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THE CULTURAL WORLDVIEW
OF ALLOPATHIC AND NATUROPATHIC PHYSICIANS

by

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A DISSERTATION

Submitted to the graduate faculty of The University of Alabama at Birmingham,
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy

BIRMINGHAM, ALABAMA

2009

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2009

THE CULTURAL WORLDVIEW
OF ALLOPATHIC AND NATUROPATHIC PHYSICIANS

CULLEN CLARK

MEDICAL SOCIOLOGY

ABSTRACT

Worldview is the socio-cultural compass with which we navigate the existential mysteries of life. It is our way of seeing – and being in – the world. As such it influences every aspect of culture from art to medicine. This exploratory study uses a sequential design combining quantitative and qualitative methodology to explore the worldview of allopathic and naturopathic physicians.

Using survey research, the study identifies five basic components of competing worldviews among allopathic (n = 550) and naturopathic physicians (n = 399). It measures agreement among the two groups with these components and explores their influence upon support for various realms of complementary and alternative medicine (CAM), as well as upon CAM use by allopathic physicians. The results of this quantitative analysis are then used to inform a series of in-depth interviews in which allopathic and naturopathic providers serve as an expert panel to review the findings of the study.

Results support the following conclusions: (1) Allopathic physicians are more likely to have an Apollonian worldview that is aggressively rational, seeks order and certitude by imposing meaning through a process of careful categorization and measurement, and favors the mechanistic framework of Newtonian science. (2) Naturopathic physicians are more likely to have a Dionysian worldview that is more

spontaneous, embraces ambiguity, seeks meaning through holistic understanding, and in which quantum physics trumps Newtonian science. (3) Allopathic physicians with a more Dionysian outlook see CAM therapies as more efficacious than those with a more Apollonian worldview. (4) Allopathic physicians with a more Dionysian worldview are more likely to have personally used a CAM therapy than their colleagues with a more Apollonian outlook.

In effect, the study indicates that worldview counts, and that its influence is contextual, varying by physician type and from one CAM domain to the next.

Keywords: Complementary and alternative medicine, naturopathic medicine, allopathic medicine, worldview

DEDICATION

This dissertation is dedicated to my wife Mary Kay Culpepper.

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Like any dissertation, this one is the culmination of many hours of effort, augmented and guided by the insights and support of many people. This project, however, would not have been possible without the support and encouragement of my wife Mary Kay Culpepper. Her judgment is always on target, and her confidence is contagious. Her belief in this project inspired me to do my best; having her as a partner in all my great adventures is my proof that life is good.

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Alternative medicine is a broad field, and any exploratory study like this one benefits from the input of complementary and alternative medical practitioners. I was very fortunate to have a community-based advisory committee for this project. For their direction, I would like to thank: Beth Gundersen, a massage therapist and instructor at the Red Mountain Institute for the Healing Arts; Margaret Pittenger, a physical therapist and

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Over the course of this study I came to appreciate that complementary and alternative medicine is a topic that resonates with many people. A number of individuals shared their own personal experiences when they learned of my study, and professional researchers in the field were kind enough to offer information and advice. Among them, I am especially grateful to John S. Haller, professor of history and medical humanities at Southern Illinois University Carbondale, who shared a copy of his manuscript on the history of homeopathy prior to its publication. His work on this topic was informative and inspirational.

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CHAPTER 1 INTRODUCTION

Why should we care about the worldview of allopathic and alternative medical practitioners? Well, because while worldview is not everything, it is vitally important. It is our way of seeing – and being in – the world. It is the socio-cultural perspective from which we craft answers to our most fundamental questions about identity and purpose. Worldview is the cultural compass with which we chart our course through the existential mysteries of life. As such, it influences every product of culture from music to sculpture to medicine. It is impossible, therefore, to fully understand differences between conventional and alternative medicine without exploring the cultural worldview of practitioners.

Understanding physician worldview – their way of seeing, and being in, the world – is also absolutely essential for anyone seeking to build a truly integrative health system of the sort desired by millions of Americans. For there is little doubt Americans embrace complementary and alternative medicine (CAM) in large numbers. Indeed, it seems at times that the public is leading a major shift in health care. More than 123 million American adults have used some form of CAM in the past 12 months, according to a study by the Centers for Disease Control and Prevention (Barnes et al. 2004). This same study found that 75 percent of American adults had used some form of CAM at some time in their life (Barnes et al. 2004). This utilization rate was an increase over the 68 percent of American adults who, in a similar survey conducted about five years before

the CDC study, reported using some form of CAM at some time in their life (Eisenberg et al. 2001). This increased utilization rate is also in keeping with studies tracking a substantial increase in CAM use through the 1990s (Harris and Rees 2000; Astin 1998; Eisenberg et al. 1998 and 1993). Even based on the 1997 utilization rates, this translates into remarkable figures. Eisenberg et al. (1998) estimated Americans made 629 million visits to CAM providers in 1997, spending \$27 billion out-of-pocket – more than they spent out-of-pocket on conventional care that year.

Interestingly, most individuals who use CAM do not entirely forsake the allopathic system. Rather, they chose CAM therapies as an adjunct to biomedical alternatives, weaving them into a tapestry of personal health choices (NCCAM 2004; Barnes et al. 2004; Coehn, Ek, and Pan 2002; Astin 1998; Eisenberg et al. 1998, Eisenberg et al. 1993). In effect, these people vote with their bodies and their pocketbooks for the type of health system they want. For them, so-called alternative medicine is a significant current in the medical mainstream.

This phenomenon is not limited to the United States. About half the citizens of many other industrialized countries also use CAM (Bodeker and Kronenberg 2002). For example, an estimated 49 percent of the French (Fisher and Ward 1994) and 48 percent of the Australian populations (MacLennan, Wilson and Taylor 1996) use alternative medicine. If the term is expanded to include traditional (i.e., indigenous) medicine (T/CAM), the figure rises to almost 80 percent in Africa (Bodeker and Kronenberg 2002). Utilization statistics for various forms of traditional oriental medicine such as Ayurveda and Chinese medicine are difficult to obtain. However, the World Health

Organization (2003) estimates traditional herbal cures account for 30 to 50 percent of all medicinal consumption in China.

Given this interesting trend in health care utilization, allopathic and alternative providers face a common challenge – to catch up with their patients, bridge an intellectual rift between the allopathic and CAM sectors, and create a truly integrative system. The National Center for Complementary and Alternative Medicine of the National Institutes of Health called for such a system at the beginning of the decade, explaining:

Within this paradigm, CAM and conventional healthcare professionals would function as interdisciplinary teams to deliver an expanded repertoire of safe and effective treatments that include a focus on the whole person. (NCCAM 2000)

As it now stands, however, there is a deep rift between alternative and biomedical practitioners, despite the willingness of their patients to build a mix-and-match network of healthcare delivery. This rift seems in many ways to be a reflection of the Cartesian divide which splits not only mind and body, but reason and emotion. It is a division between two worldviews, two ways of seeing and being in the world.

One worldview, the one which suffuses biomedicine, is aggressively rational. It seeks order and certitude, imposing meaning through a process of careful categorization and measurement. It extols linear and sequential logic. It is a decidedly Aristotelian outlook that favors the mechanistic framework of Newtonian science. It believes in an objective reality that exists independently of our senses. In short, this worldview can be thought of as a manifestation of the traits the ancient Greeks associated with Apollo, the god of clear boundaries, order and control over nature.

The other worldview, which suffuses complementary and alternative medicine, is more intuitive. It is spontaneous and decidedly non-Aristotelian, embracing ambiguity and paradox. Quantum physics trumps Newtonian science. Reality is subjective; interpretation of it is dependent upon our senses. Meaning is sought through holistic integration. Intellectual boundaries are artificial barriers to true understanding. This worldview can be thought of as a manifestation of traits the ancient Greeks associated with Dionysius, a state of fluid, shifting boundaries less concerned with controlling nature than with celebrating the natural order.

These contrasting worldviews are summarized in Table 1. This typology mirrors in many ways that used by Ruth Benedict in *Patterns of Culture* (1934).

Table 1

Comparison of Apollonian and Dionysian Worldviews

| Apollonian | Dionysian |
|--|--|
| <i>Rational</i> | <i>Intuitive</i> |
| <i>Sequential</i> | <i>Spontaneous</i> |
| <i>Seeks Certitude</i> | <i>Comfortable with Ambiguity</i> |
| <i>Believes in an Objective Reality that Exists Independently of Ourselves</i> | <i>Comfortable with Idea of a Subjective Reality</i> |
| <i>Sees Boundaries as Valuable Tools to Establish Order and Meaning</i> | <i>Sees Boundaries as Artificial Barrier to Holistic Understanding</i> |
| <i>Seeks to Control Nature</i> | <i>Celebrates the Natural World</i> |

Seeing the world from an Apollonian perspective, conventional allopathic practitioners understand health and illness in mechanistic and chemical terms. Sickness occurs when an objective and specific causal agent (be it bacterium, virus or chemical)

disrupts the mechanical functioning of the body. Cure – and even prevention – rests upon control of the causal agent and/or the body. Science is the tool that places that control in the knowledgeable hands of the physician.

Alternative practitioners, seeing the world in more quantum, Dionysian terms, understand sickness in a very different context. For them it arises from a complex interplay between causal agent and a number of other factors. Indeed, the metaphor of causal agent as invader of the body's defense system is less resonant than the idea of a causal agent as contributory factor in a chaotic disruption of a holistic energy system. And because alternative practitioners see disease in a Dionysian light, they seek different approaches to healing. Cure depends upon care, upon assisting the naturally recuperative power of the life force.

To say that one worldview suffuses a particular type of medical practice is not to say that every practitioner in that field experiences the world in that fashion. Rather, it is a way of recognizing that a particular worldview is dominant within a given medical system. For biomedicine and alternative medicine are each medical systems; or, to be more precise, they are each socio-cultural systems. Certainly they are each comprised of the components – personality, group and culture – that Sorokin (1969) argued were the triadic base from which socio-cultural systems emerge.

Even more to the point, each of these medical systems consists not just of the basic triad outlined by Sorokin, but of a more elaborate triangle. This enriched triad consists of individual, group and *environment* (used here in its broadest sense, meaning an enacted world that encompasses both the natural environment and all aspects of the man-made world including culture). It is from the interaction among these elements that

these distinct socio-cultural systems emerge, and it is this very process of emergence that reinforces the dominance of a particular worldview in each medical system.

Practical and Theoretical Implications

Arguably, one of the great weaknesses of contemporary medicine is that its rational and intuitive approaches have been largely divorced into these separate socio-cultural systems. Allopathic medicine is a system where an Apollonian worldview has gained hegemonic dominance; alternative medicine is a Dionysian realm. However, a healthy medical system, like a healthy psyche, should rely upon both the head and the heart. What is needed is a medical system that integrates reason and intuition, one that draws upon the best of both worldviews. To extend the Olympian metaphor, this system would embody traits the ancient Greeks associated with Chiron, master of arts *and* sciences, a mythic creature that symbolized the union of reason and natural impulse.

Millions of Americans have already combined elements of both allopathic and alternative medicine to craft their own mix-and-match systems of health care. The result, while seemingly satisfactory to the patient, may in reality provide fragmentary care to a constellation of symptoms that actually mask a common diagnosis. This is especially so for biopsychosocial ailments like low back pain. Consider the patient who self-prescribes St. John's Wort to elevate mood, asks a nutritionist about mega-vitamins to restore a sense of lost vitality, seeks massage for a stiff back and finally turns to a physician during an acute episode of intense low back pain. This treatment trajectory never pierces the veil of symptoms shrouding an underlying biopsychosocial ailment which is ultimately embodied as low back pain.

While the above search for symptomatic relief is probably benign and very likely beneficial, that may not be the case for an unemployed, depressed and hypertensive patient who self-prescribes St. John's Wort as a mood elevator and takes an herbal cocktail to raise his flagging libido. Compartmentalized approaches to bio-psycho-social ailments rarely lead to cure and, as in the case of the hypertensive patient, can lead to danger.

For the many Americans who mix biomedical and alternative therapies, a fragmented, episodic delivery system leads to fragmented, episodic health care. That is why health administrators and practitioners need to craft a truly holistic delivery system that fuses allopathic and alternative medicine into a model that meets the needs of people already mixing services from both sectors. By so doing, they will have managed to arrive at a destination for which their patients have already been exploring and seeking.

Unfortunately for those who share that goal, there is no magic wand that will transform *what is* into *what could, and should, be*. A structural transformation of this type will require committed effort on the part of biomedical and alternative providers – and that will require a deep understanding of the ways in which these providers see the world. Equipped with that understanding, however, people can consciously create a system that truly serves alternative providers, allopathic practitioners and patients.

From a more theoretical standpoint, the worldviews of alternative and bio-medicine offer social scientists a perfect laboratory to explore properties of emergent socio-cultural systems. Both medical systems emerge from similar interactions – treatment of illness and promotion and protection of health. Yet, because social systems are dynamic and complex, initial differences at any point of the underlying triad can

generate significant differences in an emergent system. These socio-cultural systems, with their inherent differences, in turn affect interactions within them.

Cultural worldview, therefore, becomes something of an indicator for this larger process of emergence. It is a vitally important element shaping our perception of the enacted world. As such, it shapes a component of the triad, ultimately generating significant differences in an emergent system. Thus, testing for differences in cultural worldview between biomedical and alternative practitioners is one way of testing this larger process.

This study uses survey methodology – supplemented by qualitative research – to examine the cultural worldview of conventional biomedical physicians and a specific type of alternative practitioner known as naturopathic physicians. These CAM practitioners are graduates of accredited four-year, post-graduate residential naturopathic medical programs, are licensed to practice primary care in 13 states and broadly reflect basic currents in alternative medicine.

This is an exploratory study. It is an experimental attempt to use solid quantitative techniques to examine the nature of dynamic, complex social systems while breaking free of a linear obsession with causality. While a significant body of literature has developed studying beliefs of people who use CAM, solid quantitative studies comparing cultural worldview of practitioners are rarer. There are no other studies of the cultural worldviews of CAM and allopathic practitioners that use this Apollonian – Dionysian ideal typology. Yet, this proposed study of worldviews holds the promise of mining a rich vein of knowledge that can be useful, both in efforts to bridge the divide between allopathic and alternative care and to fuel further research.

CHAPTER 2 CAM IN CONTEXT: A REVIEW OF LITERATURE

Any effort to understand the cultural worldview of biomedical and alternative medical practitioners is essentially a struggle to untangle a Gordian knot formed by several cultural and intellectual threads. These include an American tradition of medical pluralism, the rise of scientific medicine, the resurgence of unconventional therapies as people fashion a de facto healthcare delivery system that meets their desires, the intellectual tensions between differing views of science, and, ultimately, alternative cultural worldviews.

This literature review by necessity follows these intellectual threads. However, any attempt to cut this Gordian knot, indeed any study of alternative medicine, should begin with a simple question: Alternative to what? Indeed, the answer seems self-evident – an alternative to conventional medicine. However, like many seemingly self-evident questions, this one is deceptively complex. For the scientific medicine many Americans regard as traditional is not so very old, and the therapies many regard as alternative are not so new (Bates 2002; Goldstein 1999).

Look back less than a century into American history, perhaps an additional 50 years into the mists of European history, and medicine was a pluralistic *mélange* of therapeutic approaches to the understanding and treatment of disease. Absent a dominant biomedical model – and the triumphant ascendancy of scientifically-based allopathy – medicine was “a relatively undifferentiated playing field” (Saks 2003). The sick and

injured were cared for by a variety of healers including allopathic, homeopathic, osteopathic and eclectic physicians; herbalists; practitioners of folk remedies; and purveyors of patent medicines (Flannery 2000, Starr 1982).

Indeed, medical pluralism may well be *the* historic norm in the United States. In the colonial period, health care in America was provided by physicians (some the recipients of formal European training, others formally or informally trained in the colonies), midwives, apothecaries, barber-surgeons, botanical healers, native-American healers, African healers, abortionists, and *Zieckentroosters* (comforters of the sick). From this point until the late 1800s, the story of American medicine would be one of successive waves of medical reform movements – Thomsonians, Grahamites, homeopaths, hydropaths, mesmerists, chiropractors, Christian Scientists, etc. – each offering a therapeutic approach based upon its own concept of health and illness (Kaptchuk and Eisenberg 2001).

Science Triumphant: the Rise of Allopathic Medicine

There is a romantic tendency to see the evolution of biomedicine as a steady progression of ideas put forward by great physician scientists, each new idea an improvement upon its predecessors, each new idea forged in the furnace of scientific observation and tempered by clinical practice. At one level this romanticized explanation is true. From Hippocrates to Galen to Osler to Crick and Watson, each step in this passing parade of discovery did lead to deeper, more scientific understanding and cast new light on erroneous ideas of the past. But to see the growing hegemony of allopathic medicine

as an inevitable byproduct of superior ideas is to miss the complex cultural interplay of social structure, technology, and human agency that fueled its rise.

One need look no further than the professional hierarchy among medical practitioners in 18th century England – and the way in which it represented deeper social divisions – to see that medicine is swept along by cultural currents of the society in which it is practiced. In this era, as Starr (1982: 37-38) has noted:

Physicians, members of a learned profession, formed a small elite, distinct from the lower orders of surgeons, who practiced a craft, and apothecaries, who followed a trade. Each of these “medical estates” had its own guild organization and its defined functions and privileges . . . As gentlemen, physicians declined to work with their hands and only observed, speculated, and prescribed. Surgeons, who until 1745 were members of the same guild as barbers, engaged in manual tasks . . .

By the end of the 20th century, surgeons would be demigods of the medical realm. Their transformation from hacks to heroes reflects deep-seated changes in medicine and society, changes rooted in modernity. Surgeons, after all, embody the values embraced by modern western societies – action, individuality, personal enterprise, aggressive treatment of disease, the application of technology in the conquest of disease (Stein 1990, Felker 1983).

The tale of the transformation of the elite levels of the medical hierarchy from the province of gentlemen to a land of action heroes is rooted in the story of medical science from the mid-19th through the 20th century, which is in turn rooted in modernist and capitalist currents that swept Europe and America. As Stein so aptly notes: “In the portrait of medicine lies a self-portrait of the society that medicine serves and embodies” (1990: 25).

By 1830, students like Oliver Wendell Holmes were traveling from around the world to Paris to study medicine at the Paris Hospital School where Alexandre Louis had synthesized clinical observation, systematic autopsy and statistical analysis into something approaching modern clinical medicine (Warner 1986). One of these Parisian-trained American physicians, Elisha Bartlett, returned home as an incendiary advocate for an empirically based medicine, linking epistemology and therapeutics to challenge the theoretical basis of disease that supported medical heroics such as bleeding and purging (Warner 1986). Spurred on by French advances in clinical empiricism, the German universities began developing chemical and biological research laboratories that would subsequently infuse German medicine with an interest in experimental physiology and pathology (Harvey 1981).

The stage was set by the mid-1800s for a revolution that began quietly in the laboratories of Europe. By 1858, Rudolf Virchow argued in his *Cellular Pathology* that the disruption of cellular function could cause disease (Reiser 1981). In a tour de force for the scientific method of research, Louis Pasteur proved the germ theory of disease in 1861. Shortly thereafter Edward Lister applied this knowledge and created the antiseptic technique in surgery. It is hard to overstate the exponential rate at which scientific knowledge seemed to be growing. As A. McGehee Harvey (1981: xv) writes: “In one generation there was a complete realignment of the outlook on physiology, pathology, and practice, all of which came from a recognition that experiment is the very basis of science.”

Americans would flock to Europe, especially to Germany, to study medicine at the epicenter of these scientific breakthroughs. In fact, approximately 15,000 Americans

would study medicine in Germany between 1870 and 1914 (Brown 1979). These European-trained physicians returned to assume positions of medical leadership in an America that was profoundly different than the one that greeted Oliver Wendell Holmes when he returned from France in the 1830s, an America in which corporations were playing an increasingly important role. By 1870, for example, incorporated business accounted for a small sliver (five percent) of all the businesses in Massachusetts; but that tiny sliver controlled 96 percent of the state's capital and employed 60 percent of its workers (Brown 1979).

These European-trained physicians joined their U.S.-trained colleagues in an environment of medical practice that could best be described as chaotic and hyper-competitive. Medical practitioners abounded. Germany had one doctor for every 2,000 inhabitants; the United States had one for every 568 (Brown 1979). Medical schools also were abundant, graduating doctors at a dizzying pace; most were dependent upon admission fees for their survival and enrollment doubled from 11,826 to 25, 171 in the years between 1880 and 1900 (Starr 1982). The picture was further complicated by a diversity of medical approaches based upon differing ideas about the nature of health and illness. The allopaths, of which the European-trained physicians were the *crème de la crème*, competed for patients with eclectic, homeopaths, osteopaths and others (Flannery 2000, Starr 1982, Brown 1979).

Advocates for professionalizing medicine increasingly began to fuse their cause with more general scientific advances that captured the public imagination (Saks 2003). Allopathic physicians, who saw themselves as the embodiment of scientific medicine, became increasingly active in their efforts to professionalize medicine (Saks 2003, Starr

1982, Brown 1979). Into this maelstrom of professional rivalry stepped Abraham Flexner, a professional educator commissioned by the Carnegie Foundation to develop a plan to improve the level of medical education in the United States. Inspired by the German model of medical education, Flexner set high standards and:

. . . attacked medical schools for producing too many doctors, for requiring too little education before admission to medical school, for having inadequate training, and for creating a social composition for medical school that was inappropriate to its important social role. (Brown 1979: 147).

It was the Flexner Report (1910) – and subsequent involvement by the Rockefeller Foundation – that would transform the practice of medicine in the United States in ways foreseen and unforeseen, and whose influence also would spread to Europe (Saks 2003, Burrow and Burgess 2001, Fisher 1999, Goldstein 1999, Berliner 1984). This report was a clarion call for medical education and medical practice based upon scientific medicine. This approach to medicine can be characterized by: 1) a belief that disease is materially generated by specific causal agents (like bacteria, viruses, genetic malformations, etc.); 2) a passive patient role; and 3) the use of invasive manipulation to restore health defined as a statistically derived equilibrium point (Berliner 1984).

The Flexner Report set goals and standards for medical schools; the Carnegie and Rockefeller foundations funneled massive amounts of money into schools that met those standards. The Rockefeller Foundation would contribute more than \$82 million to medical education reform by 1930; it is estimated the combined total between 1910 and 1930 contributed by philanthropic foundations to medical education and research was about \$300 million (Brown 1979).

However, many medical schools, especially those with roots in non-allopathic approaches to health and disease, were unwilling or unable to meet these standards. Often existing on the edge of profitability and without major endowments, these schools lacked the financial wherewithal to clear the Flexner hurdle. Haller (1999) recounts the example of one such institution, The Eclectic Medical College of Cincinnati. The school was founded in the 1840s as the major academic institution of one of the great medical reform movements of an era when social reform was sweeping America. Lacking financial means to institute the Flexner reforms, the school also was rocked by state licensure pressures brought to bear by the American Medical Association. As licensure and hospital privileges for eclectic physicians began to dry up in New York and New Jersey, enrollment plummeted from these two states which previously supplied a significant proportion of students for the Eclectic Medical College. Despite a struggle by its trustees, the Eclectic Medical College of Cincinnati was unable to halt its ensuing financial death spiral and held its last commencement in 1939. The most remarkable thing about this story is the fact that the school managed to last as long as it did. Of the 131 medical schools operating in the United States in 1910 when the Flexner report was issued, 50 had closed their doors by 1922 (Berliner 1984). Many of those that closed had admitted women; and women would not be admitted to American medical schools again in appreciable numbers until the 1970s (Burrow and Burgess 2001).

Thus, a paradigmatic shift toward scientific medicine was aided and abetted by the financial resources of a new breed of capitalist philanthropists who saw health care as fertile ground for their efforts to improve the lot of mankind while establishing a moral basis for the new economic order (Brown 1979; Baer 2001a). But scientific medicine did

its part to justify the paradigm shift by producing a dazzling array of technological improvements in medical care. The pioneering work of Pasteur, Virchow and Lister led to dramatic improvements in both the understanding and treatment of disease. Thanks to improved microscopy, Koch was able to identify a bacterial cause for tuberculosis in 1882; by the 1890s, X-rays allowed physicians to peer into the human body (Reiser 1981). Advances in aseptic technique and anesthesia radically improved surgery. Discovery of penicillin in the 1930s, sulfonamides and other antibiotics would give physicians effective weapons against infectious diseases and infection. A successful post-World War II crusade against polio galvanized public support for medical research. As Starr (1982: 347) writes:

The magic of science and money had worked. And if polio could be prevented, Americans had reason to believe that cancer and heart disease and mental illness could be stopped, too. Who knew how long human life might be extended?

