990 to 629 million in 1997. Estimated expenditures for alternative medicine also increased 45.2% between 1990 and 1997. Another national survey conducted in 2002 by the Centers for Disease

Control and Prevention's (CDC) National Center for Health Statistics (NCHS) suggests that the overall use of alternative medicine remained stable between 1997 and 2002 (Tindle et al. 2005).

Medical historians and sociologists have emphasized that the impressive change from limited use of alternative medicine to the rapid dissemination after the 1950s was largely driven by widespread interest in counterculture (Berliner and Salmon 1980; Whorton 2002; Ruggie 2004). The counterculture in the 1960s began in part as a reaction against the political conservatism of the Cold War and the extensive military intervention in Vietnam, and later represented more general emphasis on change and experimentation for a range of issues, such as racial inequality, sexual orientation, and women's rights (Anderson 1995). The countercultural movement groups often explored alternative cultural forms by focusing on the religious and philosophical traditions of other part of the world. Calling for a holistic and humanistic healing systems and practices, some of the movement groups in the late 1970s explicitly embraced the term "holistic" to emphasize the multi-dimensional meaning of healing, including the physical, spiritual and psychological dimensions, and directed more attention toward diverse healing traditions other than mainstream Western medical treatments (Lowenberg 1989). In the late 1970s and early 1980s, a variety of self-care movements emerged and offered programs or sponsored events to help individuals and families to increase wellness through diet or lifestyle changes (Kickbusch 1989) and in particular through the techniques of alternative healing system, such as yoga, tai chi, and massage (Dossey and Swyers 1995).

In addition to cultural support for alternative medicine's values through social movements, the resurgence of alternative medicine has also been attributed to three other sources. One line of research focuses on the inability of conventional medicine to cure chronic illness and the accumulating evidence that alternative medicine is often

effective (e.g., Goldstein 2000; Spencer and Jacobs 1999; Bloom et al. 2000).

Another stream of work emphasizes the professionalization of alternative practitioners

and decrease in organized power of conventional medical professions (e.g., Welsh et

al 2004; Wailoo et al. 2004). Relevant to this second line of research is extant work

on the growth of specialties and increasing fragmentation of conventional medicine

(Scott et al. 2000; c.f., Abbott 1988). The third line of research concentrates on other

major market actors, such as pharmaceutical manufacturers, managed care

organizations, insurance firms, the media, and government agency such as OAM

(Goldstein 2002). In this line of work, scholars often situate these actors in broader

changes in the healthcare field, such as increased importance of market mechanisms

and managerial control (Scott et al. 2000).[3]

It is worth noting that the importance of OAM for alternative practitioners and

users is hard to overestimate. OAM has sponsored and conducted alternative medicine

research, trained and supported alternative medicine researchers, and most importantly

provided information about alternative medicine through information clearinghouse,

fact sheets, lecture and workshop series, continuing medical education programs, and

publication databases. Beyond the formal mission, however, the very existence of the

federal government agency represents a major signal for the increased legitimacy of

alternative medicine. Since its founding in 1991, OAM has had a stormy history,

attracting many critics from conventional medicine and the NIH.[4] However, the

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[3] Beginning in the late 1970s, there has been increased emphasis on efficiency and profit maximization in the healthcare field. Researchers have examined different factors that might have facilitated such changes, including the elevation of medical care costs (Starr 1982), social movement that stressed the rights and choices of patients (Goldstein 2002), and court decisions and legislation deregulating the industry (Winnick 2005). In particular, the rapid increase in medical care costs appears to be a major driver for this broader change. Healthcare spending reached $1.5 trillion by 2004. Expenditures for prescription drugs more than doubled during the 1990s, reaching in 1999 $100 billion.

[4] Criticism can be exemplified as a couple of interesting quotes that Young (1998) provides: "The new venture[OAM]…would resemble an Office of Astrology" and "Buying Snake Oil with Tax Dollars" by Robert L. Park and Ursula Goodenough, *New York Times,* 3 January 1996, p. A11

Office survived and grew, as evidenced by the increase in budget from two million dollars in 1992 to eighty-nine million dollars in 2001, while the overall NIH budget remained the same. Moreover, since 1998, OAM has been elevated from a program office to a center, called the National Center for Complementary and Alternative Medicine (NCCAM) with a rapidly growing funding ($123 million in 2006).

2.4 Hospitals and the spread of alternative medicine

According to the American Hospital Association's (AHA) *Annual Survey of Hospitals*, the number of hospitals offering alternative therapy services has grown from 7.7% in 1998 to 19.0% in 2005 (Figure 2.2), suggesting that the spread of alternative therapies is still at its early stage.
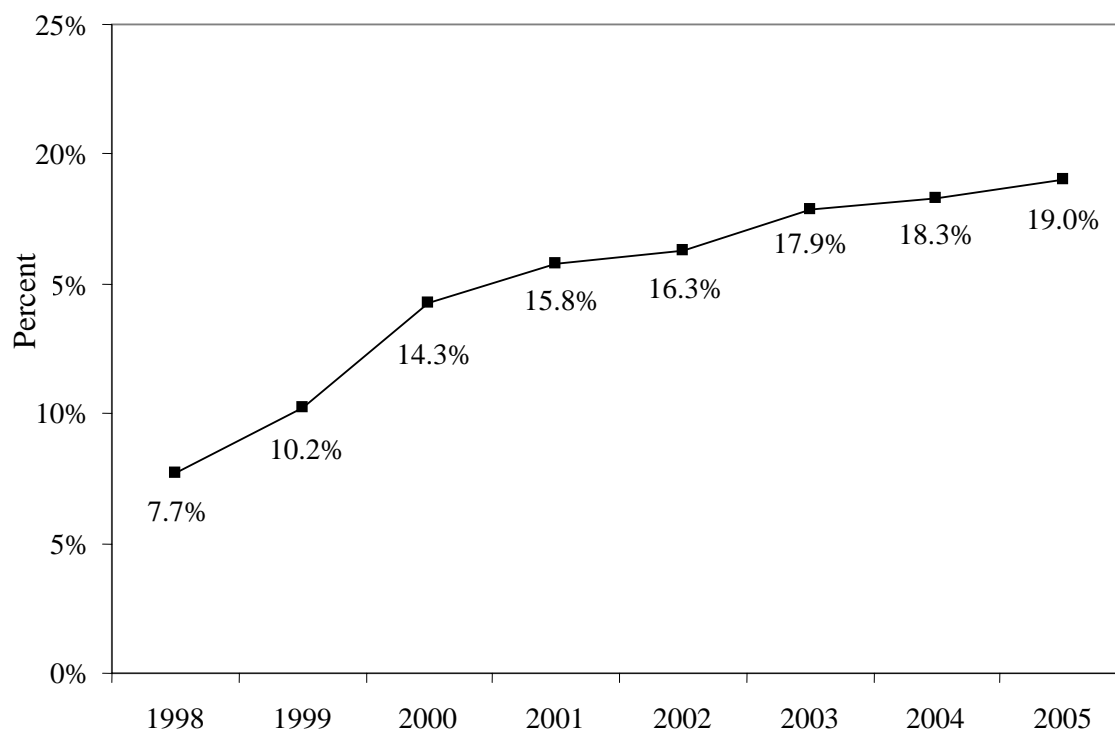
Source: American Hospital Association. 1998-2005.

Figure 2.2 Percent of Hospitals Offering Alternative Medicine

Figure 2.3 illustrates geographical distribution of hospital-based alternative

therapies at the end of 2005. Darker shades represent high percentages of hospitals

offering alternative therapies, whereas lighter shades indicate low percentages. The

figure shows that the heaviest concentrations of hospitals that offered any types of

alternative therapies reside in Colorado and in the eastern seaboard, primarily in New

York, New Jersey, Connecticut, Delaware, Vermont, New Hampshire, and the District

of Columbia.
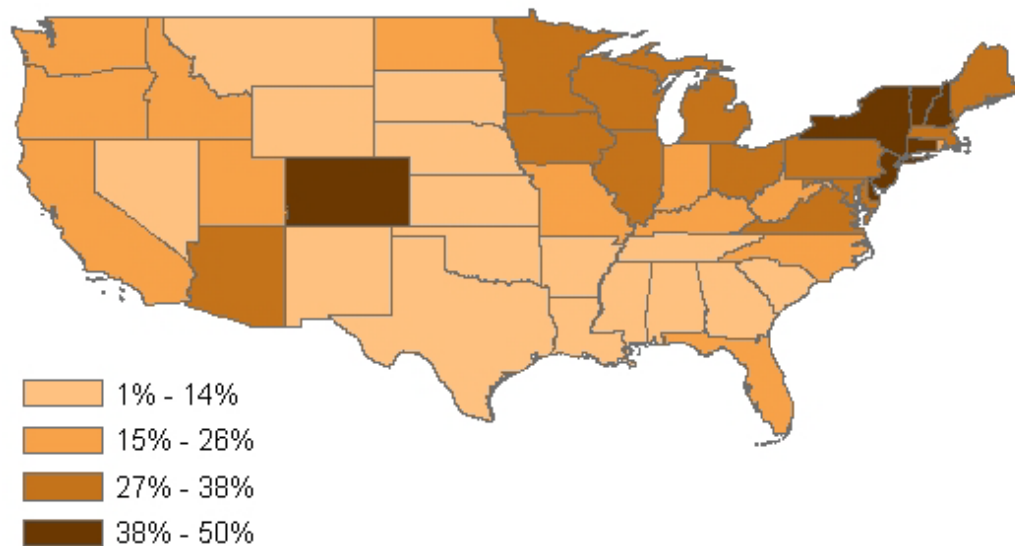
Source: American Hospital Association. 2005.

Figure 2.3 Geographic Distribution of Hospitals Offering Alternative Therapies

Finally, Figure 2.4 reports percent of hospital-based alternative medicine

offerings by therapy type in 2005. This figure indicates that massage therapy was the

most widely offered modality in hospitals in 2005, followed by taichi/qigong,

acupuncture, and therapeutic touch.

Massage — 64.1%
Taichi/Qigong — 40.0%
Acupuncture — 33.8%
Therapeutic touch — 32.2%
Reflexology — 17.6%
Acupressure — 16.2%
Chiropractic — 13.5%
Homeopathy — 7.3%
Naturopathy — 4.9%

0% 10% 20% 30% 40% 50% 60% 70%
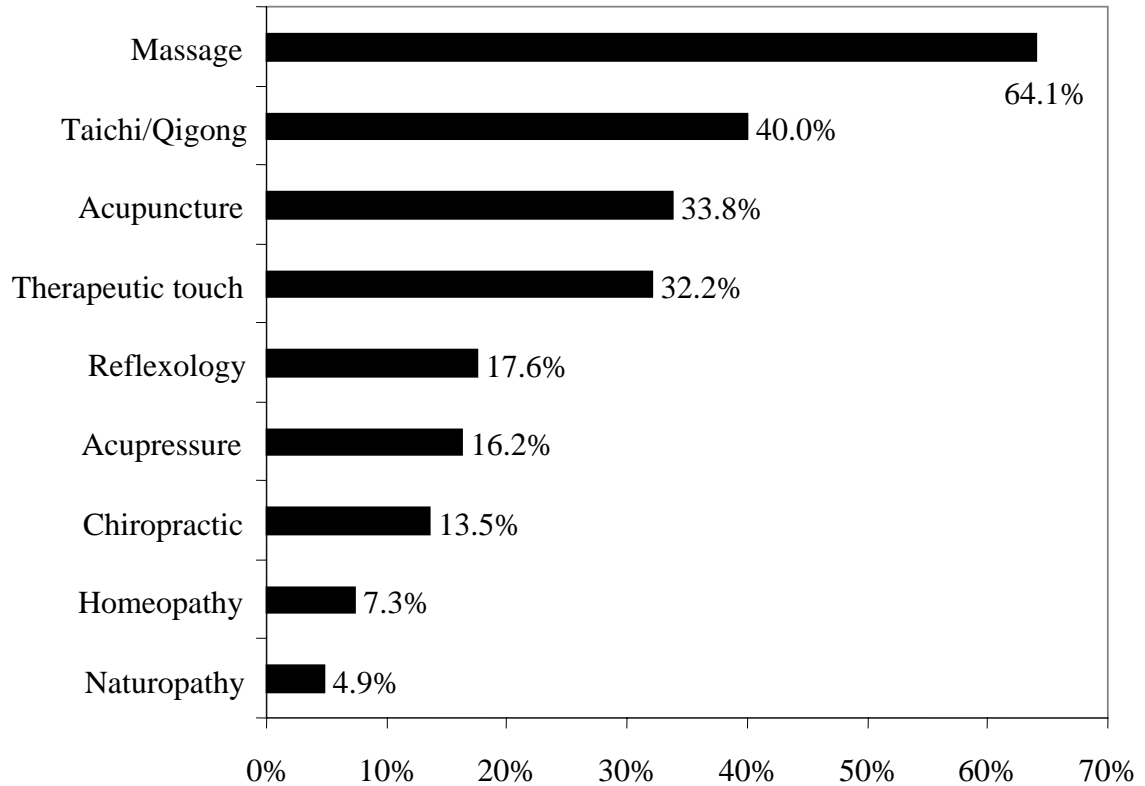
Source: American Hospital Association. 2006. Alternative Medicine Survey of Hospitals. Chicago: Health Forum.

Figure 2.4 Percent of Alternative Medicine Offerings by Therapy Type (N=370)

There is virtually no research on factors shaping the increased acceptance and diffusion patterns of alternative therapy services among conventional hospitals. To obtain an understanding of conditions affecting a hospital's adoption of alternative therapies, I conducted 12 field interviews with a vice president of a mid-sized urban hospital, an executive director of a medical research institute, four medical directors of alternative medicine programs, a medical researcher and two managers of the Samueli Institute (a nonprofit medical research organization), a management consultant, and two alternative therapists who provided treatment services in a hospital setting. Using a semi-structured protocol, the field interviews lasted approximately one hour and sometimes included clinic and hospital tours and on-site observations.

The interviews revealed that an individual hospital's propensity to accept or reject alternative therapies would be affected by several factors. First, it was often noted in interviews that hospitals tended to include alternative therapies to meet consumer demand, generate new sources of revenue, and increase market share. In his emphasis on consumer demand as a major reason to provide alternative therapy, a vice president of a mid-sized hospital in San Diego said, "We cannot ignore their [consumers'] requests. We're just providing what they want." In line with this, two directors of alternative medicine programs in New York and New Jersey respectively suggested that they generally viewed alternative medicine programs as a marketing opportunity to attract new patients to their hospitals and differentiate themselves in the market. This observation is supported by the finding that 87.1% of hospitals offering alternative therapies cited patient demand as the primary reason for their offers (Ananth and Martin 2006).[5] As a management consultant indicated, "The prevailing assumption that hospitals rely only on procedures or services that have a proven evidence base is a myth." This consultant also noted that hospitals are seeking to capture the vast amount of potential revenue – an estimated $36-$47 billion on all alternative therapies, dietary supplements, and other healthcare products.

This emphasis on consumer satisfaction, revenue generation, and differentiation appears to reflect broader changes in the healthcare field, such as emphasis on cost containment and increased competition among hospitals. Since 1980s, the U.S. hospital industry shifted focus from increasing access to health care to controlling costs (Scott et al. 2000). For instance, the Medicare Prospective Payment System (PPS) was introduced by the federal government in October, 1983, as a way to

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[5] The finding is based on the AHA CAM Survey of Hospitals. The survey was mailed to all 6347 hospitals from AHA's inventory of hospitals in December 2005. A total of 1349 responses were received for a response rate of 21%. 370 of responding hospitals (26.5%) stated they did offer one or more alternative therapies in the hospital.

control hospital costs by paying a fixed fee for each service.[6] In 1997, President

Clinton signed the Balanced Budget Act into law, which introduced more stringent

cost controls for hospitals (Cohen 2005). Accordingly hospitals received reduced cash

payments for services, often leading to cash-flow problems (Ruggie 2004). Although

hospitals attempted to increase their patient and service volume, their attempts created

more competition for patients (D'Aunno, Succi and Alexander 2000). This increased

competition might have encouraged some hospitals with comparative disadvantages to

make substantial changes in their service mix through the adoption of new treatment

services, such as alternative therapies.

Hospital managers and alternative therapists told me that they have paid

attention to the activity of managed care organizations (MCOs). My investigation

revealed that some MCOs were indeed active in offering coverage for alternative

medicine. For instance, Oxford Health Plans created a network of credentialed and/or

licensed alternative therapists in 1997 and now provide its members with access to a

network of over 4,400 practitioners including acupuncturists, massage therapists,

naturopaths, chiropractors in Connecticut, New York, and New Jersey. Kaiser, Aetna,

Prudential, Blue Cross and Blue Shield plans also provide some types of coverage

(Ruggie 2004). A national survey indicates that about two-thirds of managed care

organizations offer some type of coverage for at least one alternative therapy

(Landmark Healthcare, Inc. 1999). The actual pattern of coverage varies, however.

Some plans include certain therapies as covered benefits with higher deductible, while

others offer a contracted network of providers who agree to provide services to group

members at a discounted rate (Ruggie 2004). It should be noted that the actual

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[6] Under PPS, hospitals are paid a pre-determined rate for each Medicare admission. Each patient is classified into a Diagnosis Related Group (DRG) on the basis of clinical information. Except for certain patients with exceptionally high costs (called outliers), the hospital is paid a flat rate for the DRG, regardless of the actual services provided.

insurance expenditure for alternative therapies remains minimal. In the study of insurance expenditure, Lafferty et al. (2006) revealed that alternative providers accounted for only 2.9% of 2002 private insurance expenditure in Washington.

All interviewees unanimously agreed that regulations might play the most fundamental role in offering alternative medicine in many ways. Related to insurance coverage, for example, some states have mandates for coverage. New York State required insurers and HMOs to provide coverage for chiropractic care in 1998. The most proactive state, however, is Washington, which passed a law in 1996 mandating that all commercial health insurance companies cover the services provided by all licensed alternative practitioners. As of 2000, seven states had mandated coverage for acupuncture and two states have mandates for naturopathy (Sturm and Unutzer 2000-2001).

Another type of legislation often mentioned in the interviews was medical freedom acts advocated by consumer groups and health freedom movement activists to promote access to all healthcare information, services, treatments, and products including alternative therapies. The first medical freedom act was passed in Alaska in 1990. This legislation specifically articulated the principle that practitioners could not lose their medical licenses solely because they integrate alternative therapies into clinical care. This is often regarded as a critical point in state medical board regulation, since it "stops state medical boards from exerting pressure on alternative therapists simply due to the boards' bias against unfamiliar modalities" (Cohen 2006). More states followed, including North Carolina in 1993, Oklahoma in 1994, New York in 1994, and others. New York's legislation (N.Y. Educ. Law §6527(4)(e)) indicates that "nothing in the medical practice act should be construed to prevent a licensed practitioner from using whatever medical care, conventional or nonconventional… effectively treats human disease, pain, injury, deformity, or

physical condition" (Cohen 2006: 99).

My interviews also revealed challenges for providing alternative therapies within hospitals, including physician resistance and lack of qualified practitioners. Physician resistance appears to stem in part from lack of biomedical evidence to confirm the safety and efficacy of most alternative therapies. The editors of the New England Journal of Medicine, one of the most prestigious and widely read medical journals, defined unconventional medicine as medicine that has not been scientifically tested and whose advocates largely deny the need for such testing, and thus relying on such medicine would be "a reversion to irrational approaches to medical practice" (Angell and Kassirer 1998). Although alternative therapies have become more accepted since then, many conventional doctors seem to be still cautious in their approach to alternative medicine, reiterating their claims about lack of biomedical evidence for most alternative therapies. In my interviews, two medical directors of alternative medicine programs and a vice president of a hospital confirmed that lack of evidence-based studies was a major source of physician resistance in the adoption process.

Qualified practitioners are scarce resources for hospitals that plan to adopt alternative therapies. Figure 2.5 compares conventional medicine with selected alternative therapies in terms of the (estimated) number of practitioners. There are 250,000 massage therapists in 2002, 53,000 chiropractors in 2006, 22,000 acupuncturists in 2005, and 1,400 naturopaths in 2004, compared to 567,000 MDs in 2006. The lack of qualified practitioners appears to reflect the fact that alternative medicine is at its early stage of professionalization. Although provider practice acts exist for acupunctures, homeopathy, massage therapy, and some other modalities in varying numbers of states, chiropractors are the only alternative providers licensed in all fifty states. As of 2006, chiropractors, acupuncturists, massage therapists, and

naturopaths are the only groups whose training is accredited by organizations nationally recognized by the U.S. Department of Education. Moreover, there is no consistency between the states in how they handle alternative therapists, and thus state regulations are often contradictory (Milbank Memorial Fund 1998; Goldstein 2002).