Indeed, the victory over polio would be followed in subsequent decades by kidney, heart, heart-and-lung transplantation as well as medical intervention in the genetic code of life. This was clearly a powerful paradigm.

Against this backdrop of scientific and technological accomplishment, other forces would combine with this paradigmatic shift to further enlarge the biomedical infrastructure. In the 1940s, unions and corporations would often add group health insurance as a final step to sweeten the pot during contract negotiations; these efforts boosted two groups that had provided health insurance since the 1930s, Blue Cross and Blue Shield, pushing their respective subscribers to 19 million and two million (Starr 1982). The federal government also moved into the medical sector in the post-World War

II period, most notably with the passage of the Hill-Burton Act. This legislation helped provide funding for construction of medical facilities in rural and under-served areas; by 1982 an estimated 9,200 medical facilities in the United States had been built or renovated with Hill-Burton funds (UAB 2005). But the most massive federal intervention would be the creation of Medicare and Medicaid in the mid-1960s. These two programs alone would annually pump approximately \$500 billion into the healthcare sector by 2003 (Kaiser Family Foundation 2005).

Collectively, the federal government and private insurers – combined with the vast economic and research capacity of the pharmaceutical industry – would create a massive infrastructure organized around biomedicine by the dawn of the 21st century. In 2006, American healthcare expenditures totaled \$2.1 trillion or 16% of GDP (Center for Medicare and Medicaid Services 2008a). This makes health care the largest distinct industry in the United States, employing approximately 14 million Americans (Bureau of Labor Statistics 2008). The share of United States GDP accounted for by healthcare had more than tripled between 1960 and 2006 (Center for Medicare and Medicaid Services 2008b). The figures are less dramatic for other countries in the Organization for Economic Cooperation and Development (OECD), but they are not insignificant with healthcare accounting for 8.1 percent of GDP on average for the OECD nations (Reinhardt, Hussey, and Anderson 2004). Reinhardt et al. (2004) note that the figure for Germany is 10.7 percent, for France it is 9.5 percent, and for the United Kingdom it is 7.6 percent of GDP. Allopathic medicine, which eased ahead of its competing medical systems with support from capitalist philanthropists, had itself become big business.

In summary, allopathic medicine emerged as the dominant sector of American healthcare thanks to a convergence of intellectual and social forces. With the advent of Medicare, billions of dollars would begin flowing into a sector of the economy over which allopathic practitioners held hegemony. Health care would become a major economic sector in the United States.

Not everything that glittered in this success story was golden, however. The miraculous technology that graced the showrooms of this enormous medical infrastructure was purchased at a high psychic price. Each new piece of diagnostic and therapeutic equipment increased the distance between patient and physician; these machines “inexorably direct the attention of both doctor and patient to the measurable aspects of illness, but away from the ‘human’ factors that are at least equally important” (Reiser 1981: 229).

The Resurgence of Complementary and Alternative Medicine

Ironically, toward the end of the twentieth century at the seeming pinnacle of its influence, allopathic medicine would awaken to the fact that alternative medicine had not disappeared. Indeed, medical pluralism was alive and well. For many patients alternative medicine had become complementary, an adjunctive form of therapy integrated into their utilization of health care resources. In what has become a classic study in this literature, Eisenberg et al. (1993) found the frequency of unconventional therapy in the United States was far higher than previously reported. Thirty-four percent of their respondents reported using at least one unconventional therapy in the past 12 months.

Based on completed telephone interviews with 1,539 adults in a national sample of adults aged 18 years of age or older, Eisenberg et al. (1993) projected:

- An estimated 61 million Americans used at least one of the 16 alternative therapies studied during the preceding 12 months.
- The estimated number of ambulatory visits to alternative practitioners in 1990 was 425 million visits, exceeding the number of visits to allopathic primary care practitioners in the same time frame by 123 million.
- Americans spent approximately \$11.7 billion for alternative services in 1990, not counting expenditures for drugs, herbs, vitamins, devices, books, etc.
- One-in-four Americans seeing a physician for a serious health problem are also seeing an alternative practitioner, but seven-out-of-ten such encounters between a patient and physician occur without the patient informing the doctor they are also using an alternative therapy.

Appearing in the *New England Journal of Medicine*, the Eisenberg study was the most visible of several such efforts in the United States and abroad. In a systematic review of this literature, Harris and Rees (2000) examined a dozen of these studies. They found differences in therapies included under the CAM rubric made utilization comparisons difficult. However, the studies did indicate a significant segment of the population in each of the countries (Australia, Canada, Finland, Israel, United Kingdom and the United States) used complementary and alternative medicine.

Five years after publication of their landmark article, Eisenberg et al. (1998) expanded upon the earlier study. They found a significant increase in CAM with an estimated 42.1 percent of the American adult population using at least one of the 16

alternative therapies listed in the study. This represents an increase from 427 million visits in 1993 to 629 million visits in 1997. CAM use was more common among women (48.9%) than men (37.8%) and among people aged 35 – 49 years (50.1%). Almost 40 percent of respondents in the other cohorts (39.1% in the 34 and under cohort and 41.8% in the 50 plus cohort) used CAM in the preceding 12 months.

The 2002 National Health Interview Survey, conducted by the Centers for Disease Control and based upon more than 30,000 interviews, estimates 62.1 percent of Americans over age 18 – more than 123 million people – had used some form of alternative medical care in the past 12 months when prayer for health reasons is included (Barnes et al. 2004). When prayer for health reasons is excluded, the estimate declines to 36 percent of American adults over age 18.

Clearly, for any study attempting to measure utilization rates for CAM, taxonomy becomes an important issue. How the researcher defines CAM determines how many respondents in a sample indicate usage. Eisenberg et al. (1998) included the following therapies in their study: acupuncture, bio-feedback, chiropractic, energy healing, exercise/movement, folk remedies, herbal therapies, high dose megavitamins, homeopathy, hypnosis, imagery, lifestyle diet, relaxation techniques and spiritual healing (including prayer).

Of equal interest to the *who* and *what* of CAM utilization is the question of *why* patients seek alternative medical care. Some researchers (Leiser 2003, Furnham and Forey 1994) have found an association between use of CAM and disaffection or disappointment with allopathic medicine, but this is not a universal finding (Astin 1998). In a British study, Furnham and Forey (1994) also found patients who use CAM had a

greater knowledge of the biological and physiological functioning of the body, although this could be an artifact caused by CAM patients having higher levels of education. All three of these studies (Leiser 2003, Astin 1998 and Furnham and Forey 1994) found that a holistic orientation to health is an important factor in explaining why patients seek alternative treatment as did a study by Barrett et al. (2003).

In a study to identify predictors of alternative health use, Astin (1998) discovered that beyond this general holistic orientation, patients who used CAM demonstrated a greater desire to exercise personal control over health matters and were also more likely to have had a transformational experience that changed their worldview. He also found they were more likely to be part of a cultural group identifiable by a commitment to environmentalism and feminism, involvement with esoteric forms of spirituality and personal-growth psychology. Similarly, in a study of Israelis who use alternative medicine Leiser (2003) also found support for ecologically responsible behavior, respect for the age-old wisdom of the East, and a solid link between belief in the paranormal and support for CAM. Hildreth and Elman (2008) found evidence that health beliefs and sacred worldviews differentiate CAM users from non-users, and influence utilization rate among users.

In a study examining why CAM usage decreases among older adults and some ethnic minorities, Grzywacz et al. (2007) suggest people draw upon complementary and alternative medicine as a resource for health self-management, but their decision to use such therapies is influenced by their interpretations of somatic experiences and ailments and by their beliefs about the appropriate way to respond to them.

Given utilization patterns, it was clear that by the dawn of the 21st century, millions of Americans had fashioned a healthcare delivery system of their own device, one in which they incorporated both biomedicine and alternative therapies (Eisenberg et al. 1998, 1993). In fact, patients who used CAM were more likely to seek care from biomedical physicians than were those patients who did not use CAM (Hanyu, Simile and Hardy 2002, Druss and Rosenheck 1999).

While noting this mix-and-match phenomenon, Hanyu et al. (2002) did not attempt to explain it. Druss and Rosenheck (1999), however, explored a couple of possible explanations. One possibility, that those using both complementary and conventional care were experiencing more significant health problems, was not borne out by their data which indicated no significant difference in self-reported physical or mental health, difficulties with daily living, or difficulties with instrumental activities of daily living. The differences they did discover were that compared to those who used conventional care alone, those who used both approaches were “more likely to be female, white, more educated and live in the West” (Druss and Rosenheck 1999: 653).

This mix-and-match behavior might have surprised those safely ensconced in the biomedical system, but it would surely be less startling to sociologists and anthropologists who study the ways in which people seek care for health-related problems. Haug and Lavin (1981) clearly argued that consumerism was altering the pristine world of the sick role and professional authority as described by Talcott Parsons. Furthermore, Pescosolido, Tuch and Martin (2001) have shown this transformation – or perhaps realization – of the complex relationship between patients and biomedical

practitioners is also part and parcel of American's changing confidence in physician authority, a process inherently linked to complex public sentiments.

Also, regarding the ability of people to weave together contrasting elements, Kaja Finkler (1994: 79), in a fascinating study based upon her direct observation of spiritualism and biomedicine in Mexico, makes a relevant observation with universal application:

Unlike academicians, who regard the two healing regimens as diametrically opposed and in competition, the people who seek treatment do not distinguish the profound epistemological differences between sacred healing, such as spiritualism, and biomedicine. In the search for the alleviation of pain, pragmatism prevails; people judge the treatments they are given by their effects.

Naturopathy

The history of naturopathy epitomizes this process of initial success, decline and ultimate resurgence that is the hallmark of non-allopathic medicine in America. With its emphasis on *vis medicatrix naturae* – the healing power of nature – naturopathy is heir to a centuries-old tradition in medicine championed in the west by figures from Hippocrates to Albert Schweitzer. As a formal medical system, however, naturopathy traces its origins to the nature cures popular in Europe during the mid to late 19th century. One of the most influential of these pioneers was Sebastian Kneipp, a Bavarian priest whose natural cures made him one of the most famous people of his time and whose patients included Austro-Hungarian Emperor Franz Joseph and the Pope (Kirchfeld and Boyle 1994). One of those patients Benedict Lust, A German immigrant who had lived briefly in the United States, would become a devoted follower and bring Kneipp's famous cures to America in 1896.

When Lust returned to the United States, he had an evangelical zeal for natural cures and very little formal medical training. However, he would earn medical degrees from the New York Homeopathic College and the Eclectic Medical College of New York, as well as earning degrees in naturopathy, osteopathy, and chiropractic (Kirchfeld and Boyle 1994). The fury with which he pursued his medical training was simply a foreshadowing of the energy he would devote to the cause of naturopathy. Widely regarded as the patriarch of American naturopathy, Lust popularized the term naturopathy, founded the nation's first naturopathic medical college in New York, created a naturopathic sanatorium in New Jersey and another in Florida, edited and published a naturopathic medical journal, founded a national association for naturopathic physicians and helped organize state branches of that organization, staged an ongoing feud with the American Medical Association, and lobbied for legislation that would grant naturopaths legal status equal to that of allopathic practice (Kirchfeld and Boyle 1994).

Another former Kneipp patient, Henry Lindlahr, also became a famous nature cure advocate writing influential works on natural therapeutics and establishing a popular health resort in Elmhurst, Illinois as well as a sanitarium and natural health college in Chicago (Kirchfeld and Boyle 1994). Lindlahr would count among his patients the novelist Sinclair Lewis and socialist presidential candidate Eugene V. Debs.

The Pacific Northwest proved to be especially fertile ground for naturopathy (Baer 2001a, Whorton 1986). A sanipractic (an off-shoot of naturopathy) college was organized in Seattle in 1919, but was eventually eclipsed by Western States Chiropractic College, a joint naturopathic and chiropractic college founded by an alumnus of Lindlahr's school (Grimes 2005).

Despite the celebrity status of naturopaths like Benedict Lust and Henry Lindlahr – and the near reverential acclaim for their mentor Father Sebastian Kneipp – despite popular fascination with nature-cure health resorts and a growing number of naturopathic physicians, this period of initial success would give way to a steady decline in the movement. Naturopathy was plagued by internal divisions that split along the twin fault lines of personality and philosophical differences (Kirchfeld and Boyle 1994). After the death of Lust, six different organizations struggled to be the official association for naturopathic practitioners (Baer 2001b). These divisions probably hindered efforts to present a united defense against the challenges allopathic medicine launched against naturopathy. In the 1920s, the Council on Medical Education and Hospitals of the American Medical Association (AMA) issued a scathing indictment of naturopathic and chiropractic colleges. The AMA would subsequently decry the nature cure movement as quackery. Morris Fishbein, MD, editor of the *Journal of the American Medical Association*, was particularly vocal in his attacks. He charged Lust and Lindlahr with selling out the spirit of the saintly Kneipp, and even implied the death of Eugene V. Debs was due to malpractice and medical negligence at the Lindlahr sanitarium (Fishbein 1932). But the attacks upon naturopathy were not limited to official spokespeople for organized medicine. In 1933, the eminent neurologist Walter Cannon blasted naturopaths, chiropractors and other alternative providers in an essay entitled “The Enemies of Society” that appeared in *The Scientific Monthly* (Cannon 1933). It was an ironic attack, perhaps, given the author would himself be criticized for his studies of voodoo death.

The collapse of several naturopathic colleges, the death of Benedict Lust and Henry Lindlarh, internal divisions, bitter opposition from the AMA and the triumphant ascension of allopathic medicine all contributed to a decades-long decline of naturopathy in America. In the 1950s hard-won licensure privileges were revoked in several states with Tennessee even making it a misdemeanor to practice naturopathy; Western States Chiropractic College decided to drop its naturopathy program (Baer 2001b). A group from Western then formed the National College of Natural Medicine (NCNM) in Portland, Oregon; by the early 1970s, it was the last naturopathic school in the United States and was struggling financially (Baer 2001b).

Then, when things looked their bleakest, naturopathy gained a new lease on life. The social forces that lifted alternative medicine in general also lifted the fortunes of naturopathy (Baer 2001). This positive reversal of fortune would be institutionally evidenced by a renaissance in naturopathic education. In the late 1970s a group of NCNM alumni and other naturopaths in Seattle founded the John Bastyr College of Naturopathic Medicine, later known as Bastyr University (Grimes 2005). In 1993, the Southwest College of Naturopathic Medicine opened in Tempe, Arizona; and in 1997, Bridgeport University in Bridgeport, Connecticut opened a naturopathic medical school (Baer 2001b). Naturopathic curricula at these schools mirror allopathic training for the first two years, incorporating more classes and clinical experience in alternative medicine during the third and fourth years of the programs. Graduates of these four-year schools are eligible to take the NPLEX, a comprehensive examination offered by the North American Board of Naturopathic Examiners; passing this exam is a requirement for licensure in all states where naturopaths can practice medicine.

Given this growth in educational infrastructure – and the success of the profession in securing licensing privileges in several states – it stands to follow the number of naturopaths would increase. And, indeed, the number of practicing naturopaths has grown three fold to 3,000 in the last ten years (AANMC 2008). Nearly a half-million Americans sought care from naturopathic physicians in 2002 (Barnes et al. 2004). Patients paid for many of these visits out-of-pocket. However, insurers in several states are beginning to offer alternative health benefits, and naturopathic services are covered by state-regulated insurers in Washington, although the state law contains a provision that excludes self-insured plans (Tillman 2002).

The profession is also increasingly focused on a research agenda that uses scientific research techniques (Standish, Calabrese and Snider 2006). That emphasis is especially evident at Bastyr, recipient of a T32 training grant from the National Institutes of Health to train pre-doctoral and post-doctoral fellows, and NCNM, home to the Helfgott Research Institute which focuses on clinical research in naturopathy, Chinese medicine and energy medicine.

A Troubling Disconnect and the Need for Formal Integration

For millions of Americans, health care is not so much a monolithic delivery system as a constellation of resources from which they draw the service that suits their fancy (Kaptchuk and Eisenberg 2001). This willingness to engage in mix-and-match behavior, however, has not led to a truly integrated system in which alternative and biomedical practitioners work cooperatively to care for patients. Despite the fact that American utilization rates for CAM increased during the 1990s, one thing remained

virtually unchanged in this period: fewer than 40 percent of patients who used alternative therapies reported them to their allopathic physician (Eisenberg et al. 1998).

Frenkel and Borkan (2003) argue the potential pitfall of this current state of affairs is obvious. Alternative therapies, like biomedical therapies, have physiological effects. *Natural* does not automatically mean *benign*, especially when used in combination with other therapies. For example, ginkgo biloba, an herb commonly used by the elderly to improve memory, can interact with warfarin and increase bleeding tendency.

Recognizing patients could benefit from true integration of the alternative and biomedical spheres, The National Center for Complementary and Alternative Medicine of the National Institutes of Health set this as a key strategic focus, explaining:

Within this paradigm, CAM and conventional healthcare professionals would function as interdisciplinary teams to deliver an expanded repertoire of safe and effective treatments that include a focus on the whole person (NCCAM 2000).

At a largely personal and informal level there already has been some movement across the boundary of these two spheres. A comprehensive review of 25 surveys of physicians conducted between 1982 and 1995 found relatively high rates of physician referrals to several types of alternative practitioners, including acupuncturists (43%), chiropractic (40%), and massage (21%) (Astin et al. 1998). These researchers also found approximately half of the physicians surveyed personally believed in the efficacy of these three therapies. And at a more formal level, integrative medicine programs – which combine biomedical and various alternative therapies – are an increasingly common fixture of the American medical landscape, especially at some of the nation's leading

medical institutions. The Consortium of Academic Health Centers for Integrative Medicine, a collaborative organization dedicated to advancing integrative medicine, has 41 member institutions (The Consortium 2005).

Yet, very real barriers to integration continue to exist. Credentialing of CAM practitioners is one such issue and tends to hinge upon licensure standards for alternative providers (Eisenberg et al. 2001). A 2004 study of the members of the Consortium of Academic Health Centers for Integrative Medicine found that most of the 22 responding institutions offered their alternative providers ancillary credentials – a level of credentialing often used for hospital personnel such as nurse practitioners, physical therapists, dieticians, etc. – rather than the full staff privileges accorded MDs (Nedrow 2006) This study highlights issues raised by licensure standards, as well as issues of professionalization and politics, noting “the ability of medical doctors who take additional training in a field of alternative medicine to obtain full medical staff credentialing compared to doctoral-degreed CAM professionals who engage in the same practice (i.e., acupuncture)” (Nedrow 2006:332).

A deeper, more divisive issue that touches upon basic philosophical differences is the role and type of scientific research that should be applied to CAM (Jagtenberg et al. 2006; Boon et al. 2006; Hess 2002; Fontanarosa and Lundberg 1998, Levin 1997). Tonelli and Callahan (2001) have noted biomedicine measures the value of research claims largely upon the basis of quantitative studies that use probability statistics to project outcomes given an assumed degree of commonality; however, many alternative therapies start with a presumption of individuality. If illness can be viewed only in the context of an individual – as opposed to an independent disease entity – then population

based studies are methodologically inappropriate. Also, Tonelli and Callahan (2001) note problems with applying evidence-based medicine to invisible, but vital life forces like Qi that are often at the heart of alternative therapies.

On a more subtle philosophical level, biomedicine has traditionally accepted Cartesian dualism, while CAM therapies rest upon a holistic connection between mind, body, and spirit (Goldstein 1999, Berliner 1984). Biomedicine also is rooted in a view of science that is essentially Newtonian, while many CAM therapies embrace a holographic vision based upon quantum physics; the former grasps for certainty, the latter accepts uncertainty (Salmon 1984). The extent to which such disparate views about science are really emblematic of deeper, differing cultural worldviews among alternative and biomedical practitioners is an intriguing question.

Different Worldviews?

A landmark study comparing 340 members of the American Holistic Medical Association with 142 family practice physicians in California found the two groups very similar in demographic composition, but differing along some key dimensions (Goldstein et al. 1987). These researchers found holistic physicians were more likely than the family practitioners to have had personal experiences with religion/spirituality that had profound affects upon their life, were more open to psychotherapy and were aggressive in pursuit of physical fitness and health.

This constellation of values and beliefs among holistic physicians is especially interesting in light of the findings by Astin (1998) regarding people who use CAM. As

noted previously, he found these people conformed to a cultural subgroup identified as Cultural Creatives by sociologist Paul Ray.

This typology comes from a work published by Ray and his partner Ruth Anderson (2000) and explored previously by Ray (1997, 1996). Drawing upon a survey that measured respondents' agreement with several values/beliefs, Ray identified three cultural subgroups that coalesced around certain key values. Cultural Creatives value authenticity, self-actualization and personal growth, spirituality, simplicity, an appreciation for the exotic, and deep ecological concerns. They are very different from the dominant cultural group in America, the Moderns. This group, an estimated 48 percent of the American adult population, is rational, applauds technology, believes the human body operates much like a machine, is very materialistic, measures success in monetary terms and celebrates an abundance of choices. The third major group identified by Ray is the Traditionals who comprise almost 25 percent of the American population. They are a diverse group, but share a nostalgic longing for an America that has disappeared or, perhaps, never really existed.

The presence of several components of this constellation of Cultural Creative values and beliefs – implicitly in Leiser (2003) and Goldstein et al. (1987), explicitly in Astin (1998) – raises an interesting question. Do CAM and biomedical practitioners tend to hold differing sets of cultural values and beliefs, that is do these two types of medical providers see reality from different cultural worldviews?

James C. Whorton (2002) has argued that, historically, there has been a fundamental difference in worldview between allopathic and alternative physicians. These differences are most notable, he argued, in attitudes about the benevolence of

nature, epistemological preferences, and holism. In a study of Swiss physicians, Marian et al. (2006) found distinct differences in outlook between bio-medical physicians practicing conventional medicine and those who practiced CAM. Tilburt and Geller (2007) have argued that a biomedical worldview dominates Western allopathic medical training, so much so that its rarely questioned assumptions shape medical curricula. Worldview has also been shown to influence attitudes toward CAM among a group of students in the health sciences (nursing, physical therapy, etc.), accounting for 24 percent of total variance in their attitudes towards CAM (Pettersen and Olsen 2007).

Other authors have noted the differences in epistemology and worldview *within* allopathy and alternative medicine. Newton (2001), for example, had described a tension between rationalism (exemplified by allopathic medical scientists whose therapeutic armamentarium takes aim at the basic mechanisms of disease) and empiricism (exemplified by the evidence-based medicine of the clinical epidemiologist). Warner (1986) has described the impact this epistemological struggle had on therapeutics in the 1800s, situating the debate in socio-historical context. However, it was Shryock (1969:99) who first traced this tension between empiricism and rationalism across three centuries of American medicine, a feat accomplished by shifting “his interest from the ends of science to the means employed, from an emphasis on fact to one on method.” Focusing on the way in which physician-scientists approached their field, rather than simply chronicling a parade of medical progress, Shryock (1969) managed to create an epistemological history of American medicine. His work, therefore, is a valuable guide to this particular aspect of physician worldview.

Shryock (1969) notes this tension in medicine between empiricism and rationalism has at least a 1,700-year-old tradition in western civilization, having been commented upon by Galen, the Greek physician in the second-century C.E. The rationalists, says Shryock, chiefly rely upon reason and theory to unravel the mystery of disease and treatment; the empiricists depend upon experience for this knowledge. He further distinguishes between crude empiricists who rely upon both formal and fortuitous observation, scientific empiricists who rely upon observation to test theory and extreme empiricists who are “devoted to learning derived from sense impressions but distrustful of all intuition and theories” (Shryock 1969: 102). The epistemological history of American medicine, therefore, is a story of the gradual ascendance of scientific empiricism (Shryock 1969). But, while the force of this intellectual current is powerful, these streams of thought are not always clear as they meander through allopathic medicine; even beacons of scientific empiricism like the British physician William Harvey could also be dogmatic rationalists (Shryock 1969).

Shryock (1969) argues epistemological method was also an important distinction between allopathy and those branches of American medicine we now term CAM – for example, osteopathy, naturopathy and chiropractic. At a time when allopathy was increasingly under the sway of scientific empiricism, these medical systems seemed to have galvanized around some general rationalist principle; the structural importance of the spine to health in the case of osteopathy and chiropractic, the belief in naturopathy that nature is the ultimate healer. Shryock (1969) believed the ability of these systems to move into the mainstream of American medicine as was the case with osteopathy – or the

inability to do so in the case of naturopathy and chiropractic – was tied to their willingness to adopt the ascendant epistemological form.

Arguably, in the four decades since Shryock (1969) published his work in the *Proceedings of the Antiquarian Society*, the landscape of mainstream medicine has changed considerably. Naturopathy, which he predicted would disappear, is newly resurgent. Chiropractic won a major legal settlement against the American Medical Association and is now reimbursed by private insurance as well as Medicare. Even the Institute of Medicine supports an active movement to integrate allopathic and alternative approaches to care. However, an epistemological tension still seems to permeate medicine with some of the brightest sparks ignited by the friction between crude, scientific and extreme empiricism as evidenced by debates over outcomes research and evidence-based medicine. Nor has rationalism disappeared from this debate; Cohen, Stavri and Hersch (2004:37), for example, in a critique of evidence-based medicine argue that it is “EBM is a poor philosophic basis for medicine,” that it is “an approach founded on evidence provided by experimental studies designed to minimize bias, rather than on physiologic theory.”

As important as these epistemological differences are, they nevertheless constitute only one aspect of worldview. Because, while worldview is about *how* we know, it is also about *what* we believe there is to know (ontology). Worldview certainly encompasses – but is not limited to – epistemological preference.

In a study of Canadian naturopaths, Boon (1998) found her respondents to be divided between those who held scientific and those who held holistic worldviews. Perhaps one of the most intriguing findings of Boon’s (1998) study was that differences

in worldview modulated the way these naturopaths chose treatment modalities. Respondents with more holistic orientations incorporated the patient's spirituality and drew upon their own intuition in treatment decisions; those with more scientific worldviews reported selecting treatments based upon available scientific evidence. The holistic respondents also spent longer time with their patients than those with a more scientific orientation.

Of course, every individual holds many beliefs which in some fashion are fused into a system that makes psychological if not logical sense. In almost poetic fashion Rokeach (1976: 1) argues that:

... it must be assumed that man's beliefs – like the physicist's electrons and protons, like the astronomer's moons and planets and suns, like the geneticist's chromosomes and genes – become somehow organized into architectural systems having describable and measurable structural properties which, in turn, have observable behavioral consequences.

Clearly, it seems several common themes flow through complementary and alternative medicine, offering evidence of an organized architectural system, a world view. As noted previously in this section these themes include holism, deep ecology, openness to more esoteric forms of spirituality and the paranormal, respect for the age-old wisdom of the East, a comfort with ambiguity, and a holographic vision of science rooted in quantum physics. Collectively, they seem to indicate a Dionysian outlook that is non-Aristotelian, comfortable with paradox, unconcerned with ordered boundaries, and more determined to be a celebrant of the natural world than to control nature.

Likewise, several themes in biomedicine – among them its traditional acceptance of Cartesian dualism, desire for certitude and essentially Newtonian view of science – also seem to offer evidence of an alternative architectural system. They seem to indicate a

decidedly Aristotelian outlook, an Apollonian worldview concerned with order and control of nature.

Indeed, in a qualitative study Barrett et al. (2004, 2003) asked 32 CAM practitioners – ranging from shamans to naturopaths – what differentiated CAM from conventional therapy. The respondents said CAM was more holistic, empowering, inductive, individualistic and intuitive while conventional medicine was more reductionistic, controlling, deductive, generalizable and scientific.

Are such differences really emblematic of alternative worldviews? My study explores this relatively uncharted terrain. But, while this is a voyage of discovery, it is certainly not a case of blind navigation. Benedict (1934) used a similar Apollonian and Dionysian typology in her classic study of Native American cultures. And my own application of this Dionysian-Apollonian typology draws heavily upon the work of Pitirim Sorokin.

Sorokin (1969, 1957) elaborately explains his ideas about sensate, ideational and idealistic ways of seeing the world. The sensate approach focuses on the material world, relying upon sensory information shaped by reason to understand the universe. The ideational approach, however, relies upon supra-sensory information; it is comfortable resting its knowledge base upon things unseen. The idealistic way of knowing combines both sensory and supra-sensory approaches.

This study also draws upon the work of Germer, Efran and Overton (1982) who hypothesized that individuals view the world through one of two seemingly irreconcilable paradigms – organicism or mechanicism. In their description of mechanicism, these authors note:

The root metaphor of the mechanistic world is the machine, and its dynamics are essentially Newtonian. The universe is understood as being composed of discrete parts which are inherently at rest. . . . The epistemology of this view asserts that reality is external to the knower, and the knower comes to copy or reflect the world to various degrees of precision. The object of knowledge is, therefore, distinguishable from the subject (1982: 5).

The organismic paradigm, according to Overton et al., draws upon the metaphor of an organism:

. . . its dynamics are more Einsteinian than Newtonian. The universe is inherently active and changing. Any apparent stability is the product of rational concepts. . . . The epistemology of this position maintains that although the world may have an independent existence, the knower can have knowledge of the world only through rational activity. Thus, the known world is an active construction of the knower (1982: 6).

Germer, Efran and Overton (1982), in turn, drew upon the work of Pepper (1942) who identified four fundamental ways of viewing the world—*formism*, which draws upon similarity of essences as a root metaphor; *mechanism*, with its root metaphor of the machine; *contextualism*, for which holistic context serves as a root metaphor; and *organicism*, which draws upon an organic whole as its root metaphor. Interestingly, applying Pepper's concepts to psychology, Lyddon (1989: 446) suggested "that the primary reason counselors hold different positions regarding the practice and process of counseling is that they are committed to different philosophical frames of reference, or worldviews." Kagee and Dixon (1999) found a modest relationship between worldview as measured by the organicism-mechanicism paradigm inventory and health promoting behavior in a convenience sample of college students.

There are deep similarities – and some key differences – respectively between the mechanicism-organicism paradigms and the Apollonian/Dionysian worldviews employed

in this study. There are also deep parallels between Apollonian and sensate worldviews, just as there are between the Dionysian and ideational. Furthermore, these parallels with Sorokin's work offer hope that a deeper knowledge of these two ways of seeing the world increases the likelihood that practitioners and health administrators can create an *idealistic* system that combines the best elements of Dionysian and Apollonian worldviews. Such a system would provide a formal integration of elements that patients are already weaving together in an informal, personalized and episodic fashion.

CHAPTER 3 THEORETICAL PERSPECTIVE AND HYPOTHESES

Ecology and systems theory are the natural habitat of sociology. For what is society but a complex, perhaps even chaotic, system created by humans through our interaction with the world around us. Yet, in our preoccupation with identifying some mysterious factor which makes us uniquely human, we often overlook an even more fascinating area, the very thing we share with all living creatures. We miss the *bio-logic*, the underlying pattern of life, the reality that every healthy organism has a will to thrive that is expressed through an attempt to maximize its own existence.

Our humanity stems not from the fact that we are different from the rest of the animal kingdom, but that our vaunted brains make us so much more like them. Far from making us different from the other phyla, our sophisticated neuronal system makes us a more effective and efficient embodiment of the will to maximize our own existence. It is as if we exhibit basic instincts in an exponential fashion. In humans, the primal fear of the unknown and the drive for self-preservation can be made manifest in wars of incredibly destructive power. Yet, curiosity finds expression in creation of remarkably complicated healthcare technology; compassion in the use of that technology to treat total strangers, even, at times, the enemy injured by our acts of rage.

This is not to argue that humans are inevitably locked, tooth-and-claw, in some social-Darwinian jungle. Indeed, bio-logic suggests the very opposite. Life is not a zero-

sum game where one species advances at the cost of another, but an ecological web marked by interdependency. Organisms and environment are engaged in an intricate dance of creation in which each influences the other. The stream with an abundant source of young timber provides a habitat for the beaver whose dam then slows the stream, ultimately changing it into a tranquil wetland with the carrying capacity to support a host of wildlife. The process is transformative, non-linear and holistic with each component affecting every other.

The difference between beavers and humans is a matter of degree; that is, our neuronal system enables us to more effectively impact our environment and then react more creatively to the resulting transformations. Like the Hindu god Shiva, we move through time, simultaneously creating the new with one hand and transforming the old with another. This dance of creation alters our natural world and gives rise to a broader environment that also includes the man-made world around us. Our attempt to maximize our existence transforms our own everyday landscape, moving over time from farm to factory to virtual reality. The computer screen becomes as synonymous with productivity in our time as the plow was in a former era.

This transformed landscape is, in essence, our enacted world. It is an amalgam of our physical world and the manifestations of our cultural adaptations to that world – from sunshine on a wheat field in Kansas to the feverish futures market, from a colony of *vibrio cholerae* floating in a bay to World Health Organization anti-cholera programs, from the miracle of birth to religious mystery. Our enacted world is the world that greets us as we go forth to meet the day.

Social systems are emergent phenomena that arise from our interactions with one another and with this enacted world. They can range from the simple to the advanced; but at every stage of their development, social systems are dynamic because they contain feedback. Having arisen, they then act back on the humans whose actions gave birth to them – a dialectical process that is repeated *ad infinitum*. And because social systems are dynamic, they are non-linear. Cause and effect can be difficult to trace, since in a dynamic system small almost imperceptible causes can lead to large effects. What is more, as dynamic systems become more complex, there are more components interacting with one another and influencing the causal chain. The search for cause and effect becomes elusive; predictability becomes problematic.

When social systems reach the point of critical complexity, seemingly small causes can have remarkably wide-ranging consequences. This is the proverbial point at which the straw breaks the camel's back. The dynamics of the system overheat. Parisians storm the Bastille or financial markets melt down. Metaphorically, it is as if the weight of a single snow flake creates an avalanche. The system sweeps people along; and, in turn, we react to the wild ride. Napoleon offers post-revolutionary stability. Financial markets create mechanisms that promise to insure investors; speculative bubbles burst.

Given their very nature, dynamic social systems – both in their normal state and at the point of critical complexity – can give every appearance of randomness. It looks as though things happen spontaneously and totally out of the blue. However, nothing could be farther from the truth. Dynamic systems are not random; they are chaotic. Or, to be more precise, they are chaotic in the mathematical sense of the term. That is, they are deterministic. They are very sensitive to initial conditions; even a slight change in the

starting point can lead to big differences in outcomes. But there is a method in the apparent madness of a dynamic social system, even if the madness overshadows the method.

Chaos creates uncertainty, but uncertainty is not the same thing as inexplicability. Causal chains exist in chaotic systems, even if they are sometimes interdependent. They frequently are camouflaged by apparent randomness or obscured by a maze of interacting variables. Linear based analyses, or regression analyses that warp multi-dimensional realities into a one-dimensional form, often are of limited effectiveness when searching for a method obscured by what seems like chaotic madness. Understandably, these techniques provide highly significant accounts of a disappointingly small percentage of variance. The more complicated the social phenomenon under study, the more likely it is to be enmeshed in chaos, and consequently the more likely to require non-linear analyses.

Faced with this uncertainty inherent in chaotic systems, there is a temptation to abandon altogether the belief in solutions. The guiding equation is buried so deeply that one begins to doubt if there even is a guiding equation. Thus, our preoccupation with *why* obscures the valuable information that can be gleaned through the use of the interrogatory *what*. Lacking our preferred scaffolding, we question our ability to construct meaningful theory at all, rather than basing it on what we can observe.

Yet, knowledge of these inherent properties of a dynamic, chaotic system can provide a firm foundation for exploring social systems—large and small—that arise from human interaction with one another and our environment. From the Wednesday night bowling league to financial markets, we humans give birth to recursive social systems that in turn enrich, enable and enclose our life chances. Collectively, these social systems

form the cosmos of our social environment. In so doing, they help shape both our own sense of identity and our view of the world.

At this point, one might imagine an individual at the center of a whirling mass of socio-cultural systems, each of them revolving about him or her like particles about the nucleus of an atom, to form a social cosmos. However, this simile misses a critical point. The individual may, indeed, be the center of his social universe, but he or she is an engaged nucleus actively participating in each of these “orbiting” socio-cultural systems. It is the very interaction of these nuclei – with one another and with the enacted world – that gives rise to these systems which can, in turn, influence individuals moving in its orbit.

As an engaged nucleus, each individual seeks to maximize his or her own glorious sense of being alive. For this sense of being fully alive is the only yardstick by which to measure the success of our efforts to maximize our existence. Naturally, there is a physical component to this drive to thrive. We seek the basics of security – food, shelter and the other necessities of life. But, given the sophistication of our neuronal structure, we also seek existential security. It is hard for us to feel we have reached an optimal state of being, if the specter of *nothingness* shrouds our horizon. Hence, our desire to engage in interactions from Wednesday night bowling league to more intimate relations, each easing our sense of existential anxiety and collectively generating a lifestyle that feeds our sense of being alive.

In our era, we have a remarkable range of interactions from which to choose; indeed, variety is the hallmark of high modernity. People are presented with an almost bewildering array of options unheard of in traditional societies. From these choices – of

mates, religion, schools, careers, décor, amusements and medical care – people must weave together a lifestyle that will, in turn, both bear witness to and shape their individual identity (Giddens, 1991).

In earlier epochs, before the dawn of the industrial revolution, options were much more limited. People were born into a society structured around a prevailing meta-narrative, a cultural storyline that explained the world and an individual's role in it. Men pursued the occupation of their fathers; women's roles were equally circumscribed. In this way, identity was shaped by role and meta-narrative. Acceptance or rejection of role and/or the near universally agreed upon storyline was the only option available to individuals. However, rejection brought severe consequences up to and including banishment or death.

The industrial revolution transformed society, gradually creating more options for individuals in the way they lived their lives. New social interaction patterns within socio-cultural systems altered individuals' enacted world. Traditional agrarian patterns gave way to a world ordered by the needs of industrial production. And with the emergence of the industrial revolution came a new cultural storyline shaped by the forces of industrial development and capitalism. This new meta-narrative valued freedom (as defined by a large number of options), the rational, the scientific and practical, efficiency, and a belief that bigger is better. It is precisely the success and vitality of this cultural storyline that inspired the work of Max Weber, and it is the current triumph of this meta-narrative that drives the McDonaldization phenomenon described by George Ritzer (1996).

Yet, because socio-cultural systems are dynamic, every social epoch carries within it the seeds of its own transformation. Just as the agrarian revolution made

possible the concentrations of population necessary for industrial development, forces unleashed by the industrial revolution helped create what Anthony Giddens (1991) has called a relentless juggernaut of modernity. This juggernaut waits for no man and touches all, leaving a world of increased material abundance and existential anxiety in its wake (Giddens 1991). In our time, individuals cannot escape the necessity to create their self-identity. The work of the self must truly be our own. It increasingly falls upon our own shoulders to maintain a sense of self-identity that might have been structurally imposed in the past. Moving across our life trajectories, we pick a lifestyle, see a therapist, read a self-help book, join a 12-step program – all in an effort to craft that most autonomous of systems, the *self*. From this effort comes new ideas, new ways of seeing the world, and an increasing openness to freshly synthesized world views.

Despite this seemingly endless array of lifestyle options, an individual creating his or her own self-identity still feels the tug of two fundamental – even archetypal – ways of being in the world. One way is rational, sequential and concerned with certitude. It is a manifestation of traits the ancient Greeks associated with Apollo, god of boundaries, order and man's control over nature. The other way is intuitive, spontaneous and quite comfortable with ambiguity. In mythic terms it is a manifestation of traits associated with Dionysius; it is a state of fluid, shifting boundaries less concerned with control over nature than with being a celebrant of the natural world.

These fundamentally different ways of seeing – and being in – the world truly are, in the deepest sense, worldviews. They determine how we look at the world and how we interpret what we see. The perceptions to which they give rise, in turn, are molded into a cognitive reality that reinforces our worldview. In this way, the imagined world is made

real.¹ Berger and Luckman (1967) have detailed the way through which the imagined is transformed into reality, noting it consists of three phases, or moments, in a continuing dialectical process. They are externalization, objectivation and internalization. Human existence, they argue, is a process of externalization. “As man externalizes himself, he constructs the world into which he externalizes himself. In the process of externalization, he projects his own meanings into reality (Berger and Luckman 1967: 104).” Through objectivation, the products of these externalized meanings obtain an objective character, and thus are capable of acting back upon humanity. Internalization occurs when, one of the objective products acts back upon a person and the individual draws meaning from the encounter. These three moments occur not in temporal order, but simultaneously, each moment reflecting what Berger and Luckman (1967: 61) call a fundamental relationship of social reality, i.e., that: “Society is a human product. Society is an objective reality. Man is a social product.”

Suffice it to say, we fashion a reality – or accept a socially conditioned one – and then fashion our lives around that reality. Repeated many fold by many individuals, this embrace gives birth to social structure. It is precisely this intricate coupling of agency and structure that Giddens (1984) calls structuration. Giddens (1984) argues that in our day-to-day interactions, individuals also are reproducing social life. Productive interactions are repeated again and again, becoming increasingly relevant for a group of people, a process known as signification. Relevance leads to a sense of legitimation; the action or idea practically becomes status quo. Increasing levels of signification and legitimation enable an action or idea to gain domination in a group; it is seen as an inevitable given, an unquestioned assumption. The action or idea has become part of the practical

consciousness – routinized; legitimized, capable of acting back upon its producer, who having internalized values, externalizes and pours new meaning into the world, and so this dialectical process goes.

Repetition gives birth to expectation. We expect our interactions to go a certain way, because that is the way things are done. And we put resources, like time and money, into ensuring that things go as they should. Thus, from numerous interactions arise expectations – or, rules and routines – that guide social life, as well as an accumulation of resources which individuals vest in institutions to perpetuate those rules and routines.

Giddens (1984: 25) describes this interplay of agency and structure as follows:

The constitution of agents and structures are not two independently given sets of phenomena, a dualism, but represent a duality. According to the notion of duality of structure, the structural properties of social systems are both medium and outcome of the practices they recursively organize.

Thus, society is enacted by people through countless daily interactions. People's actions, in turn, are guided by their sense of what is socially appropriate, acceptable or acclaimed. Close examination, however, reveals this is really a three-dimensional process which Pitirim Sorokin (1969: 63) argued was comprised of *personality*, *society* and *culture*. He referred to this triad as an inseparable trinity:

. . . 1) *personality* as the subject of interaction; 2) *society* as the totality of interacting personalities, with their sociocultural relationships and processes; and 3) *culture* as the totality of the meanings, values, and norms possessed by the interacting persons and the totality of the the vehicles which objectify, socialize, and convey these meanings.

If there is a weakness in Sorokin's triad, it lies at the cultural point of the triangle. His definition of culture is dead on, and his "totality of the vehicles which objectify, socialize and convey these meanings" offers a tantalizing suggestion of the cultural adaptations to the natural world, which I argued above are an inherent component of our

enacted world. Tantalizing or not, however, it still requires an intellectual leap to jump from culture to an enacted world. Yet, it is a leap worth taking because of the insight it generates, and it is one that follows naturally from the ecological currents that flow through this theoretical perspective. By placing our enacted world at the corner of this trinity, we more accurately capture the triad whose interactions gives rise to emergent socio-cultural systems – the individual, society, and the enacted world (with its natural and man-made elements) in which they live.

While these triads only come in one shape, they do come in many sizes. Perhaps whenever two or more people interact in a shared enacted world we have the potential for a triad from which can emerge a social system – a marriage, for example. And, as the size of the society increases and/or the horizons of the enacted world expand, so does the scope of the triad and the socio-cultural system arising from it.

Just as interaction between environment and organisms can lead to speciation, increases in the size of society and/or changes in the enacted world can result in a specialization of triads marked by a proliferation in their number and variety. Because the social systems emerging from these triads are dynamic and chaotic, they always are in a state of flux. Some are powerful; others are weak. Some are ascendant, while others are in decline, and others are in a state of disintegration. Thus a triad built around an enacted agrarian world can decline in importance, relative to one anchored by an enacted industrial world.

Culture, of course, is an incredibly powerful force in creating our enacted world. To begin with, the totality of meanings, values and norms possessed by an individual shapes the very way he or she sees the world, and for that reason it is referred to as

worldview in this study. A worldview is the psychological primordial soup from which meta-narratives and other elements of culture evolve. It is a dynamic, organic force, enduring but not immutable, that shapes the way we know the world around us.

Worldview determines not only what we see, but where we look and how we perceive that which lies within our gaze. It is an ontological spring from which bubbles forth the perceptions and cognitions that ultimately feed the streams of philosophy, ideology and meta-narrative. In this sense it is closely akin to what Sorokin (1969: 590) called systems of truth, which he said were “based upon the most comprehensive and general of all the ontological principles, namely, *the one defining the ultimate nature of reality and value*”.

A critical point about worldview, as it is used in this study, is the idea that while one system of truth may dominate an individual’s outlook, worldviews are not necessarily mutually exclusive, as Germer et al. (1982) seem to propose. Few people are solely Apollonian or Dionysian, and other worldviews may be possible. In fact, Sorokin (1969) identifies three systems of truth. The sensate, perhaps more accurately described as empiricism, relies upon reason to assess sensory impressions of reality. The ideational system seeks truth in the realm of the supra-sensory, convinced there is a level of knowing that lies beyond the ken of the senses where intuition and revelation are the best guides. The third, or idealistic, system of truth is a synthesis of the empirical and intuitive. Like the tao, it reflects a union of polar complements; it is a system in which knowledge of reality emerges from the embrace of yin and yang. An appropriate mythical exemplar of the idealistic system would be Chiron, master of many arts *and* sciences,

who as a Centaur (part man and part horse) symbolized the union of reason and natural impulse.

Like Sorokin's sensate approach, the Apollonian way of seeing and being in the world clearly relies upon sensory investigations of the material world. It is an approach that relies upon specialization, fragmenting reality into carefully bordered fields which can then be explored and understood by the careful application of logical reasoning. In an Apollonian worldview, there is an objective reality that exists independently of ourselves and which we come to know through the use of our senses and reason.

The Dionysian worldview is an ideational system of truth. It is much more comfortable with the idea that reality is subjective, a sort of mental map that emerges in phenomenological fashion from an interaction between our senses, the external physical world and the supersensory world. Boundaries are artificial and anathema. Where an Apollonian seeks order and meaning through division, a Dionysian finds meaning in holistic integration. They seek to understand the forest by studying the forest, not individual trees. The Dionysian worldview revels in the intuitive. Indeed, it maintains that intuition is the cornerstone of knowledge.

Of course, this psychic tug-of-war between the forces of reason and intuition is nothing new. Sorokin (1957, 1969) has painstakingly shown how these systems of truth are reflected across history in the arts and other elements of culture. And Nietzsche ([1872] 2000) offers a dramatic and Teutonic representation of this fundamental duality in *The Birth of Tragedy*. Benedict (1934) drew upon Nietzsche for *Patterns of Culture*.

What is different about our contemporary confrontation with the Apollonian-Dionysian struggle is that the forces and cultural adaptations that have shaped our

modern world have eroded the institutions that once anchored us to the more ordered Apollonian path. With the triumph of the industrial age, church and rural village life gave way to a more secular existence in the metropolis. Then, with an insatiable appetite for change, the forces of modernity in turn consumed the heavy capitalist world they had made, replacing it with a lighter capitalism, a liquid modernity in which boundaries evaporate (Bauman 2000). In essence, factory and foundry gave way to software as the motive force of society, and the new *modus operandi* ushered in a new *modus vivendi*. Repeated and ever more rapid differentiation created a plethora of boundaries until the very notion of boundaries began to dissolve. Even the very technologies that serve as an extension of our senses and bring us a global network of information seem to erode our old structured view of the world (McLuhan 1964).

In this milieu, people drift toward a more Dionysian way of being in the world. Perhaps this is what the sociologist Paul H. Ray (2000) tapped into with his discovery of an American subculture some 50 million strong that he calls Cultural Creatives. As the name implies, these people fuse together various cultural elements creating a unique subculture that values authenticity, self-actualization and personal growth, spirituality, simplicity, an appreciation for the exotic, and deep ecological concerns (Ray and Anderson 2000).

In many ways, including their willingness to cross boundaries, their love of nature, their attachment to personal growth and spirituality, Cultural Creatives seem to personify a Dionysian worldview. And they surface in a very interesting place – a seminal study on the reasons people use alternative medicine (Astin 1998). In a survey of a thousand people (n=1,035), Astin (1998) found little evidence that users of alternative

therapies were less satisfied than non-users with traditional bio-medicine. However, he found that people who mixed alternative care with traditional bio-medicine were more highly educated, held a holistic philosophical orientation to health (i.e., they believed in the importance of body, mind and spirit as component of good health), were more likely to have had a transformational experience that altered their worldview and tended “to be classified in a value subculture as cultural creatives”.