Practitioners, n
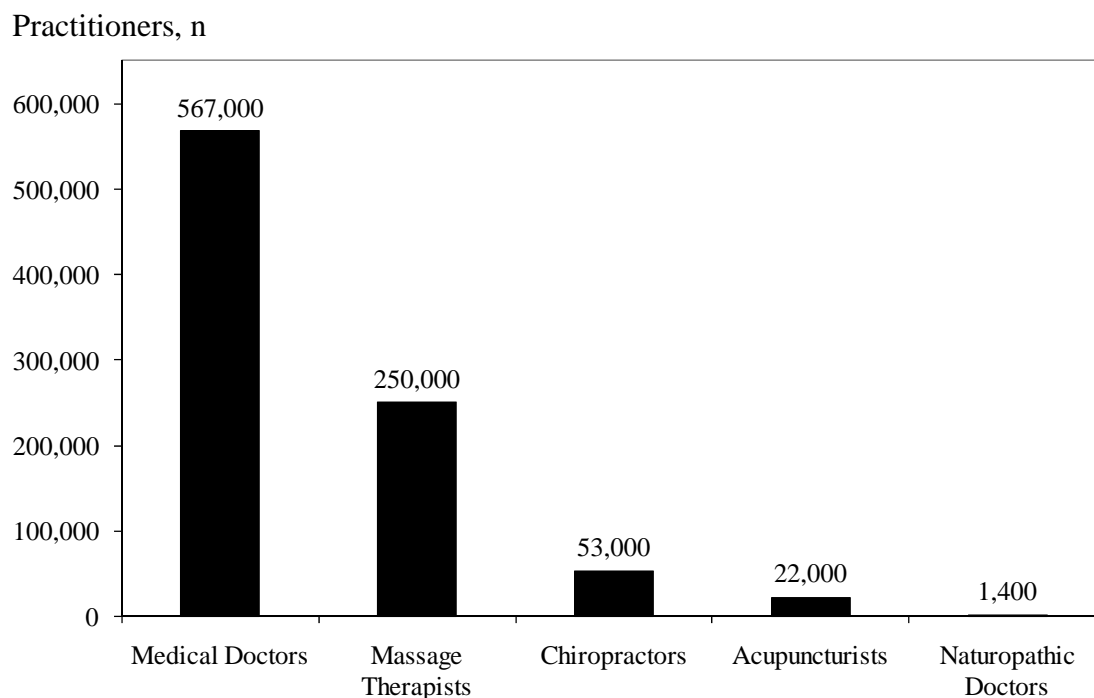
Sources:
Medical Doctors: Bureau of Labor Statistics (2006-07)
Massage Therapists: American Massage Therapy Association (2002)
Chiropractors: Bureau of Labor Statistics (2006-07)
Acupuncturists: Cohen (2005)
Naturopathic Doctors: Boon et al. (2004)

Figure 2.5 Number of Conventional and Alternative Medical Practitioners

CHAPTER 3

THEORETICAL BACKGROUND

This chapter develops a theory of contagion across multiple practices to explain how the diffusion of some practices influences the diffusion of other practices. My main argument is that prior adoptions of a practice are not only relevant to the spread of the same practice, but they are also relevant because they can affect some potential adopter's perceptions of other associated practices. Insofar as a practice "A" positively affects perceptions of the other practice "B," B is more likely to be adopted. Raised to a level of symbolic abstraction, this involves contagion in which A infects B.

In order to examine this contagion process systematically, I first review previous research on contagion between actors (Section 3.1). The review is intended to gain some useful insights that can be incorporated into the theorization of contagion across practices and to identify some limits that should be addressed to develop specific hypotheses tested in my research setting (Section 3.2). Prior research suggests that contagion occurs between prior and potential adopters embedded in social linkages when potential adopters use others as social cues to manage uncertainty about new practices. The emphasis on uncertainty as a general condition that makes social cues important seems useful in explaining contagion between practices. However, a focus on social linkages between prior and potential adopters seems less useful in the current context of an emerging market niche where no direct social cues are available due to the scarcity of prior adopters.

In Section 3.3, I propose that categorization, which lumps similar practices into a common category, can serve as a cognitive basis for association between practices that would otherwise be viewed as disconnected. Insofar as practices belong to a common category, the imagery of ties between them may emerge, although such ties are not purely relational (Strang and Meyer 1993). Given the presence of categorical

association, the adoption of one practice is likely to become an informational cue on which potential adopters rely in deciding whether to adopt other practices. Especially when adoption decisions are made in the context in which a new practice's value is highly uncertain and no direct social cues are available due to the absence of prior adopters of the same practice, those who adopted categorically associated practices can be regarded as alternative sources of social cues that potential adopters will likely use to manage uncertainty. Moreover, as long as informational cues of one practice enhance the familiarity and acceptability of the other practice, this type of influence between practices may also be understood as the contagion of legitimacy in which the legitimacy of some practices is transferred to other practices in the same category (Zucker 1987; Dobrev, Ozdemir and Teo 2006). This chapter concludes with a general proposition: Given the presence of perceived association between practices, the diffusion of some practices increases the likelihood of other practices being accepted by potential adopters.

3.1 Network-based contagion

Researchers have offered the important insight that innovation diffusion may be driven by social contagion involving "some form of meaningful communication and influence" between actors who have and have not yet adopted new practices (Strang and Tuma 1993: 615; e.g., Ryan and Gross 1943; Coleman, Katz, and Menzel 1966; Tolbert and Zucker 1983; Fligstein 1985; Davis 1991; Haunschild 1993; Jensen 2006). In this view, contagion has been typically proposed as a useful concept to examine how adoption decisions of potential adopters are affected by their exposure to prior adopters. Central to this concept of contagion, according to Burt (1987), is the "synapse over which innovation is transmitted" between prior and potential adopters (p. 1288):

In the simplest case, the interpersonal synapse over which social contagion occurs involves one individual, ego, who has not yet adopted the innovation under study, and a second individual, alter, who has adopted. Something about the social structural circumstances of ego and alter makes them proximate such that ego's evaluation of the innovation is sensitive to alter's adoption.

As for the "something about the social structural circumstances of ego and alter," scholars have typically focused on interaction networks which serve as the conduits of diffusion.[7] For instance, classical diffusion studies (e.g., Coleman, Katz, and Menzel 1966) often emphasized the importance of cohesion – close social relations characterized by frequent, face-to-face interactions engendering much exchange of information. The more frequent the interaction between prior and potential adopters, the more likely it is that potential adopters will actually adopt new practices. This type of relations is often characterized by strong ties that facilitate actors to share the same understanding of new practices and to exert normative pressures for conformity (Strang and Soule 1998).

More recent work (e.g., White, Boorman, and Breiger 1976; Burt 1987; Galaskiewicz and Burt 1991; Strang and Tuma 1993) refined this view, suggesting that structurally equivalent actors – those who have similar ties to others – attend carefully to each other. Structurally equivalent actors are proximate to the extent that they have the same pattern of relations to others. This view highlights competition between actors who use one another to evaluate their relative standing – e.g., two hospitals trying to keep up with new medical innovations in order to maintain their reputation and attract patients. Thus, the more similar the ties of prior and potential

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[7] Some researchers have argued that physically proximate actors influence each other. Insofar as physical proximity increases the chance to observe prior adoptions, it not only sends information about new practices to potential adopters, but also serves as a basis for vicarious learning (Bandura 1977; Denrell 2003). Physical proximity has been examined in a wide variety of contexts, including the spread of municipal reform (Knoke 1982), the adoption of matrix management (Burns and Wholey 1993), and the diffusion of golden parachutes in geographical regions (Davis and Greve 1997).

adopters to the third actors, the more likely it is that potential adopters will quickly adopt new practices perceived to make prior adopters more competitive. Stated generally, these studies provide relational models which emphasize the role of social ties in linking prior and potential adopters.

The role of relational linkages in contagion appears to become more important when adoption decisions are made in highly uncertain contexts. Indeed, adopting an innovation is inherently uncertain since it often involves poorly understood ideas and procedures, little evidence for effectiveness, and unpredictable returns. Actors may then cope with such uncertainty by depending on others to guide their adoption behavior. In Burt's word, "[s]ocial contagion arises from people proximate in social structure using one another to manage the uncertainty of innovation" (1987: 1288). The emphasis on the role of uncertainty in contagion echoes the general argument that uncertainty increases the importance of social cues. This argument is supported by a wide variety of theoretical perspectives, such as neoinstitutional perspective (e.g., DiMaggio and Powell 1983), vicarious learning theory (Bandura, 1977; Denrell 2003), and economics (Bikhchandani, Hirshleifer, and Welch 1992; Banerjee 1992).

3.2 Limitations of prior research on contagion

The review above was aimed at gaining some insights that could be incorporated into the theorization of contagion across practices. It appears that uncertainty serves as an important condition for contagion across practices (the focus of this research), as well as contagion between actors (the focus of traditional research on diffusion). Without uncertainty about a new practice, potential adopters are less likely to pay attention to information about the diffusion of related practices, or even the same practice. Instead, the spread of a new practice will be primarily driven by the practice's characteristics and an adopter's idiosyncratic needs. Thus uncertainty

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should be incorporated into my theoretical argument for contagion across practices.

However, there are at least two conditions that limit the applicability to the current study: the scarcity of prior adopters and the absence of direct ties between therapies.

Scarcity of prior adopters: Research on contagion between actors assumes the presence of prior adopters who can influence the adoption decision of potential adopters. Especially under high uncertainty about a new practice, potential adopters may want to draw on others to obtain social cues to guide their behavior. The most likely targets for such cues are those who already adopted the same practice. Thus the presence of prior adopters represents a critical condition that social contagion can operate, because they provide sources of social cues to potential adopters.

But what if there are no or very few organizations that already adopted the same practice? Without prior adopters, no direct social cues are available for potential adopters. Therefore it is not clear whether and how social contagion operates in the context where the adoption of a new practice involves high uncertainty but no direct social cues are available due to the absence of prior adopters of the same practice. This is often the case in an emerging market, such as a new niche of alternative medicine, where all actors in the market niche are by definition early entrants and have to engage in the very early stage of practice diffusion (Aldrich and Ruef 2006).

Chiropractic therapies, for instance, were available in 2001 at only 89 hospitals out of the total number of 4775 U.S. hospitals (0.019%). In this setting, the small number of hospitals that adopted chiropractic is less likely to serve as an important source of social influence. First of all, the scarcity of prior adopters may lower the chance that potential adopters observe the actions of prior adopters. Moreover, even if potential adopters are exposed to the small number of prior adopters, it is not obvious if the adoption of chiropractic by potential adopters is substantially dependent on the

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actions of prior adopters of chiropractic. On the one hand, the small number of prior adopters may be not enough to generate social influence that makes potential adopters conform to the actions of prior adopters, as threshold models of decision making suggest (Granovetter 1978; Wood and Doan 2003). On the other hand, potential adopters may not regard the small number of prior adopters as useful information for their decision making, as indicated by the organizational learning literature (March and Simon 1958; Denrell 2003).

Absence of direct ties between practices: The traditional approach to contagion also assumes the presence of relational linkages that connect prior and potential adopters. In this approach, social linkages are the pathways along which "some form of meaningful communication and influence" spreads between prior and potential adopters (Strang and Tuma 1993: 615; Burt 1987). Contagion between prior and potential adopters thus relies on interaction ties and network positions that make potential actors sensitive to the influence of prior adopters.

Unlike prior research on contagion between prior and potential adopters, my research concentrates on contagion across multiple practices that have no direct ties. How would the diffusion of one practice influence the diffusion of another practice without direct ties that serve as the channels of influence? Hence, the absence of relational linkages between practices is another source that significantly limits the applicability of the traditional contagion argument.

I suggest that the two conditions, the scarcity of prior adopters and the absence of direct ties between practices, represent important points of departure for the theoretical development of the current study. An immediate answer to the question of "what if there are no or very few prior adopters?" would be that potential adopters in an emerging market niche cannot use social cues from prior adopters. This answer implies that when there are no or very few prior adopters, potential adopters depend

not on the actions of prior adopters but on their idiosyncratic interests and unique internal demands. This conforms, at least partially, to the argument of extant research that early adopters rationally pursue their unique interests, while late adopters are under increasing social pressure (e.g., Tolbert and Zucker 1983; Westphal, Gulati, and Shortell 1997; Sherer and Lee 2002). But given the established proposition that uncertainty increases the importance of social cues (e.g., DiMaggio and Powell 1983; Bandura 1977; Denrell 2003; Banerjee 1992), it is also hard to reject the influence of social cues entirely. Thus I suggest that the scarcity of prior adopters can serve as a condition under which potential adopters are motivated to look to other sources of social cues. As alternative social cues, I concentrate on other organizations that adopted other practices associated with a focal practice that potential adopters eventually adopt. Central to these arguments are the questions of whether such association exists between multiple practices and how the association influences adoption decisions.

3.3 Category-based contagion

As an underpinning process of such association, I focus on categorization that provides perceived association between multiple practices that would otherwise be regarded as disconnected. A category is a set of items that are assigned a common identity based on perceived similarity. Categorization involves perceptual symbol systems that lump objects into one of several possible categories (Rosch 1978; Barsalou 1999). An important effect of categorization is the simplification of cognitive processes by delimiting how we allocate attention (Simon 1947; March and Simon 1958). In the same line, social cognition research suggests that categorization is a fundamental cognitive mechanism. For example, stereotyping is an important implicit mode of categorization in which humans mentally classify other individuals

into a particular group and unconsciously apply the typical characteristics of the group to individuals in the group (Greenwald and Banaji 1995). If categorization simplifies the cognitive process, it will require less mental resources. Insofar as the category-based cognitive process is mentally less demanding and does not lead to negative consequences, we are unlikely to change it deliberately (Devine 1989; Lounsbury and Hayagreeva 2004). This implies that categorization, once established, may have substantial, continuous influence.

Researchers have shown that an established category has substantial influence on social actors by providing an important foundation for conformity in various settings. In particular, categorization is at the heart of institutional approaches (Zuckerman 1999; Scott 2001). This perspective suggests that categories, once accepted as legitimate models, provide a default condition for making sense of social arrangements, thereby shaping perception, interpretation, and interests of social actors (Lounsbury and Hayagreeva 2004). Thus categories define the range of appropriate actions, encourage imitation, and decrease variety (e.g., DiMaggio and Powell 1991; Scott 2001). For instance, Zuckerman (1999) showed that the stock price of a firm was discounted if the firm was not covered by the securities analysts who typically used existing classification systems for industry and organization analysis.

In the similar vein, this study concentrates on the influence of a perceived common identity and shared understanding about similarity between categorized items (DiMaggio 1986; Barsalou 1999, 2003; Hamilton 2007). The perceived similarity and identity are important because they may serve as a cognitive basis for association between practices. As Strang and Meyer (1993) suggest, "the cultural understanding that social entities belong to a common social category constructs a tie between them" (p. 490). Although their focus was not directly on multiple practices but on social actors, the insight will apply to my research setting where disparate medical therapies

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are understood through a formal categorical scheme widely available in the health care field. Insofar as different practices are organized into a common category, such as "alternative medicine," associational ties between them emerge, although such ties are not purely relational.

Given the presence of categorical association, then, why does contagion across practices occur? A primary mechanism hinges on the role of associational ties in disseminating informational cues on which potential adopters rely in deciding whether to adopt other practices. I argue that associational ties constructed by cultural categories are functionally equivalent to relational ties in their roles in the diffusion of practices. In order to explain the functional equivalence of categories to relational linkages, it is useful to draw on the argument that "the presence or absence of a tie between two actors becomes the basis on which third parties make inference about underlying qualities of those actors" (Podolny 2005: 5). Podolny and his collaborators examined the relevance of this argument in a wide array of contexts, including investment banking, wine, semiconductors, shipping, and venture capital (e.g., Podolny 1993, 1994; Podolny and Stuart 1995; Podolny, Stuart, and Hannan 1996; Benjamin and Podolny 1999).[8] In this view, ties to prominent actors are important not because they convey information and resources between actors but because they affect third parties' perceptions and the inferences about the quality of the actors involved (Stuart et al. 1999; Podolny 2005).

Insofar as categorization creates some form of linkages between practices, we can replace "a tie between two actors" with "a (non-relational) tie between two practices." In the context of the adoption of alternative therapies by hospitals, the

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[8] In addition, Baum and Oliver (1991) suggested that a day care center's ties to prominent organizations, such as governmental agencies, have positive effects on its survival. Similarly, in the context of initial public offerings, Stuart, Hoang, and Hybels (1999) showed that private firms involved in relationships with prominent exchange partners performed better than otherwise comparable firms that lack prominent associates.

category-based association linking two different therapies may become the basis on which hospitals make inference about underlying qualities of the therapies. For example, if therapeutic touch is associated with acupuncture that is previously adopted by hospitals, the inferences that other hospitals (potential adopters) make about the quality of therapeutic touch will be positively affected by the association. Then, the diffusion of acupuncture will increase the likelihood of therapeutic touch being accepted by potential adopters. Here contagion between therapeutic touch and acupuncture occurs. In this example, association is important not because it serves as a conduit of resources and information passed between two therapies but because it affects some hospital's perceptions of the qualities of therapies. In sum, given the presence of categorical association, the adoption of some therapies by prior adopters may play a role of informational cues on which other hospitals depend for their adoption decisions.

Since informational cues can enhance the familiarity and acceptability of new practices, this type of contagion may also be understood as the contagion of legitimacy, the process in which cognitive legitimacy of accepted practices is transferred to other less established practices (Zucker 1987). Innovations, by definition, embody new elements that lack cognitive legitimacy or taken-for-grantedness. Simply put, potential adopters are not certain about the value of new practices. Insofar as practices are perceived as similar and linked to each other, the acceptance of some practices by hospitals makes other associated practices more familiar and perceived to be more valuable. The increased information availability and familiarity about associated practices, then, may enhance the likelihood that other hospitals are exposed to information about new practices, perceive them as acceptable, and eventually consider the adoption of some of the practices.

Contagion between practices may also be driven by competitive concerns.

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This appears to involve two-stage process. Potential adopters are first attracted to new practices since they are concerned that their rivals who have adopted the new practices could gain a competitive advantage unless they adopt the practices (e.g., Burt 1987). At the second stage of competition, potential adopters try to establish relative desirability and avoid direct competition (Fennell 1980; Zuckerman 1999). This competitive concern, then, leads to differentiation in which potential adopters attend to similar practices in a category, but not the same ones. In my empirical context, the increasing popularity of alternative medicine appears to encourage hospitals to attend to a set of emerging therapies labeled as "alternative medicine," but hospitals try to differentiate their treatment services from those already provided by their peers. This argument conforms to prior research on diffusion and competition: "while competition often spurs imitation, it may also spur differentiation" (Strang and Soule 1998). In the study of radio stations, for instance, Greve (1996) showed that a station's decision to determine market positions is more influenced by the behavior of stations in other local markets than stations in their local markets.

These arguments lead to a general proposition: *Given the presence of perceived association between practices, the diffusion of some practices increases the likelihood of other practices being accepted by potential adopters.*

CHAPTER 4

HYPOTHESES

This chapter presents hypotheses that examine the formal incorporation of alternative therapies into hospitals' array of conventional treatment services. I focus on nine of the most widely used alternative therapies, as shown in Figure 1.1: acupressure, acupuncture, therapeutic touch, chiropractic, homeopathy, massage therapies, naturopathy, reflexology, and taichi/qigong. I first ask if prior adoptions of eight alternative therapies already adopted by hospitals increase adoption rates of the other alternative therapies (Section 4.1). Since alternative therapies are less likely to have the same chance of affecting and being affected by one another, I also develop other hypotheses regarding factors that explain differential influences that some therapies may have on adoption rates of other therapies. The first set of hypotheses focuses on categorical characteristics of therapies (Section 4.2), while the second set of hypotheses primarily relates to relational characteristics of hospitals (Section 4.3).

4.1 Contagion across alternative therapies

This section applies the proposition stated in Chapter 3 to the empirical context: the emerging market niche of alternative medicine in the U.S. health care field. My main argument is that prior adoptions of alternative therapies by hospitals enhance adoption rates of other therapies which are nevertheless in the same category. As shown in Figure 1.1, alternative medicine represents the distinct categorical name that broadly includes the nine therapies.

Take acupuncture as an example. Insofar as the categorization scheme provides the shared understanding that multiple practices (including acupuncture) belong to a common category of "alternative medicine," the therapies will likely be perceived as similar to and associated with acupuncture. The perceived similarity

serves as a critical condition under which a focal hospital attends to the spread of other related therapies to guide its adoption behavior. Then, the acceptance of other practices will become an informational cue that may positively affect the focal hospital's perceptions of alternative medicine as a whole. Since acupuncture is a member of the same category (i.e., alternative medicine), the focal hospital is more likely to perceive acupuncture as more familiar and acceptable. Thus, I expect that:

Hypothesis 1: The number of other hospitals adopting any of the eight alternative therapies is positively associated with a focal hospital's adoption of the other therapy.

4.2 Categorical positions and contagion

Figure 1.1 shows that within the broad category of alternative medicine, there are a series of subcategories, each of which includes a number of specific therapies. And each therapy takes a unique position in the categorical scheme relative to other therapies. For instance, acupuncture and acupressure are both in the same broad category ("alternative medicine") and the sub-category ("alternative systems of medical practice"). However, acupressure is also organized into another subcategory—i.e., "manual healing methods" simultaneously. I argue that these categorical characteristics based on their positions in the category may account for differences in adoption rates. I focus on two key characteristics: categorical similarity and ambiguity.

4.2.1 Categorical similarity

Therapies are more similar when they are in the same subcategories. For instance, acupuncture is more similar to homeopathy than to chiropractic, since acupuncture and homeopathy are located in the same subcategory of "alternative

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systems of medical practice." Alternative therapies that are more similar to a focal

therapy (e.g., acupuncture) will likely be perceived as having stronger association with

each other and thus more salient for hospitals adopting that therapy (acupuncture).