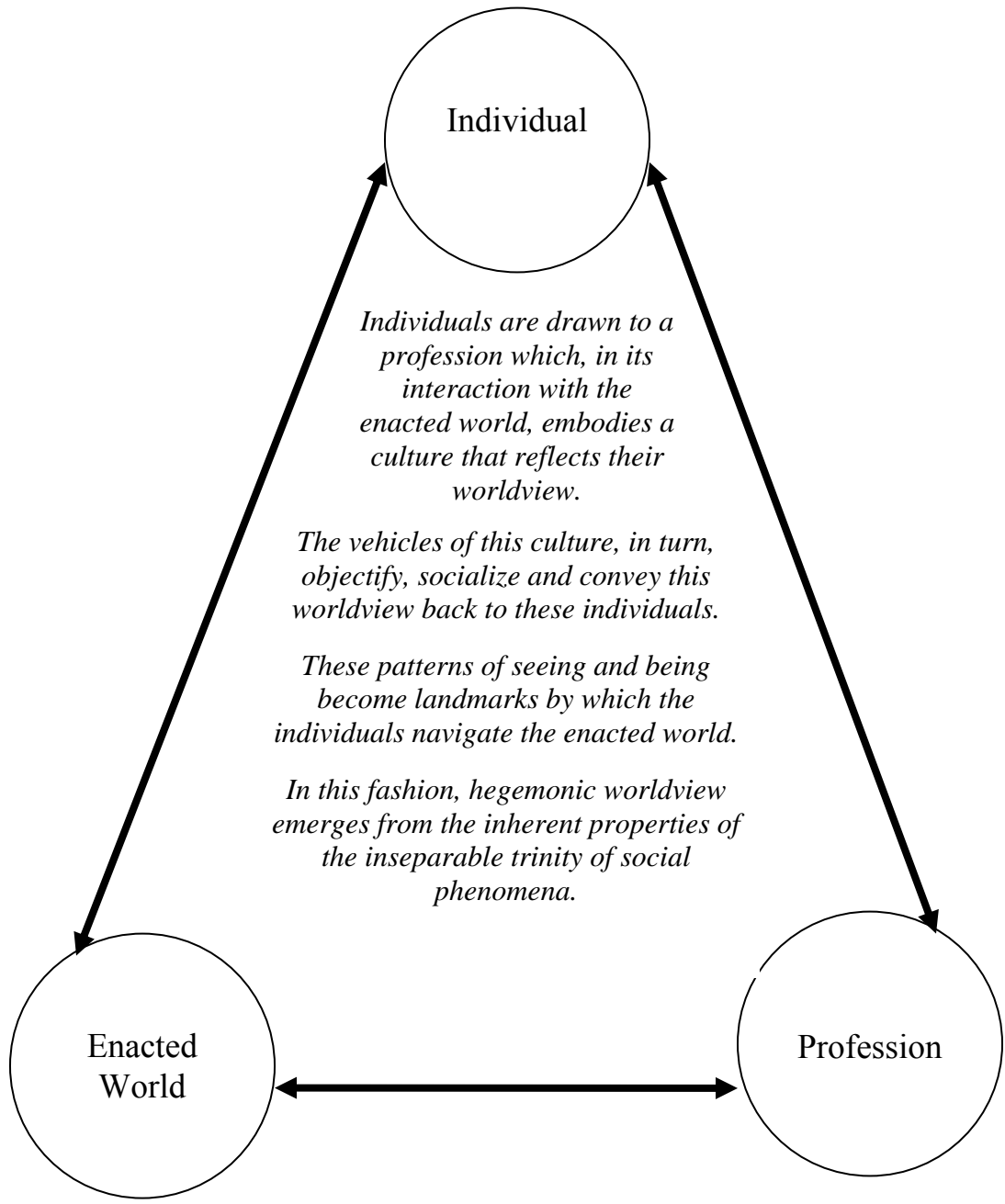
This is a particularly intriguing finding given the almost silent transformation of American healthcare over the last two decades as Americans increasingly embraced complementary and alternative medicine (CAM). If, indeed, this phenomenon is an expression of a deeper cultural shift among segments of the public, it raises an interesting question about cultural worldview among healthcare practitioners. Could it be that the gulf between allopathic and CAM practitioners – a turbulent sea often roiled by struggles over money and prestige – is also a reflection of competing worldviews? Could it be that health care has become a battleground between Apollonian (sensate/biomedical) and Dionysian (ideational/CAM) ways of seeing the world?

Certainly, the idea that social phenomena rest upon an inseparable trinity offers instructive insight with which to construct a mechanism of how a worldview can come to dominate a profession. *Personalities* with a worldview are drawn into a *society* (profession) engaged in an enacted world that is based upon a common *culture* (including an Apollonian or Dionysian worldview as well as a totality of vehicles to objectify, socialize and convey that worldview). As the dialectical “circle” turns each element of the trinity reinforces the others.

Sorokin argued interaction was *solidary* “when the aspirations (meanings-values) and overt actions of the interacting parties concur and are mutually helpful for the realization of their objectives” (1969: 93). Given the intense interactions associated with physician professionalization, it is easy to see how they would have a strong solidary effect and reinforce the dominant worldview. This process which leads to the emergence of a hegemonic worldview within a profession is presented schematically in Figure 1 (next page).

To some this argument might seem tautological, a way of saying, for example, that complementary and alternative medicine is dominated by Dionysian worldview because a majority of its practitioners happen to hold a Dionysian worldview. This objection, however, seems to fail on two fronts. First, it does not acknowledge the dynamic nature of the underlying process. The dominant worldview of a socio-cultural system exists precisely because of the interaction of each element of the triad. Indeed, it is phenomenologically emergent from that interaction in the same way that a baseball game emerges from actions of the players on a baseball diamond. Interrupt the dynamic, mutually reinforcing connection between each element of the trinity and the phenomenon does not exist anymore than a baseball game exists if the players take the field and remain immobile.

Figure 1. Dynamic Which Gives Rise to Hegemonic Worldview Within a Profession



Secondly, the tautological objection also seems to rest in part upon an unspoken premise that logic must proceed in linear fashion. While this unspoken premise holds a very distinguished position in Western thought, it is never-the-less something of a cultural construct. Other traditions – the native-American, for example – celebrate circularity. The important point, it seems, is not whether the argument moves in circular fashion, but whether it leads back around to a meaningful conclusion.

In order to understand this dynamic of emergence more fully, it is necessary to focus on the individual, for it is this component of the triad that serves as both performer and choreographer of this dance. It is my contention that every individual comes to the profession with a worldview, but also with something even more elemental – *eros*, or the biologic drive to thrive. This drive to fully experience its own existence is inherent in every healthy living organism. Indeed, it is an inescapable byproduct of the normal functioning of an organism's constituent parts, as much a part of life as alimentation and elimination.

Eros is filtered through personality and the cultural, perceptual and cognitive screens of worldview and gives rise to *impulse*, which is an intention to manipulate one's surroundings in order to maximize one's existence. Eros filtered through a Dionysian worldview gives rise to a *creative impulse* in which creativity becomes the preferred means to achieve desired ends. Eros filtered through an Apollonian worldview gives rise to a *controlling impulse* in which control becomes the preferred tool for maximizing one's existence.

Impulse is expressed through an *action* which is selected from the choices (influenced by values and norms of the worldview) that are made available through life

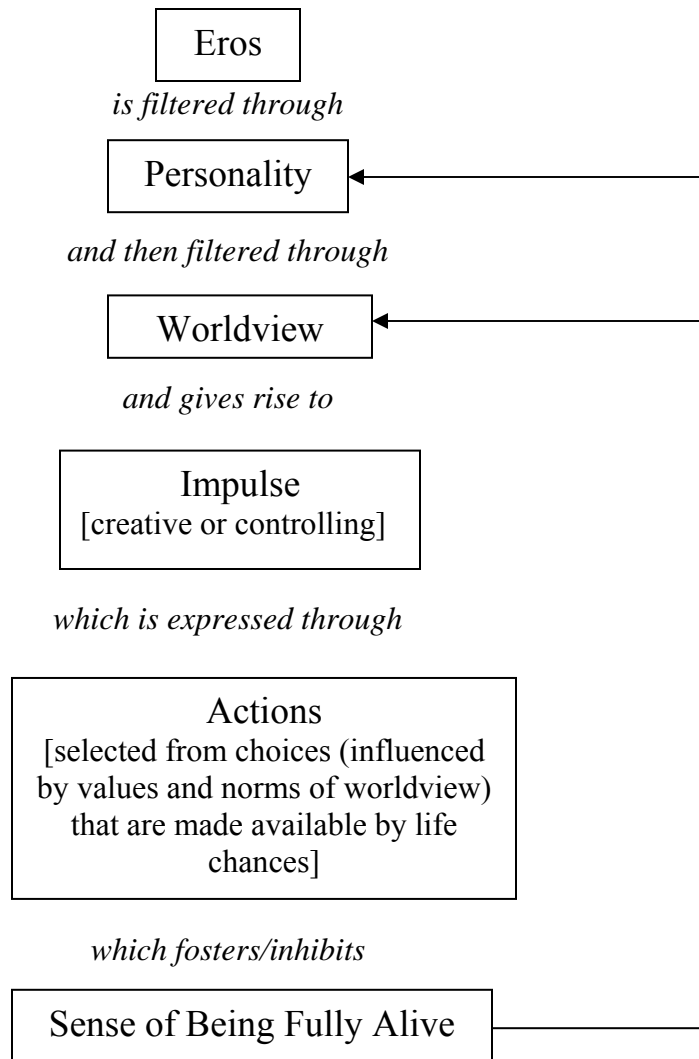
chances. The more opportunities afforded an individual, i.e. the greater the realm of perceived choices, the broader the field of action through which to express impulse. Actions, in turn, either foster or inhibit a *sense of being fully alive*. This process is presented schematically in Figure 2 (next page).

It is precisely this sense of being fully alive that serves as a barometer of our desire to fully experience our existence. Actions that foster this sense reinforce our feeling that we have found an appropriate way of being in the world, our worldview. However, when our actions repeatedly inhibit or erode our sense of being fully alive, we begin to doubt the validity of our worldview.

When our way of seeing and being in the world blocks our biologic drive to thrive, we begin to alter our worldview. This may occur incrementally over time as a series of successive adjustments or in a single, sweeping conversion experience. Worldview is enduring, but not immutable. Individuals are shaped by structure, but they also are agents capable of altering their social structures when the walls around them become too confining.

Thus, within the individual triadic component of social phenomena, eros drives a process in which an individual's worldview can change. When worldview shifts, so does the nature of an individual's interactions with others within the profession. If this happens on a broad enough scale, that is if enough people change their worldview, the resulting changes in interactions lead to a change in the profession (society). This leads to a shift in the dominant worldview, i.e. the totality of meanings, values and norms possessed by the interacting persons.

Figure 2. Eros Dynamic Within Individual Component of Social Triad



Of course, when considering the influence of worldview on CAM and biomedicine, it is important to remember that people select careers and professions based on a host of reasons beyond perceived compatibility of worldview, including expectations of prestige and income. It is quite possible someone would cast themselves into a profession only to find it is dominated by a worldview different than their own. In this situation, interactions are likely to range from totally antagonistic to a mediocre mix that is partially solidary and partially antagonistic. This situation suggests three possible responses. First, if the interactions become too antagonistic, an individual may leave the chosen triad in search of another. Second, moved by cognitive dissonance, an individual may begin to alter his or her initial worldview. Finally, an individual may retain their original worldview and become a catalyst for change within the chosen profession, bringing fresh insights into their interactions with others.

In reality, therefore, to say that an Apollonian worldview dominates biomedicine or that a Dionysian worldview dominates alternative medicine is to say that these ways of seeing the world are hegemonic in one medical system or the other. It is not to imply that every biomedical practitioner sees the world in rigid, bordered Apollonian terms anymore than every CAM practitioner is an intuitive celebrant of the natural order. Instead, each approach to medicine is seen as a society existing within an inseparable trinity in which one worldview is preponderant, not universal and absolute.

Both alternative and allopathic medical systems arise from interactions of the personalities within them; neither spring fully grown like Athena from the head of Zeus. Medicine, like every aspect of our enacted world, develops in stages. It is influenced by social and historical context, objective disease patterns and local understandings of

disease etiology (Salmon 1984). Certainly, differing views of health and illness have always shaped differing schools of medicine. One can trace the materialist, positivist nature of allopathic medicine back to the Cartesian divide when body and mind were rent asunder. Much of what we now call alternative medicine is based on a holistic vision that rejects the dualism of Descartes (Goldstein 1999).

Indeed, the ultimate irony may be that CAM – suffused with a probabilistic ethos, a greater acceptance of uncertainty, and a concern for energy fields – lies closer to the quantum reality envisioned by contemporary physicists than allopathic medicine with its death grip on Newtonian reality. It is, after all, the complementary practitioners who have sought new evidence-based ways of scientific understanding, while allopathic medicine has largely clung to what Steven Goodman (1999) has called the p-value fallacy.

Perhaps no one has done a better job than Michel Foucault of bringing to light the complex dance between science and the social from which emerged medicine as we know it. In *Birth of the Clinic* he comments on the tension between holism and dualism:

Hence his paradoxical position. If one wishes to know the illness from which he is suffering, one must subtract the individual, with his particular qualities The patient is a geometrically impossible spatial synthesis, but for that very reason unique, central and irreplaceable . . . (1975: 14 - 15)

Foucault also made explicit the positivist intellectual currents that run below the surface of modern, allopathic medicine. In the conclusion to *Birth of a Clinic*, he notes:

It is understandable, then, that medicine should have had such importance in the constitution of the sciences of man – an importance that is not only methodological, but ontological, in that it concerns man's being as object of positivist knowledge (1975: 197).

Given that medicine is a fusion between science and social – and given the dynamically reinforcing potential created by the inseparable trinity – it is not surprising

the various domains of medical practice could become reservoirs of people who share similar worldviews. Allopathic medicine – steeped in a Newtonian scientific ethos, benefactor of an expansive bio-medical infrastructure, whose hospitals are temples of technology – is a worthy home for those who see the world through a positivistic Apollonian lens. Alternative therapies – with their embrace of the holistic and rejection of Cartesian dualism, a focus on the life force, and openness to the realm of the spiritual – are a perfect setting for those with a more Dionysian orientation.

Based on this theoretical perspective, this study proposes the following hypotheses:

H₁ Naturopathic physicians are more likely than allopathic physicians to agree with values and beliefs that reflect a Dionysian worldview.

H₂ Allopathic physicians are more likely than naturopathic physicians to agree with values and beliefs that reflect an Apollonian worldview.

H₃ Among allopathic physicians, scores on a measure of attitudes toward CAM will correlate with their degree of agreement with values and beliefs that reflect a Dionysian worldview. That is, the more strongly allopathic physicians agree with values and beliefs that reflect this worldview, the more favorably disposed they will be toward CAM.

H₄ Among allopathic physicians, there also will be a direct and positive relationship between agreement with values and beliefs that reflect a Dionysian worldview and personal use of alternative therapies. That is the more they agree with values and beliefs that reflect this worldview, the more likely they are to personally use CAM.

CHAPTER 4 RESEARCH DESIGN AND METHODS

This exploratory study uses a sequential design that combines quantitative and qualitative methodology. Using survey research it identifies basic tenets of competing worldviews among allopathic and naturopathic physicians. It measures agreement among the two groups with these tenets and explores the influence of these tenets of worldview upon support for various realms of complementary and alternative medicine, as well as upon CAM use by allopathic physicians. The results of this quantitative analysis are then used to inform a series of in-depth interviews in which biomedical and alternative providers serve as an expert panel to review the findings of the study.

The Study Population

One of the great challenges for those interested in studying complementary and alternative practitioners is to define precisely whom they wish to study. If one defines an alternative practitioner as anyone who provides a therapeutic modality other than allopathic care, then the field is very wide, indeed, and runs the gamut from voodoo priests to the customer at Rite-Aid who self-medicates with herbal concoctions. The problem with such a broadly defined group is that practical considerations of creating – and contacting – an appropriate sample doom such an effort to failure. Fortunately, the composition of CAM practitioners is arrayed in such a way that it is possible to avoid

complications created by an overly broad definition by focusing on a specific category of alternative providers – naturopathic physicians.

For the purposes of this study, naturopathy serves as a good composite of CAM approaches to healing. In a single therapeutic approach, it incorporates many of the most common themes in alternative healing – the belief in the natural tendency of the body to heal itself, an emphasis on holistic approaches to health care, an almost radical concern for the importance of diet, a fundamental concern with the life force, strong elements of homeopathy and botanical medicine, as well hydrotherapy, physical medicine, iridology, and acupuncture (See Appendix I for additional information about naturopathy).

There are, of course, two other widely known categories of CAM practitioners that might be used for a study such as this – osteopaths and chiropractors. Collectively, these groups represent an appreciable segment of American medicine with both groups being licensed in all 50 states. The American Osteopathic Association (2009) estimates almost 57,000 osteopaths actively practice in the United States. Approximately 53,000 chiropractors practice in the United States (U.S. Bureau of Labor Statistics 2008). And osteopathic and chiropractic care are reimbursed by major insurance companies as well as Medicare.

Wardwell (1988) has compared the origins of both groups to dissident sects rebelling against established allopathic medicine in similar fashion to the way religious sects dissent from orthodox faith. Given these rebellious origins – and the fact that both osteopathy and chiropractic are now strong, vibrant and highly organized – they might seem logical CAM choices for this study. However, both groups present significant weaknesses that limit their desirability for inclusion. Osteopaths, despite their *alternative*

origins, have moved increasingly into the orbit of allopathic medical practice (Gevitz 1988). Osteopaths are active in the American Medical Association. Osteopathic graduates are also accepted into allopathic residency programs (and *vice versa*). Chiropractors, on the other hand, present methodological challenges because their scope of practice significantly differs from that of physicians, even from orthopedists whose work often focuses on joint and spinal problems. For these reasons neither of these groups are as ideally suited to this study as naturopathic physicians.

Which brings us to the other segment of the study population – conventional, allopathic physicians. Since the scope of practice for licensed naturopathic physicians is limited to primary care, the study population is focused on allopathic physicians (family physicians, general practitioners, and general internists) who are also engaged in the practice of primary care. At the time this study was conducted, thirteen states licensed naturopathic physicians to practice primary care. These states were Alaska, Arizona, California, Connecticut, Hawaii, Kansas, Maine, Montana, New Hampshire, Oregon, Utah, Vermont and Washington. Therefore, the study population consists of the approximately 2,300 naturopathic physicians licensed to practice primary care medicine in these states along with the more than 40,000 conventional – or allopathic – physicians practicing primary care in the study area.

Sample

The sample used for this study consists of 951 physicians licensed to practice medicine in the states mentioned above. Of these doctors, 399 are naturopathic and 550 are allopathic physicians. (Practice type was indeterminate for two respondents.) Almost

52 percent of the overall sample is male; 45 percent is female. (About three percent of the overall sample did not identify their gender.) The average age is 47.45 years. Almost half of the respondents annually earn \$101,000 or more from the practice of medicine.

As can be seen in Table 2 (next page), however, there are some interesting demographic differences between the two groups. Almost 62 percent of the naturopathic respondents are female compared to 32.5 percent of the allopathic physicians. The naturopathic physicians are younger with a mean age of 43.94 years compared to the allopathic physicians whose mean age is 50.06 years. The naturopaths also average fewer years in medical practice (10.39 years) compared to allopaths with an average 19.68 years in medical practice. There are also appreciable differences in income between the two types of physicians, a reflection perhaps of the lack of third-party reimbursement for naturopathic care in many states. More than half of the naturopathic physicians (56.4 percent) reported an annual income from medical practice of less than \$71,000 per year. Only 11.1 percent of the allopathic physician reported similar earnings. At the opposite end of the scale, 16.4 percent of the allopaths reported annual earnings of more than \$191,000 per year from the practice of medicine while only 5.6 percent of the naturopathic respondents reported similar incomes.

Table 2

Characteristics of the Study Sample (n = 951)

| | Allopaths (n = 550) | Naturopaths (n = 399) |
|---------------------------------------|---------------------|-----------------------|
| Age | | |
| Mean Age in Years \pm SD | 50.06 \pm 14.126 | 43.94 \pm 11.709 |
| Sex % | | |
| Male | 62.2 | 36.8 |
| Female | 32.7 | 61.9 |
| Missing/Unknown | 5.1 | 1.3 |
| Race % | | |
| African-American | 2.7 | 2.3 |
| Asian | 10.0 | 3.3 |
| Hispanic/Latino | 2.2 | 2.0 |
| Other | 3.8 | 5.5 |
| White | 68.9 | 80.5 |
| Missing/Unknown | 12.4 | 6.5 |
| Father's Education % | | |
| Post Graduate | 40.2 | 31.1 |
| College Degree | 21.1 | 25.1 |
| Some College | 11.8 | 12.3 |
| High School | 16.0 | 21.1 |
| < High School Degree | 10.0 | 9.6 |
| Missing/Unknown | .9 | 1.0 |
| Mother's Education % | | |
| Post Graduate | 17.3 | 17.0 |
| College Degree | 27.1 | 27.3 |
| Some College | 22.4 | 21.1 |
| High School | 24.9 | 26.8 |
| < High School Degree | 8.1 | 6.8 |
| Missing/Unknown | .4 | 1.0 |
| Years in Practice | | |
| Mean Years in Practice \pm SD | 19.68 \pm 11.968 | 10.39 \pm 9.237 |
| Income from Medical Practice % | | |
| < \$71 K per year | 11.1 | 56.4 |
| \$71 – 100 K per year | 11.1 | 20.6 |
| \$101 – 130 K per year | 19.8 | 9.0 |
| \$131 – 160 K per year | 19.8 | 3.3 |
| \$161 – 190 K per year | 14.9 | 1.8 |
| > \$191 K per year | 16.4 | 5.6 |
| Missing/Unknown | 6.7 | 3.5 |

*Practice type – allopath or naturopath – was indeterminate for two respondents.
Percentages may not sum to 100 due to rounding.*

The majority of respondents in both physician groups are white, 68.9 percent of the allopathic and 80.5 percent of the naturopathic physicians. One of the most interesting demographic characteristics of both physician groups is parental education. Forty percent of the allopathic respondents noted that their father had a post-graduate education; 31 percent of the naturopathic respondents indicated their father had a post-graduate education. Twenty-one percent of allopaths and 25.1 percent of the naturopaths said their father had an undergraduate college degree. Even more intriguing is the educational attainment of the mothers of the respondents. Approximately 17 percent of both allopathic and naturopathic respondents noted their mother had completed a post-graduate degree, and approximately 27 percent of respondents in each group reported their mother had an undergraduate college degree.

Identifying allopathic physicians for the study was a straightforward exercise. Direct Medical Data of Des Plaines, Illinois, a licensed list broker for the American Medical Association (AMA), provided a randomly drawn mailing list of 5,000 physicians licensed to practice medicine in the study area. This list was drawn from both AMA members and non-members to avoid any potential selection bias that might arise from participation in this medical organization. Doctors of Osteopathy (DOs) were excluded from the list to ensure a comparison between conventional allopathic physicians and naturopathic physicians.

Licensed naturopathic physicians were identified through state licensure authorities in these states and other publicly accessible sources. Licensure was critical to ensure these respondents had completed four years of postgraduate education at an accredited naturopathic medical college, a program of study that mirrors allopathic

education but also includes training in subjects like homeopathy, botanical medicine, etc. The goal, of course, was to develop lists of practitioners who were as close as possible in terms of formal medical training and scope of practice.

Physician lists from each group were examined using a United States Postal Service approved software to identify inaccurate or incomplete addresses. This procedure eliminated 40 entries from the identified allopathic list for a total of 4,960 correct addresses; it eliminated 107 entries from the naturopathic list for a total of 2,120 correct addresses.

Using random numbers as the selection basis, a mailing list of 1,000 allopathic physicians and 1,000 naturopathic physicians was drawn from each respective address-corrected list. These physicians were then surveyed following Dillman's (2000) tailored design method. Each potential respondent was contacted four times. The first contact consisted of a card informing the physician they had been selected as a participant in the study and urging them to watch their mail for additional information. The second contact contained a letter that explained the nature of the study, a copy of the Physician Worldview Survey (i.e., the survey questionnaire), and a postage-paid return envelope. The third contact was a personalized reminder card requesting the physician to return the survey if they had not done so – and expressing appreciation for their support if they had. The fourth contact included another letter asking them to participate in the survey, another copy of the questionnaire and another postage-paid return envelope.