Thus prior adoptions of therapies will be positively associated with the adoption rate

of the focal therapy if the therapies are in the same subcategory than if they are not.

For instance, the effect of prior adoptions on the focal hospital's adoption rate of

acupuncture will be significant when adopted therapies are homeopathy, naturopathy,

acupressure, massage, and Taichi/Qigong (Figure 1.1). Therefore, I posit that:

Hypothesis 2: The number of other hospitals adopting therapies in a sub-category is

positively associated with the focal hospital's adoption of any of the other therapies in

the same sub-category.

4.2.2 Categorical ambiguity

A therapy lies in an ambiguous categorical position if it is a member of more

than one sub-category. Similar therapies may be either categorically ambiguous or

unambiguous. For example, acupressure, massage therapies and taichi/qigong are

categorically similar to acupuncture, but unlike acupuncture they are categorically

ambiguous since they are organized into two sub-categories simultaneously—

alternative systems of medical practice and manual healing methods (see Figure 1.1).

If the diffusion of an alternative therapy by hospitals serves as an informational

cue that guides the behaviors of other hospitals, the influence of this cue can be

expected to be greater when the cue is less ambiguous. In contrast, the ambiguous

categorical membership will negatively affect perceived similarity and association

between practices. As Zuckerman (1999) suggested, for instance, failure to conform

to established categories leads to confusion over the identity of products or services,

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which in turn depresses attention. I expect that prior adoptions of therapies will be more positively associated with the adoption rate of the focal therapy if the therapies are exclusively in the same sub-category. For instance, the effect of prior adoptions on the focal hospital's adoption rate of acupuncture will be stronger when the adopted therapies are homeopathy and naturopathy than when the adopted therapies include acupressure, massage, and taichi/qigong (Figure 1.1; see also Figure 4.1). Thus I posit that:

Hypothesis 3: The number of other hospitals adopting therapies exclusively in a given sub-category is more strongly associated with a focal hospital's adoption of the other therapy in the same sub-category.

Hypothesis 4: The number of other hospitals adopting therapies that are members of more than one sub-category is less strongly associated with the focal hospital's adoption of the other therapy in the same sub-category.

Hypotheses 3 and 4 are based on the argument that categorically ambiguous therapies have an unclear identity which in turn is subject to social penalty (i.e., lack of attention). If categorically ambiguous therapies indeed have weaker impact on the adoption of other therapies in the category, what about the flip side—i.e., the influence of other therapies on categorically ambiguous therapies? Categorical ambiguity stems from dual membership of sub-categories. The effect of dual membership seems double-sided. On the one hand, double membership may weaken the influence of prior adoptions on categorically ambiguous therapies. Hospitals may perceive the therapies with dual membership as less coherent and consistent with other therapies. Such confusion over identities depresses attention (Zuckerman 1999) and inhibits

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legitimacy transfer (Dobrev et al. 2006). On the other hand, dual membership may attract greater attention than those with single membership since it can serve as double sources of informational cues and legitimacy transfer. Thus, acupressure, massage, or Taichi/Qigong—those that hold dual membership—can either benefit from their categorical positions or be subject to social penalty – i.e., lack of attention and legitimacy. I propose the following competing hypotheses:

Hypothesis 5a: The number of other hospitals adopting any of the eight alternative therapies is more strongly associated with the focal hospital's adoption of therapies that are members of more than one subcategory than with the adoption of therapies that are members of one subcategory.

Hypothesis 5b: The number of other hospitals adopting any of the eight alternative therapies is less strongly associated with the focal hospital's adoption of therapies that are members of more than one subcategory than with the adoption of therapies that are members of one subcategory.

4.3 Relational positions and contagion

I also formulate hypotheses that primarily examine relational characteristics of hospitals. By relational characteristics of hospitals, I mean patterns of connections between individual hospitals. I suggest that if a focal hospital is exposed to other hospitals that adopted one therapy (for instance, chiropractic) through relational linkages, the focal hospital attends to the spread of other associated therapies (such as therapeutic touch) in the same category. Thus, this is not to replicate prior research on diffusion that claims that prior adoptions of chiropractic lead to additional adoptions of chiropractic; rather I suggest that relational linkages of hospitals can increase the

awareness of chiropractic, which eventually influences the adoption of associated therapies, such as therapeutic touch, on the basis of categorical association. I focus on three relational properties: network ties, structural equivalence, and status.

4.3.1 Network ties and contagion across alternative therapies

In the hospital industry, two kinds of network ties may be especially relevant to the transfer of information about new therapies between hospitals: common membership in strategic alliances and multihospital systems. Alliances refer to contractual arrangements between hospitals for their collaboration to provide health care services. Multihospital systems consist of two or more physically separate hospitals sharing common ownership. Hospital alliances and systems are often characterized by high levels of informal and formal communication between member organizations (Westphal, Gulati, and Shortell 1997; Krishnan, Joshi, and Krishnan 2004). This form of interaction also facilitates mutual understanding of each hospital's idiosyncratic needs, which in turn enhances the quality of information obtained from hospitals that have prior experience in adopting alternative therapies (Burt 1987; Gulati 1995). If the diffusion of an alternative therapy by hospitals serves as an informational cue that facilitates adoptions of other associated therapies by other hospitals, the cohesive relationships based on close network ties serve as conduits or channels through which the informational cue flows between connected hospitals. These arguments suggest that prior adoptions of other therapies are more salient for the adoption of the focal therapy when hospitals are connected through network ties of alliances or systems. Thus, I expect that:

Hypothesis 6: The greater the number of alliance ties (system ties) to prior adopters of any of the eight therapies, the more likely a focal hospital will adopt the other therapy.

4.3.2 Structural equivalence and contagion across alternative therapies

The notion of structural equivalence (White et al. 1976; Burt 1987; Galaskiewicz and Burt 1991; Strang and Tuma 1993) may also be relevant to the spread of informational cues about alternative therapies. In particular, the logic of competition highlighted in the structural equivalence model appears to fit in with contagion between practices which is in part driven by competitive concern. Potential adopters are apt to be concerned that their rivals who have adopted alternative therapies could gain a competitive advantage unless they also adopt the therapies. Since structurally equivalent hospitals are likely to attend carefully to each other, the information cue conducive to contagion between practices will spread fast between them.

Hypothesis 7: The greater the number of structurally equivalent hospitals offering any of the eight therapies, the more likely a focal hospital will adopt the other therapy.

4.3.3 Status and contagion across alternative therapies

The salience of informational cues may be influenced more strongly by high-status adopters than by low-status adopters. Status refers to a hierarchical ordering of an actor's position (Podolny 1993, 2005; Phillips and Zuckerman 2001; Deephouse and Suckman 2007). Recent work suggests that high-status provides a number of benefits related to market competition (Podolny 2005). For example, a higher-status actor can often provide a good or service of a given quality at a lower cost (Podolny 1993, 2005), charge a higher price (Benjamin and Podolny 1999), and gain easier access to resources (Stuart et al. 1999). These benefits may attract attention of lower-status actors who generally attempt to obtain high-status, leading them to imitate high-

status actors. Thus, the adoption of alternative medicine by high-status actors exerts greater normative influence on the social acceptability of alternative medicine. "[A]doptions by central actors shift community norms or interaction patterns sufficiently that others find it hard not to go along" (Strang and Soule 1998: 275). If the diffusion of an alternative therapy by hospitals serves as an informational cue that facilitates the spread of other associated therapies, the social visibility and acceptability provided by high-status hospitals will increase the impact of the informational cue on potential adopters' perceptions of other associated therapies. Thus, I expect that:

Hypothesis 8: The greater the number of high-status hospitals having any eight therapies, the more likely a focal hospital will adopt the other therapy.

CHAPTER 5

METHODS

5.1 Sample

The study sample consists of all community medical hospitals in New York State in the period 1992-2001 (as of 2001, n=177). Community hospitals refer to short-stay, non-specialty hospitals which meet most community needs for hospital care. It is worth noting that community hospitals are a highly legitimate organizational form (Scott et al. 2000). Since the contagion of legitimacy in part depends on the role of highly institutionalized collectivity in conferring legitimacy to new, unfamiliar practices (Zucker 1988, 1991), it is important to make sure that such organizations exist in my empirical setting. Hospitals are a taken-for-granted organizational arrangement for providing health care services, and this organizational form is also endorsed through licensure and accreditation by other highly institutionalized regulative authority as well as established professional bodies, such as the American Medical Association (Ruef and Scott 1998).

The hospital industry in New York State provides a suitable context in which to examine the diffusion of alternative therapies. New York had shown an impressive increase in acceptance of alternative medical practices by hospitals in the study period, and thus temporal variation in diffusion of alternative medicine was greater than other states. For instance, the number of hospitals offering any types of alternative medicine increased from 29 in 1998 to 57 in 2001. New York has also been characterized by active legal regulation for alternative medicine (e.g., early adoption of medical freedom act). Moreover focusing on one state is a good analytical strategy, since legal status of alternative therapies, such as scope of services and licensing legislation, is significantly different across states.

5.2 Theoretical scope and empirical setting

The hypotheses proposed in this research are best tested in markets with three basic characteristics. First, the market should be characterized by a variety of new practices that are simultaneously introduced, promoted, and experimented, but weak in their legitimacy. Second, my theoretical framework requires a setting in which there is a considerable level of uncertainty such that potential adopters are motivated to depend on social cues in the adoption decisions. Third, a categorization scheme should exist and provide perceptions of similarity between diverse practices.

The emerging market niche of alternative medicine meets these requirements. As I fully detailed in Chapter 2, alternative therapies include a wide range of multiple practices whose characteristics are substantially different in terms of historical origins, actual delivery of treatments, diagnostic procedures, clinical evidence, and legal status. Moreover, the U.S. health care field has been generally characterized by high uncertainty. Health outcomes are typically complex and difficult to assess (Ruef and Scott 1998; WHCCAMP 2002). The quality of alternative therapies is even more uncertain in part because conclusive biomedical evidence for the effectiveness of such modalities is not available yet.

The presence of categorization for alternative therapies critically determines theoretical scope of this research. As Figure 1.1 shows, a well-defined categorical system exists. The categorization scheme uses the term "alternative medicine" to represent a category that broadly sets the boundary of alternative therapies. This broad category consists of a series of subcategories, each of which includes a number of specific therapies.

The categorization scheme was first proposed by the first conference on alternative medicine (the Chantilly Conference) in September 1992, with a total of more than 200 practitioners and researchers of alternative medicine. The editorial

review board that supervised the structuring of the information presented later organized a governmental publication, Alternative Medicine: Expanding Medical Horizons. According to the publication, the main goal of the conference was to establish a baseline of information on the state of alternative medicine, which would serve as an important foundation for future research and policy discussions (Workshop on Alternative Medicine 1995: vii and x). The main route chosen was to describe similarities and differences among therapies (Ruggie 2004). The description was based on seven subcategories, "fields of practice," as shown in Table 2.1.

The analytic basis of seven subcategories, however, was not clearly specified by the conference. Most of the subcategories appear to be roughly based on major treatment techniques typically used by alternative therapists of each subcategory. For instance, manual healing methods include therapies that employ physical forces (e.g., chiropractic and therapeutic touch), whereas the mind-body category consists of psychological techniques such as mental imaging and hypnosis (Workshop on Alternative Medicine 1995: xlvi). However, some subcategories do not follow this rule of categorization. For example, alternative systems of medical practices include therapies that have been traditionally used by specific ethnic groups (e.g., China and acupuncture; India and Ayurvedic medicine).

After the conference, the categories of alternative therapies were adopted by the OAM, which used the proposed categories when providing funding to universities and individual researchers and documenting fact sheets available for the general public. Over time, the categories of alternative therapies have become institutionalized. As shown Figure 2.1, the term, "alternative medicine," has been widely available, and viewed as an appropriate name to make sense of non-conventional medicine. The categories of alternative medicine, either in part of as a whole, have been extensively used by nationwide surveys (e.g., Barnes et al. 2004), government reports (e.g.,

WHCCAM 2002), clinical trials, and popular journals and newspapers.

Table 5.1 provides evidence of the effect that the categorical scheme has had on perceived similarity between nine alternative therapies that I concentrated on in this research. As a proxy measure of closeness between therapies, I calculated co-occurrence scores of all pairs of therapies in biomedical journal articles in MEDLINE for two-ten periods—1982-1992 and 1992-2001. For example, to obtain the co-occurrence score between acupuncture and acupressure in 1992-2001 (3.436%), I divided the number of biomedical journal articles that examined both acupuncture and acupressure by the total number of articles that investigated any of the two therapies. The average of co-occurrence scores increased by 7.5% between the two periods, suggesting that nine therapies were getting closer. The result of paired t-test shows that the difference in co-occurrence scores between the two periods is statistically significant (t = 3.943, df = 35, p = 0.0002, one-tailed test).

Figure 5.1 provides a graphical representation for change in closeness. To illustrate the relative distance of all nine therapies, I drew upon the concept of closeness centrality. Researchers have developed several centrality measures, such as degree, closeness, and betweenness, to understand an actor's prominent position relative to others. Closeness centrality represents an actor's ability to access independently other actors (Wasserman and Faust 1994). Because this measure is computed as the inverse of the sum of the shortest distances between each node and every other node in the network, it is particularly relevant in showing how close a therapy is to all the other therapies. This measure ranges from 0 to 1. I added one more therapy, pet therapy which was not in the category, to better compare the effect of categorization. I measured a therapy's closeness centrality scores groups of therapies using the co-occurrence matrix in Table 5.1. Figure 5.1 shows that nine therapies (except pet therapy) were getting closer since 1992 when the categorical

scheme was proposed and became widely available. In contrast, pet therapy remained far from other nine therapies. The average closeness centrality score for nine therapies (except pet therapy) increased from 0.26 to 0.71, suggesting that the relative distance of the therapies substantially decreased between the two ten-year periods.

Table 5.1 Closeness between Alternative Therapies, 1982-2001:
Number of Co-occurrence in the Medical Journal Articles (%)

	1982-1991	1	2	3	4	5	6	7	8
1	Acupuncture								
2	Acupressure	1.679							
3	Chiropractic	0.864	0.000						
4	Homeopathy	1.316	0.000	1.046					
5	Massage therapies	1.137	0.388	0.135	0.000				
6	Naturopathy	0.403	0.000	1.163	2.823	0.000			
7	Reflexology	0.000	0.000	0.000	0.000	0.269	0.000		
8	Tai chi/Qi Gong	0.204	0.000	0.000	0.000	0.132	0.000	0.000	
9	Therapeutic touch	0.067	0.000	0.000	0.000	0.892	0.000	0.000	1.667

	1992-2001	1	2	3	4	5	6	7	8
1	Acupuncture								
2	Acupressure	3.436							
3	Chiropractic	2.872	0.261						
4	Homeopathy	3.733	0.575	2.625					
5	Massage therapies	4.234	1.437	2.290	1.546				
6	Naturopathy	0.655	0.000	1.280	2.430	0.606			
7	Reflexology	0.712	0.526	0.688	1.513	2.680	2.083		
8	Tai chi/Qi Gong	0.477	1.685	0.902	1.793	1.040	9.848	12.745	
9	Therapeutic touch	0.554	0.930	0.236	0.387	2.065	0.521	0.847	3.801

	Difference	1	2	3	4	5	6	7	8
1	Acupuncture								
2	Acupressure	1.757							
3	Chiropractic	2.008	0.261						
4	Homeopathy	2.417	0.575	1.579					
5	Massage therapies	3.097	1.049	2.155	1.546				
6	Naturopathy	0.252	0.000	0.118	-0.392	0.606			
7	Reflexology	0.712	0.526	0.688	1.513	2.412	2.083		
8	Tai chi/Qi Gong	0.274	1.685	0.902	1.793	0.907	9.848	12.745	
9	Therapeutic touch	0.487	0.930	0.236	0.387	1.173	0.521	0.847	2.135

1982-1991

naturopathy
0.278

acupressure
0.253

pet therapy   therapeutic touch   massage   homeopathy   acupuncture   chiropractic   taichi   reflexology
0   0.111   0.253   0.397   0.397   0.278   0.111   0

1992-2001

chiropractic
0.593

acupuncture
0.593

homeopathy
0.711

naturopathy   massage   acupressure
0.593   0.79   0.547

taichi
0.711

therapeutic touch
0.508

pet therapy
0

reflexology
0.593
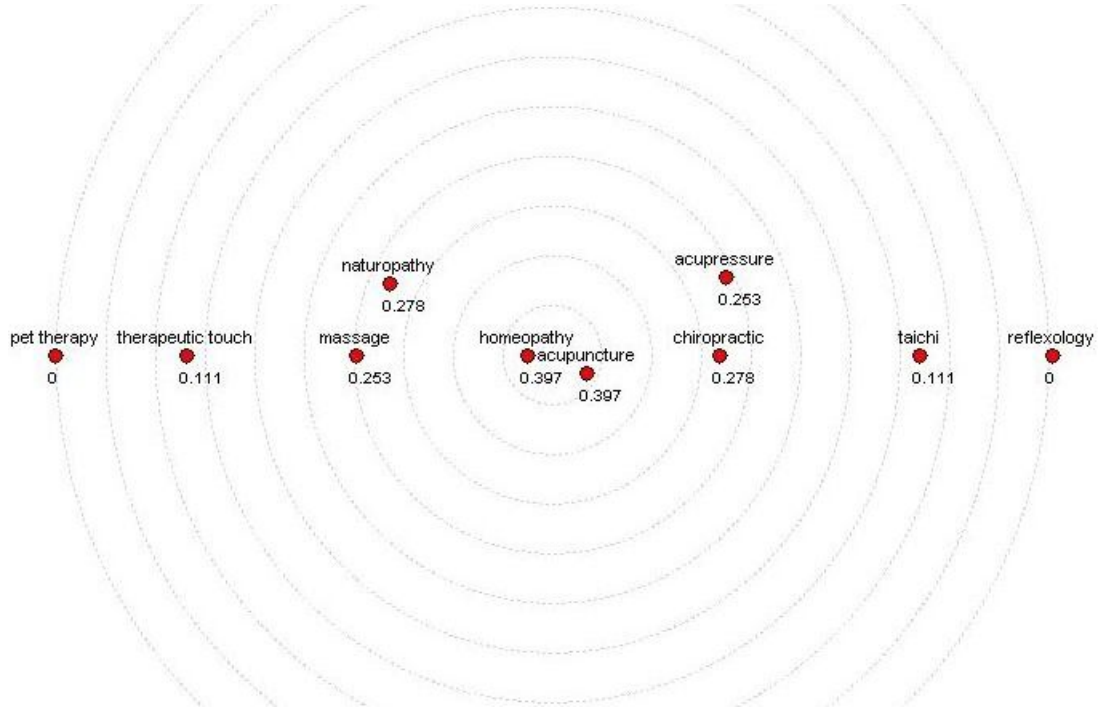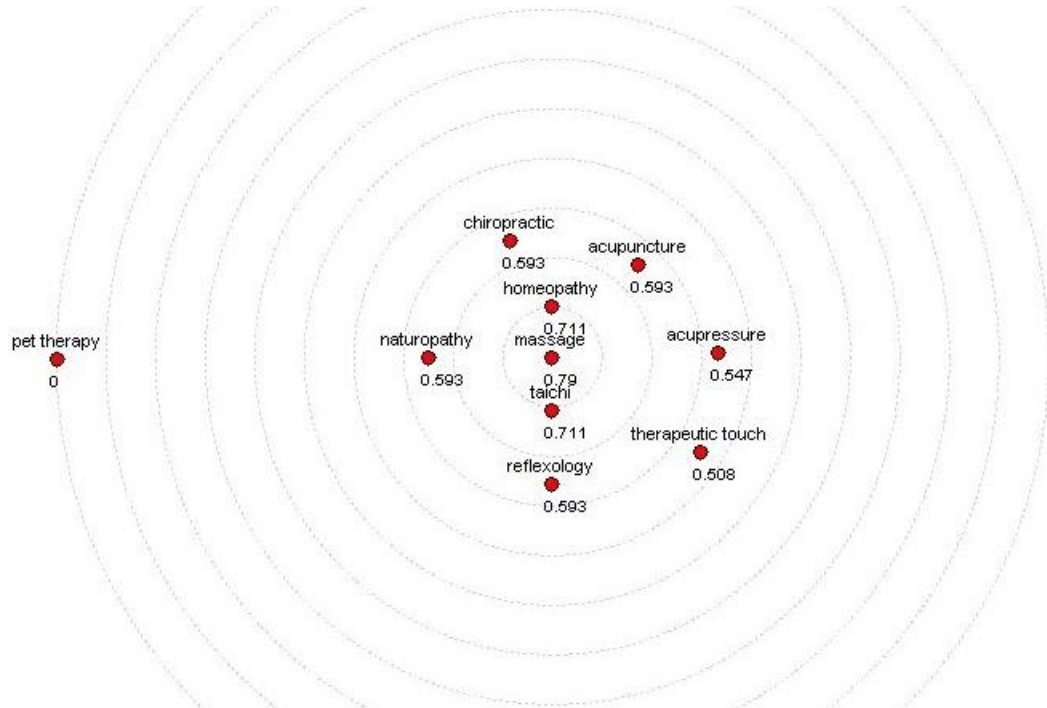
Figure 5.1 Closeness Centrality of Alternative Therapies, 1982-2001

A therapy is more tightly associated with other therapies in the same subcategory than with therapies in different subcategories. For instance, the average closeness scores were 2.791% for therapies in alternative systems of medical practice and 2.678% in manual healing methods (1992-2001), whereas the average score for pairs of therapies in different subcategories (e.g., acupuncture-chiropractic) was 2.091%.

It is notable that closeness scores differ even within the same subcategory. Table 5.2 presents average closeness scores of three groups of therapies: (1) therapies exclusively in the alternative system category (acupuncture, homeopathy, and naturopathy), (2) therapies that are members of the two subcategories (acupressure, massage, and Taichi/Qigong), and (3) therapies exclusively in the manual healing method category (therapeutic touch, reflexology, and chiropractic). In the subcategory of alternative systems of medical practice, for instance, there are two groups of therapies, one with a pure category and the other with a mixed category. The average closeness score for acupuncture, homeopathy, and naturopathy was greater than the average score for acupressure, massage, and Taichi/Qigong (1.514 vs. 0.173 for the 1982-1991 period and 2.273 vs. 1.387 for the 1992-2001 period).

Interestingly, it seems that acupuncture, homeopathy, and naturopathy became substantially closer to acupressure, massage, and Taichi/Qigong. The average closeness score for pairs of therapies in the two groups (i.e., closeness between one therapy in one group and another therapy in the other group, such as acupuncture-acupressure, homeopathy-massage etc.) increased from 0.503 to 3.753 in the two-ten year periods. In the manual healing subcategory, therapeutic touch, reflexology, and chiropractic became even closer to acupressure, massage, and Taichi/Qigong. The difference in closeness between the two groups of therapies (e.g., therapeutic touch-acupressure, reflexology-massage etc.) was 3.873 (from 0.497 to 4.367).

Table 5.2 Closeness Scores by Subgroups of Alternative Therapies, 1982-2001 (%)

	1982-1991	1	2	3
1	Acupuncture, homeopathy, and naturopathy	1.514		
2	Acupressure, massage, and taichi/qigong	0.503	0.173	
3	Therapeutic touch, reflexology, and chiropractic	0.523	0.494	0.000

	1992-2001	1	2	3
1	Acupuncture, homeopathy, and naturopathy	2.273		
2	Acupressure, massage, and taichi/qigong	3.753	1.387	
3	Therapeutic touch, reflexology, and chiropractic	2.091	4.367	0.590

	Difference	1	2	3
1	Acupuncture, homeopathy, and naturopathy	0.628		
2	Acupressure, massage, and taichi/qigong	3.249	1.214	
3	Therapeutic touch, reflexology, and chiropractic	1.568	3.873	0.590

5.3 Analytic procedure

I used cross-sectional time-series logit models to predict the likelihood that a hospital will adopt an alternative therapy.[9] Logit regression analyses are appropriate when the dependent variable is a dichotomous (adoption or non-adoption). I used random effects since typical fixed effects models for longitudinal data cannot estimate effects for hospitals that showed no variation in my key variables, such as status, teaching, and ownership, during the study period. The omission of these variables from the models would lead to undesirable misspecification.

I first built a baseline model of the effects of control variables, such as the focal hospital's organizational characteristics (such as age and size) and contextual forces (such as mass media exposure). I then added independent variables—measures

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[9] Because all covariates were lagged by one period in the analysis to enhance causal explanation, the dataset consists of 9 time points (1992 dropped).

of prior adoptions of alternative therapies which were constructed differently

according to theoretical interests of this study. These variables are discussed below in

more detail. The modeling procedure helped me to demonstrate whether or not the

diffusion of other similar therapies influences the adoption of the focal therapy after

controlling for idiosyncratic characteristics of hospitals and contextual forces. Table

5.3 shows the measures for all study variables.

Table 5.3 Variables and Their Measures

Variable	Measure
Adoption	Formal incorporation of alternative therapies along with other treatment services within a focal hospital (1 = yes, 0 = no)
Categorical Characteristics	
Therapies: Same category	Number of hospitals (except a focal hospital) that adopted any therapies (except a focal therapy), regardless of the categorical position of each therapy; Included all eight therapies except the focal therapy
Therapies: Same sub-category	Number of hospitals (except a focal hospital) that adopted any therapies (except a focal therapy) in the same sub-category of the focal therapy; Included homeopathy, naturopathy, acupressure, massage, and taichi/qigong, when acupuncture was the focal therapy
Therapies: Non-ambiguous category	Number of hospitals (except a focal hospital) that adopted any therapies (except a focal therapy) exclusively in the same sub-category of the focal therapy; Included homeopathy and naturopathy, when acupuncture was the focal therapy
Therapies: Ambiguous category	Number of hospitals (except a focal hospital) that adopted any therapies sharing another sub-category; Included acupressure, massage, and taichi/qigong
Relational Characteristics	
Alliance ties	Number of other hospitals offering alternative therapies (except a focal therapy) and sharing the same alliance ties
System ties	Number of other hospitals offering alternative therapies (except a focal therapy) and sharing the same system ties
Structural equivalence	Number of other hospitals offering alternative therapies (except a focal therapy) and sharing the same block
High status	Number of high-status hospitals that adopted alternative therapies (except a focal therapy)

Table 5.3 (Continued)

Variable	Measure
Prior adoption (focal therapy)	Traditional contagion effects, measured by the number of other hospitals that adopted a focal therapy in focal and contiguous counties
Density	Number of hospitals in focal and contiguous counties
Organizational Characteristics	
Age	Number of years since a hospital's founding
Size: staffed bed	Number of beds set up and staffed for use
Size: outpatient	Number of outpatient visits
Growth: staffed bed	Change in beds over a one-year period
Growth: outpatient	Change in outpatient visits over a one-year period
Prior adoption (focal hospital)	Dummy variable coded as 1 if a focal hospital had adopted any alternative therapies.
Service scope	Number of treatment services that a hospital reported in the AHA Annual Survey Data Files
Status	Dummy variable coded as 1 for high-status hospitals that included both the elite hospitals identified by the NORC and those that had ties (i.e., alliance and system membership) to the elite hospitals
Ownership	Hospital ownership is for-profit (1 = yes, 0 = no) or not-for-profit (1 = yes, 0 = no); Public is an omitted category
Teaching	Dummy variable, coded as 1 if the focal hospitals were members of the Council of Teaching Hospitals (COTH)
Contextual Characteristics	
Mass media exposure	Number of articles about a focal alternative therapy appeared in the following popular magazines and newspapers
Total population	Total population of focal and contiguous counties
% population > 65	Percent of population age 65 or older in focal and contiguous counties
% Asian population	Percent of Asian population including Chinese, Filipino, Japanese, Asian Indian, Korean, Vietnamese, Cambodian, Hmong, Laotian, and Thai
Accreditations	Number of professional accreditations of a focal hospital
Clinical evidence	Cumulative number biomedical journal articles for a focal therapy

* All variables are measured for each year.

5.4 Measurement of variables and data sources

5.4.1 Dependent variable

The dependent variable is the adoption of each of the nine alternative therapies by hospitals. By adoption, I mean the formal incorporation of alternative therapies along with other treatment services within a focal hospital. According to this definition, the referral to off-site free-standing alternative care centers not directly managed by the focal hospital was not regarded as adoption. Similarly, irregular workshops for alternative medicine that did not involve patient encounters were excluded as well. The American Hospital Association (AHA) Annual Survey Data Files (1992-2001) provided an initial listing of hospitals offering any alternative therapies (n=77). However, this data source did not specify exactly which alternative therapies were provided and when hospitals adopted such therapies.

Thus, I conducted a survey to verify the listing and collect additional data about the types of therapies and dates of adoption, in collaboration with the Survey Research Institute (SRI) at Cornell. Since this survey was by nature retrospective, the information obtained from the survey could have had some problems of accuracy. This issue of inaccurate responses might arise especially when therapies were adopted in the long past and/or if the respondents were newly hired. Thus, it was critical to identify the person who was most knowledgeable enough to provide accurate answers. Using an initial listing of hospitals offering any alternative therapies compiled from the AHA Survey, I initially contacted all sample hospitals and identified potential respondents who would complete the survey. Among 77 hospitals, I obtained 43 email addresses of potential respondents. The email addresses were used for the web-based survey administered by the Survey Research Institute.

The remaining 34 hospitals refused to disclose emails (15) or were initially unable to identify the right persons to contact (19). For the hospitals that refused to

provide emails, I obtained necessary information through fax or phone from 12 hospitals. Additional contacts revealed that the hospitals that could not locate the potential respondents were mostly those that have not formally adopted alternative therapies (e.g., external referral services, irregular workshop by contract therapists and a few physicians' exploratory practice for a short time). My field interviews also showed that when answering the AHA survey question about alternative medicine, the respondents sometimes included non-alternative therapies, such as support groups, smoking cessation program, women's health services, and fitness services to name a few. This might be due to the fact that the AHA survey instruction did not include a complete list of alternative therapies. Without a complete list, respondents might have used discretion in determining whether they provided any alternative therapies. This seemed to inflate the number of hospitals offering alternative medicine reported by the AHA survey.

For the 43 hospitals whose emails were available, the web-based survey was launched with its corresponding invitations on October 2nd, 2007 and was followed by two reminder emails to non-respondents on October 11th and 16th. The final reminder was sent on November 7th and data collection ended on November 28th. Only 14 people completed the survey, yielding a response rate of 36.8%. I contacted later the non-responding hospitals and obtained relevant information from 10 hospitals via direct site visits and/or phone interviews. Sixteen hospitals out of the remaining 19 hospitals that did not answer survey questions turned out that they did not provide any of the nine therapies that my research focused on. Three hospitals refused to provide answers. Taken together, the total number of hospitals identified as providing alternative therapies in my research was 36. Table 5.4 presents the number of adoption events by the hospitals between 1992 and 2001.

Table 5.4 Number of Hospitals that Adopted Alternative Therapies by Year

Year	Acupuncture	Acupressure	Chiropractic	Homeopathy	Massage	Naturopathy	Reflexology	Taichi/Qigong	Therapeutic Touch
1992	1	0	0	0	0	0	0	0	0
1993	0	0	0	0	1	0	0	0	0
1994	1	2	0	0	0	0	0	0	1
1995	1	1	1	0	0	0	0	0	0
1996	0	1	0	0	0	0	0	0	1
1997	1	0	1	0	1	0	0	1	0
1998	1	0	2	3	3	1	0	0	2
1999	8	4	4	1	9	0	2	3	1
2000	5	1	0	0	2	0	5	2	4
2001	4	1	0	0	3	0	1	1	1
Total	22	10	8	4	19	1	8	7	10

5.4.2 Independent variables

For each therapy studied, I examined the effect of prior adoptions of other alternative therapies on the focal hospital's adoption. Although the effect of prior adoptions has been typically measured by counting the number of prior adopters, I considered two important measurement issues in constructing the count measure in the current empirical context. First, what should be counted? Since one hospital can adopt more than one therapy, the actual number of alternative therapies offered by each hospital should be considered. Two approaches are available. The first approach is to count the number of hospitals that adopted alternative therapies. Counting the number of hospitals, however, may not exactly capture the effect of prior adoptions. According to this approach, for instance, a hospital X adopting 10 therapies and another hospital Y offering one therapy are assumed to have the same impact on the focal hospital Z's adoption rate of alternative medicine. The second approach is to count the number of adoption decisions made by any hospitals. This approach suggests that X is ten times more salient than Y in the influence on Z's adoption of alternative medicine. This approach is based on a questionable assumption that the influence of X is the same as that of ten different hospitals each of which provides one therapy. Insofar as Z regards ten different hospitals as more influential than one, this approach exaggerates the effect of prior adoptions. A more reasonable assumption is that the actual effect of prior adoptions would be somewhere between two extremes captured by the measurement approaches. I report in the next chapter results of analyses based on the first approach for simplicity, but also provide results based on the second approach for comparative purposes.

Second, who should be counted? Since contagion involves some form of interaction and influence among organizations, it is unreasonable to assume that all hospitals in New York State simultaneously affect and are affected by each other. For

instance, the mutual awareness and interaction between hospitals in Ithaca and Elmira would be reasonably high, while the same level of influence would be unlikely between hospitals in Buffalo and New York City unless they are directly connected through network relations. Without assuming such network, researchers often suggest that "proximity provides the best summary of the likelihood of mutual awareness and interdependence" (Strang and Soule 1998: 275). Thus, geographically localized measures seemed appropriate for testing the hypotheses that assumed no network relations (all hypotheses except hypotheses 6 and 7). I constructed a measure of prior adoptions by counting the total number of hospitals in the focal county (where the focal hospital is located) and all contiguous counties (see D'Aunno, Succi and Alexander 2000 for a similar approach). I included hospitals in contiguous counties since hospitals often provide services to patients from neighboring counties.

Count data were obtained from the survey I conducted in collaboration with SRI. The specific methods of constructing independent variables varied according to the hypotheses being tested. Figure 5.2 shows the scope of therapies included in the count measures when the focal therapy is acupuncture. Measures of prior adoptions for hypotheses 1, 2, 3 and 4 were based on the different therapies, with the scope of therapies for hypothesis 3 and 4 being the narrowest. Specifically a count measure of prior adoptions for hypothesis 1 included hospitals (except focal hospitals) that adopted any of the eight therapies, regardless of each therapy's categorical position (therapies: same category). Hypothesis 2 examined the effect of other hospitals offering therapies in the same sub-category. Thus, when a focal therapy was acupuncture, the count measure of prior adoptions included hospitals that adopted homeopathy, naturopathy, acupressure, massage therapies, and Taichi/Qigong in the subcategory of alternative systems of medical practice (therapies: same sub-category). The measure for hypothesis 3 focused on therapies with a clear categorical identity.

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Since acupressure, massage therapies, and Taichi/Qigong have double membership, their categorical positions are ambiguous. Hence I excluded these therapies in calculating the prior adoption measure for hypothesis 3 (therapies: non-ambiguous category). In contrast, the measure for hypothesis 4 included the three therapies to test for the influence of categorically ambiguous therapies (therapies: ambiguous category). Hypothesis 5 examined the adoption of categorically ambiguous therapies. Thus, for example, the dependent variable for hypothesis 5 could be the adoption of acupressure by a focal hospital. When acupressure was a focal therapy, the measure of prior adoptions was the number of hospitals that adopted any of the eight therapies other than acupressure.
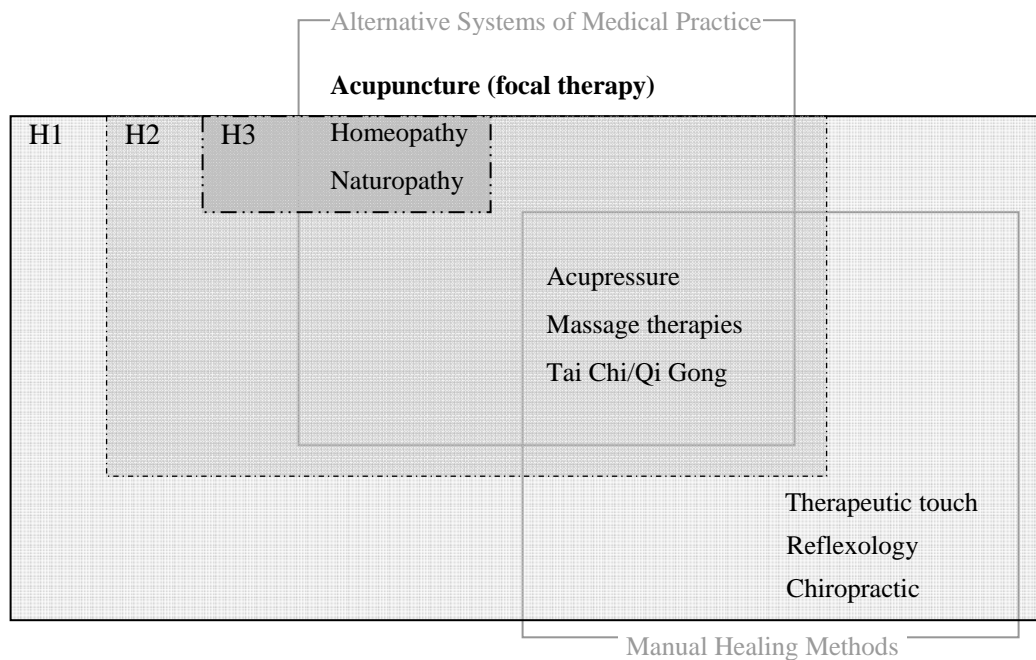
Figure 5.2 Measuring Prior Adoptions (Focal Therapy: Acupuncture)

Hypothesis 6 drew on network structural arguments to examine if information cues about the diffusion of some alternative therapies moved faster through relational

ties and thus facilitated the focal hospital to adopt other alternative medicine. This variable was constructed using alliance and multihospital system ties available from the AHA Survey data (see Westphal et al. 1997). Ties to alliance partners who adopted alternative therapies were measured as a count variable equal to the number of alliance partners who adopted alternative therapies (other than the focal therapy) prior to the focal hospital. Since the number of ties was counted for multiple therapies, this measure was calculated as follows:

$$n_{im} = \sum_{n}^{m \neq n} \sum_{j}^{i \neq j} \sum_{k} x_{imk} \, y_{jnk} \ ,$$

where n_{im} refers to the network size (number of ties) of hospital i at risk of adopting the focal therapy m; x_{imk} is 1 if the focal hospital participates in alliance k, otherwise 0; y_{jnk} is 1 if other hospital j already offering the therapy n participates in alliance k, otherwise 0. In other words, for a hospital at risk of adopting the focal therapy, this measure represents the total number of other hospitals offering alternative therapies (but not the focal therapy) and sharing the same alliance network (alliance). The variable for ties to system was measured in a similar way (system).

Hypothesis 7 used another network measure—structural equivalence. As a way of identifying structurally equivalent hospitals, I focused on the similarities between the patterns of conventional biomedical therapies offered by each pair of hospitals. This measure was constructed using a blockmodel analysis, which partitions networks based on hospitals' common patterns of relations with all other hospitals in the network (i.e., structural equivalence). This model could identify nominal groups without other information about attributes of hospitals and regardless of whether those hospitals were directly linked or not (White et al. 1976; Gerlach 1992; Wasserman and Faust 1994). Using the AHA Survey data, I first constructed an

n×l matrix H, where $H_{ij} = 1$ if a hospital i offered a medical service j, and $H_{ij} = 0$ otherwise. I then performed the matrix multiplication of HH' (H and the transposed matrix of H) to create an n×n matrix S, where $S_{ij} = 1$ if hospitals i and j provided the same medical service and 0 otherwise. Based on this matrix, I identified structural equivalence among hospitals using an iterated correlation algorithm, called CONCOR (Breiger, Boorman, and Arabie 1975). CONCOR identifies groups of actors with similar relationships and divides them into blocks, within which all hospitals are structurally equivalent. I used UCINET (Borgatti et al. 2002), a widely used network analytical program, to perform this algorithm. After identifying blocks, I constructed a count measure of hospitals that adopted alternative therapies and were in the same block (structural equivalence). This measure was created in the same way that the measure of ties to multihospital system was constructed.

Hypothesis 8 suggests that the salience of informational cues about other therapies is influenced by the adoption of high-status hospitals. Drawing upon the recent status literature that emphasizes a small number of empirical distinctions of status groups, such as higher, middle, and lower status (Phillips and Zuckerman 2001; Deephouse and Suchman 2007), I identified the group of high-status hospitals and counted the number that adopted alternative therapies in the following two-step process. First, a group of high-status hospitals was identified using hospital rank data available from the National Organization for Research and Computing (NORC) at the University of Chicago. The NORC annually identified 150-200 hospitals with the highest rank scores based on a survey using a stratified random sample of physicians, and the list of elite hospitals was published by the USNews.com (America's Best Hospitals). Second, since the total number of elite hospitals per year was less than 200 and a small number of hospitals in New York State were listed, I included a hospital that had ties (i.e., alliance and system membership) to the elite hospitals as a member

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of the high-status group. This approach matches the concept of status introduced by Podolny (1993, 2005), who suggested that high status is derived from affiliations with prominent actors. I constructed a count measure of hospitals that adopted alternative therapies and that were in the high-status group (high status).

5.4.3 Control variables

All models in the analyses included the number of other hospitals that adopted a focal therapy to control for the effect of traditional contagion. For example, when I analyzed the adoption of acupuncture, I included a count measure of other hospitals that adopted acupuncture in focal and contiguous counties (prior adoption: focal therapy). All models also included a density variable, measured as the total number of hospitals in the same geographical areas (density). When independent variables were based on non-geographical boundaries, such as alliances and systems (hypothesis 6) and blocks (hypothesis 7), prior adoption: focal therapy and density were matched to the same boundaries. For instance, a density variable for hypothesis 6, which examined ties to multihospital systems, was constructed to include the total number of hospitals in the same multihospital system.