Of the 1,000 naturopathic physicians contacted, 399 completed and returned surveys. Despite efforts to secure as clean a mailing list as possible, 88 surveys were

returned by the postal service as undeliverable. This resulted in a response rate of 43.75 percent among naturopathic physicians.

One hundred and twelve allopathic physicians completed and returned questionnaires in this wave of surveying. After accounting for 22 surveys returned due to incorrect addresses, this resulted in a response rate of 12.16 percent. To increase the number of surveys completed by allopathic physicians, a second wave of surveys was administered to the 3,960 physicians on the allopathic mailing list who were not surveyed in the first wave. This second wave of surveying used exactly the same Dillman (2000) tailored method employed in the first wave and resulted in 436 completed surveys. Thirty-nine packets were returned from this wave as undeliverable by the postal service. Combined, the two waves of sampling generated 550 completed surveys for a total response rate of 11.23 percent among allopathic physicians.

Of course, response rates of 11.23 percent can raise red flags for researchers, signaling the possibility – although not the inevitability – of nonresponse bias. Indeed, it is not the response rate *per se*, but fear of what that rate may represent, i.e. nonresponse bias, that is at issue (Groves 2006). Recent case studies, however, have shown little relationship between nonresponse rate and nonresponse bias (Curtin, Presser and Singer 2000; Keeter et al. 2000; Merkle and Edelman 2002). In an analysis of 30 nonresponse bias studies, Groves (2006) shows that nonresponse rate alone is not a good predictor of nonresponse bias. The devil, it seems is not in the numbers, but in the details. Bias is not a simple function of response rate, but “a multiplicative function of the nonresponse level and the nonrespondents’ distinctiveness” (Curtin, Presser and Singer 2000: 414). Or, as Keeter et al. (2000: 126) succinctly explain, “nonresponse error is a function of both the

nonresponse rate and the difference between respondents and nonrespondents on the statistic of interest.” Thus, high nonresponse rates may generate low nonresponse error if the difference between respondents and nonrespondents is small; conversely, low nonresponse rates can yield higher degrees of error if there is a dramatic difference between respondents and nonrespondents (Keeter et al. 2000; Biemer and Lyberg 2003).

To explore potential bias in this sample, demographic information (age and sex) for all allopathic respondents was compared to known demographic parameters for the population from which the sample was drawn. T-tests revealed no statistically significant difference between respondents and the population for either proportion female or mean age, indicating that at least along these two demographic characteristics the sample seemed to closely mirror the population. By far the bulk of allopathic respondents were secured during the second wave of surveying when questionnaires were mailed to 3,960 physicians. Consequently, t-tests were conducted to compare second-wave respondents to the actual population of allopathic physicians on these same demographic characteristics. No statistically significant differences were found between these respondents and the allopathic physician population. Results of these tests are reported in Table 3 (next page).

Of course, assuring the sample mirrors the population on known demographic characteristics, while important, is only one dimension of concern when considering potential nonresponse bias in a sample. Of equal concern is possible variance between respondents and nonrespondents on key variables in the study. In an exploratory study like this one, however, there are often no known parameters against which sample values can be judged. Therefore, to compensate, values for a critical variable in this study were compared between early second-wave responders and their late counterparts (as a proxy

Table 3

Comparison of Means Between Sample and Population for Selected Demographic Characteristics

| | <u>Mean</u> | (Allopath Population, <i>n</i> = 41,812) <u>Target Value</u> | <i>t</i> | <u>Sig. (2-tailed)</u> | <u>Mean Difference</u> | 95% Confidence Interval of the Difference | |
|--|-------------|--|----------|------------------------|----------------------------|--|--------------|
| | | | | | | <u>Lower</u> | <u>Upper</u> |
| Allopath Sample (<i>n</i> = 541) | | | | | | | |
| Age in Years | 50.06 | 49.55 | .841 | .399 | .513 | -.68 | 1.71 |
| Proportion Female | .3500 | .3353 | .815 | .415 | .018 | -.03 | .06 |
| 2nd Wave of Allopath Sample (<i>n</i> = 421) | | | | | | | |
| Age in Years | 50.31 | 49.55 | 1.159 | .247 | .756 | -.53 | 2.04 |
| Proportion Female | .3600 | .3353 | .914 | .362 | .022 | -.02 | .07 |

for nonrespondents). This technique draws upon continuum of resistance theory which proposes that potential survey respondents fall along a continuum stretching from those ready and eager to respond to those who simply refuse to participate. Respondents whose participation is achieved only after repeated requests are seen as more likely to resemble nonrespondents. The variable in question, the Worldview Index, a measure of Apollonian/Dionysian aspects of worldview, is described in greater detail in the following section. Again, t-tests were used to test for differences in means between the two groups. Results indicated no statistically significant differences between early and late responders. Results are presented in Table 4.

Table 4

T-test of Difference of Means Between Early and Late Responders for Key Variable

| Key Variable | Early Responders | Late Responders | Significance (two-tailed) |
|-----------------|------------------|-----------------|------------------------------|
| Worldview Index | (n = 281) | (n = 122) | |
| Mean | -1.127 | -1.009 | .630 |
| Std. Dev. | 2.027 | 1.837 | |

Collectively, these tests offer a certain degree of reassurance about potential nonresponse bias in this sample of allopathic physicians despite the nonresponse rate. These results are perhaps a reflection of what Cull et al. (2005: 221) in their meta-analysis of response rates and response bias for 50 surveys of pediatricians call a “pattern in the research literature showing response bias to be more of a problem for surveys of the general population than for surveys of fairly homogenous groups such as physicians.”

Survey Instrument

There are no ready-made scales to measure Apollonian/Dionysian aspects of cultural worldview. The Oraganicism-Mechanicism Paradigm Inventory (Germer et al. 1982) comes close, but falls short on one key theoretical point. It assumes that a more mechanistic view of the universe (closely akin to the Apollonian worldview) and a more organic, holistic view (similar to the Dionysian) are mutually exclusive paradigms. Based on this theoretical assumption, it uses 26 pairs of forced choice items to determine respondent worldview. However, as noted in the theoretical perspective section of this paper, while Apollonian and Dionysian worldviews are fundamentally different ways of seeing the world, they are not mutually exclusive. Although one worldview or the other is dominant in most individuals, elements of the other are always present.

Therefore, this study relies on a questionnaire designed expressly for this project. Questionnaire items explore the cultural worldview of allopathic and naturopathic physicians to see if the hypothesized differences are truly manifest along several dimensions – from the nature of reality to the nature of health and illness. Survey items use Likert-scale response categories ranging from strongly disagree to strongly agree. (With the exception of reverse coded statements, these items are scored from one for strongly disagree to seven for strongly agree. In the following discussion, reverse coded items are indicated by the letter “r”.) The questionnaire also measures personal beliefs about efficacy of various types of conventional and alternative medical treatments. And it collects demographic information about the respondents.

Nature of Health and Illness

If, indeed, there are differences in cultural worldview between alternative and conventional practitioners, they should be clearly obvious in beliefs about the nature of health, illness and treatment. As a basic starting point, therefore, the questionnaire contains three items which attempt to measure fundamental beliefs about what constitutes good health, i.e. whether it is simply an absence of disease (item 1), an optimum state of being (item 2), or a goal to be pursued (item 3).

1. *Good health is simply an absence of disease. (R)*
2. *Good health is more than just an absence of disease; it is an optimum state of being.*
3. *Good health doesn't just happen; it is a goal that must be pursued.*

Item four measures the degree to which respondents agree that mind and body are one, thus rejecting an Apollonian tendency to draw a clear boundary between mind and body.

4. *The mind and the body are one.*

Statements five and six probe beliefs about the concept of disease. They attempt to measure support for the belief that disease stems from organic causes (Item 5) or that causes of disease are rooted in more ambiguous psycho-social causes (Item 6).

5. *The primary – or underlying – cause of most disease is organic. (R)*
6. *The primary – or underlying – cause of most disease is psycho-social.*

In an ordered Apollonian worldview, diagnosis and treatment are an exercise in order, control and certitude. However, diagnosis and treatment look much different – more personal and ambiguous – when observed from a Dionysian worldview. One would expect conventional practitioners to express greater agreement with an Apollonian belief

that there are universal cures for universal diseases (item 7). CAM practitioners, on the other hand, are more likely to agree that diagnosis and treatment are patient specific (item 8).

7. When it comes to diagnosis and treatment, there are universal cures for universal diseases. (R)

8. There are not universal cures for universal diseases because diagnosis and treatment is patient specific and varies from case to case.

One would also expect naturopathic physicians to express stronger agreement with the central premise of homeopathy that like cures like (item 9), a belief more indicative of a Dionysian worldview.

9. Like cures like.

Item 10 measures agreement with the belief that treatments not based upon modern science are useless. Allopathic physicians should express stronger agreement with this essentially Apollonian belief with its appeal to certitude.

10. Treatments that are not based on modern scientific studies are useless. (R)

The concept of the life force is an important theme in complementary and alternative medicine and is addressed in statements 11 – 13. One would expect CAM practitioners to express stronger agreement with beliefs emphasizing importance of the life force (items 11 and 12), while allopathic practitioners might be troubled by something that falls beyond the realm of white-coat laboratory science (item 13).

11. An appreciation and understanding of the life force should be the foundation of medical practice.

12. The healing properties of energetic fields are more pseudoscience than medicine. (R)

13. There is an energetic field around the human body, by way of which it is possible to heal a person.

Statements 14 – 16 focus on biomedicine. One would expect conventional practitioners with their Apollonian worldview to express stronger agreement for the belief that biomedicine is a complete approach to medical care, since biomedicine is the epitome of a rational search for certitude (statement 14).

14. Modern biomedicine offers a complete approach to medical care because it is the pinnacle of centuries of scientific advancement. (R)

One would expect those with a Dionysian worldview – given its tendency to blur boundaries – to express greater agreement with the need to fuse biomedicine with other traditions (statements 15 and 16).

15. Modern biomedicine could benefit from an infusion of the wisdom of other traditions like oriental medicine and ayurveda.

16. Modern biomedicine could benefit by incorporating more information from the social and behavioral sciences.

Finally, within the nature of health and illness there is one other area in which differences in worldview should be apparent, and that is beliefs about the source of healing. From a Dionysian perspective, healing is spiritual process (statement 17) that can be affected by rites and rituals (statement 19). From a rational, Aristotelian perspective, healing is a purely physical process (statement 18) unaffected by rites and rituals (statement 20).

17. The true source of healing is spiritual.

18. The true source of healing is physical. (R)

19. Rites and rituals can affect the outcome of an illness.

20. Rites and rituals may offer psychological comfort, but don't really affect the outcome of an illness. (R)

Philosophical and metaphysical issues

It seems reasonable that Apollonian and Dionysian influences would clearly manifest themselves across philosophical and metaphysical questions that address the very nature of reality.

Astin (1998) found patients who use complementary and alternative medicine (CAM) have an interest in spirituality and personal growth psychology. Thus, two items (21 – 22) are intended to measure a respondent's sense of the transcendent within their daily life.

21. I often feel the presence of the divine in my own life.

22. In my own life, I feel a deep sense of inner peace or harmony.

Statement 23 asks respondents if their religious beliefs are a blend of the teachings of other faiths, an indication the respondent feels a Dionysian comfort in crossing boundaries.

23. My own religious beliefs are a blend of the teachings of more than one denomination or faith.

Leiser (2003) notes a possible connection between beliefs in the paranormal, esoteric religion and CAM use among patients, although Furnham (2000) did not find a link between belief in CAM and several occult practices (astrology, graphology, palmistry, etc.). Such attempts to connect the dots linking paranormal beliefs and CAM may miss a deeper connection. Belief in the paranormal may actually be a marker for a larger sense that reality is rather open and fluid. In other words, the person who believes there is more to reality than what we can experience directly through our senses – or understand through our reason – may be more open to the possibility that paranormal phenomena are real. For this questionnaire, openness to the paranormal is regarded as

something of a barometer of where the respondent falls in regards to Apollonian certitude or Dionysian ambiguity. Items 24 – 28 probe beliefs about a series of psychic and paranormal phenomena. Item 29 is a chance for those with a taste for certitude to express their feelings that belief in the paranormal is simply superstition.

24. Some people have an amazing capacity for powers such as mental telepathy, the ability to see the future, etc.

25. Reincarnation is possible, that is we may have lived before and may live again.

26. It is possible that intelligent beings from another planet have visited earth.

27. Events which seem like coincidences are often really the way fate works to shape our lives.

28. Horoscopes and the zodiac offer real insight into the forces that shape our life.

29. Belief in things like mental telepathy or the ability to see the future is superstitious and misguided. (R)

Building upon this paranormal theme, statement 30 addresses belief about time – whether one sees it in linear, ordered terms or holds a more flexible view in which the boundaries of past, present and future are blurred.

30. Time is fluid and there may be more overlap between past, present and future than we commonly acknowledge.

Statement 31 seeks to measure agreement with an Apollonian sense of order in the universe, while question 32 seeks to measure agreement with a Dionysian acceptance of ambiguity and chaos.

31. The universe is ordered and runs with predictable regularity like a clock. (R)

32. The universe is a place of almost mystical chaos.

Item 33 measures another dimension of the nature of reality, the belief that objects do not have magical or spiritual powers. Those with a more fixed and ordered view of reality should express greater agreement with this statement.

33. Objects do not have magical or spiritual powers. (R)

Items 34 and 35 explore the realm of phenomenology – whether there is an objective reality independent of our senses, or whether what we call reality emerges from subjective sensory impressions. Those respondents with a more fluid, Dionysian view are expected to agree more strongly with statement 34; those more Apollonian in their take on the world will agree more strongly with statement 35.

34. Reality is just another name for our subjective, sensory perceptions of the world.

35. There is an objective reality which exists independently of our senses. (R)

Given the holistic themes that run through so much of complementary and alternative medicine, one would expect CAM practitioners to express stronger support for key precepts of holism than biomedical practitioners. Yet, holistic beliefs are harder to place on an Apollonian – Dionysian dichotomy. Is the belief in the inter-connectedness of things a Dionysian appreciation for lack of boundaries, or an Apollonian attempt to provide structure and order in complex systems? Item 36 is an attempt to gauge preference for a systems approach to understanding complex systems. Statement 37 attempts to measure agreement with the holistic concept that everything is interconnected.

36. When trying to understand something complex, it is more helpful to examine it in terms of its component systems and how they relate to one another than to break it down into smaller, stand-alone units.

37. Nothing stands alone; everything is interconnected.

The ordered, Apollonian worldview finds strong expression in the modern world with its emphasis on Weberian rationalism. By contrast, the more fluid, non-Aristotelian, Dionysian worldview finds its expression in post-modernism with its shifting boundaries and skepticism of meta-narratives. Thus, items 38 – 40 address a discomfort with meta-narratives that stems from the post-modernist feeling that reality is too complex to be summed up in any one theory, even a big idea like religion.

38. Reality is far too complex to be explained by any single theory or idea.

39. My religion is the one true faith. (R)

40. My religion has no greater claim to total truth than any other.

One of the challenges of post modernism is an amazing panorama of thought that falls into the domain. To understand one post modernist is to understand one post modernist. It does not necessarily imply an understanding of an entire philosophical movement. Yet, there are some fairly common themes – some shared sensibilities – among post modernists. These include a sense that tolerance is a virtue of great importance, creativity is prized over efficiency, emotion is a better life-guide than reason and true objectivity is an illusion. Items 41 – 45 address these sentiments.

41. Tolerance in day-to-day life is a more important value for society than truth.

42. Efficiency is more important to the success than creativity. (R)

43. Reason is a much better guide to the world than emotion. (R)

*44. The world would be a better place if more people followed their heart,
rather than their head.*

45. True objectivity is an illusion.

Ecological and scientific issues

Attitudes toward nature obviously offer a key division between Apollonian and Dionysian worldviews. In the former, nature is something to be controlled. In the latter, it is an almost mystic force which rules man as surely as it rules the other parts of the natural world; far from controlling nature, man must learn to live in harmony with it. One would expect, therefore, that ecological sensibilities might offer another key insight into Apollonian or Dionysian proclivities. Items 46 – 51 measure agreement with several key beliefs about nature. They go beyond a sort of “everyone loves green” environmentalism and approach a genuine love of the earth, a sense that nature is sacred.

46. The earth is sacred.

47. We will destroy the environment if we keep living the way we do.

48. Humans are part of nature, not its ruler.

49. The entire earth is a giant, living organism.

50. Nature is a greater source of threats than comfort. (R)

51. Nature is benevolent, if we only learn to live in harmony with it.

The Apollonian worldview sees reason as the basis of knowledge and science as a quest for certitude. The Dionysian worldview is less committed to reason and objectivity as the basis of knowledge and is more likely to see science inevitably leading into the sort of paradoxes that seem to push quantum physics toward mysticism. Given the differences between worldviews made manifest through epistemology and the nature of science, items 52 – 60 probe these elements.

Items 52 – 54 measure beliefs about the objectivity and independence of science.

52. *In today's world, science is used to pursue money and power more often than it is used to advance the human condition.*

53. *Science is less influenced by money and power than other fields of human activity. (R)*

54. *Science is a body of knowledge shaped and sanctioned by elites.*

Items 55 and 56 attempt to measure preference for quantum versus quantified versions of physics.

55. *Quantum physics provides a more philosophically satisfying explanation of the cosmos than classical, Newtonian physics.*

56. *I prefer the order and certainty of Newtonian physics to the uncertainty that lies at the heart of quantum physics. (R)*

Statements 57 – 60 probe beliefs about the source of knowledge, i.e. agreement with the rational scientific method (statement 57) versus agreement with less rationally based approaches to creating knowledge.

57. *The scientific method is the best path to knowledge. (R)*

58. *The scientific method is one of many equally valid paths.*

59. *Observation, traditional practices and intuition are as effective as a clinical trial for evaluating new information.*

60. *People who generate great ideas have a strong connection to a higher cosmic consciousness.*

Medical practice and life

Items 61 – 72 address several aspects of medical practice and personal preferences which are not specifically germane to this study, but provide data for future projects.

Demographics

Last, but not least, the questionnaire seeks demographic information about respondents. Items 78 – 85 ask for everything from the state in which the physician practices (item 78) to income from medical practice (item 85).

78. *In what state do you practice?* _____

79. *How many years have you been in practice?* _____

80. *If you practice as a specialist, what is your area of specialty?* _____

81. *What type of medical degree did you receive?
(if multiple degrees circle all that apply)*

DO MD ND Other (please specify) _____

82. *What is your:*

___ *Age* ___ *Sex* ___ *Race*

85. *What was your father's highest completed level of education?*

___ *Grade School* ___ *Middle School* ___ *High School*
___ *Some College* ___ *College* ___ *Post Graduate*

86. *What was your mother's highest completed level of education?*

___ *Grade School* ___ *Middle School* ___ *High School*
___ *Some College* ___ *College* ___ *Post Graduate*

87. *What is your annual income from practicing medicine?
(circle the correct income range)*

\$40,000 or less \$41,000 – 70,000 \$71,000 – 100,000 \$101,000 – 130,000

\$131,000 – 160,000 \$161,000 – 190,000 \$191,000 – 220,000

\$221,000 – 250,000 \$251,000 – 280,000 \$281,000 – 310,000

\$310,000 and above

Principal Components and Variables

Principal Components

A two step cluster analysis identified 26 statistically significant questionnaire items that cleanly separate respondents into two groups, one largely comprised of allopathic physicians and the other of naturopathic physicians. Principal components analysis, in turn, reduced these 26 items to five principal components which are used as independent variables in a series of subsequent regression analyses. These components are:

- *Spirituality* – loading heavily on items emphasizing the transcendent nature of human experience and the spiritual nature of healing.
- *Deep ecology* – loading heavily on items emphasizing environmental themes.
- *Nature of medicine* – loading heavily on items emphasizing the fundamental foundations of medicine
- *Critique of science* – loading heavily on items emphasizing the strengths or shortcomings of science
- *Diagnosis and treatment* – loading heavily on items emphasizing the nature of diagnosis and treatment of disease.

Independent Variables

The principal components also become the foundation for another variable in this study, the *Cultural Worldview Index*. This variable is created by summing factor scores of each of the five components. Lower scores on the Cultural Worldview Index indicate

- *Race*
- *Number of years in practice* – included because of the considerable difference in number of years in practice between allopaths and naturopaths

Dependent variables

The National Center for Complementary and Alternative Medicine (2008) identifies five major areas of complementary and alternative medicine – biologically-based practices, energy medicine, manipulative and body-based practices, mind body medicine, and whole medical systems. This study uses respondent efficacy scores for therapies encapsulated by each of these areas to create an average perceived efficacy score for each major CAM domain. These variables are:

- *Efficacy score for biologically-based practices* – Biologically-based practices emphasize the use of natural things like herbs and vitamins. This variable is computed by averaging scores for herbal therapies and high-dose megavitamins.
- *Efficacy score for energy medicine* – Energy medicine utilizes energy fields to heal patients. Energy healing is the only therapy in this category measured by the questionnaire, so this efficacy score directly reflects respondent rating.
- *Efficacy score for manipulative and body-based practices* – Manipulative and body-based practices involve the manipulation and/or movement of the body to treat illness and various musculo-skeletal maladies. This variable is created by averaging scores for acupuncture, chiropractic, hydrotherapy, massage, and osteopathy.

- *Efficacy score for mind-body medicine* – This CAM domain focuses on techniques that use the power of the mind to heal the body. This variable is created by averaging scores for biofeedback, guided imagery, spiritual healing/prayer, and yoga.
- *Efficacy score for whole medical systems* – Whole medical systems, by definition, “are built upon complete systems of theory and practice” (NCCAM 2008). This variable is created by averaging scores for ayurveda, homeopathy, naturopathy, and traditional oriental medicine.

Other dependent variables used in this study are:

- *Total CAM Efficacy* – This variable is computed by summing efficacy scores of each of the five CAM categories.
- *Type of Doctor* – A dichotomous categorical variable reflecting type of medical practice (allopathic or naturopathic).
- *CAM Use*– A measure of personal use of CAM therapies calculated by summing the number of alternative therapies a respondent indicates using (from survey items 75 – 77). Possible values range from zero to three. Twenty-two percent of respondents (213) report they have never personally used a CAM therapy. Ten percent (97) reported using one CAM therapy. Twelve percent (116) reported using two therapies; 55.2 percent (525) reported using at least three CAM therapies.

Quantitative Analysis

The data analysis began with a search for data anomalies. Given the exploratory nature of the study – and the potentially controversial aspects of some questionnaire items – responses to all items were carefully examined. Eleven attitudinal items had “no opinion/don’t know” response rates of at least 18 percent and were not used in subsequent analyses. These items and their “no opinion / don’t know” response rates are listed in Table 5 (next page).

Exploring Differences in Worldview

At its core, this study is an effort to explore whether naturopathic and allopathic physicians actually hold different worldviews and, if so, to discern along which dimensions of worldview such differences manifest themselves.

Two-step cluster analysis. Cluster analysis is a statistical technique that is perfectly suited for subdividing cases into homogenous groups; and in SPSS, two-step cluster analysis allows quick and efficient clustering of large data sets by first preclustering to reduce the size of the matrix and then employing a standard hierarchical clustering algorithm on the preclusters (Norusis 2003). The technique is used here because the analytical objective is to subdivide the cases into homogenous groups based upon worldview – and to determine which attitudinal items on the Worldview Survey for Physicians account for this division. Type of doctor is the categorical variable. The number of clusters is determined using the automatically determine feature, and the clustering criterion selected was Schwarz’s Bayesian Criterion. As explained in greater detail in the next chapter, this analysis

ultimately identified 26 questionnaire items that neatly divided the cases into two groups.

Naturopaths comprise 95.1 percent of the membership in the first of these groups;

allopaths comprise 95.7 percent of the membership in group two.

Table 5

Items with Large “No Opinion/Don’t Know” Response Rates

| Item | No Opinion/Don’t Know Response Rate |
|---|-------------------------------------|
| 9. Like cures like. | 29.7 % |
| 13. There is an energetic field around the human body by way of which it is possible to heal a person. | 23.5 % |
| 25. Reincarnation is possible, that is we may have lived before and may live again. | 28.1 % |
| 28. Horoscopes and the zodiac offer real insight into the forces that shape our life. | 20.7 % |
| 30. Time is fluid and there may be more overlap between past, present and future than we commonly acknowledge. | 27.2 % |
| 31. The universe is ordered and runs with predictable regularity like a clock. | 18.4 % |
| 32. The universe is a place of almost mystical chaos. | 26.5 % |
| 33. Objects do not have magical or spiritual powers. | 21.1 % |
| 55. Quantum physics provide a more philosophically satisfying explanation of the cosmos than classical Newtonian physics. | 36.5 % |
| 56. I prefer the order and certainty of Newtonian physics to the uncertainty that lies at the heart of quantum physics. | 34.8 % |
| 60. People who generate great ideas have a strong connection to a higher cosmic consciousness. | 33.3 % |

Reliability analysis. As a prelude to further levels of analysis, Cronbach alpha and Guttman split-half coefficients were performed to test the internal consistency of these 26 items.

Principal Components Analysis. Principal components analysis was then used to boil down the 26 items identified in the two-step cluster analysis into a more manageable number of components for subsequent regression analyses. This technique has an added advantage of also providing a glimpse at possible underlying dimensional structure of worldview as measured by the 26 item scale.

This analysis was done using SPSS 15. Principal components analysis was selected as the extraction method; Varimax with Kaiser normalization was chosen for the rotation method. The Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of sphericity were used to determine suitability for factor analysis. Results were examined to determine percentage of variance explained. Factor loadings were studied to discover the items each component loaded upon most heavily, paying careful attention to whether these loadings seemed theoretically consistent and provided a logical, overall theme to the component. Reproduced correlations were evaluated to determine if the level of nonredundant residuals with absolute values greater than 0.05 indicated the principal components model was a good solution. Factors scores were saved for each component; they were computed using the regression method option in SPSS.

Discriminant Function Analysis. To further test the utility of the principal components identified in the above analysis, the five components were used as independent variables in a discriminant function analysis with cluster membership as the dependent variable. This, in effect, tests the power of the components to predict membership in the two groups identified by the cluster analysis. If the principal components analysis is a good solution, the five components should effectively discriminate between members in the two groups confirming their utility as a substitute for the 26 items in subsequent regression analyses.

Independent Samples T-Test. Finally, after identifying 26 items that separate respondents into two clearly defined groups and boiling those items down into five principle components, comes the acid test of whether there is a demonstrable difference in agreement between naturopaths and allopaths on these tenets of worldview. Or, put more precisely, are differences in mean scores between allopaths and naturopaths for these five principle components statistically significant. An independent samples t-test for each component provides a straightforward way to determine this. The analysis was done with SPSS 15. The five components – spirituality, deep ecology, nature of medicine, critique of science, and diagnosis and treatment – were used as test variables. Type of doctor is the grouping variable.

The Influence of Worldview

While the first stage of this quantitative analysis is an exercise in identifying and measuring potential differences in worldview between allopaths and naturopaths, this stage is a more detailed exploration of their influence.

Multiple regression analyses. Having identified five principle components of worldview, a series of multiple regression analyses are used to examine their impact and influence upon perceived efficacy of CAM therapies and personal use of CAM.

The first regression series, using data from all respondents collectively, looks at influence of worldview on perceived efficacy for each major domain of CAM. Principle components are used as independent variables. Then, step-by-step, this base model is expanded, adding the variables years in practice, sex and race as controls. Standardized beta coefficients reveal the relative influence of each principle component upon perceived efficacy scores for each area of CAM. Adjusted r-square shows the amount of variance accounted for by the model.

Next, using the data/split file option in SPSS 15, output is grouped by doctor type (i.e., naturopath and allopath). The same models are then used in another set of regressions to examine influence of the five principle components upon perceived efficacy of CAM domains by doctor type. This allows for a thorough comparison and contrast of the influence and impact of worldview.

A final series of regression analyses focuses on the influence of worldview upon personal use of CAM by allopathic physicians. Using the data/split file option in SPSS 15, output is again grouped by doctor type. The five principle components are used as

independent variables. Years in practice, sex and race are again used as controls. CAM use, a measure of personal use of CAM therapies, is the dependent variable.

Qualitative Analysis

Given the exploratory nature of this project, an expert panel of allopathic and naturopathic physicians was interviewed in-depth about the results of this study. This provided a laboratory in which to test these research findings against the real-world, personal experience of these doctors.

The Panel

The expert panel consists of six physicians – three allopaths and three naturopaths. Original recruitment materials for The Worldview Survey for Physicians offered respondents a chance to request copies of the study results. Four panel members were recruited from physicians who took advantage of this option. They were then contacted by e-mail or conventional mail, provided a copy of preliminary findings, and asked if they would participate in the qualitative phase of the study. In addition, two naturopathic members of the panel were recruited by the author based upon their knowledge and outstanding reputation within the field of naturopathic medicine. These panelists were contacted via recruitment letter at the end of the quantitative portion of the study, provided the copy of preliminary findings and invited to participate in the qualitative phase of the study. The composition of the panel is detailed in Table 6.

Table 6

Composition of Expert Review Panel

| Identifier | Years in Practice | Geographic Region | Nature of Practice |
|------------|-------------------|-------------------|----------------------------------|
| ND-1 | 3 | Pacific Northwest | Public Health |
| ND- 2 | 20 + | Pacific Northwest | Family Practice |
| ND-3 | 23 | West | Family Practice |
| MD-1 | 5 | West | Family Practice |
| MD-2 | 24 | West | Primary Care – Internal Medicine |
| MD-3 | 16 | Pacific Northwest | Integrative Medicine Practice |

ND = naturopathic physician; MD = allopathic physician

In-depth Interviews

To ensure consistency, interviews followed a carefully crafted script designed to determine if study results conformed to the personal experience of the physician and, if not, how they differed. Doctors were led through each major finding of the study and asked both closed and open-ended questions to determine their agreement with – and thoughts about – these findings. Follow-up questions were asked when appropriate or necessary to clarify responses. At the conclusion of the interview, physicians were given an opportunity to further elaborate upon any points discussed, or to address topics they felt were relevant but were not covered in the discussion. (See Appendix 2 for a copy of the script)

These interviews took 45 minutes to one hour to complete. One was conducted in person; the other five were done by phone. All conversations were recorded for accuracy, and interviewers also noted key comments on copies of the interview scripts.

Analysis

Comments were carefully analyzed to detect common – and anomalous themes – within and between the two physician categories. The results are reported in Chapter 7, and serve as a reflexive guide to inform the study conclusions as presented in Chapter 8.

CHAPTER 5 RESULTS

Descriptive Findings

Collectively, the responses to the Physician Worldview Survey provide a glimpse into several attitudes and beliefs that fuse to form the prism through which these respondents view the world. And it is, indeed, an interesting pattern that emerges from this data, especially along the dimensions of health and illness. Overall, respondents seem to view health itself as something more than the mere absence of disease. Indeed, almost nine out of ten survey respondents either agree or strongly agree that health is an optimal state of being. And almost eight out of ten express the same level of agreement with the idea that good health doesn't simply just happen, but must be pursued. Interestingly, only 10.4 percent of respondents express any level of disagreement with the idea that mind and body are one.

Respondents are more cautious in their attitudes about the root cause of disease with 46.2 percent expressing some level of agreement that it is organic, while 51 percent express some level of agreement that the root cause is psycho-social. Many respondents seemed reluctant to come down on one side of the equation and express some level of agreement – sometimes the same level of agreement – with both statements, a fact that may be explained by belief in multi-causality.

Even though medicine has been pointed to as the epitome of scientific progress and rationalization (Freidson 1988), responses to a series of items exploring therapeutic

intervention suggests that for these respondents the practice of medicine is still something of an art. More than half either disagree or disagree strongly that there are universal cures for universal diseases, and more than eight in ten express some level of agreement with the idea that diagnosis and treatment are patient specific. Almost 85 percent express some level of disagreement with the statement that treatments not based upon modern scientific studies are useless; 31 percent disagree strongly with this statement. Only 22 percent of the respondents express any level of disagreement with the idea that an appreciation and understanding of the life force should be the foundation of medical practice. Interestingly, only 6.2 percent of the respondents express any level of disagreement with the belief that rites and rituals can affect illness.

Respondents also seem to feel there is room for improvement in biomedicine. Only 14 percent express any level of agreement with the belief that modern biomedicine offers a complete approach to medical care. Almost 82 percent say it could benefit from an infusion of the wisdom of other traditions like ayurveda and traditional oriental medicine, while 95.6 percent believe biomedicine could benefit from incorporating more information from the social and behavioral sciences.

Even more fascinating are patterns emerging out of the data from each category of respondents. At this level of analysis differences in attitudes and opinions among allopathic and naturopathic physicians become apparent, as can be seen in Table 7 which highlights physician attitudes about selected aspects of health, illness and medical treatment. The prism through which these respondents view their world refracts sharply. For example, more than half of the naturopaths responding to the survey (52.5 percent) strongly disagree with the idea that good health is simply an absence of disease, while

Table 7

Physician Attitudes about Health, Illness and Medical Treatment.

| Survey Item | Physician Type | n | Disagree Strongly | Disagree | Disagree Somewhat | No Opinion | Agree Somewhat | Agree | Agree Strongly |
|--|----------------|-----|-------------------|----------|-------------------|------------|----------------|--------|----------------|
| Good health is simply an absence of disease. | Allopath | 549 | 29.7 % | 41.0 % | 14.6 % | 0.7 % | 9.8 % | 2.9 % | 1.3 % |
| | Naturopath | 398 | 52.5 % | 31.9 % | 4.3 % | 0 % | 8.3 % | 2.5 % | 0.5 % |
| Good health is . . . an optimum state of being. | Allopath | 550 | 0.9 % | 0.5 % | 2.0 % | 1.5 % | 17.1 % | 41.5 % | 36.5 % |
| | Naturopath | 397 | 0 % | 0.3 % | 1.0 % | 0 % | 3.0 % | 26.2 % | 69.5 % |
| Good health doesn't just happen, it must be pursued. | Allopath | 549 | 0.7 % | 1.1 % | 3.3 % | 0.7 % | 17.5 % | 43.4 % | 33.3 % |
| | Naturopath | 398 | 0.5 % | 0.3 % | 1.0 % | 1.5 % | 12.3 % | 39.4 % | 45.0 % |
| Mind and body are one. | Allopath | 550 | 0.9 % | 8.5 % | 5.1 % | 5.3 % | 22.7 % | 34.4 % | 23.1 % |
| | Naturopath | 398 | 1.3 % | 2.5 % | 0.8 % | 1.8 % | 12.6 % | 32.2 % | 49.0 % |
| Root cause of disease is organic. | Allopath | 550 | 2.9 % | 17.1 % | 22.4 % | 5.3 % | 33.1 % | 17.6 % | 1.6 % |
| | Naturopath | 396 | 9.3 % | 22.2 % | 24.0 % | 6.3 % | 29.3 % | 7.3 % | 1.5 % |
| Root cause of disease is psychosocial. | Allopath | 549 | 3.3 % | 17.9 % | 32.8 % | 4.4 % | 31.7% | 8.6 % | 1.5 % |
| | Naturopath | 395 | 3.0 % | 10.6 % | 17.2 % | 4.6 % | 47.1 % | 13.7 % | 3.8 % |
| Universal cures for universal diseases. | Allopath | 547 | 14.6 % | 32.0 % | 19.7 % | 8.0 % | 17.6 % | 6.6 % | 1.5 % |
| | Naturopath | 394 | 31.0 % | 32.2 % | 16.2 % | 3.6 % | 12.9 % | 2.5 % | 1.5% |
| Diagnosis and treatment are patient specific. | Allopath | 549 | 1.5 % | 7.5 % | 12.4 % | 2.4 % | 26.8 % | 34.1 % | 15.5 % |
| | Naturopath | 397 | 0.8 % | 1.8 % | 3.8 % | 0.5 % | 17.1 % | 33.8 % | 42.3 % |
| Treatments not based on modern scientific studies are useless. | Allopath | 546 | 11.7 % | 31.9 % | 33 % | 2.9 % | 15.4 % | 3.3 % | 1.8 % |
| | Naturopath | 399 | 57.9 % | 31.3 % | 7.8 % | 0.3 % | 2.3 % | 0 % | 0.5 % |

Table 7 – continued

Physician Attitudes about Health, Illness and Medical Treatment.

| Survey Item | Physician Type | n | Disagree Strongly | Disagree | Disagree Somewhat | No Opinion | Agree Somewhat | Agree | Agree Strongly |
|---|----------------|-----|-------------------|----------|-------------------|------------|----------------|--------|----------------|
| An understanding and appreciation of the life force should be the foundation of medical practice. | Allopath | 542 | 6.5 % | 19.2 % | 9.8 % | 24.0 % | 23.8 % | 12.5 % | 4.2 % |
| | Naturopath | 398 | 0.3 % | 0.5 % | 3.5 % | 4.3 % | 18.3 % | 37.7 % | 35.4 % |
| Like cures like. | Allopath | 540 | 12.4 % | 21.9 % | 9.1 % | 44.3 % | 9.1 % | 2.8 % | 0.6 % |
| | Naturopath | 394 | 1.0 % | 3.3 % | 2.8 % | 9.6 % | 36.0 % | 28.9 % | 18.3 % |

Percentages may not sum to 100.00 due to rounding.

only 29.7 percent of the allopaths express this same intensity of disagreement. Almost 70 percent of the naturopaths strongly agree that health is an optimum state of being, while only 36.5 percent of the allopaths express similar sentiments. Less than two percent of the naturopaths express any level of disagreement with the statement that good health doesn't just happen that it is a goal that must be pursued; 45 percent of them strongly agree with the idea. Five percent of the allopaths express some level of disagreement with it, while only 33.3 percent strongly agree. And 49 percent of the naturopaths strongly agree that mind and body are one; only 4.6 percent express any level of disagreement with this idea. Almost 15 percent of the allopaths express some level of disagreement with this unity of mind and body concept, however, and only 23.1 percent of them strongly agree with it.

Even in an area such as the root cause of disease where respondents tended overall to gravitate toward the middle ground, there are still noticeable differences between the two types of physicians. Almost 20 percent of allopaths say they agree or strongly agree that the root cause of disease is organic; only about nine percent of the naturopaths express similar views. Conversely, only 10 percent of allopaths agree or strongly agree that the root cause of disease is psycho-social compared to 17.5 percent of naturopaths.

Responses between the two groups are in stark contrast on questionnaire items exploring therapeutic intervention. Sixty-three percent of naturopaths disagree or disagree strongly that there are universal cures for universal diseases compared to 46.6 percent of allopaths, while allopaths (21.4 percent) are more than three times as likely as naturopaths (6.4 percent) to express some level of disagreement with the idea that diagnosis and treatment are patient specific. Almost 58 percent of the naturopaths

strongly disagree with the statement that treatments not based upon modern scientific studies are useless while 11.6 percent of allopaths share that sentiment. Only 4.3 percent of naturopaths express any level of disagreement with the belief that an appreciation and understanding of the life force should be the foundation of medical practice; 35.5 percent of allopaths express some level of disagreement. However, the sharpest dichotomy appears in response to the idea that like cures like, a fundamental premise of homeopathic medicine. Eighty-three percent of naturopaths express some level of agreement while 9.6 percent answer no opinion/don't know. Slightly less than 13 percent of allopaths express any level of support for this concept while 44.3 percent answer no opinion/don't know.

These differences between allopaths and naturopaths are very evident when respondents rank various therapies and medical modalities on a one-to-ten scale where one is least efficacious and 10 most efficacious. Osteopathy receives the highest average ranking among allopaths with a mean score of 5.80 followed by biofeedback (mean = 5.75) and massage therapy (mean = 5.63). Naturopaths tend to give osteopathy and massage therapy higher average efficacy rankings than their allopathic counterparts (means are 6.67 and 6.94 respectively), although the average effectiveness ranking for biofeedback was slightly lower among naturopaths (mean = 5.44).

Allopaths also tend to assign higher efficacy scores for each conventional therapy than do naturopaths. The average efficacy score for cardiac catheterization is 7.90 for allopaths and 4.07 for naturopaths. Allopaths assign chemotherapy an average efficacy score of 6.73 compared to the naturopathic average of 4.17. Allopaths give surgery an average efficacy score of 8.10; naturopaths give it 6.31. Perhaps the most intriguing difference in efficacy rankings is the score for immunization. Allopaths give it an average

efficacy score of 8.56 while the naturopathic average is 4.68. Table 8 provides a complete list of therapies and their efficacy scores by physician category.

Table 8

Average Efficacy Scores on 1-to-10 Scale for Therapies/Modalities by Physician Type *

| Therapy/Modality | Allopath | | | Naturopath | | |
|-------------------------------|----------|--------|-----|------------|--------|-----|
| | Mean | Median | n | Mean | Median | n |
| Ayurveda | 1.44 | 0 | 457 | 5.11 | 6.00 | 354 |
| Biomedicine | 6.43 | 8.00 | 495 | 5.66 | 5.00 | 383 |
| Biofeedback | 5.75 | 6.00 | 503 | 5.44 | 6.00 | 370 |
| Cardiac Catheterization | 7.90 | 8.00 | 498 | 4.07 | 5.00 | 348 |
| Chelation Therapy | 2.46 | 1.00 | 465 | 5.70 | 6.00 | 371 |
| Chemotherapy | 6.73 | 7.00 | 508 | 4.17 | 4.00 | 372 |
| Chiropractic | 5.00 | 5.00 | 507 | 6.89 | 7.00 | 382 |
| Energy Healing | 2.12 | 1.00 | 469 | 5.75 | 6.00 | 371 |
| Guided Imagery | 3.37 | 3.00 | 481 | 5.72 | 6.00 | 372 |
| Herbal Therapies | 3.96 | 4.00 | 493 | 7.97 | 8.00 | 390 |
| High-dose Megavitamins | 2.37 | 2.00 | 487 | 6.74 | 7.00 | 376 |
| Homeopathy | 2.74 | 2.00 | 480 | 7.30 | 8.00 | 388 |
| Hydrotherapy | 2.53 | 2.00 | 462 | 7.34 | 8.00 | 384 |
| Immunization | 8.56 | 9.00 | 528 | 4.68 | 5.00 | 364 |
| Iridology | .75 | 0.00 | 453 | 2.98 | 2.00 | 343 |
| Massage Therapy | 5.63 | 6.00 | 513 | 6.94 | 7.00 | 385 |
| Naturopathy | 3.10 | 3.00 | 475 | 8.85 | 9.00 | 389 |
| Osteopathy | 5.80 | 6.00 | 494 | 6.67 | 7.00 | 365 |
| Spiritual Healing/Prayer | 4.99 | 5.00 | 491 | 6.64 | 7.00 | 374 |
| Surgery | 8.10 | 8.00 | 526 | 6.31 | 6.00 | 369 |
| Traditional Oriental Medicine | 4.06 | 4.00 | 455 | 7.75 | 8.00 | 381 |
| Voodoo | 1.06 | 1.00 | 455 | 1.04 | 0.00 | 324 |
| Yoga | 4.85 | 5.00 | 492 | 6.72 | 7.00 | 377 |

* 1 = least effective;
10 = most effective

Differences of opinion between the two groups are not limited to matters of health and illness, however. They are also clearly present in response to several questionnaire items probing spiritual and metaphysical issues, as can be seen in Table 9. On three items concerning spirituality, for example, responses by the majority of both groups indicate a

Table 9

Physician Attitudes about Selected Spiritual and Metaphysical Items.

| Survey Item | Physician Type | n | Disagree Strongly | Disagree | Disagree Somewhat | No Opinion | Agree Somewhat | Agree | Agree Strongly |
|---|----------------|-----|-------------------|----------|-------------------|------------|----------------|--------|----------------|
| I often feel the presence of the divine in my own life. | Allopath | 544 | 8.1 % | 13.4 % | 5.5 % | 9.4 % | 18.9 % | 23.2 % | 21.5 % |
| | Naturopath | 396 | 2.3 % | 1.3 % | 2.3 % | 5.6 % | 16.4 % | 37.6 % | 34.6 % |
| In my own life, I often feel a deep sense of inner peace or harmony. | Allopath | 546 | 1.1 % | 7.0 % | 15.2 % | 6.2 % | 33.3 % | 27.1 % | 10.1 % |
| | Naturopath | 397 | 0 % | 4.5 % | 4.8 % | 3.8 % | 33.8 % | 39.3 % | 13.9 % |
| My religious beliefs blend more than one denomination or faith. | Allopath | 545 | 8.1 % | 13.9 % | 5.9 % | 7.5 % | 25.3 % | 26.2 % | 13.0 % |
| | Naturopath | 398 | 3.3 % | 3.5 % | 1.8 % | 3.3 % | 10.1 % | 42.2 % | 35.9 % |
| Time is fluid; there may be overlap between past, present and future ... | Allopath | 548 | 7.5 % | 12.4 % | 6.2 % | 31.6 % | 24.5 % | 14.6 % | 3.3 % |
| | Naturopath | 399 | 0.8 % | 3.8 % | 1.0 % | 21.3 % | 26.1 % | 29.3 % | 17.8 % |
| The universe is a place of almost mystical chaos. | Allopath | 546 | 10.3 % | 22.9 % | 13.0 % | 25.5 % | 19.6 % | 7.5 % | 1.3 % |
| | Naturopath | 397 | 5.0 % | 12.1 % | 14.1 % | 28.0 % | 25.7 % | 12.3 % | 2.8 % |
| Objects do not have magical or spiritual powers. | Allopath | 547 | 0.4 % | 5.5 % | 12.4 % | 17.9 % | 10.6 % | 30.5 % | 22.7 % |
| | Naturopath | 397 | 5.3 % | 17.1 % | 24.4 % | 25.7 % | 8.8 % | 14.6 % | 4.0 % |
| Reality is just another name for our subjective, sensory perceptions of the world | Allopath | 548 | 5.8 % | 8.2 % | 4.9 % | 8.6 % | 33.8 % | 33.2 % | 5.5 % |
| | Naturopath | 398 | 1.8 % | 5.8 % | 3.5 % | 9.5 % | 26.4 % | 40.5 % | 12.6 % |
| There is an objective reality that exists independently of our senses. | Allopath | 548 | 1.5 % | 2.9 % | 6.4 % | 17.3 % | 24.5 % | 35.9 % | 11.5 % |
| | Naturopath | 398 | 2.3 % | 8.3 % | 9.5 % | 16.1 % | 24.6 % | 29.6 % | 9.5 % |
| It is possible that intelligent beings from another planet visited earth. | Allopath | 548 | 16.6 % | 13.1 % | 4.7 % | 33.9 % | 17.2 % | 11.1 % | 3.3 % |
| | Naturopath | 399 | 3.0 % | 5.3 % | 1.8 % | 41.6 % | 16.5 % | 22.1 % | 9.8 % |

Percentages may not sum to 100.00 due to rounding.

certain resonance with spiritual themes. Yet, the percentage of naturopaths reporting some level of agreement with these items considerably exceeds that of the allopaths.

Almost 89 percent of naturopaths, compared to 63.6 percent of allopaths, express some level of agreement with the statement that they often felt the presence of the divine in their own life. Eighty-seven percent of naturopaths report some level of agreement with the statement that they often feel a deep sense of inner peace or harmony in their life while almost 71 percent of allopaths report some level of agreement with this. And 88.2 percent of naturopath respondents, compared to 64.5 percent of allopaths, express some level of agreement that their own religious beliefs are a blend of teachings from more than one denomination or faith.

Among the items measuring attitudes about metaphysical issues – i.e. the ultimate nature of reality – three of them generate sharply different responses from the two groups. Approximately three quarters of the naturopaths (73.2 percent) indicate some level of agreement with a statement that time is fluid and there may be more overlap between past, present and future than we commonly acknowledge while fewer than half of the allopaths (42.4 percent) express similar sentiments. Almost half (46.2 percent) of allopaths express some level of disagreement with the idea that the universe is a place of mystical chaos compared to 31.2 percent of naturopaths. And 63.8 percent of allopaths express some level of agreement with the statement that objects do not have magical or spiritual powers while only 27.4 percent of naturopaths express some level of disagreement with that statement. However, differences between the two groups are much less severe, on two items that directly address the nature of reality. Only seven percentage points separate respondents from the two groups who express some level of

agreement with the statement that reality is just another name for our subjective, sensory perceptions of the world (79. percent of naturopaths and 72.5 percent of allopaths).

Similarly narrow margins separate the respondents from each group who express some level of agreement that there is an independent reality that exists independently of our senses (63.7 percent of naturopaths and 72.5 percent of allopaths).

It should also be noted that more mystical items in this section tended to elicit large percentages of “no opinion/don’t know” responses from both groups. For example, 41.6 percent naturopaths – and 33.9 percent of allopaths – answered “no opinion/don’t know” to an item about the possibility of intelligent beings from another planet visiting earth.