To rule out other alternative explanations, I also included two sets of control variables in all models: organizational and contextual characteristics. First, I controlled for organizational characteristics since the focal hospital's adoption could be driven by its internal needs and idiosyncratic features. The organization-level control variables included age, size, growth, past adoption of alternative therapies, service scope, status, ownership, and teaching. Second, I used a set of variables that measured contextual characteristics of the focal hospitals. The danger of common contextual effects for contagion between actors has been well documented (e.g., Coleman et al. 1966; Haunschild and Miner 1997; Van den Bulte and Lilien 2001).

These studies suggest that mutual awareness and perceptions about innovations may not be exclusively influenced by contagion between actors; rather common contextual forces, such as mass media exposure, may induce both prior and potential adoptions even when no direct interaction and mutual influence exist between actors.[10] Thus, failure to control for the contextual forces may induce spurious relationships. This issue of common contextual forces applies to the current research context: if unobserved factors affect prior adoptions of one alternative therapy and adoptions of the other therapy, my argument about contagion between practices cannot hold. As contextual forces, I examined mass media exposure, market demand, normative influence of conventional/alternative medicine, and cumulative clinical evidence.

Organizational characteristics: Organizational age has been studied as a major factor affecting rates of organizational change (e.g., Delacroix and Swaminathan 1991). Age was measured as the number of years since a hospital's founding (age).

Organizational size has also been suggested to influence change (Scott et al. 2000). I used a standard measure of size for hospitals—the number of staffed beds (size: staffed bed). I also used an alternative measure of size, the number of outpatient visits (size: outpatient), because my field interviews suggested that most alternative therapies were provided to outpatients, rather than inpatients. The adoption decision of a hospital's treatment services may be driven by its growth. Thus I included two measures of growth based on the two size measures—growth: staffed bed and growth: outpatient.

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[10] Granovetter (1978) also considered this issue by providing an extreme example: "individuals who appear to react to one another are actually all responding to an external influence." In his quote from Weber (1968: 23): "thus, if at the beginning of a shower a number of people on the street put up their umbrellas at the same time, this would not ordinarily be a case of action mutually oriented to that of each other, but rather of all reacting in the same way to the like need of protection from the rain." However, this does not necessarily mean that there is no social contagion. As Granovetter added, "there are surely some whose umbrella behavior is determined in part by that of others around them" (p. 1437).

I also controlled for past adoption of alternative therapies (prior adoption: focal hospital). Past adoptions can encourage focal organizations to adopt similar practices. For instance, Washington and Ventresca (2004) showed that colleges that adopted football teams were more likely to adopt lacrosse and hockey teams than other schools that did not have such experience. Sanders and Tuschke (2007) also found that the adoption of accounting practice positively affects the subsequent adoption of stock option pay.[11] Past adoption was measured using a dummy variable coded as "1" if the focal hospital had adopted any alternative therapies.

Patients and their physicians tend to do "one-stop shopping" at hospitals providing a wide array of services (Succi, Lee, and Alexander 1997). Insofar as alternative therapies are viewed as new medical practices that can help hospitals make a larger, richer mix of treatment services, current service scope will affect rates of the focal hospital's adoption of alternative therapies. Thus, I included the number of treatment services that hospitals reported in the AHA Annual Survey Data Files (service scope).

Status was measured by a dichotomous variable coded as "1" for high-status hospitals that included both the elite hospitals identified by the NORC and those that had ties (i.e., alliance and system membership) to the elite hospitals (status).

Hospital ownership was measured by dummy variables representing public (an omitted category), private for-profit (ownership: for-profit), and private not-for-profit ownership (ownership: not-for-profit).

Finally, teaching hospitals were measured by a dummy variable, coded as "1" if the focal hospitals were members of the Council of Teaching Hospitals (COTH) in a

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[11] Note that these studies are different from the current research since they focus on the adoption of different practices by the same organization, whereas my focus is on the adoption of different practices by different organizations.

given year (<u>teaching</u>), a common definition of a major academic teaching institution. Teaching status seems important in the adoption of alternative therapies in two opposite ways. On the one hand, major academic teaching hospitals acquire prestige by developing new medical research programs to train students in the most recent medical practices and new knowledge, such as alternative therapies. On the other hand, the mission in teaching hospitals is typically to disseminate well-developed standards of practice and to encourage compliance with clinical protocols and external reviews, thereby discouraging the adoption of less legitimate medical treatments.

Contextual characteristics: The critical role of mass media in the diffusion of new practices and structure has been well documented (e.g., Abrahamson 1991, 1996; see Strang and Soule 1998 for a review). I measured the effect of mass media as the number of articles about alternative therapies appeared in the following popular magazines and newspapers in a given year (<u>mass media exposure</u>): New York Times, Newsweek, Wall Street Journal, Washington Post, and USA Today.

Market demand plays a key role in affecting the behavior of hospitals. In general, local markets with low market demand cannot provide sufficient resources for all hospitals that depend on the same resource needs (Hannan and Freeman 1977, 1989). Insufficient consumer demand for hospitals' services may lead to the adoption of new practices which are believed to attract new patients. Demand was measured by three indicators: total population (<u>total population</u>), percent of population age 65 or older (<u>% population > 65</u>), and percent of Asian population (<u>% Asian population</u>). For the measure of % Asian population, I included the following ethnic groups: Chinese, Filipino, Japanese, Asian Indian, Korean, Vietnamese, Cambodian, Hmong, Laotian, and Thai. Following D'Aunno et al. (2000), I created these measures based on the values of the focal and contiguous counties. These data were available from the Area Resource File provided by the National Center for Health Workforce Analysis.

Professionals are often viewed as a critical source of normative influence since they reconstruct cognitive, normative frameworks that define areas within which they claim jurisdiction and seek to exercise control (Abbott 1988; Freidson 2001). Highly organized professions can exert stronger pressures on hospitals than less organized occupational groups. I used the number of accreditations that a hospital had in a given year as a measure of the normative influence of conventional medicine (accreditations). Major accrediting agencies, such as the Joint Commission on Accreditation of Healthcare Organizations, exert normative influence from the perspective of conventional medicine (Ruef and Scott, 1998). For instance, these organizations have very strict standards that strongly recommend hospitals not to provide any therapies that do not have biomedical evidence for therapeutic efficacy. Since conclusive evidence for efficacy is not available yet for some alternative therapies, hospitals adopting the therapies may be subject to scrutiny and the potential loss of accreditation. Thus I expected that the greater the number of accreditations that a focal hospital had, the less likely the hospital would adopt alternative therapies. The data for this measure was available from the AHA data files.

If hospitals tend to adopt medical therapies that have strong biomedical evidence for therapeutic efficacy, the increase in cumulative evidence for an alternative therapy will have a positive effect on the adoption rate of the therapy by hospitals. I measured clinical evidence as the cumulative number of biomedical journal articles for each therapy (clinical evidence). When a model examined the adoption of acupuncture as a dependent variable, I included in the model a measure based on the cumulative number of journal articles that showed clinical evidence for acupuncture. This data was available from MEDLINE.

Chapter 6

RESULTS

For simplicity, this chapter first focuses on the adoption of acupuncture by hospitals when presenting results of analyses in Sections 6.1 and 6.2. The chapter then reports results of additional analyses in Section 6.3 to show comparisons across therapies, such as acupuncture, therapeutic touch, and acupressure – the three therapies that represent three different categorical positions in Figure 1.1. The chapter also provides other results of analyses to show whether contagion across practices operates even among conventional therapies. All independent variables were based the number of hospitals offering alternative therapies, not the number of adoption decisions. For comparison purposes, Section 6.3 shows the summary results based on the alternative variable construction (i.e., number of adoption decisions).

Table 6.1 presents summary statistics and a correlation matrix for all variables. It is worth noting that some independent variables are significantly associated with measures of mass media exposure and market demand, suggesting the importance of contextual characteristics. In terms of the strength of association, mass media exposure had a weaker effect than market demand, measured by percent of Asian population, percent of population age 65 or older, and total population in the same geographical area. Among the three measures of market demand, percent of Asian population was highly and positively correlated with prior adoptions of other therapies by hospitals. Since it is unlikely that the adoption of alternative therapies by hospitals affected increase in Asian population, the association may imply that the adoption of alternative therapies by hospitals was significantly driven by Asian population, presumably the main users of traditional oriental medicine. The negative association between % population > 65 and variables of prior adoptions appears to indicate that alternative therapies are more popular among younger generation.

Table 6.1 Descriptive Statistics: Means, Standard Deviations, and Correlations

	Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
1	Adoption	0.028	0.166												
2	Age	82.159	41.577	0.081											
3	Size (staffed bed)	320.637	287.136	0.075	0.285										
4	Size (outpatient)	159550	185771	0.129	0.294	0.586									
5	Growth (staffed bed)	-6.308	65.342	0.006	-0.042	0.050	-0.010								
6	Growth (outpatient)	6559.725	71739.240	0.013	0.028	0.084	0.283	0.120							
7	Prior adoption (focal hospital)	0.034	0.182	0.472	0.091	0.029	0.075	-0.013	-0.010						
8	Service scope	85.203	76.033	-0.073	-0.057	0.043	-0.084	0.040	0.004	0.020					
9	Status	0.146	0.353	0.099	0.203	0.211	0.172	0.027	0.039	0.055	-0.126				
10	Ownership (Not-for-profit)	0.681	0.466	0.007	0.173	-0.079	0.106	0.057	0.038	0.029	-0.036	0.164			
11	Ownership (For-profit)	0.079	0.270	-0.035	-0.166	-0.142	-0.209	0.032	-0.023	-0.027	0.048	-0.058	-0.430		
12	Teaching	0.208	0.406	0.141	0.120	0.406	0.451	-0.030	0.039	0.052	-0.008	0.361	-0.137	-0.087	
13	Mass media exposure	441.161	265.568	0.148	0.069	-0.051	0.122	0.042	-0.019	0.087	-0.724	0.208	0.030	-0.039	0.001
14	Total population	3061907	2650081	0.081	0.108	0.388	0.243	-0.050	0.002	0.051	0.080	0.408	-0.126	0.092	0.421
15	% population > 65	0.134	0.011	-0.130	-0.075	-0.091	-0.038	0.039	0.014	-0.090	-0.013	-0.147	0.070	-0.054	-0.093
16	% Asian population	0.041	0.035	0.084	0.064	0.391	0.262	-0.050	0.000	0.062	0.055	0.430	-0.125	0.085	0.459
17	Accreditations	4.122	1.791	0.109	0.311	0.523	0.588	0.006	0.060	0.047	-0.031	0.311	0.250	-0.258	0.583
18	Clinical evidence	973.210	584.283	0.151	0.069	-0.049	0.122	0.046	-0.019	0.095	-0.690	0.206	0.030	-0.039	0.001
19	Prior adoption (focal therapy)	1.652	2.204	0.136	0.069	0.157	0.162	0.024	-0.023	0.086	-0.054	0.299	-0.088	0.032	0.215
20	Therapies: Same category	1.501	2.228	0.143	0.091	0.167	0.204	0.018	-0.015	0.064	-0.248	0.369	-0.073	0.020	0.235
21	Therapies: Same sub-category	1.278	1.920	0.147	0.083	0.166	0.194	0.022	-0.019	0.068	-0.222	0.343	-0.074	0.023	0.225
22	Therapies: Non-ambiguous	0.152	0.558	0.137	0.096	0.127	0.172	0.030	-0.020	0.092	-0.141	0.246	-0.044	-0.012	0.183
23	Alliance ties	0.071	0.346	0.112	0.116	0.061	0.045	0.036	-0.004	0.070	-0.115	0.300	0.072	-0.043	0.068
24	System ties	0.104	0.374	0.031	0.031	0.164	0.189	-0.015	-0.005	0.053	-0.115	0.400	-0.073	-0.052	0.355
25	Structural equivalence	5.386	7.175	0.152	0.059	-0.023	0.137	0.007	-0.009	0.132	-0.500	0.126	0.076	-0.064	0.039
26	High status	0.502	1.177	0.138	0.086	0.164	0.199	0.016	-0.021	0.082	-0.231	0.355	-0.050	0.013	0.212

Table 6.1 (continued)

	Correlations	13	14	15	16	17	18	19	20	21	22	23	24	25
14	Total population	0.020												
15	% population > 65	-0.099	-0.348											
16	% Asian population	0.080	0.937	-0.373										
17	Accreditations	0.013	0.365	-0.085	0.385									
18	Clinical evidence	0.097	0.021	-0.103	0.079	0.011								
19	Prior adoption (focal therapy)	0.362	0.633	-0.529	0.628	0.150	0.383							
20	Therapies: Same category	0.514	0.662	-0.426	0.668	0.182	0.530	0.904						
21	Therapies: Same sub-category	0.494	0.657	-0.466	0.652	0.173	0.511	0.947	0.970					
22	Therapies: Non-ambiguous	0.394	0.472	-0.335	0.471	0.152	0.410	0.811	0.768	0.819				
23	Alliance ties	0.270	0.146	-0.208	0.153	0.115	0.280	0.383	0.360	0.381	0.292			
24	System ties	0.221	0.341	-0.144	0.383	0.169	0.222	0.281	0.363	0.351	0.254	0.121		
25	Structural equivalence	0.729	0.022	-0.100	0.058	0.044	0.742	0.330	0.417	0.408	0.326	0.259	0.201	
26	High status	0.483	0.579	-0.352	0.606	0.183	0.496	0.816	0.917	0.895	0.813	0.318	0.385	0.386

Note: $p < 0.05$ where $|r| > 0.039$

6.1 Categorical positions and contagion

Table 6.2 provides the results of maximum-likelihood logistic regression analyses for categorical characteristics hypotheses (H1-4). All models are structured in the order of hypotheses developed in Chapter 5. Model 1 provides the baseline model that includes control variables. Model 2-4 include three measures for categorical characteristics hypotheses—the number of prior adoptions of eight therapies other than acupuncture (therapies: same category), the number of prior adoptions of five therapies in the same sub-category—homeopathy, naturopathy, acupressure, massage, taichi/qigong (therapies: same sub-category), and the number of prior adoptions of two therapies exclusively in the same sub-category—homeopathy and naturopathy (therapies: non-ambiguous category). Model 5-6 test for effects of prior adoptions of three categorically ambiguous therapies—acupressure, massage, and taichi/qigong (therapies: ambiguous category). Overall, the results provide strong evidence for my argument that the diffusion of a set of practices influences the adoption of other associated practices, if they are grouped in the same category.

Model 2 in Table 6.2 shows that prior adoptions of eight therapies (excluding acupuncture) by hospitals significantly predict the adoption of acupuncture by the focal hospital, even after controlling for the effect of traditional contagion arguments—i.e., the number of other hospitals that adopted acupuncture (prior adoption: focal therapy). The estimated coefficient of therapies: same category suggests that other things being equal, each additional increase in the number of hospitals offering any eight therapies increases the odds that the focal hospital will adopt acupuncture by a factor of 2.152. This was calculated using the exponentiated coefficient (odds ratio) of the variable, therapies: same category (0.766). This result provides support for hypothesis 1.

Table 6.2 Cross-Sectional Time-Series Logit Analysis: Adoption of Acupuncture

	M1	M2	M3	M4	M5	M6
Age	0.006	0.004	0.006	0.006	0.007	0.006
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Size (staffed bed)	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Size (outpatient)	0.100	0.082	0.078	-0.005	0.098	-0.026
	(0.235)	(0.249)	(0.245)	(0.248)	(0.241)	(0.255)
Growth (staffed bed)	-0.004	-0.003	-0.004	-0.005	-0.005	-0.004
	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.006)
Growth (outpatient)	0.261	0.261	0.249	0.315	0.285	0.315
	(0.278)	(0.282)	(0.275)	(0.272)	(0.275)	(0.278)
Prior adoption (focal hospital)	5.296***	5.763***	5.551***	5.418***	5.446***	5.630***
	(0.992)	(1.059)	(1.040)	(1.030)	(1.027)	(1.062)
Service scope	-0.001	0.003	0.002	0.002	0.002	0.003
	(0.015)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Status	-1.069	-0.980	-0.944	-0.751	-0.826	-0.856
	(0.966)	(1.041)	(1.009)	(1.014)	(0.992)	(1.035)
Ownership (Not-for-profit)	0.190	0.548	0.452	0.678	0.407	0.717
	(1.173)	(1.225)	(1.219)	(1.208)	(1.203)	(1.230)
Ownership (For-profit)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(1.296)	(1.033)	(1.082)	(2.073)	(1.933)	(1.724)
Teaching	1.848	2.043	1.868	2.175	1.832	2.235
	(1.323)	(1.368)	(1.347)	(1.384)	(1.334)	(1.396)
Mass media exposure	-0.004	0.013	0.008	-0.005	0.003	0.004
	(0.021)	(0.024)	(0.023)	(0.023)	(0.023)	(0.024)
Total population	-0.015	-0.089	-0.112	-0.163**	-0.087	-0.182**
	(0.048)	(0.070)	(0.070)	(0.073)	(0.067)	(0.076)
% population > 65	-1.630***	-1.925***	-1.914***	-1.726***	-1.794***	-1.929***
	(0.630)	(0.673)	(0.694)	(0.628)	(0.668)	(0.674)
% Asian population	0.074	-0.155	0.019	0.042	0.039	0.001
	(0.336)	(0.369)	(0.349)	(0.350)	(0.345)	(0.357)
Accreditations	0.569	0.607	0.592	0.559	0.602	0.549
	(0.359)	(0.380)	(0.374)	(0.376)	(0.369)	(0.382)
Clinical evidence	0.005	-0.003	-0.000	0.007	0.002	0.002
	(0.009)	(0.011)	(0.010)	(0.010)	(0.010)	(0.011)
Prior adoption (focal therapy)	-0.172	-0.810**	-1.042*	-1.085**	-0.829	-1.685***
	(0.241)	(0.361)	(0.557)	(0.435)	(0.538)	(0.646)
Density		0.096	0.115*	0.195***	0.096*	0.215***
		(0.059)	(0.062)	(0.071)	(0.058)	(0.074)
Therapies: Same category		0.766**				
		(0.321)				
Therapies: Same sub-category			1.036*			
			(0.625)			
Therapies: Non-ambiguous category				3.326**		3.143**
				(1.342)		(1.379)
Therapies: Ambiguous category					0.504	0.828
					(0.398)	(0.650)
Constant	7.483	9.303	8.176	4.131	6.962	6.343
	(8.594)	(9.368)	(9.518)	(8.638)	(9.218)	(9.180)
Wald X^2	59.841	61.668	60.794	62.173	60.454	61.969
Degrees of freedom	18	20	20	20	20	21

Standard errors in parentheses

* significant at 10% ** significant at 5% *** significant at 1%

Model 3 examines the effect of categorical similarity, whereas Model 4 investigates the influence of categorical ambiguity. Model 3 shows that the measure of prior adoption of other therapies in the same sub-category has a positive, significant effect on the adoption of acupuncture (therapies: same sub-category). It thus provides support for hypothesis 2 which suggested that categorically similar therapies have positive influence on the adoption of acupuncture. Model 4 indicates that the coefficient of therapies: non-ambiguous category is positive and significant. The result provides support for hypothesis 3, which predicted that the number of other hospitals that adopted therapies exclusively in one sub-category would be positively associated with the focal hospital's adoption of the other therapy in the same sub-category.

Model 5 and 6 provide further support for the categorical ambiguity argument. Unlike prior adoption of other therapies exclusively in the same sub-category tested in Model 4, prior adoption of other therapies sharing another sub-category—therapies: ambiguous category (acupressure, massage, and taichi/qigong) in Model 5 was not significant. This result provides support for hypothesis 4 and suggests that a kind of social penalty in the adoption process may operate against the therapies whose categorical identities are ambiguous and inconsistent (Zuckerman 1999). Model 6 shows that the categorical ambiguity argument remained significant when two variables were included simultaneously—the one with therapies exclusively in the same sub-category (homeopathy and naturopathy) and the other with therapies that share another sub-category (acupressure, massage, and taichi/qigong). Only the measure of prior adoption of therapies exclusively in the same sub-category (therapies: non-ambiguous category) was significant. Taken together, the results suggest that the influence of multiple therapies on the adoption of acupuncture is largely driven by categorically non-ambiguous therapies.

Table 6.3 Cross-Sectional Time-Series Logit Analysis: Adoption of Acupressure

	M1	M2	M3	M4	M5	M6	M7
Age	0.030	0.035	0.033	0.031	0.030	0.032	0.034
	(0.024)	(0.026)	(0.025)	(0.025)	(0.025)	(0.025)	(0.026)
Size (staffed bed)	-0.020*	-0.024**	-0.023**	-0.022**	-0.021**	-0.024**	-0.023*
	(0.010)	(0.012)	(0.012)	(0.011)	(0.011)	(0.012)	(0.012)
Size (outpatient)	0.858	1.072	1.065	0.958	0.969	1.102	0.987
	(0.605)	(0.662)	(0.653)	(0.638)	(0.637)	(0.700)	(0.689)
Growth (staffed bed)	-0.029	-0.030	-0.029	-0.030	-0.029	-0.028	-0.030
	(0.019)	(0.021)	(0.021)	(0.020)	(0.020)	(0.022)	(0.021)
Growth (outpatient)	0.684	0.702	0.708	0.664	0.669	0.733	0.641
	(0.616)	(0.557)	(0.539)	(0.570)	(0.548)	(0.593)	(0.591)
Prior adoption (focal hospital)	8.274***	8.306***	8.379***	8.135***	8.222***	8.686***	8.048***
	(2.078)	(2.170)	(2.193)	(2.104)	(2.120)	(2.285)	(2.127)
Service scope	0.049*	0.055*	0.053*	0.055*	0.052*	0.055*	0.059*
	(0.030)	(0.031)	(0.031)	(0.031)	(0.031)	(0.033)	(0.032)
Status	-4.359	-2.970	-3.010	-3.291	-3.330	-3.111	-3.459
	(3.522)	(3.533)	(3.561)	(3.699)	(3.701)	(3.528)	(3.632)
Ownership (Not-for-profit)	-0.257	-0.297	-0.196	-0.324	-0.275	0.291	-0.217
	(2.366)	(2.433)	(2.429)	(2.404)	(2.397)	(2.575)	(2.437)
Ownership (For-profit)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(2.192)	(5.340)	(6.025)	(2.697)	(8.767)	(3.954)	(8.739)
Teaching	6.748*	6.869*	6.987*	6.766*	6.836*	7.873*	7.056*
	(3.751)	(3.840)	(3.885)	(3.792)	(3.820)	(4.136)	(3.832)
Mass media exposure	0.507*	0.519*	0.482	0.508*	0.483	0.498	0.532*
	(0.301)	(0.304)	(0.304)	(0.300)	(0.302)	(0.316)	(0.307)
Total population	-0.348**	-0.425**	-0.446**	-0.394*	-0.413**	-0.522**	-0.388*
	(0.151)	(0.212)	(0.216)	(0.209)	(0.210)	(0.245)	(0.211)
% population > 65	-1.842	-2.204	-2.194	-1.931	-1.925	-2.680*	-2.122
	(1.193)	(1.353)	(1.360)	(1.254)	(1.258)	(1.494)	(1.319)
% Asian population	2.073**	2.260**	2.244**	2.205**	2.184**	2.363**	2.275**
	(0.969)	(1.037)	(1.029)	(1.010)	(1.004)	(1.061)	(1.044)
Accreditations	-0.391	-0.262	-0.269	-0.290	-0.297	-0.390	-0.386
	(0.822)	(0.835)	(0.832)	(0.832)	(0.828)	(0.867)	(0.865)
Clinical evidence	-0.283*	-0.272	-0.255	-0.270	-0.259	-0.261	-0.274
	(0.168)	(0.169)	(0.170)	(0.168)	(0.169)	(0.175)	(0.170)
Prior adoption (focal therapy)	0.522	0.794	0.768	0.540	0.512	0.403	0.521
	(1.537)	(1.712)	(1.726)	(1.693)	(1.697)	(1.675)	(1.700)
Density		0.084	0.091	0.048	0.055	0.163	0.041
		(0.118)	(0.120)	(0.118)	(0.117)	(0.150)	(0.121)
Therapies: Same category		-0.600					
		(0.550)					
Therapies: Same sub-category (Alternative systems of medical practice)			-0.592				
			(0.609)				
Therapies: Same sub-category (Manual healing methods)				-0.508			
				(0.722)			
Therapies: Ambiguous category (Massage, Taichi/Qigong)					-0.496	0.754	0.035
					(0.815)	(1.281)	(0.995)
Therapies: Non-ambiguous category (Acupuncture, Homeopathy, Naturopathy)						-1.408	
						(1.112)	
Therapies: Non-ambiguous category (Chiropractic, Reflexology, Therapeutic Touch)							-1.307
							(1.262)
Constant	8.637	10.307	10.740	7.816	8.183	16.118	9.432
	(16.185)	(18.045)	(18.206)	(17.133)	(17.267)	(19.314)	(17.702)
Wald X^2	19.411	19.129	18.713	19.450	19.122	18.394	19.433
Degrees of freedom	18	20	20	20	20	21	21

Standard errors in parentheses
* significant at 10% ** significant at 5% *** significant at 1%

Table 6.3 provides results for hypotheses 5a and 5b, which investigated the effect that other therapies have on categorically ambiguous therapies—the flip side of categorical ambiguity argument. The hypotheses were tested using a different dependent variable—the adoption of acupressure. Model 1 included controls. Model 2 examined the influence of eight other therapies on the adoption of acupressure (therapies: same category). Model 3 and 4 included five therapies in the sub-categories (therapies: same sub-category); due to acupressure's double membership of categories, both sub-categories (alternative systems of medical practice and manual healing methods) were examined in the models. Model 5-7 examined other therapies for complete comparisons across different sub-groups of therapies. Model 5 examined the effect of massage and taichi/qigong—the two other therapies whose categorical identity is ambiguous. Model 6 included two groups of therapies that make the complete sub-category of alternative systems of medical practice: (a) massage and taichi/qigong and (b) acupuncture, homeopathy, and naturopathy. Similarly Model 7 included two variables that decompose the sub-category of manual healing methods into two groups of therapies: (a) massage and taichi/qigong and (b) chiropractic, reflexology, and therapeutic touch.

These models provide a complete analysis for the argument that categorically ambiguous therapies have double membership of sub-categories (e.g., acupressure) which may serve as double sources of informational cues and legitimacy transfer (hypothesis 5a). The competing hypothesis 5b predicted that the effect of other therapies on categorically ambiguous therapies would be weak. The results provide support for hypothesis 5b; no coefficients in all models were significant, suggesting that prior adoptions of other therapies do not significantly explain the adoption rates of acupressure.

6.2 Relational positions and contagion

Table 6.4 includes four models relational characteristics hypotheses—alliances, systems ties, structural equivalence, and high-status. Model 1 and 2 in Table 6.4 test for hypothesis 6, which predicted that prior adoptions of other therapies are salient for the adoption of acupuncture when hospitals are connected through network. The results provide partial support; the coefficient of relational characteristics variable in Model 1 (alliance) was significant, but the coefficient of system in Model 2 was not. One speculation is that although hospital alliances and systems may facilitate the flow of information between member organizations, the formal implementation of alternative medicine programs may require greater autonomy. On the one hand, hospital alliances involve contractual arrangements for the provision of services and do not impose any further constrains on the decision making of member hospitals. On the other hand, system memberships bind hospitals together under common ownership and may provide universal mandates that limit autonomy.

Model 3 examines if informational cues conducive to contagion across practices spread fast between structurally equivalent hospitals (hypothesis 7). The results suggest that the number of structurally equivalent hospitals that offered alternative therapies was influential in the adoption decision of acupuncture by a focal hospital. Other things being equal, each additional increase in the number of hospitals offering any eight therapies increases the odds that the focal hospital will adopt acupuncture by a factor of 2.7 if the hospitals are structurally equivalent.

Model 4 shows the results for hypothesis 8, which predicted that the salience of informational cues may be influenced by high-status adopters. The results indicate significant influence of the high-status hospitals; when the number of high-status hospitals that offered acupuncture increases by one, the odds of adopting acupuncture increase by a factor of 4.094.

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Table 6.4 Cross-Sectional Time-Series Logit Analysis:
Adoption of Acupuncture—Relational Characteristics Hypotheses

	Alliance (M1)	System (M2)	SE (M3)	Status (M4)
Age	0.007	0.008	0.004	0.007
	(0.011)	(0.011)	(0.011)	(0.012)
Size (staffed bed)	-0.001	-0.001	-0.002	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Size (outpatients)	0.041	0.109	0.162	0.039
	(0.252)	(0.232)	(0.242)	(0.246)
Growth (staffed bed)	-0.004	-0.005	-0.004	-0.003
	(0.005)	(0.005)	(0.006)	(0.006)
Growth (outpatients)	0.239	0.252	0.378	0.209
	(0.288)	(0.268)	(0.265)	(0.280)
Prior adoption (focal hospital)	6.238***	5.264***	5.311***	5.847***
	(1.120)	(0.997)	(1.000)	(1.063)
Service scope	-0.003	0.001	0.008	-0.001
	(0.016)	(0.015)	(0.020)	(0.016)
Status	-1.122	-0.813	-0.803	-0.942
	(1.014)	(0.999)	(0.990)	(1.024)
Ownership (Not-for-profit)	0.673	-0.000	0.016	0.542
	(1.234)	(1.170)	(1.206)	(1.217)
Ownership (For-profit)	-0.002	-0.002	-0.002	-0.002
	(1.779)	(1.460)	(6.434)	(1.878)
Teaching	2.604*	2.061	1.068	2.214
	(1.390)	(1.321)	(1.270)	(1.375)
Mass media exposure	0.004	0.009	-0.253***	0.016
	(0.020)	(0.021)	(0.080)	(0.022)
Total population	-0.031	-0.026	-0.015	-0.103
	(0.047)	(0.046)	(0.045)	(0.070)
% population > 65	-1.666***	-1.472***	-1.570***	-1.334**
	(0.592)	(0.545)	(0.584)	(0.559)
% Asian population	0.101	0.110	0.080	-0.033
	(0.349)	(0.340)	(0.337)	(0.356)
Accreditations	0.568	0.566	0.520	0.668*
	(0.374)	(0.364)	(0.368)	(0.370)
Clinical evidence	0.001	-0.001	0.123***	-0.005
	(0.009)	(0.009)	(0.038)	(0.010)
Prior adoption (focal therapy)	-4.330**	-1.484	-2.934***	-0.850
	(1.906)	(1.425)	(0.708)	(0.585)
Density	-0.001	0.005	0.124***	0.080
	(0.006)	(0.009)	(0.036)	(0.058)
Relational characteristics	3.197**	0.031	0.995***	1.409*
	(1.512)	(0.985)	(0.348)	(0.727)
Constant	7.964	4.353	-7.961	2.388
	(8.270)	(7.981)	(9.336)	(8.242)
Wald X^2	59.060	61.187	58.250	62.543
Degrees of freedom	20	20	20	20

* significant at 10% ** significant at 5% *** significant at 1%

6.3 Additional analysis

6.3.1 Comparisons across therapies

Tables 6.5 shows comparisons across three therapies, including acupuncture, therapeutic touch, and acupressure that represent three different categorical positions. Acupuncture and therapeutic touch are organized into categorically non-ambiguous sub-categories, whereas acupressure is categorically ambiguous due to its dual categorical membership.

The results in Table 6.5 show interesting differences in the effects of prior adoption among the three therapies. First, results of categorical characteristics hypotheses for acupuncture and therapeutic touch (H1-4) are very similar (all significant for H1-3 and not significant for H4), but sharply contrast with the results for acupressure. The results show additional support for the proposition that prior adoptions of alternative therapies by hospitals enhance diffusion rates of other therapies especially when the categorical identity of therapies is not ambiguous.

Second, there is some evidence for the influence of relational linkages. Results of relational characteristics hypotheses (H6-8) indicate that the role of relational linkages in the dissemination of alternative therapies for contagion processes varies across individual therapies. Alliance ties, structural equivalence, and high status play a significant role in affecting the adoption of acupuncture, whereas no relational characteristics of hospitals are significant in predicting the adoption of therapeutic touch. For the adoption of acupressure, alliance ties have significant influence, while structural equivalence and high status do not have such influence.

The difference in the effects of prior adoption among the three therapies is more evident for categorical characteristics hypotheses than relational characteristics hypotheses. This should not be surprising because the three therapies were selected on the basis of categorical positions of each therapy.

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Table 6.5 Comparisons across acupuncture, therapeutic touch, and acupressure

Hypothesis	Therapies in a broad category	Therapies in a sub-category	Therapies only in one sub-category	Therapies in two sub-categories	Alliance ties	Structural equivalence	High status
Therapy	H1	H2	H3	H4	H6	H7	H8
Acupuncture	+	+	+		+	+	+
Therapeutic touch	+	+	+				
Acupressure				not applicable	+		

Note:

1. This table gives directions of the effect estimates for statistically significant effects only. + indicates positive, significant effects.

2. The table does not include H5, because it examined the adoption of only one therapy (the influence of other therapies on the adoption of acupressure). A result for H4-acupressure is not applicable because H4 examined the influence of therapies in two sub-categories, which include acupressure.

3. Results of acupuncture are based on Table 6.2 and 6.4. Results of therapeutic touch are available in Appendix 1. Results of H1-4 for acupressure are based on Table 6.3 and other results for acupressure are available in Appendix 2.

6.3.2 Contagion among conventional therapies

Categorization is important because it provides a simplified, classificatory identity to new, multiple practices and further shapes our perception about similarities for the categorized practices. Given the fact that alternative medicine serves as a source of legitimacy contagion between therapies, it is interesting to examine if conventional medicine can also serve as a meaningful category for multiple conventional therapies and exert similar influence on the adoption of conventional biomedical therapies/treatments currently available in most conventional medical establishments. If conventional medicine provides a sense of similarity for multiple therapies, we should find that the diffusion of some therapies influences the adoption of other therapies that are organized into the category of "conventional medicine." If not, the result will inform that conventional medicine is rarely used as a meaningful category to make sense of biomedical treatment services.

Models 1-3 in Table 6.6 examine if the number of other hospitals that already adopted conventional therapies is positively associated with the adoption of other conventional therapies by focal hospitals. For consistency, I randomly chose nine therapies from the list of treatment services reported by the AHA data files. Magnetic resonance imaging (MRI) was the focal therapy in the models. Model 1 and 2 include control variables. The result of Model 3 shows that the coefficient of <u>therapies: same category</u> was not significant, providing no support for contagion effects among treatments in conventional medicine.[12] The results suggest the importance of high uncertainty about practices and the presence of categorization systems for making sense of the practices, the conditions that significantly limit the theoretical scope of my arguments.

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[12] Additional analyses for different therapies other than MRI showed the same results (not shown).

Table 6.6 Cross-Sectional Time-Series Logit Analysis:
Adoption of Magnetic Resonance Imaging (MRI), 1992-2001

	M1	M2	M3
Age	-0.001	-0.002	-0.003
	(0.007)	(0.007)	(0.007)
Size (staffed bed)	-0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)
Size (outpatient)	0.429**	0.387**	0.344*
	(0.178)	(0.180)	(0.179)
Growth (staffed bed)	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)
Growth (outpatient)	-0.007	-0.012	-0.009
	(0.234)	(0.236)	(0.223)
Service scope	-0.009**	-0.001	-0.000
	(0.004)	(0.006)	(0.006)
Status	0.781	0.758	0.555
	(0.542)	(0.547)	(0.555)
Ownership (Not-for-profit)	2.099***	2.112***	1.997***
	(0.701)	(0.699)	(0.700)
Ownership (For-profit)	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Teaching	1.386	1.348	1.398
	(0.882)	(0.882)	(0.884)
Prior adoption (focal hospital)	1.989***	1.867***	1.844**
	(0.715)	(0.714)	(0.717)
Total population	-0.028	-0.003	0.078*
	(0.027)	(0.030)	(0.046)
% population > 65	-0.266	-0.212	-0.195
	(0.246)	(0.248)	(0.250)
% Asian population	0.120	0.016	-0.112
	(0.205)	(0.211)	(0.215)
Accreditations	0.413**	0.410**	0.439**
	(0.207)	(0.208)	(0.208)
Prior adoption (focal therapy)		-0.024**	0.058
		(0.012)	(0.058)
Density			-0.069*
			(0.037)
Therapies: same category			-0.013
			(0.009)
Constant	-2.335	-3.239	-2.565
	(3.562)	(3.599)	(3.702)
Wald X^2	72.060	75.459	86.639
Degrees of freedom	15	16	18

Standard errors in parentheses
* significant at 10% ** significant at 5% *** significant at 1%

6.3.3 Alternative approach to independent variables

I have argued that the effect of prior adoptions of other alternative therapies could be measured using two different approaches. The first approach was to count the number of hospitals that adopted alternative therapies, and the second approach was to count the number of adoption decisions made by any hospitals. The distinction between two approaches lies in the possibility that one hospital may adopt multiple therapies. In my empirical data, 26 out of 36 hospitals offered more than one therapy during the study period of 1992-2001. Thus the results reported in Section 6.1 and 6.2 may be sensitive to the different approaches. Using the alternative approach (number of adoption decisions), I ran all the models to examine if the main results were robust.

Table 6.7 presents results of analyses for categorical characteristics hypotheses. For comparison purposes across therapies, models included acupuncture (M1-3), therapeutic touch (M4-6), and acupressure (M7-9). All models revealed very similar patterns of significant influence shown in Section 6.1. The adoptions of acupuncture and therapeutic touch were significantly influenced by prior adoptions of other therapies, whereas the adoption of acupressure was not predicted by prior adoptions of other therapies. Therefore, the results in Table 6.7 provide additional support for the proposition that prior adoptions of alternative therapies enhance diffusion rates of other therapies, especially when therapies present a coherent categorical identity.

Table 6.8 provides results of relational characteristics hypotheses which examined the influence of network ties (alliance and system), structural equivalence, and high status. Models included all three therapies and examined the effects of four variables for each therapy. Overall, the results in Table 6.8 showed limited support for the influence of relational characteristics. Structural equivalence plays a significant role in the adoptions of acupuncture and therapeutic touch, while alliance ties influence the adoption of acupressure.

Table 6.7 Cross-Sectional Time-Series Logit Analysis:
Alternative Variables for Categorical Characteristics (Number of Adoption Decisions)

	Acupuncture			Therapeutic Touch			Acupressure		
	M1	M2	M3	M4	M5	M6	M7	M8	M9
Age	0.007	0.008	0.006	0.024	0.016	0.022	0.036	0.035	0.033
	(0.011)	(0.011)	(0.011)	(0.036)	(0.026)	(0.029)	(0.026)	(0.026)	(0.025)
Size (staffed bed)	-0.001	-0.001	-0.001	-0.006	-0.004	-0.005	-0.025**	-0.024**	-0.022**
	(0.002)	(0.002)	(0.002)	(0.006)	(0.005)	(0.005)	(0.012)	(0.012)	(0.011)
Size (outpatient)	0.075	0.071	-0.005	0.977	0.548	0.559	1.158*	1.143*	1.051
	(0.246)	(0.245)	(0.248)	(0.692)	(0.564)	(0.564)	(0.681)	(0.669)	(0.642)
Growth (staffed bed)	-0.005	-0.005	-0.005	-0.012	-0.007	-0.008	-0.030	-0.029	-0.029
	(0.006)	(0.006)	(0.005)	(0.023)	(0.016)	(0.018)	(0.022)	(0.021)	(0.021)
Growth (outpatient)	0.352	0.316	0.315	0.621	0.363	0.353	0.730	0.738	0.690
	(0.283)	(0.277)	(0.272)	(0.709)	(0.798)	(0.731)	(0.537)	(0.531)	(0.524)
Prior adoption	5.737***	5.564***	5.418***	8.551***	5.635***	6.148***	8.542***	8.576***	8.371***
(focal hospital)	(1.056)	(1.039)	(1.030)	(3.037)	(2.002)	(2.163)	(2.263)	(2.268)	(2.186)
Service scope	0.001	0.002	0.002	-0.000	0.024	0.023	0.057*	0.055*	0.054*
	(0.016)	(0.016)	(0.016)	(0.052)	(0.046)	(0.047)	(0.033)	(0.032)	(0.031)
Status	-0.777	-0.800	-0.751	1.814	0.849	0.669	-3.059	-2.996	-3.187
	(1.007)	(0.999)	(1.014)	(2.684)	(2.088)	(2.068)	(3.414)	(3.445)	(3.563)
Ownership	0.473	0.500	0.678	1.775	0.898	1.559	-0.268	-0.249	-0.312
(Not-for-profit)	(1.210)	(1.214)	(1.208)	(3.229)	(2.497)	(2.819)	(2.462)	(2.450)	(2.419)
Ownership	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
(For-profit)	(1.863)	(1.229)	(2.073)	(2.268)	(2.588)	(3.511)	(2.736)	(11.832)	(6.190)
Teaching	1.903	1.941	2.175	5.048	2.417	3.124	7.319*	7.247*	6.941*
	(1.342)	(1.342)	(1.384)	(3.902)	(2.938)	(3.182)	(3.959)	(3.950)	(3.857)
Mass media exposure	0.008	0.006	-0.005	-0.258	-0.648	-0.435	0.498	0.488	0.481
	(0.023)	(0.023)	(0.023)	(0.643)	(0.682)	(0.652)	(0.304)	(0.305)	(0.301)
Total population	-0.096	-0.108	-0.163**	0.045	0.017	-0.012	-0.428**	-0.442**	-0.419**
	(0.069)	(0.069)	(0.073)	(0.243)	(0.204)	(0.201)	(0.214)	(0.216)	(0.211)
% population > 65	-1.855***	-1.904***	-1.726***	-1.617	-1.488	-1.269	-2.414*	-2.348*	-2.072
	(0.655)	(0.678)	(0.628)	(1.140)	(0.996)	(0.996)	(1.455)	(1.426)	(1.322)
% Asian population	-0.122	0.010	0.042	-3.624*	-2.025	-2.056	2.341**	2.312**	2.241**
	(0.363)	(0.348)	(0.350)	(2.040)	(1.546)	(1.497)	(1.057)	(1.044)	(1.020)
Accreditations	0.631*	0.585	0.559	-1.144	-0.630	-0.616	-0.354	-0.324	-0.308
	(0.374)	(0.373)	(0.376)	(1.046)	(0.806)	(0.815)	(0.840)	(0.830)	(0.823)
Clinical evidence	-0.001	0.001	0.007	0.070	0.134	0.109	-0.259	-0.257	-0.256
	(0.011)	(0.010)	(0.010)	(0.099)	(0.112)	(0.104)	(0.169)	(0.170)	(0.168)
Prior adoption	-1.202**	-1.289**	-1.085**	-24.379***	-12.069**	-13.109**	0.657	0.642	0.593
(focal therapy)	(0.512)	(0.609)	(0.435)	(9.072)	(5.628)	(5.278)	(1.684)	(1.689)	(1.693)
Density	0.127**	0.129**	0.195***	0.334	0.268	0.299	0.067	0.078	0.055
	(0.061)	(0.062)	(0.071)	(0.221)	(0.189)	(0.191)	(0.117)	(0.117)	(0.117)
Therapies:	0.486**			1.517**			-0.323		
same category	(0.222)			(0.622)			(0.246)		
Therapies:		0.730*			0.809			-0.391	
same sub-category		(0.382)			(0.607)			(0.320)	
Therapies:			3.326**			1.349*			-0.576
Non-ambiguous			(1.342)			(0.774)			(0.599)
Constant	7.608	7.706	4.131	-3.161	-6.327	-11.250	13.164	12.637	9.701
	(9.030)	(9.267)	(8.638)	(18.518)	(17.195)	(17.032)	(19.260)	(19.009)	(18.006)
Wald X^2	61.124	60.345	62.173	13.328	14.752	14.848	18.329	18.357	18.788
Degrees of freedom	20	20	20	20	20	20	20	20	20