Differences between the two groups again arise in a series of items examining general philosophical orientation to life as shown in Table 10 (next page). Less than a quarter of allopaths (22.2 percent) express any level of disagreement with the idea that reason is a much better guide to the world than emotion. Half of the naturopaths (51.2 percent) express some level of disagreement with that statement. In a similar vein, 30.4 percent of allopaths express some level of agreement with the statement that the world would be a better place if more people followed their heart rather than their head compared to 65.6 percent of naturopaths. Two other items elicit sharp differences in the percentage of respondents in each group saying they agree or agree strongly. For instance, 88.4 percent of naturopaths but only 53.5 percent of allopaths say they agree or agree strongly with the concept that everything is interconnected. Approximately 40 percent of naturopaths agree or strongly agree that true objectivity is an illusion; 23 percent of allopaths express similar views.

Table 10

Physician Attitudes about Selected Philosophical Items.

| Survey Item | Physician Type | n | Disagree Strongly | Disagree | Disagree Somewhat | No Opinion | Agree Somewhat | Agree | Agree Strongly |
|---|----------------|-----|-------------------|----------|-------------------|------------|----------------|--------|----------------|
| Reason is a much better guide to the world than emotion. | Allopath | 547 | 1.1 % | 6.8 % | 14.3 % | 9.0 % | 36.7 % | 26.5 % | 5.7 % |
| | Naturopath | 395 | 2.8 % | 20.8 % | 27.6 % | 9.9 % | 25.6 % | 11.6 % | 1.8 % |
| World would be better if more people followed their heart . . . | Allopath | 547 | 6.0 % | 17.4 % | 29.3 % | 17.0 % | 19.0 % | 9.9 % | 1.5 % |
| | Naturopath | 394 | 0.5 % | 3.0 % | 15.7 % | 15.0 % | 36.5 % | 19.5 % | 9.6 % |
| Nothing stands alone; everything is interconnected. | Allopath | 549 | 1.1 % | 2.9 % | 3.6 % | 5.1 % | 34.6 % | 36.9 % | 16.6 % |
| | Naturopath | 397 | 0.3 % | 0.3 % | 0.8 % | 0.3 % | 10.1 % | 42.6 % | 45.8 % |
| True objectivity is an illusion. | Allopath | 546 | 4.0 % | 11.7 % | 13.7 % | 16.7 % | 30.8 % | 18.1 % | 4.9 % |
| | Naturopath | 397 | 1.3 % | 6.5 % | 9.1 % | 15.4 % | 27.5 % | 27.0 % | 13.4 % |

Percentages may not sum to 100.00 due to rounding.

Not surprisingly, clear differences also emerge between the two groups in their responses to a series of items reflecting opinions about several ecological and scientific issues. These findings are summarized in Table 11 (next page). On the ecological issues: Slightly more than half of the naturopaths (56.7 percent) say they strongly agree that the earth is sacred, 17.8 percent of the allopaths express the same view. Fifty-seven percent of naturopaths say they strongly agree the earth is a giant, living organism, compared to 23.5 percent of allopaths. Sixty-five percent of naturopaths strongly agree that humans are part of nature, not its ruler; 35.8 percent of allopaths strongly hold that view. And 62.5 percent of naturopaths – but 39.1 percent of allopaths – strongly agree that we will destroy the earth if we keep living as we do.

On the scientific issues: Allopaths were less likely to hold strongly negative opinions on items probing attitudes about the beneficence of science. For example, naturopathic respondents were almost three times more likely than allopaths to strongly agree with the statement that in today's world science is used to pursue money and power more often than it is used to advance the human condition (29.9% of naturopaths versus 10.8 percent of allopaths). What is more, 61.7 percent of naturopaths disagree or disagree strongly with the notion that science is less influenced by money and power than other fields compared to 33.5 percent of allopaths.

Table 11

Physician Attitudes about Selected Ecology and Science Items.

| Survey Item | Physician Type | n | Disagree Strongly | Disagree | Disagree Somewhat | No Opinion | Agree Somewhat | Agree | Agree Strongly |
|--|----------------|-----|-------------------|----------|-------------------|------------|----------------|--------|----------------|
| The earth is sacred. | Allopath | 546 | 4.6 % | 7.1 % | 6.0 % | 15.8 % | 19.8 % | 28.9 % | 17.8 % |
| | Naturopath | 397 | 0 % | 0.8 % | 1.5 % | 4.5 % | 10.6 % | 25.9 % | 56.7 % |
| The entire earth is a giant, living organism. | Allopath | 549 | 6.2 % | 11.8 % | 7.7 % | 6.9 % | 16.9 % | 27.0 % | 23.5 % |
| | Naturopath | 398 | 0.5 % | 0.5 % | 1.5 % | 3.3 % | 9.3 % | 27.9 % | 57.0 % |
| Humans are part of nature, not its ruler. | Allopath | 547 | 1.6 % | 4.4 % | 6.8 % | 2.4 % | 13.2 % | 35.8 % | 35.8 % |
| | Naturopath | 399 | 0.8 % | 1.8 % | 1.0 % | 0.8 % | 7.0 % | 23.6 % | 65.2 % |
| We will destroy the environment if we keep living as we do. | Allopath | 547 | 2.2 % | 3.3 % | 4.2 % | 3.7 % | 15.7 % | 31.8 % | 39.1 % |
| | Naturopath | 397 | 0.3 % | 0.3 % | 2.5 % | 0.3 % | 7.8 % | 26.4 % | 62.5 % |
| . . . science used to pursue money and power more often than to advance the human condition. | Allopath | 547 | 3.3 % | 11.2 % | 16.5 % | 8.6 % | 26.1 % | 23.6 % | 10.8 % |
| | Naturopath | 398 | 0.5 % | 1.5 % | 7.3 % | 4.5 % | 28.1 % | 28.1 % | 29.9 % |
| Science less influenced by money and power than other fields . . . | Allopath | 549 | 8.4 % | 25.1 % | 27.0 % | 10.6 % | 19.1 % | 7.7 % | 2.2 % |
| | Naturopath | 396 | 26.8 % | 35.4 % | 20.2 % | 7.6 % | 8.6 % | 1.3 % | 0.3 % |
| The scientific method is the best path to knowledge. | Allopath | 546 | 1.5 % | 8.1 % | 16.3 % | 8.6 % | 34.6 % | 24.5 % | 6.4 % |
| | Naturopath | 397 | 11.1 % | 29.5 % | 30.5 % | 6.3 % | 17.9 % | 3.5 % | 1.3 % |
| The scientific method is one of many equally valid paths to knowledge. | Allopath | 549 | 1.6 % | 9.1 % | 13.8 % | 5.1 % | 38.3 % | 25.3 % | 6.7 % |
| | Naturopath | 399 | 0.5 % | 2.0 % | 4.0 % | 3.3 % | 26.1 % | 47.9 % | 16.3 % |

Percentages may not sum to 100.00 due to rounding.

These expressed differences in attitudes toward science are not limited to opinions about moral and ethical dimensions of the field or apparent motivations of the scientific establishment. They also extend to beliefs about science as a path to knowledge. Almost 41 percent of naturopaths say they disagree or disagree strongly with the idea that the scientific method is the best path to knowledge, while 64.2 percent of them say they agree or agree strongly that the scientific method is one of many equally valid paths to knowledge. Only 9.6 percent of allopaths express similar levels of disagreement with the idea that science is the best path to knowledge; 32 percent agree or agree strongly that it is one of many equally valid paths.

Clearly, results from the Physician Worldview Survey show these two physician groups hold different – sometimes dramatically different – attitudes. Occasionally, these differences between the two groups appear to be almost diametrically opposed. At other times the differences appear to be a matter of degree. The question, of course, is whether these differences are significant in either the statistical or metaphorical sense. By assigning a value of one to seven for the range of potential responses (totally disagree to totally agree) for the first 60 attitudinal items on the questionnaire, it is possible to compute a survey score ranging from 60 to 420 for each respondent. Sub-scores can also be computed for each of the dimensions measured by these items. As t-tests results shown in Table 12 demonstrate, attitudinal differences between the two physician groups rise to the level of statistical significance collectively and across the dimensions – health and illness; spiritual, philosophical and metaphysical issues; ecology and the nature of science – probed by these 60 items.

Table 12

Different visions, Different Values: Results of T-Tests for Equality of Means.

| | | Allopaths | Naturopaths | Significance |
|---|-----------|------------------|--------------------|---------------------|
| Worldview Score (sum of all items 1 – 60) | | (n = 490) | (n = 353) | (two-tailed) |
| | Mean | 262.122 | 321.677 | p<.001 |
| | Std. Dev. | 35.917 | 31.275 | |
| Health and Illness Score (sum of items 1 – 20) | | (n = 523) | (n = 379) | |
| | Mean | 92.629 | 113.110 | p < .001 |
| | Std. Dev. | 13.121 | 10.960 | |
| Spirituality, Metaphysical Philosophical Score (sum of items 21 – 45) | | (n = 517) | (n = 376) | |
| | Mean | 102.222 | 125.598 | p < .001 |
| | Std. Dev | 17.892 | 15.618 | |
| Ecology and Science Score (sum of items 46 – 60) | | (n = 533) | (n = 382) | |
| | Mean | 67.664 | 83.241 | p < .001 |
| | Std. Dev. | 10.647 | 8.798 | |

Statistical Analyses

Exploring Differences in Worldview

More sophisticated statistical analyses reveal important information about the attitudinal differences between the two physician groups. Careful exploration of the data using two-step cluster analysis with type of doctor (naturopath or allopath) as the categorical variable shows 26 statistically significant items on the Worldview Survey for Physicians that account for a remarkably clean division between the two clusters. The first cluster is overwhelmingly comprised of naturopaths; indeed, they account for 353 (95.1 percent) of the 371 physicians in this grouping. Membership in the second cluster is a direct reversal of the first with allopathic physicians accounting for 493 (95.7 percent) of the 515 physicians in the grouping.

As the centroids in Table 13 show, cluster one has higher average (i.e., more Dionysian) scores for each of the 26 items than does either cluster two or both groups combined. Of course, in cluster analysis, by-variable importance charts indicate which opinion items exercise the most influence on each cluster. Many Worldview Survey items rank fairly close in importance across the two groups, but as the rank of importance for the items in Table 14 shows, there are a few interesting exceptions. For example, the idea that treatments not based upon modern scientific studies are useless ranks second in cluster one but sixth in cluster two. And the item that the scientific method is the best path to knowledge ranks fourth in cluster two, while it ranks eighth in cluster one. An item probing spiritual and transcendental issues (I often feel the presence of the divine in my own life) ranks nineteenth for cluster two but tenth in importance for cluster one.

In addition, items exploring the role of reason and emotion rank higher in importance for cluster two (allopaths) than cluster one (naturopaths). One of these items, the idea that the world would be a better place if people followed their hearts rather than their heads, ranked seventh in cluster two and twelfth in cluster one. The other item, the idea that reason is a much better guide to the world than emotion, ranks eleventh in cluster two, but twenty-second in importance for cluster one.

As might be expected from the descriptive findings, ecological issues also seem to carry differing degrees of importance for the two clusters. The statement that the earth is a giant living organism is sixth in importance for cluster one, but twelfth for cluster two. The idea that humans are part of nature, not its ruler ranks sixteenth in importance for cluster one and twenty-first for cluster two. And the belief that we will destroy the earth if we keep living as we do is nineteenth for cluster one but twenty-fourth for cluster two.

Table 13

Centroids from Two-Step Cluster Analysis

| Item: | Cluster 1 (Naturopaths) | | Cluster 2 (Allopaths) | | Combined | |
|--|----------------------------|-----------|--------------------------|-----------|----------|-----------|
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| The mind and body are one. | 6.22 | 1.120 | 5.27 | 1.508 | 5.67 | 1.436 |
| The root cause of most disease is organic. | 4.61 | 1.580 | 3.85 | 1.507 | 4.17 | 1.582 |
| Universal cures for universal diseases. | 5.62 | 1.452 | 4.87 | 1.581 | 5.19 | 1.571 |
| Diagnosis and treatment is patient specific. | 6.10 | 1.131 | 5.05 | 1.528 | 5.49 | 1.469 |
| Treatments not based on modern scientific studies are useless. | 6.49 | .784 | 4.97 | 1.410 | 5.61 | 1.403 |
| Appreciation of life force should be foundation of medical practice. | 6.03 | .993 | 3.85 | 1.531 | 4.77 | 1.714 |
| Healing properties of energy fields more pseudoscience | 5.69 | 1.288 | 3.19 | 1.490 | 4.25 | 1.872 |
| Modern biomedicine offers complete approach to medical care. | 6.10 | 1.233 | 4.89 | 1.412 | 5.40 | 1.468 |
| Modern biomedicine could benefit from oriental medicine . . . | 6.41 | .838 | 4.88 | 1.348 | 5.53 | 1.384 |
| True source of healing is spiritual. | 5.20 | 1.284 | 3.83 | 1.524 | 4.41 | 1.580 |
| Rites and rituals can affect outcome of an illness. | 5.82 | .882 | 5.00 | 1.195 | 5.35 | 1.147 |
| I often feel the presence of the divine in my own life. | 5.96 | 1.158 | 4.62 | 1.967 | 5.19 | 1.798 |
| My religious beliefs are blend of several denominations/faiths . . . | 5.89 | 1.407 | 4.50 | 1.847 | 5.09 | 1.811 |
| Nothing stands alone, everything is interconnected. | 6.35 | .760 | 5.40 | 1.184 | 5.80 | 1.129 |
| Reality is too complex to be explained by single theory or idea. | 5.93 | 1.250 | 5.20 | 1.406 | 5.50 | 1.389 |
| Reason is much better guide to the world than emotion. | 4.32 | 1.456 | 3.19 | 1.333 | 3.67 | 1.493 |
| World would be better if more people followed heart than head . . . | 4.87 | 1.289 | 3.55 | 1.395 | 4.11 | 1.501 |
| The earth is sacred. | 6.36 | .979 | 4.89 | 1.624 | 5.51 | 1.566 |
| We will destroy environment if we keep living as we do. | 6.49 | .837 | 5.73 | 1.472 | 6.05 | 1.298 |
| Humans are part of nature, not its ruler. | 6.52 | .910 | 5.66 | 1.510 | 6.02 | 1.359 |
| The entire earth is a giant, living organism. | 6.40 | .959 | 4.85 | 1.885 | 5.50 | 1.740 |
| Nature is benevolent, if only we live in harmony with it. | 5.23 | 1.477 | 4.40 | 1.562 | 4.75 | 1.580 |
| Science used to pursue money/power more often than to advance human condition | 5.70 | 1.219 | 4.53 | 1.644 | 5.02 | 1.586 |
| Science less influenced by money and power than other fields. | 5.66 | 1.261 | 4.55 | 1.521 | 5.02 | 1.518 |
| Scientific method is best path to knowledge. | 5.10 | 1.347 | 3.24 | 1.374 | 4.03 | 1.645 |
| Other methods like observation, traditional practices, and intuition are as effective as clinical trials to evaluate medicine. | 5.40 | 1.256 | 3.30 | 1.537 | 4.10 | 1.766 |

Table 14
Relative Importance of Opinion Item for Each Cluster

| Item: | Ranking | |
|--|----------------------------|--------------------------|
| | Cluster 1 (Naturopaths) | Cluster 2 (Allopaths) |
| The mind and body are one. | 21 | 20 |
| The root cause of most disease is organic. | 26 | 25 |
| Universal cures for universal diseases. | 25 | 26 |
| Diagnosis and treatment is patient specific. | 17 | 17 |
| Treatments not based on modern scientific studies are useless. | 2 | 6 |
| Appreciation of life force should be foundation of medical practice. | 1 | 2 |
| Healing properties of energy fields more pseudoscience . . . | 3 | 1 |
| Modern biomedicine offers complete approach to medical care. | 14 | 10 |
| Modern biomedicine could benefit from oriental medicine. | 4 | 5 |
| True source of healing is spiritual. | 11 | 9 |
| Rites and rituals can affect outcome of an illness. | 18 | 18 |
| I often feel the presence of the divine in my own life. | 10 | 19 |
| My religious beliefs are a blend of several denominations/faiths . . . | 13 | 14 |
| Nothing stands alone, everything is interconnected. | 9 | 13 |
| Reality is too complex to be explained by any single theory or idea. | 23 | 23 |
| Reason is much better guide to the world than emotion. | 22 | 11 |
| World would be better if more people followed heart than head . . . | 12 | 7 |
| The earth is sacred. | 7 | 8 |
| We will destroy environment if we keep living as we do. | 19 | 24 |
| Humans are part of nature, not its ruler. | 16 | 21 |
| The entire earth is a giant, living organism. | 6 | 12 |
| Nature is benevolent, if only we live in harmony with it. | 24 | 22 |
| Science used to pursue money/power more often than to advance human condition | 15 | 16 |
| Science less influenced by money and power than other fields. | 20 | 15 |
| Scientific method is best path to knowledge. | 8 | 4 |
| Other methods like observation, traditional practices, and intuition are as effective as clinical trials to evaluate medicine. | 5 | 3 |

In summary, two-step cluster analysis identifies 26 statistically significant items that divide respondents into two groups. One cluster is predominantly comprised of naturopathic physicians the other of allopathic physicians. Scores on the 26 statistically significant items tend to be higher (i.e., more Dionysian) for the cluster comprised primarily of naturopathic physicians than for either the other cluster or both groups combined, a clear indication that the clusters are grouped around differing beliefs and attitudes. An examination of by-variable importance indicates sharp differences in influence between the clusters for certain items reflecting ideas about science, spirituality, the role of reason and ecology.

Principal Components Analysis

The 26 items identified in the cluster analysis show a striking degree of overall internal consistency ($\alpha = .907$; Guttman Split-Half coefficient = .848). Collectively, these items clearly measure a difference in attitudinal outlook between two clusters identified in the analysis. Yet, by its very definition, cultural worldview is a multi-dimensional construct, a psycho-logic in which various elements can interact with and influence one another. Not surprisingly, an analysis of Pearson correlation coefficients for these 26 items shows statistically significant correlations between items probing the same theme – such as ecology or spirituality – as can be seen in Table 15 (next page). However, there are also statistically significant correlations between some items that at first blush do not seem related. For example, the idea that the earth is sacred correlates with such items as an appreciation of the life force should be the foundation of medical practice ($r = .420$, $p < .01$) and modern biomedicine could benefit from an infusion of the wisdom of oriental

Table 15

Selected Inter-item Pearson Correlations by Subject

| Item: | <u>Selected Ecology Items</u> | | | | |
|--|-------------------------------|------------------------------------|---------------------------|-------------------------------------|-----------------|
| | Nature is benevolent | Earth is an organism | Humans are part of nature | Will destroy environment | Earth is sacred |
| Earth is sacred | .350** | .523** | .341** | .381** | 1 |
| Will destroy environment if we keep living as we do | .281** | .414** | .472** | 1 | |
| Humans are part of nature, not its ruler. | .261** | .474** | 1 | | |
| The entire earth is a giant, living organism | .361** | 1 | | | |
| Nature is benevolent, if we live in harmony with it. | 1 | | | | |
| | | <u>Selected Spirituality Items</u> | | | |
| Item: | | Often feel presence of the divine | Rites and rituals | True source of healing is spiritual | |
| True source of healing is spiritual. | | .579** | .281** | 1 | |
| Rites and rituals can affect outcome of an illness. | | .248** | 1 | | |
| I often feel the presence of the divine in my life. | | 1 | | | |

** significant at .01 level, two-tailed

medicine and ayurveda ($r = .444, p < .01$). To explore any possible underlying dimensions tapped by the scale – and to reduce more than two dozen items to a more manageable number of components for subsequent analyses – a principal components analysis was performed on the 26 items.

The Kaiser-Meyer-Olkin measure of sampling adequacy is .923, a level that falls into what Kaiser (1974) called the marvelous range, indicating factor analysis is certainly appropriate. Bartlett's Test of Sphericity generates an approximate Chi-square of 8190.744 with 325 degrees of freedom indicating $p < .001$, leading, therefore, to rejection of the null hypothesis that all non-zero correlation coefficients are due to sampling error and reinforcing the conclusion that factor analysis is appropriate.

Principal components analysis with Varimax rotation in SPSS extracts five components that converge in seven iterations. Major factor loadings are presented in Table 16 (next page). Collectively, these components explain 53.154 percent of total variance.

The most striking feature of component one is the degree to which it is heavily loaded with items relating to spirituality and the transcendental. The item "I often feel the presence of the divine" has the heaviest factor loading (.770). It is followed closely by "the true source of healing is spiritual" (.752). Other items loading heavily on this factor are: appreciation of life force should be the foundation of medical practice (.556); world would be better if more people followed their heart (.521); earth is sacred (.509); and nothing stands alone, everything is interconnected (.490). This component accounts for approximately 13.46 percent of total variance.

Table 16

Major Factor-Loading Patterns for Principal Dimensions of Physician Worldview.

| | <u>Principal Dimensions (Components) of Worldview</u> | | | | |
|---|---|--------------|------------------|---------------------|-----------|
| | Spirituality | Deep Ecology | Medical Ontology | Critique of Science | Dx and Tx |
| Major Factors by Principal Components: | | | | | |
| <i>Spirituality, n = 887, percent of variance = 13.459 %</i> | | | | | |
| I often feel the presence of the divine in my own life. | .770 | | | | |
| True source of healing is spiritual. | .752 | | | | |
| Appreciation of the life force should be foundation of medical practice. | .556 | | | | |
| World would be better if people followed their heart . . . | .521 | | | | |
| Earth is sacred. | .509 | | | | |
| Nothing stands alone, everything is interconnected. | .490 | | | | |
| . . . traditional practices and intuition as effective as clinical trials . . . | .429 | | | | |
| The mind and body are one. | .329 | | | | |
| <i>Deep Ecology, n = 887, percent of variance = 12.963 %</i> | | | | | |
| Humans are part of nature, not its ruler. | | .780 | | | |
| We will destroy the earth if we keep living as we do. | | .726 | | | |
| The entire earth is a giant living organism. | | .650 | | | |
| Earth is sacred. | | .522 | | | |
| My religious beliefs are a blend of several denominations/faiths . . . | | .474 | | | |
| Reality is too complex to be explained by any single theory or idea. | | .446 | | | |
| Nature is benevolent if we learn to live in harmony with it. | | .433 | | | |

Table 16 – continued

Major Factor Loading Patterns for Principal Dimensions of Physician Worldview.

| | Principal Dimensions (Components) of Worldview | | | | |
|--|--|--------------|------------------|---------------------|-----------|
| | Spirituality | Deep Ecology | Medical Ontology | Critique of Science | Dx and Tx |
| Major Factors by Principal Components: | | | | | |
| <i>Medical Ontology, n = 887, percent of variance = 12.863 %</i> | | | | | |
| Modern biomedicine offers a complete approach to medical care. | | | .679 | | |
| Treatments not based on modern scientific studies are useless. | | | .669 | | |
| Scientific method is the best path to knowledge. | | | .587 | | |
| Healing properties of energy fields are more pseudoscience than medicine. | | | .540 | | |
| Rites and rituals can affect the outcome of an illness. | | | .524 | | |
| The root cause of disease is organic. | | | .515 | | |
| Reason is a much better guide to the world than emotion. | | | .495 | | |
| Modern biomedicine could benefit from oriental medicine . . . | | | .463 | | |
| . . . traditional practices and intuition as effective as clinical trials . . . | | | .408 | | |
| <i>Critique of Science, n = 887, percent of variance = 7.472 %</i> | | | | | |
| Science less influenced by money and power than other fields. | | | | .756 | |
| Science used to pursue money and power. | | | | .722 | |
| . . . traditional practices and intuition as effective as clinical trials . . . | | | | .415 | |
| <i>Nature of Diagnosis and Treatment, n = 887, percent of variance = 6.398 %</i> | | | | | |
| Universal cures for universal diseases. | | | | | .851 |
| Diagnosis and treatment is patient specific. | | | | | .841 |

The second component is heavily loaded with items related to ecology. The item with the heaviest loading is “humans are part of nature, not its ruler” (.780); the second heaviest loading item is “we will destroy the environment if we keep living as we do” (.726). But it is the next tier of factor loadings that give this component its complexity, that show it is mapping something deeper than a “green is nice” environmentalism. These items are: the entire earth is a giant, living organism (.650); earth is sacred (.522); and nature is benevolent, if we learn to live in harmony with it (.433). The gestalt of this component seems to reveal an outlook more akin to deep ecology, a view of nature consistent with a more Dionysian outlook. This component accounts for approximately 12.96 percent of the total variance.