Standard errors in parentheses

* significant at 10% ** significant at 5% *** significant at 1%

Table 6.8 Cross-Sectional Time-Series Logit Analysis:
Alternative Variables for Relational Characteristics (Number of Adoption Decisions)

	Acupuncture				Therapeutic Touch				Acupressure			
	Alliance	System	SE	Status	Alliance	System	SE	Status	Alliance	System	SE	Status
Age	0.007	0.009	0.005	0.008	0.007	-0.002	0.004	0.009	0.047	0.041	0.028	0.034
	(0.011)	(0.011)	(0.011)	(0.011)	(0.023)	(0.023)	(0.024)	(0.024)	(0.028)	(0.026)	(0.021)	(0.024)
Size (staffed bed)	-0.001	-0.001	-0.002	-0.001	-0.001	-0.004	-0.005	-0.003	-0.025*	-0.024**	-0.021*	-0.023**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)	(0.005)	(0.004)	(0.013)	(0.012)	(0.012)	(0.012)
Size (outpatient)	0.012	0.092	0.121	0.029	0.138	0.241	0.475	0.303	1.584**	1.282**	0.806	1.122*
	(0.246)	(0.233)	(0.243)	(0.242)	(0.569)	(0.483)	(0.535)	(0.490)	(0.733)	(0.625)	(0.594)	(0.647)
Growth (staffed bed)	-0.004	-0.005	-0.003	-0.005	-0.001	-0.006	-0.016	-0.002	-0.040*	-0.035	-0.028	-0.029
	(0.005)	(0.005)	(0.006)	(0.005)	(0.014)	(0.015)	(0.022)	(0.015)	(0.023)	(0.023)	(0.024)	(0.022)
Growth (outpatient)	0.239	0.237	0.314	0.233	0.563	0.574	0.469	0.349	0.843	0.756	0.788	0.757
	(0.287)	(0.267)	(0.262)	(0.269)	(0.687)	(0.946)	(0.715)	(0.718)	(0.669)	(0.481)	(0.647)	(0.546)
Prior adoption (focal hospital)	5.736***	5.309***	4.767***	5.448***	5.381***	6.426***	6.316***	4.706***	9.537***	9.225***	8.139***	8.379***
	(1.052)	(1.001)	(0.949)	(1.014)	(1.708)	(2.063)	(2.430)	(1.532)	(2.714)	(2.574)	(2.237)	(2.211)
Service scope	-0.002	0.000	0.030	-0.001	-0.007	-0.013	0.021	-0.000	0.053	0.060*	0.044	0.057*
	(0.015)	(0.016)	(0.018)	(0.016)	(0.040)	(0.040)	(0.115)	(0.038)	(0.037)	(0.032)	(0.039)	(0.033)
Status	-0.982	-1.099	-1.145	-0.888	-2.262	-3.006	-3.737	-2.185	-9.485*	-4.092	-1.527	-2.580
	(0.995)	(1.038)	(0.985)	(1.003)	(2.115)	(2.286)	(5.623)	(2.378)	(5.126)	(3.880)	(3.010)	(3.450)
Ownership (Not-for-profit)	0.541	-0.143	0.120	0.545	0.075	0.883	1.022	0.921	-1.378	-1.977	-0.341	0.051
	(1.198)	(1.183)	(1.196)	(1.198)	(2.307)	(2.443)	(3.524)	(2.339)	(2.740)	(2.640)	(2.265)	(2.455)
Ownership (For-profit)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(1.265)	(1.877)	(3.154)	(1.290)	(1.606)	(2.108)	(2.992)	(2.183)	(2.577)	(5.211)	(13.401)	(19.806)
Teaching	2.307*	2.006	1.210	1.890	0.147	0.036	2.319	0.989	7.135	7.455*	4.373	7.818*
	(1.362)	(1.315)	(1.272)	(1.345)	(2.581)	(2.435)	(4.056)	(2.556)	(4.556)	(4.385)	(3.323)	(4.043)
Mass media exposure	-0.001	0.011	-0.201***	0.009	-0.321	-0.478	-2.235	-0.111	0.732*	0.786**	-0.273	0.556*
	(0.020)	(0.021)	(0.067)	(0.021)	(0.403)	(0.430)	(2.341)	(0.405)	(0.386)	(0.391)	(0.457)	(0.326)
Total population	-0.033	-0.024	-0.012	-0.116	0.144	0.142	0.177	0.064	-0.290	-0.405**	-0.263**	-0.437*
	(0.047)	(0.046)	(0.045)	(0.073)	(0.098)	(0.092)	(0.155)	(0.164)	(0.177)	(0.176)	(0.128)	(0.238)
% population > 65	-1.511***	-1.421***	-1.671***	-1.176**	-0.931	-0.714	-0.580	-0.671	-2.672*	-2.170	-1.975*	-2.421*
	(0.564)	(0.548)	(0.587)	(0.575)	(0.827)	(0.814)	(0.865)	(0.766)	(1.514)	(1.425)	(1.086)	(1.401)

Table 6.8 (Continued)

	Acupuncture				Therapeutic Touch				Acupressure			
	Alliance	System	SE	Status	Alliance	System	SE	Status	Alliance	System	SE	Status
% Asian population	0.139	0.107	0.061	0.079	-1.300	-1.163	-1.790	-1.265	1.525	2.748**	1.584*	2.334**
	(0.345)	(0.341)	(0.335)	(0.349)	(0.900)	(0.820)	(1.457)	(1.047)	(1.178)	(1.206)	(0.884)	(1.070)
Accreditations	0.574	0.608*	0.456	0.662*	0.200	0.397	-0.401	0.107	-0.879	-0.888	0.168	-0.462
	(0.366)	(0.368)	(0.364)	(0.364)	(0.613)	(0.588)	(0.861)	(0.601)	(0.937)	(0.958)	(0.821)	(0.848)
Clinical evidence	0.003	-0.002	0.104***	-0.002	0.060	0.075	0.550	0.031	-0.389*	-0.412*	0.223	-0.302*
	(0.009)	(0.009)	(0.033)	(0.009)	(0.053)	(0.056)	(0.499)	(0.054)	(0.201)	(0.212)	(0.310)	(0.182)
Prior adoption (focal therapy)	-2.022	-2.419	-2.253***	-0.044	-0.002	-0.002	-16.374*	-0.002	-0.004	-0.003	-8.374**	2.479
	(1.703)	(1.504)	(0.577)	(0.489)	(6.554)	(6.773)	(8.939)	(3.803)	(6.536)	(9.789)	(3.567)	(2.594)
Density	-0.001	0.005	0.105***	0.094	-0.017	-0.041*	0.338	0.063	0.026	0.042	0.086*	0.050
	(0.006)	(0.009)	(0.031)	(0.061)	(0.014)	(0.025)	(0.259)	(0.115)	(0.023)	(0.030)	(0.045)	(0.120)
Relational characteristics	0.387	0.533	0.209**	0.143	-0.300	-0.227	1.004*	0.320	2.335*	0.621	0.560	-0.483
	(0.569)	(0.506)	(0.097)	(0.279)	(1.086)	(0.884)	(0.564)	(0.337)	(1.248)	(1.131)	(0.348)	(0.376)
Constant	5.945	3.599	-8.210	-0.378	-0.893	-3.014	-112.209	-5.629	14.573	6.605	7.643	13.964
	(7.901)	(8.038)	(9.152)	(8.361)	(12.453)	(12.452)	(85.493)	(12.771)	(19.977)	(19.623)	(13.386)	(18.665)
Wald X^2	59.966	61.653	58.117	63.421	17.243	15.240	13.656	20.336	14.735	17.063	18.892	18.085
Degrees of freedom	20	20	20	20	20	20	20	20	20	20	20	20

Standard errors in parentheses

* significant at 10% ** significant at 5% *** significant at 1%

CHAPTER 7

DISCUSSION AND CONCLUSION

7.1 Recapitulation of research

The main argument of this research is that insofar as a number of practices belong to a common category, the categorized practices will likely be perceived as similar and associated with each other. Given the perceived similarity and association, prior adoptions of individual practices serve as social cues for potential adopters in accepting other practices in the same category. Accordingly, the diffusion of one or more practices affects the acceptance of other practices, the process which I refer to as the contagion of legitimacy between practices. Categorization provides a critical condition that makes a focal organization sensitive to the spread of other associated practices. The empirical findings of this research revealed that given the presence of categories of alternative medicine, a focal hospital's adoption decision of an alternative therapy was driven by prior adoptions of other alternative therapies by other hospitals.

In addition, the current study explained differential influences that alternative therapies had on adoption rates by concentrating on categorical characteristics of therapies that are subject to adoption by hospitals and relational characteristics of hospitals that adopt therapies. The results of analyses for categorical characteristics of therapies showed that therapies more similar to a focal therapy were salient for the adoption of the focal therapy and that therapies whose categorical positions are ambiguous had a weaker effect on the adoption of focal therapies. The influence of other therapies on categorically ambiguous therapies was also weak or not significant. The results of analyses for relational characteristics of hospitals provided mixed support for the arguments that other therapies were influential in the adoption of the focal therapy when prior adopters of other therapies had network ties to the focal

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hospital, when prior adopters and the focal hospital were structurally equivalent, and when prior adopters were high-status hospitals.

7.2 Limitations

7.2.1 Alternative explanations

While the results of this research strongly support my main argument about legitimacy contagion, there is some room for alternative explanations of the empirical findings. First of all, although this study at least partially examined the effect of competition on contagion by adding a density measure and using the concept of structural equivalence, it would be worth further exploring the role of local competitive pressures on practice adoption by hospitals. An interesting finding was that the traditional contagion effect (<u>prior adoption: focal therapy</u>) was negative and significant in most models. This negative relationship seemed contrary to the traditional contagion argument, which suggests that prior adopters positively affect the adoption of the same practice by potential adopters. But the way I constructed the prior adoption variable might have influenced this result. I created this variable by counting the number of hospitals in focal and contiguous counties. Thus, the negative, significant effect of the traditional contagion argument might have in fact reflected competitive forces in local areas. Prior adopters in the same region are more likely to be the very competitors with which potential adopters have to engage in direct, local competition for the same limited pool of patients (Baum and Haveman 1997; D'Aunno et al. 2000; Freeman and Audia 2006). Hospitals that are close-by will try to establish relative desirability and avoid direct competition (Fennell 1980; Zuckerman 1999). The competitive intensity will then discourage hospitals from adopting the same therapies and instead encourages them to differentiate their treatment services from those already provided by their peers.

This finding also confirms the argument that competition and mutualism may be complicatedly intermingled in the local market (Barnett and Carroll 1987; Saxenian 1994; Dobrev and Kim, 2006). For example, Barnett and Carroll (1987)'s study on early telephone companies found no density dependence effect of local density aggregated at the county level on the death rate. In addition, the concept of mutual forbearance (Baum and Korn, 1996; Greve 2000; Haveman and Nonnemaker, 2000) emerging from multi-market contacts acknowledges complex aspects of local competition and mutualism not explained by the density dependence model. More recently, Dobrev and Kim (2006) provided an improvement over prior density dependence analyses by arguing that legitimacy occurs at the broader level of a market segment while competition is niche localized.

It should be noted that this argument of competitive pressures cannot completely undermine the validity of my main argument of legitimacy contagion. Although competitive intensity explains why hospitals are motivated to adopt something different, it cannot predict what they actually adopt to become different. The contagion of legitimacy suggests that hospitals adopt different practices that are still in the same category. Specifically, hospitals choose what they think is similar to the practice of interest, and the categorical scheme widely available provides the social understanding of perceived similarity. In this sense, my study of legitimacy contagion provides a scope of differentiation under competition, thereby serving as a good complement to competition arguments. Moreover, the result of analysis for contagion between conventional therapies in Section 6.3.3 provides additional evidence for the unique contribution of legitimacy contagion. Using the same sample of hospitals (therefore the same level and pattern of competition between hospitals), models in Table 6.6 examined if the diffusion of one or more conventional therapies affected the adoption of other conventional therapies. The results indicate no contagion effect for

conventional therapies.

Another source of alternative explanations is resource scarcity. Scarce resources required for adopting the same therapy may lead potential adopters to focus on other therapy requiring different resources. For example, qualified practitioners are critical and limited resources for hospitals; there are 250,000 massage therapists in 2002, 53,000 chiropractors in 2006, 22,000 acupuncturists in 2005, and 1,400 naturopaths in 2004, compared to 567,000 MDs in 2006 (see Figure 2.5). The problem of scarcity will become more aggravated when prior adopters are those hospitals in the same region that deplete existing resources. If prior adoptions involve resourceful therapies (i.e., therapies with many licensed practitioners, such as massage therapists), potential adopters will be able to adopt the same practice without having trouble in identifying licensed practitioners. However, when the number of licensed practitioners of a therapy is small, focal hospitals may not be able to adopt the therapy and instead have to seek other resourceful therapies.

Finally, it is worth examining the strength of integration between alternative and conventional therapies in their actual provision to patients. If prior adoptions of alternative therapies by hospitals serve as informational cues that facilitate the adoptions of other associated therapies, the salience of informational cues may rely not only on the total number of prior adoptions, but also on the extent to which adopted therapies are tightly integrated into conventional medical services because tight relationship between alternative therapies and a hospital's core activities (i.e., conventional biomedical therapies) may enhance the credibility of informational cues. As Zucker insightfully suggests, "The more tightly integrated the structure, the more rapidly the legitimacy spreads" (Zucker 1988: 24; see also Hernes 1976). The tightness measures may include co-location of alternative and biomedical therapies within the same facility and direct physician involvement, such as physical presence of

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MDs in alternative medicine centers.

7.2.1 Generalization

      My research design limits the sample to hospitals in New York State, and is therefore not a random sample of all hospitals in the U.S. Moreover my analysis was limited to conventional hospitals that were listed in the American Hospital Association (AHA) data file. Although the AHA data file provides the most comprehensive list of hospitals, I cannot rule of the possibility that the adoption of alternative practices by hospitals that were not listed in the AHA data file influenced hospitals in my sample. Moreover, I did not include in the sample other medical establishments that were not conventional hospitals, but provided alternative therapies to the general public (e.g., free-standing alternative care centers). Thus, the current study could not examine if the adoption of alternative practices by non-hospital care centers influenced the sampled hospitals.

      It is also important to note that my arguments in this research apply only to markets that are characterized by the presence of multiple practices, high uncertainty, and categories for the practices. The empirical setting of this research—i.e., the emerging market niche of alternative medicine—met these requirements. There are other examples that may show a similar effect of legitimacy contagion between related practices. For instance, high-performance work systems (HPWS) refer to a set of separate human resource (HR) practices designed to enhance employee's skills, commitment, and productivity (Lawler 1992; Pfeffer 1998). HPWS typically include different HR practices, such as rigorous selection procedures, flexible job assignments, merit-based promotions, grievance procedures, cross-functional teams, extensive training and development, information sharing, group-based rewards, and competitive compensation (Takeuchi et al. 2007; Datta, Guthrie and Wright 2005: 136). Insofar as

HPWS serve as a legitimate category for these HR practices and provide a common identity that shapes our perception about similarity for the practices, it is likely that the adoption of one or more HR practices positively influences the adoption of other HR practices grouped as HPWS. This interaction in adoption between HR practices would be more likely to occur, especially when potential adopters face significant difficulty in evaluating the validity of the HR practices.

Total Quality Management (TQM) may show even more interesting patterns of practice diffusion. Although TQM typically includes a set of multiple quality management practices, such as work teams, training, top-down implementation, benchmarking, and employee involvement, Hackman and Wageman point out that:

> An astonishing number of other interventions, some related to TQM and some not, are increasingly being herded under the TQM banner. In one or another book or article, virtually every intervention ever tried by an organization development consultant has been specified as something that is supposed to be done as part of TQM… That the sharp and defining edges of a management program become blurred as more and more initiatives are launched in its name is, if not inevitable, at least a sign of that program's popularity and acceptance. (1995: 338-9)

The most frequently chosen "add-on" interventions were group-level performance-contingent rewards, work redesign, and empowerment programs (Hackman and Wageman 1995). While the contagion of legitimacy may occur among original TQM practices, the add-on practices under the TQM banner may also show similar diffusion dynamics.

However, many markets may not display the conditions under which the contagion of legitimacy becomes valid. Empirical observation suggests that zero-sum competition between practices and technologies, rather than collective legitimation through contagion, is more likely to occur. For instance, Japan Victor's VHS format

for home videocassette recorders vanquished Sony's Beta-max format in the 1980s, and Microsoft's Word and Excel triumphed over WordPerfect and Lotus 1-2-3. Recently, public attention is focused on the battle over the next-generation DVD formats, Blu-ray and HD DVD. Under what conditions are multiple practices and technologies subject to the battles for market dominance, rather than legitimacy contagion? It appears that zero-sum competition is more likely to arise when practices and technologies are incompatible. Compatibility is especially important when the number of prior adopters affects the utility that a given user derives from the adopted good or service, often referred to as "network effects" (Katz and Shapiro 1985). In markets with strong network effects (e.g., fax machines), users tend to choose the most widely adopted technology, which can provide highest compatibility. Accordingly, organizations that provide incompatible technologies in such markets often engage in standards wars for market dominance.

7.3 Implications and directions for future research

The findings have important implications for existing theory and research in a number of ways. First of all, this study emphasized the multiplicity of practices in the diffusion processes. This is a significant departure from previous research on diffusion, which has almost exclusively focused on the spread of a single practice. One might argue that there are a few studies that might have addressed this neglected issue. For instance, Davis and Greve (1997) showed how golden parachutes and poison pills were diffused in strikingly different ways. However, the study showed a simple comparison of individual adoption patterns. Thus the question of how multiple practices affect and are affected in their adoption processes remained unanswered. My research provides one answer to the question by examining the influence that the diffusion of one practice exerts on adoption rates of the other practice.

A few studies in the literature on the economics of technological innovations have examined this issue more directly by focusing on a firm's decision when multiple technologies are available. For example, Stoneman and Kwon (1994) examined the role of technological complementarity in the joint adoption of numerically controlled machine and coated carbide equipment (cutting tools). In their study, technological complementarity was defined to exist when the gross profit gain from the simultaneous adoption of two technologies is greater than the simple sum of gains from the adoption of each technology. They concentrated on a question of how a single organization simultaneously adopted multiple practices to obtain the joint profit gains. In contrast, I examined how an organization's adoption decisions were driven by prior adoptions of other practices by other organizations even without a clear sign of joint profit gains.

The unique contribution of my research is summarized in Table 7.1. The table uses two dimensions—adopters and practices—along which the explanations of organizational adoption are differentiated. Because much research typically examines the adoption of a practice by potential adopters, the target phenomena of interest can be represented as the T cell in Table 7.1. The traditional contagion argument may be best described as an approach from A to T in the sense that this view draws upon the process in which adoption decisions of potential adopters are driven by their exposure to prior adopters. In other words, the traditional contagion argument involves the relationship between prior and potential adopters in the diffusion of a single practice. Another approach from B to T involves the study of simultaneous adoption of two technologies in the economics of technological innovations literature (Stoneman and Kwon 1994). A similar approach includes the recent work on organizational learning which suggests that past adoption of a practice by an organization can encourage the same organization to adopt similar practices. For instance, colleges that adopted

football teams were more likely to adopt lacrosse and hockey teams than other schools that did not have such experience (Washington and Ventresca, 2004). The theoretical interest of these studies lies in the relationship between focal and other similar/complementary practices adopted by the same organizations.

Table 7.1 Different Approaches to Research on Organizational Adoption

	focal practice	other practices
focal adopter (potential adopters)	T	B
other adopters (prior adopters)	A	C
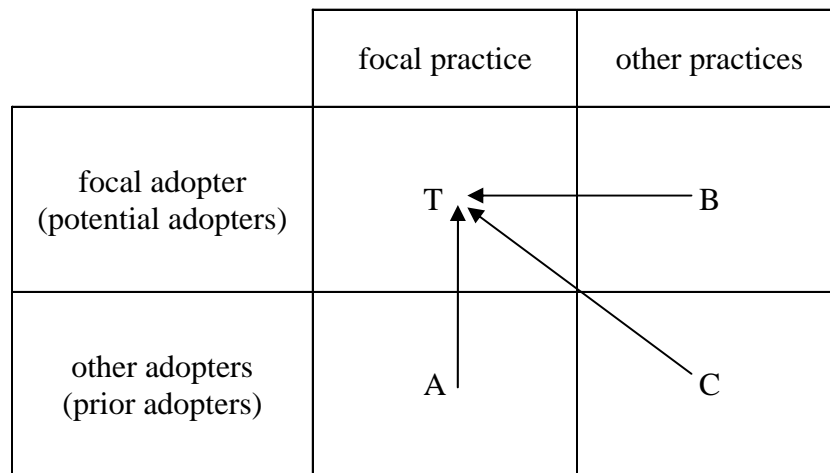
Note: T denotes the target organizational behavior of research interest—i.e., the adoption of a focal practice by a focal organization. A—T stands for the traditional contagion approach that explains the adoption behavior by focusing on the influence of prior adopters on diffusion of the single practice. B—T represents the recent organizational learning literature and the economics of technological innovations literature that emphasize the role of past adoption of practices by a focal organization in the adoption of other similar/complementary practices by the same organization. C—T refers to the current research that concentrates on the influence of some practices by other organizations on the adoption of other practices by a focal organization.

Unlike prior approaches, my research provided a unique approach to diffusion studies by focusing on how the adoption of a focal practice by a focal adopter can be driven by the adoption of other practices by other adopters (C to T). To my knowledge, the current research provided the first empirical test for the new approach. Even after controlling for the other two effects examined by prior research streams,

the results of this research provided strong support for the proposition that the diffusion of individual therapies enhances the adoption of other associated therapies.[13]

This study also extended prior work on the role of cultural category in practice diffusion. Although most diffusion studies typically consider diffusion a relational phenomenon, Strang and Meyer suggest that diffusion can be shaped by "culturally analyzed similarities among actors" (1993: 487). Insofar as social entities belong to a common social category, the imagery of ties between them may emerge, although such ties are not purely relational but cultural. As Strang and Meyer argue, "[W]here actors are seen as falling into the same category, diffusion should be rapid" (1993: 490). The results of my research provided empirical evidence of the significance of cultural category. Moreover, this research further explored the role of other categorical characteristics, such as similarity and ambiguity, in the diffusion dynamics of categorized practices. The results are also consistent with two studies of Zuckerman that focused on the role of categories: (1) Securities analysts who specialized in a product's category discounted firms whose products were not clearly categorized into existing classification systems of products (Zuckerman 1999), and (2) firms often engaged in de-diversification when product lines did not present coherent product identity in the stock market (Zuckerman 2000).

Institutional approaches have long studied how organizations are constrained by accepted models, such as established categories shared by important audiences. As Zuckerman suggests (1999: 1428), for instance, "for a product to compete in any market, it must be viewed by the relevant buying public as a player in the product categories in which it seeks to compete." Failure to conform to the shared categories invites social penalties, such as reduced attention and recognition. Earlier studies have

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[13] Control variables for the traditional contagion effect (A-T in Table 7.1) and the learning effect (B-T) were prior adoption: focal therapy and prior adoption: focal hospital, respectively.

focused on how categories constrain actors, but have devoted less energy to analyzing how categories enable actions. I addressed this gap by investigating how categories facilitated the spread of multiple therapies.

This research also sheds light on the under-theorized process in which a small number of individual practices lead to the diffusion of other non-legitimate practices at an early stage of market creation and development and thereby contribute, if not intentionally, to the collective legitimation of a larger body of new practices and a broader industry niche. Insofar as a small number of practices sequentially infect other associated practices which may in turn infect less associated practices, this contagion process may end up with the legitimation of non-legitimate elements that are only remotely connected to the original practices and would otherwise be unlikely to gain legitimacy. As such, the present study contributes to a growing body of research on the evolution of new markets and industries where a variety of new practices and structures are introduced and experimented, but weak in their legitimacy (Aldrich and Ruef 2006).

This notion of legitimacy contagion is not entirely new, however. More than twenty years ago, Zucker (1987) proposed that once a single element becomes institutionalized in formal organizations, other associated activities in organizations become "infected" with legitimacy (p. 446; see also Zucker 1988, 1991). This insightful notion of legitimacy contagion, however, has not been empirically tested. My research revived the concept and provided the first empirical test for the usefulness of the concept. Moreover, this research went beyond the original argument and further examined categorization as a source of association—the critical omission of Zucker's proposition.

Recently, organizational ecologists have proposed a similar concept of legitimacy transfer. In particular, theories in community ecology suggest that

legitimacy can flow between organizational forms if they are related (i.e., the overlap of identities) (Ruef 2000; Dobrev 2001; Dobrev, Ozdemir and Teo 2006). For instance, in their studies of Bulgarian newspaper enterprises and Singapore financial cooperatives, Dobrev and his collaborators (Dobrev 2001; Dobrev, Ozdemir and Teo 2006) demonstrated that the emergent population can source legitimacy from an established one such that the failure rates of emergent population decrease. This line of research concentrates on contagion of legitimacy between populations, whereas my research focuses on contagion of legitimacy across practices to explain the diffusion of multiple practices within a population. Thus the findings of my research complement and extend recent development in organizational ecological perspectives by providing evidence of the validity and usefulness of legitimacy contagion.

It is notable that previous research on the creation of new markets and industries often exaggerates the ability of change agents and invokes the imagery of hero, thereby deflecting attention away from the broader institutional forces and unintended consequences of purposive action (Hwang and Powell 2005; Aldrich and Ruef 2006; Lounsbury and Crumley 2007). I did not assume that the collective legitimation of an emerging industry niche should be facilitated by the intentional coordination of industry-level association or voluntary collaboration between the professions of alternative practitioners. Rather, it was simply assumed that actors (e.g., alternative therapists, hospitals, conventional practitioners, etc.) might indirectly affect the legitimation process "as part of their routine professional activities, as jurisdictional expansion, or as a matter of survival" (Hwang and Powell 2005: 226). This not only represents a more nuanced behavioral assumption, but also conforms to the current professional dynamics in the market of alternative medicine where no overarching, well-organized professional associations, such as AMA, exist. A more coordinated endeavor was not pursued until 2003 when American Hospital

Association organized a national conference that primarily aimed at disseminating best management practices of alternative medicine programs among senior-level health care executives, medical directors, nursing directors, and other alternative medicine practitioners. Thus, this research presented a more interesting exploration into the context where individual level routine activities and field-level categorical systems combined to help less legitimate practices to gain acceptance and to legitimize a new industry niche at the collective level.

In addition to the behavioral assumption of overly capable actors, another related weakness in existing theory concerns the overemphasis on rational decision-making of early adopters. Much diffusion research has suggested that early adopters rationally pursue their interests, while late adopters are under increasing social pressure with the development of widespread and powerful cultural norms (e.g., Tolbert and Zucker 1983; Westphal, Gulati, and Shortell 1997; Sherer and Lee 2002). In contrast, the current study examined whether and how the early adoption of a practice was driven, at least partially, by social influence of other actors as well as by an adopter's idiosyncratic needs and interests. If a practice is at its early stage of diffusion when no or very few prior adoptions of the practice can be observed, potential adopters may have to depend solely on their unique interests to make adoption decisions. However, insofar as the early stage of diffusion is characterized by high uncertainty, potential adopters may also want to rely on social cues to guide their behavior. Rather than rejecting the influence of other actors entirely, this study suggested that those who adopted similar, but not the exactly same, practices could serve as important sources of social cues that potential adopters look to.

The findings of this study also show that hospitals avoided adopting the same practice that other hospitals already adopted, but they did not adopt too distinct therapies, either. This finding provides an interesting parallel with prior research on

an optimal balance in identity. For instance, Brewer (1991, 2003) proposed the concept of "optimal distinctiveness" and suggested that individuals desire to attain an optimal balance between inclusion and uniqueness. The two basic human needs are in tension with one another. Thus when there is too much of one motive, the other must increase in order to counterbalance it. Other researchers have also identified two opposing pulls as primary drivers of identity dynamics among individuals (e.g., Graafsma et al. 1994; Kreiner, Hollensbe, and Sheep 2006). It is not clear whether organizations have the same internal orientation toward an optimal balance between inclusion and uniqueness and if so, how they attain such an optimal balance in identity. Nevertheless, this idea of optimal distinctiveness is intriguing and worth further investigation. In particular, it would be interesting to examine whether and how an organization's attempt to attain an optimal balance in identity leads to differentiation and isomorphism. Although some researchers have suggested that "differentiation works hand in hand with isomorphism" (Zuckerman 1999: 1402; Baum and Haveman 1997), they have typically focused on economic conditions (e.g., competition) as major forces that shape organizational dynamics of differentiation and isomorphism.

Another interesting finding was that the significance of idiosyncratic characteristics of hospitals in adoption decisions of alternative therapies differed according to therapies. Specifically, organizational characteristics of hospitals, such as size, service scope, and teaching, were significant predictors for the adoption of acupressure, when prior adoptions of other therapies did not explain the adoption of acupressure. It was nicely contrasted with the results for acupuncture and therapeutic touch. Prior adoptions of other therapies had significant influence on the adoptions of acupuncture and therapeutic touch, while organizational characteristics did not. It appears that a hospital's idiosyncratic characteristics become stronger predictors for

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the adoption of categorically ambiguous therapies, such as acupressure, while they lose the predictive power in the case of categorically unambiguous therapies, such as acupuncture and therapeutic touch. This result may suggest that categorical ambiguity discourages hospitals from using social cues, thereby increasing the influence of organizational characteristics. The changing importance of organizational influence on adoption decisions between therapies whose categorical identities are different is an interesting parallel with the temporal change in the influence of organizational characteristics in adoption decisions. The early vs. late adopter argument (e.g., Tolbert and Zucker 1983; Westphal, Gulati, and Shortell 1997; Sherer and Lee 2002) suggests that an organization's idiosyncratic characteristics explain the adoption rates better when institutional pressures are not strong in the early stage of practice diffusion than when most organizations conform to normative pressures in the later stage of diffusion.

Finally, my argument about legitimacy contagion across practices heavily depends on the stability of categorization. As such, it will be interesting to examine if the contagion effect remains significant when categorization is less stable. There has been a major disruption of the categorical scheme after NCCAM changed the categories of alternative medicine by merging and dropping existing sub-categories and adding new categories in recent years. As a result, current categorical systems of alternative medicine are different from those available during my study period. According to NCCAM's recent fact sheets, categories of therapies are as follows: Whole Medical Systems (homeopathy, naturopathy, traditional Chinese medicine including acupuncture and massge, and Ayurveda), Mind-Body Medicine (meditation, prayer, mental healing, and therapies that use creative outlets such as art, music, or dance), Biologically Based Practices (dietary supplements and herbal products), Manipulative and Body-Based Practices (chiropractic medicine, massage, and

naturopathy), Energy Medicine (qigong, Reiki, therapeutic touch, and bioelectromagnetic-based therapies).[14] The change in previously accepted categorical systems may have weakened the influence of categorization on how we make sense of diverse alternative therapies and thus destabilized the association between multiple therapies. This future direction is important because it can provide a complete picture of the role of categories on diffusion.

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[14] Accessed at http://nccam.nih.gov/health/whatiscam/#4 on April10, 2008.

Cross-Sectional Time-Series Logit Analysis: Adoption of Therapeutic Touch

	M1	M2	M3	M4	M5	M6
Age	0.011	0.025	0.016	0.024	0.009	0.024
	(0.021)	(0.053)	(0.024)	(0.032)	(0.023)	(0.032)
Size (staffed bed)	-0.002	-0.008	-0.004	-0.005	-0.003	-0.005
	(0.004)	(0.010)	(0.004)	(0.005)	(0.004)	(0.005)
Size (outpatient)	0.171	1.495	0.668	0.616	0.325	0.628
	(0.523)	(1.095)	(0.549)	(0.591)	(0.514)	(0.609)
Growth (staffed bed)	-0.004	-0.038	-0.005	-0.007	-0.007	-0.007
	(0.016)	(0.033)	(0.015)	(0.020)	(0.016)	(0.020)
Growth (outpatient)	0.391	1.368	0.405	0.369	0.285	0.377
	(0.854)	(1.170)	(0.743)	(0.683)	(0.696)	(0.694)
Prior adoption (focal hospital)	4.447***	17.214**	6.081***	7.356***	4.673***	7.371***
	(1.607)	(8.468)	(2.073)	(2.568)	(1.670)	(2.575)
Service scope	0.022	-0.004	0.020	0.020	0.040	0.019
	(0.038)	(0.064)	(0.042)	(0.049)	(0.045)	(0.050)
Status	-0.952	3.372	0.805	0.546	0.070	0.595
	(1.946)	(4.109)	(2.088)	(2.331)	(2.002)	(2.406)
Ownership (Not-for-profit)	0.092	2.578	0.755	1.870	0.668	1.826
	(2.249)	(4.990)	(2.250)	(3.047)	(2.380)	(3.082)
Ownership (For-profit)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(6.456)	(2.435)	(2.095)	(3.007)	(2.292)	(3.003)
Teaching	0.823	8.331	3.010	4.046	1.592	4.021
	(2.601)	(6.131)	(2.753)	(3.438)	(2.766)	(3.439)
Mass media exposure	-0.524	0.223	-0.423	-0.328	-0.877	-0.331
	(0.433)	(0.889)	(0.635)	(0.640)	(0.669)	(0.644)
Total population	0.194	-0.118	-0.032	-0.076	0.000	-0.073
	(0.131)	(0.412)	(0.207)	(0.220)	(0.177)	(0.224)
% population > 65	-1.372	-2.336	-1.662*	-1.332	-1.275	-1.368
	(0.891)	(1.599)	(1.001)	(1.048)	(0.874)	(1.142)
% Asian population	-1.233	-6.965*	-2.523	-2.583	-1.317	-2.613
	(1.139)	(3.969)	(1.743)	(1.683)	(1.203)	(1.734)
Accreditations	-0.253	-2.094	-0.842	-0.772	-0.375	-0.788
	(0.701)	(1.440)	(0.813)	(0.906)	(0.729)	(0.928)
Clinical evidence	0.108*	0.020	0.097	0.096	0.178	0.096
	(0.063)	(0.133)	(0.099)	(0.099)	(0.110)	(0.100)
Prior adoption (focal therapy)	-4.707**	-53.981*	-13.095**	-15.738***	-7.401*	-15.870***
	(2.339)	(27.564)	(5.303)	(5.740)	(3.954)	(6.001)
Density		0.742*	0.316*	0.391*	0.257	0.390*
		(0.449)	(0.178)	(0.210)	(0.181)	(0.211)
Therapies: Same category		6.708*				
		(3.454)				
Therapies: Same sub-category			1.702*			
			(0.903)			
Therapies: Non-ambiguous category				2.605**		2.603**
				(1.162)		(1.161)
Therapies: Ambiguous category					0.131	0.092
					(0.932)	(1.096)
Constant	-1.111	-6.269	-0.847	-12.328	-12.876	-11.553
	(12.810)	(24.811)	(15.588)	(17.432)	(15.765)	(19.836)
Wald X^2	18.279	8.987	14.849	14.647	15.405	14.622
Degrees of freedom	18	20	20	20	20	21

APPENDIX 1 (Continued)

	Alliance	System	SE	Status
Age	0.007	-0.001	0.007	0.008
	(0.023)	(0.023)	(0.016)	(0.023)
Size (staffed bed)	-0.001	-0.004	-0.002	-0.003
	(0.004)	(0.004)	(0.003)	(0.004)
Size (outpatient)	0.145	0.225	0.177	0.313
	(0.565)	(0.471)	(0.329)	(0.485)
Growth (staffed bed)	-0.001	-0.005	-0.007	-0.002
	(0.014)	(0.015)	(0.008)	(0.015)
Growth (outpatient)	0.559	0.616	-0.054	0.351
	(0.685)	(0.785)	(0.827)	(0.707)
Prior adoption (focal hospital)	5.383***	6.442***	4.190***	4.693***
	(1.710)	(2.074)	(1.114)	(1.527)
Service scope	-0.006	-0.020	0.154*	0.000
	(0.040)	(0.044)	(0.091)	(0.038)
Status	-2.303	-3.658	0.321	-2.061
	(2.119)	(2.391)	(1.450)	(2.331)
Ownership (Not-for-profit)	0.064	0.915	0.908	0.801
	(2.306)	(2.459)	(1.928)	(2.303)
Ownership (For-profit)	-0.002	-0.002	-0.002	-0.002
	(2.096)	(5.341)	(3.353)	(2.446)
Teaching	0.128	0.003	-0.862	0.826
	(2.561)	(2.482)	(2.227)	(2.538)
Mass media exposure	-0.324	-0.479	0.045	-0.142
	(0.409)	(0.423)	(0.495)	(0.401)
Total population	0.142	0.136	0.050	0.072
	(0.097)	(0.090)	(0.069)	(0.164)
% population > 65	-0.929	-0.813	-0.589	-0.641
	(0.829)	(0.863)	(0.579)	(0.759)
% Asian population	-1.290	-1.150	-0.607	-1.219
	(0.894)	(0.812)	(0.597)	(1.035)
Accreditations	0.194	0.444	-0.529	0.120
	(0.615)	(0.610)	(0.536)	(0.598)
Clinical evidence	0.060	0.073	0.783	0.035
	(0.053)	(0.055)	(0.961)	(0.054)
Prior adoption (focal therapy)	-0.002	-0.002	-4.161*	-0.002
	(5.217)	(1.978)	(2.282)	(3.802)
Density	-0.017	-0.037	-0.003	0.058
	(0.014)	(0.024)	(0.047)	(0.115)
Relational characteristics	-0.188	0.901	0.426	0.467
	(1.550)	(1.452)	(0.416)	(0.573)
Constant	-0.832	-1.558	-35.653**	-6.118
	(12.429)	(13.092)	(15.768)	(12.739)
Wald X^2	17.213	15.427	23.558	20.475
Degrees of freedom	20	20	20	20

Standard errors in parentheses

* significant at 10% ** significant at 5% *** significant at 1%

Cross-Sectional Time-Series Logit Analysis:
Adoption of Acupressure (Relational Characteristics Hypotheses)

	Alliance	System	SE	Status
Age	0.046	0.042	0.027	0.037
	(0.029)	(0.026)	(0.021)	(0.025)
Size (staffed bed)	-0.023*	-0.024**	-0.022*	-0.025**
	(0.013)	(0.012)	(0.012)	(0.012)
Size (outpatient)	1.636**	1.288**	0.853	1.189*
	(0.698)	(0.627)	(0.609)	(0.669)
Growth (staffed bed)	-0.043*	-0.035	-0.030	-0.031
	(0.023)	(0.023)	(0.025)	(0.022)
Growth (outpatient)	0.801	0.749	1.103	0.829
	(0.613)	(0.478)	(1.272)	(0.563)
Prior adoption (focal hospital)	9.901***	9.062***	9.880**	8.587***
	(2.842)	(2.524)	(4.038)	(2.297)
Service scope	0.062	0.058*	0.039	0.059*
	(0.042)	(0.032)	(0.041)	(0.034)
Status	-10.449**	-4.273	-1.132	-2.286
	(4.876)	(3.940)	(3.026)	(3.298)
Ownership (Not-for-profit)	-1.896	-2.082	-0.012	-0.107
	(2.799)	(2.638)	(2.338)	(2.489)
Ownership (For-profit)	-0.002	-0.002	-0.002	-0.002
	(2.477)	(2.791)	(4.638)	(20.096)
Teaching	6.915	7.439*	4.611	7.721*
	(4.456)	(4.315)	(3.475)	(4.023)
Mass media exposure	0.712*	0.757**	-1.368	0.590*
	(0.405)	(0.375)	(1.131)	(0.334)
Total population	-0.425*	-0.399**	-0.303**	-0.399*
	(0.222)	(0.175)	(0.143)	(0.234)
% population > 65	-2.389	-2.145	-2.067*	-2.524*
	(1.583)	(1.410)	(1.156)	(1.435)
% Asian population	2.342*	2.720**	1.827*	2.289**
	(1.404)	(1.203)	(0.951)	(1.066)
Accreditations	-0.862	-0.924	0.121	-0.431
	(0.922)	(0.949)	(0.857)	(0.838)
Clinical evidence	-0.369*	-0.394*	0.771	-0.321*
	(0.206)	(0.201)	(0.549)	(0.187)
Prior adoption (focal therapy)	-0.003	-0.003	-14.038	3.411
	(5.997)	(3.224)	(13.072)	(2.803)
Density	0.035	0.045	0.111*	0.031
	(0.027)	(0.031)	(0.062)	(0.123)
Relational characteristics	6.139**	1.647	2.411	-1.306
	(2.640)	(2.670)	(3.042)	(0.918)
Constant	8.088	6.334	12.329	14.878
	(22.187)	(19.541)	(15.388)	(19.027)
Wald X^2	14.916	17.335	14.824	18.132
Degrees of freedom	20	20	20	20

Standard errors in parentheses

* significant at 10% ** significant at 5% *** significant at 1%

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