The third component loads most heavily on the items “modern biomedicine offers a complete approach to medical care” (.679) and “treatments not based upon scientific studies are useless” (.669). The third heaviest loading item is “the scientific method is the best path to knowledge” (.587); the fourth is “the healing properties of energy fields are more pseudoscience than medicine” (.540). Clearly, this component taps into sentiments about the role of science in medicine. However, there is more at work here than a simple exaltation of science. This component strikes at what might be called medical ontology, the very nature of the foundations of medicine. Consider that the idea that rites and rituals can affect the outcome of an illness also loads fairly heavily on this component (.524) as does the item “modern biomedicine could benefit from an infusion of wisdom from oriental medicine” (.463). What is being measured, it seems, is less one’s enchantment with science than one’s belief about the very foundations of medicine and medical knowledge. This component accounts for 12.86 percent of total variance.

The items loading most heavily on the fourth component are “science is less influenced by money and power than other fields” (.756) and “science is used to pursue money and power more often than it is used to advance the human condition” (.722). The third heaviest loading item in this component is the idea that traditional practices and intuition are as effective as clinical trials (.415). This fourth component represents a critique of science – i.e., a reflection upon the role and value of science rather than a criticism of it *per se*. It accounts for about 7.47 percent of total variance.

The fifth component represents ideas about the nature of diagnosis and treatment. The item that loads most heavily on it is “when it comes to diagnosis and treatment, there are universal cures for universal diseases” (.851). This item is followed closely by “there are not universal cures for universal diseases because diagnosis and treatment is patient specific . . .” (.841). This component accounts for approximately 6.4 percent of the total variance.

As can be seen from the factor loadings of items in Table 16, the rotated matrix achieves a simple structure. One exception is “the earth is sacred” which loads almost evenly on the spirituality (.509) and deep ecology (.522) components, a loading that makes perfect sense given the meaning of the item and context of the two components. Another exception is the item regarding traditional practices and intuition being as effective as clinical trials. This item loads fairly evenly across three components – spirituality (.429), medical ontology (.408), and critique of science (.415). Again, given the nature of the item, this makes sense, adding richness of context to each component.

Testing the Utility of the Components – Discriminant Function Analysis

An examination of residuals computed between observed and reproduced correlations shows there are 115 (35 percent) non-redundant residuals with absolute values greater than .05, indicating the principal components model is a good solution. However, given the exploratory nature of the research, it seems advisable to further examine the utility of these five components. Therefore, factor scores from each of the components were used as independent variables in a discriminate function analysis with cluster membership as the dependent variable. This, in effect, tests the power of the components to predict membership in the two groups identified by the cluster analysis. If the principal components analysis is a good solution, the five components should effectively discriminate between members in the two groups thus confirming their utility as a substitute for the 26 items in subsequent regression analyses.

Pertinent results from this analysis are presented in Table 17. For the naturopathic cluster (cluster one), the mean discriminant score generated by the discriminant function is 1.381; for the predominantly allopathic group (cluster two), it is -1.103. These centroids can be thought of as focal points around which scores for each cluster revolve like solar systems in Cartesian space. Considerable distance separates these centroids. The fact that one is located in positive quadrant and the other in a negative indicates the function does a good job of “pushing” them apart. Furthermore, the function has a canonical correlation of .764, indicating a strong, positive and direct correlation between the discriminant scores and the groups.

Table 17

Results for Discriminant Analysis of Clusters One and Two

| Components: | Canonical Coefficients |
|---|------------------------|
| Component 1 – Spirituality | .801 |
| Component 2 – Deep Ecology | .603 |
| Component 3 – Nature of Medicine | 1.006 |
| Component 4 – Critique of Science | .532 |
| Component 5 – Diagnosis and Treatment (Constant) | .322 .003 |
| Group Centroids: | Values |
| Cluster 1 | 1.381 |
| Cluster 2 | – 1.013 |
| Canonical Correlation | .764 |
| Wilks' Lambda | .416 |
| Chi-Square | 772.452 |
| <i>p</i> | .000 |
| <i>n</i> | 886 |

The Wilks' lambda value (.416) shows that almost 60 percent of the variance can be explained by differences among the groups, a sign that the function does a good job of separating cases into groups. The chi-square value of 772.452, which is significant at the .001 level, shows the function does better than chance at assigning cases into groups. Finally, the function correctly classifies 88.1 percent of cross-validated, grouped cases.

Collectively, this information strongly supports the efficacy of the principal components analysis and suggests the components can serve as a good proxy in subsequent multiple regressions for the 26-items identified in the two-step cluster analysis.

Independent Samples T-test

Having identified 26 items that divide respondents into two clusters (one overwhelmingly comprised of naturopaths and the other of allopaths), distilled these items into five principal components, and established that these components are effective proxies for the 26 items, a critical issue still remains. Is there a fundamental difference between allopathic and naturopathic respondents along each principal component? And based on these measures, do allopathic physicians express a more Apollonian worldview and naturopathic physicians a more Dionysian?

An equality of means test for each component, performed as a preliminary to the discriminant function analysis, showed there was a statistical difference in average scores for every component between *clusters*. Yet, while the two clusters are predominantly comprised of one category of physician or the other, they are not exclusively so constituted. Consequently, mean component scores are examined by physician type as are mean scores on the Cultural Worldview Index (CWI), a variable created by summing factor scores for each of the five principal components. (Lower CWI scores indicate a more Apollonian perspective; higher scores a more Dionysian.)

This examination reveals considerable differences between allopaths and naturopaths for both mean component scores and mean CWI scores. The question is whether these differences rise to the level of statistical significance. An independent samples t-test for equality of means indicates this, indeed, is the case. As can be seen in Table 18 (next page), differences in mean scores for both principal components and CWI are statistically significant. Allopaths do express more Apollonian views; naturopaths, more Dionysian.

Table 18

Differences for Principal Components of Worldview and Cultural Worldview Index

| <u>Component</u> | | Allopaths (n = 515) | Naturopaths (n = 371) | Significance (two-tailed) |
|-------------------------|-----------|------------------------|--------------------------|------------------------------|
| Spirituality | Mean | -.3054 | .4214 | p < .001 |
| | Std. Dev. | 1.0322 | .7772 | |
| Deep Ecology | Mean | -.2135 | .2938 | p < .001 |
| | Std. Dev. | 1.1224 | .70143 | |
| Nature of Medicine | Mean | -.3694 | .51112 | p < .001 |
| | Std. Dev. | .9977 | .7477 | |
| Critique of Science | Mean | -.2177 | .3007 | p < .001 |
| | Std. Dev. | 1.0227 | .8856 | |
| Diagnosis and Treatment | Mean | -.0941 | .1284 | p < .001 |
| | Std. Dev. | 1.060 | .8959 | |
| <u>Index</u> | | | | |
| CWI | Mean | -1.2001 | 1.6556 | p < .01 |
| | Std. Dev. | 1.850 | 1.558 | |

The Influence of Worldview

What is the relationship between worldview and belief in the efficacy of complementary and alternative medicine (CAM)? What influence, if any, do these five principal components of worldview exert on allopathic and naturopathic physicians?

Regression Analyses

Efforts to answer these questions begin with a Pearson correlation examining Cultural Worldview Index (computed by summing factor scores) and CAM efficacy index. (This latter variable is computed by summing values measuring perceived efficacy for each of five major realms of CAM identified by the National Center for Complementary and Alternative Medicine – biologically-based practices, body-based therapies, energy medicine, mind-body therapies and whole medical systems.) Conducting this analysis on all respondents collectively indicates a strong ($r = .732$) and positive relationship between the variables. This correlation is significant at the .01 level and explains almost 54 percent of the variance.

Repeating this analysis for naturopathic and allopathic physicians respectively shows a positive, but weaker relationship ($r = .443$ for naturopaths and $r = .576$ for allopaths) between worldview and belief in the efficacy of complementary and alternative medical therapies. Again, both correlations are significant at the .01 level.

Clearly, there is a relationship here that bears more precise and in-depth examination. To that end, each of the five principal components are used as independent variables in a series of regression models in which perceived efficacy scores for each of

the five major realms of CAM are used as dependent variables. Years in medical practice, sex, and race are entered as controls. The results reveal a fascinating flux in which the influence of various components of worldview waxes and wanes – as does the total amount of variance explained.

Take, for example, the model regressing principal components and controls on efficacy scores for biologically-based practices. This realm of complementary and alternative medicine uses natural substances, including herbs and vitamins, to treat health problems. The base model with five principal components explains 49.5 percent of the variance among all respondents – a rather striking impact for worldview. (See Table 19 on next page.) The controls make a minimal contribution, with the full model only explaining an additional one percent of the variance; of the three controls, only years in practice makes a statistically significant contribution in the full model.

Standardized beta coefficients for the full model show that the nature of medicine has the greatest influence ($\beta = .392$) with spirituality making the second greatest contribution ($\beta = .386$). Critique of science is the third most influential variable in the full model ($\beta = .244$) followed closely by deep ecology ($\beta = .243$). Diagnosis and treatment makes a negligible contribution ($\beta = .083$). The first four components of worldview are statistically significant at the .001 level. The fifth component, diagnosis and treatment, is significant at the .01 level. Interestingly, years in practice has a small but negative impact on perceived efficacy of biologically-based practices. For every additional year in practice, perceived efficacy scores decrease by .096 ($p < .01$).

Table 19

Influence of Worldview on Perceived Efficacy Scores for Biologically-Based Therapies.

| | Model 1 | Model 2 | Model 3 | Model 4 |
|-------------------------------------|-----------|-----------|-----------|-----------|
| <i>Components of Worldview</i> | | | | |
| Component 1 – Spirituality | .410*** | .389*** | .384*** | .386*** |
| Component 2 – Deep Ecology | .272*** | .254*** | .245*** | .243*** |
| Component 3 – Nature of Medicine | .431*** | .403*** | .396*** | .392*** |
| Component 4 – Critique of Science | .253*** | .240*** | .240*** | .244*** |
| Component 5 – Diagnosis & Treatment | .081** | .083** | .082** | .083** |
| <i>Controls</i> | | | | |
| Years in Practice | ---- | -.106*** | -.091** | -.096** |
| Sex | ---- | ---- | .049 | .047 |
| Race | ---- | ---- | ---- | -.033 |
| Adjusted R-Square: | .495 | .504 | .508 | .509 |
| F | 158.29*** | 136.84*** | 118.05*** | 103.61*** |

*** p<.001; ** p<.01; * p<.05

Worldview and manipulative/body-based therapies. Years in practice also has a slightly negative effect ($\beta = -.079$, $p < .05$) on perceived efficacy scores for manipulative and body-based therapies (Table 20, next page). Spirituality, however, is the most influential variable in the full model ($\beta = .315$, $p < .001$). Nature of medicine is the second most influential variable ($\beta = .281$, $p < .001$); deep ecology is third ($\beta = .258$, $p < .001$). Critique of science ($\beta = .161$, $p < .001$) and diagnosis and treatment ($\beta = .118$, $p < .001$) make modest contributions to the model. Sex of the respondent also has a statistically significant effect ($p < .001$) with being female adding .153 to the total perceived efficacy score for manipulative and body-based therapies. The base model with the five principal components accounts for 37.3 percent of the variance in perceived efficacy scores among all respondents for this CAM domain, and the full model accounts for 40.5 percent of the variance.

Table 20

Influence of Worldview on Perceived Efficacy Scores for Manipulative/Body-Based Therapies.

| | Model 1 | Model 2 | Model 3 | Model 4 |
|-------------------------------------|----------|----------|----------|----------|
| <i>Components of Worldview</i> | | | | |
| Component 1 – Spirituality | .350*** | .326*** | .312*** | .315*** |
| Component 2 – Deep Ecology | .309*** | .288*** | .261*** | .258*** |
| Component 3 – Nature of Medicine | .341*** | .310*** | .286*** | .281*** |
| Component 4 – Critique of Science | .171*** | .157*** | .156*** | .161*** |
| Component 5 – Diagnosis & Treatment | .117*** | .119*** | .117*** | .118*** |
| <i>Controls</i> | | | | |
| Years in Practice | ---- | -.119*** | -.073* | -.079* |
| Sex | ---- | ---- | .156*** | .153*** |
| Race | ---- | ---- | ---- | -.046 |
| Adjusted R-Square: | .373 | .384 | .403 | .405 |
| F | 96.66*** | 84.68*** | 78.63*** | 69.29*** |

*** p<.001; ** p<.01; * p<.05

Worldview and mind-body therapies. Spirituality ($\beta = .427$, $p < .001$) is also the dominant influence in the full model for mind-body therapies, a CAM domain that includes yoga and prayer (Table 21). The nature of medicine ($\beta = .282$, $p < .001$) is the second most important variable in this model; deep ecology ($\beta = .184$, $p < .001$) is third. Critique of science ($\beta = .084$, $p < .01$) and diagnosis and treatment ($\beta = .06$) make minor contributions. Sex ($\beta = .096$, $p < .01$) makes a slight contribution to the full model, but neither years in practice nor race make statistically significant contributions.

Again, the five principal components account for the bulk of the explained variance with the base model explaining 36.3 percent of the variance, and the full model 37.5 percent.

Table 21

Influence of Worldview on Perceived Efficacy Scores for Mind-Body Therapies

| | Model 1 | Model 2 | Model 3 | Model 4 |
|-------------------------------------|----------|----------|----------|----------|
| <i>Components of Worldview</i> | | | | |
| Component 1 – Spirituality | .455*** | .438*** | .430*** | .427*** |
| Component 2 – Deep Ecology | .212*** | .198*** | .181*** | .184*** |
| Component 3 – Nature of Medicine | .312*** | .291*** | .277*** | .282*** |
| Component 4 – Critique of Science | .100*** | .090** | .089** | .084** |
| Component 5 – Diagnosis & Treatment | .086** | .087** | .086** | .086** |
| <i>Controls</i> | | | | |
| Years in Practice | ---- | -.083** | -.055 | -.050 |
| Sex | ---- | ---- | .093** | .096** |
| Race | ---- | ---- | ---- | .044 |
| Adjusted R-Square: | .363 | .368 | .374 | .375 |
| F | 92.49*** | 78.92*** | 69.60*** | 61.30*** |

*** $p < .001$; ** $p < .01$; * $p < .05$

Worldview and energy medicine. Spirituality ($\beta = .391$, $p < .001$) and nature of medicine ($\beta = .367$, $p < .001$) are major components in the full model for energy medicine efficacy scores (Table 22, next page). Deep ecology ($\beta = .189$, $p < .001$) is the third most influential variable in this model. Critique of science ($\beta = .167$, $p < .001$) and diagnosis and treatment ($\beta = .134$, $p < .001$) exert modest influence. Neither years in practice nor race make statistically significant contributions to the model. However, being female is associated with a .078 ($p < .05$) increase in perceived efficacy scores for energy medicine. The basic model accounts for 40.4 percent of the variance among all respondents; the full model only accounts for an additional .4 percent of variance of perceived efficacy scores for energy medicine.

Table 22

| <i>Influence of Worldview on Perceived Efficacy Scores for Energy Medicine</i> | | | | |
|--|-----------|----------|----------|----------|
| | Model 1 | Model 2 | Model 3 | Model 4 |
| <i>Components of Worldview</i> | | | | |
| Component 1 – Spirituality | .406*** | .399*** | .392*** | .391*** |
| Component 2 – Deep Ecology | .209*** | .202*** | .188*** | .189*** |
| Component 3 – Nature of Medicine | .388*** | .378*** | .366*** | .367*** |
| Component 4 – Critique of Science | .174*** | .169*** | .168*** | .167*** |
| Component 5 – Diagnosis & Treatment | .134*** | .135*** | .134*** | .134*** |
| <i>Controls</i> | | | | |
| Years in Practice | ---- | -.039 | -.016 | -.015 |
| Sex | ---- | ---- | .078* | .078* |
| Race | ---- | ---- | ---- | -.008 |
| Adjusted R-Square: | .404 | .404 | .409 | .408 |
| F | 109.97*** | 92.01*** | 80.35*** | 70.24*** |

*** p<.001; ** p<.01; * p<.05

Worldview and whole medical systems. The National Center for Complementary and Alternative Medicine (2008) defines complete whole medical systems as being “built upon complete systems of theory and practice”. This CAM domain includes naturopathic medicine, homeopathy, ayurveda, and traditional oriental medicine. Thus, scores of perceived efficacy for this area are more broadly and philosophically encompassing than those more closely tied to specific therapies. The perceived efficacy scores for whole medical systems reflect ideas about basic approaches to medicine. It is not surprising, therefore, that nature of medicine – a component emphasizing fundamental aspects of medicine – exercises more influence in this model ($\beta = .444$, $p < .001$) than in models exploring efficacy scores for other CAM domains (Table 23, next page).

Spirituality ($\beta = .424$, $p < .001$) also makes a strong contribution to this model.

Deep ecology ($\beta = .290$, $p < .001$) is the third most influential variable. Critique of science

($\beta = .267$, $p < .001$) makes a more substantial contribution to this model than it does to any of the models exploring efficacy scores for other areas of CAM. Diagnosis and treatment ($\beta = .122$, $p < .001$) makes a modest contribution. Years in practice has a negative impact with each additional year in practice being associated with a decline of .088 ($p < .001$) on scores of perceived efficacy for whole medical systems. Sex has a small, but statistically significant effect; being female is associated with a .061 increase in efficacy scores ($p < .05$) for whole medical systems. Race has no statistically significant impact.

Table 23

| <i>Influence of Worldview on Perceived Efficacy Scores for Whole Medical Systems</i> | | | | |
|--|---------|-----------|-----------|-----------|
| | Model 1 | Model 2 | Model 3 | Model 4 |
| <i>Components of Worldview</i> | | | | |
| Component 1 – Spirituality | .449*** | .428*** | .423*** | .424*** |
| Component 2 – Deep Ecology | .320*** | .302*** | .296*** | .290*** |
| Component 3 – Nature of Medicine | .483*** | .456*** | .450*** | .444*** |
| Component 4 – Critique of Science | .278*** | .266*** | .266*** | .267*** |
| Component 5 – Diagnosis & Treatment | .121*** | .123*** | .123*** | .122*** |
| <i>Controls</i> | | | | |
| Years in Practice | ---- | -.104*** | -.085*** | -.088*** |
| Sex | ---- | ---- | .062* | .061* |
| Race | ---- | ---- | ---- | -.01 |
| Adjusted R-Square: | .629 | .635 | .638 | .638 |
| F | 28.57** | 232.48*** | 201.72*** | 176.49*** |

*** $p < .001$; ** $p < .01$; * $p < .05$

The five components explain a remarkable 62.7 percent of the variance among all respondents on scores of perceived efficacy for whole medical systems. When controls are added, the adjusted r-square increases to .638. In the social sciences, explained variance levels of this magnitude almost reflexively trigger concerns about collinearity or other anomalies. Yet, collinearity diagnostics reveal no troubling entanglements among

the variables. As can be seen in Table 24, standard errors for the coefficients in the model are not large. The lowest tolerance value (.766 for years in practice) is well above zero; variance inflation factors range in the full model from 1.00 to 1.306 – well within the safe range (Norusis 2003). The largest condition index value is 4.801, far below the threshold of 15 set by Belsley, Kuh and Welsch (1980) as a flag for potential problems.

Table 24

No Troubling Entanglements: Collinearity Diagnostics for Regression Analysis of Perceived Efficacy Scores for Whole Medical Systems.

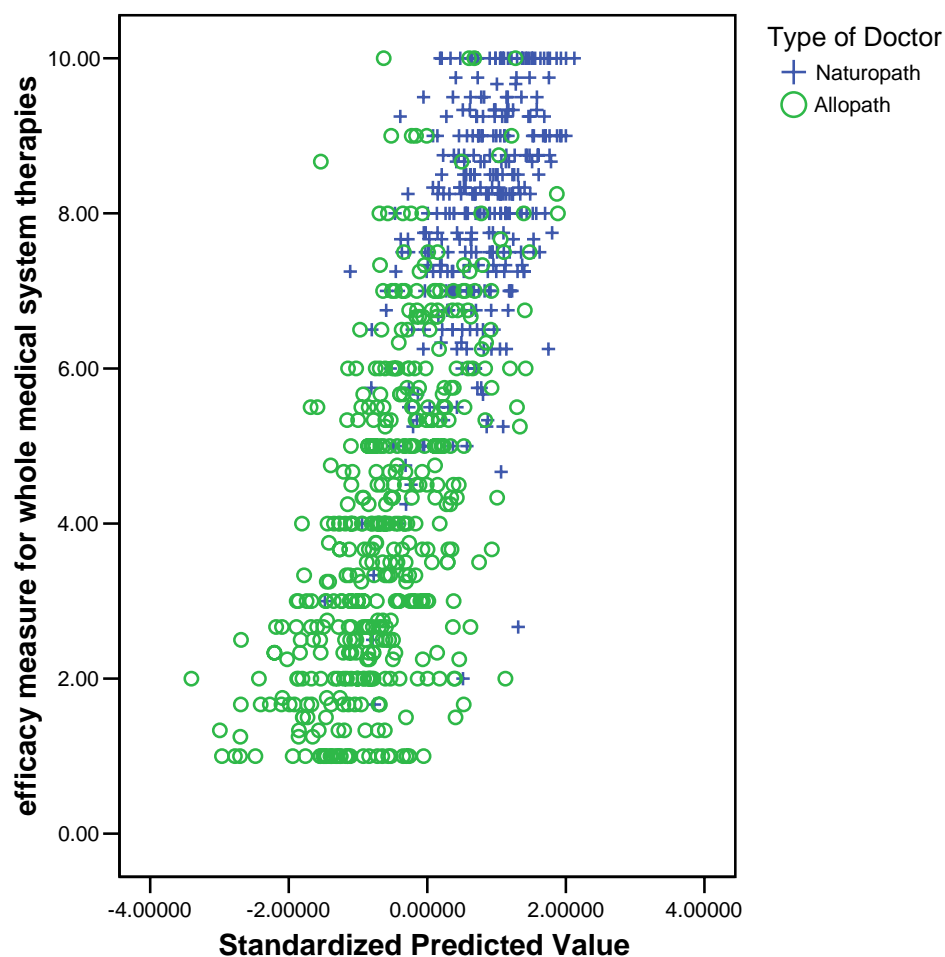
| | <u>Unstandardized Coefficients</u> | | <u>Collinearity Statistics</u> | |
|--|------------------------------------|-------------------|--------------------------------|------------------------|
| | B | Std. Error | Tolerance | VIF |
| (Constant) | 5.923 | .137 | | |
| Component 1 – Spirituality | 1.130 | .059 | .943 | 1.060 |
| Component 2 – Deep Ecology | .775 | .059 | .929 | 1.076 |
| Component 3 – Nature of Medicine | 1.186 | .060 | .892 | 1.121 |
| Component 4 – Critique of Science | .713 | .058 | .969 | 1.032 |
| Component 5 – Diagnosis & Treatment | .326 | .057 | 1.00 | 1.00 |
| Years in Practice | -.020 | .005 | .766 | 1.306 |
| Sex | .327 | .128 | .797 | 1.255 |
| Race | -.039 | .050 | .955 | 1.047 |
| Dimension: | | <u>Eigenvalue</u> | | <u>Condition Index</u> |
| 1 | | 2.458 | | 1.000 |
| 2 | | 1.208 | | 1.427 |
| 3 | | 1.092 | | 1.500 |
| 4 | | 1.000 | | 1.568 |
| 5 | | 1.000 | | 1.568 |
| 6 | | 1.000 | | 1.568 |
| 7 | | .713 | | 1.857 |
| 8 | | .423 | | 2.411 |
| 9 | | .107 | | 4.801 |

Finally, a histogram of regression standardized residuals, a normal p-plot of regression standardized residuals, and a scatterplot of regression studentized deleted residuals by regression standardized predicted values indicate no collinearity issues. However, a scatterplot of efficacy measures for whole medical systems by standardized predicted values (Figure 4, next page) provides a clue that solves the mystery of explained variance.

The data points actually tend to fall into two clusters arrayed along the regression line. At the lower end is a cloud of data points comprised almost entirely of allopathic respondents; these data points cluster around a mean standardized predicted value of $-.5987$. At the upper end is another cloud of data points comprised almost entirely of naturopathic respondents with a mean predicted value of $.7538$. Thus, a regression line bisecting the data points has a distinctly steep slope. The regression equation does explain a large percentage of the variance of scores of perceived efficacy for whole medical systems among all respondents *collectively*. However, in regression analyses, just as with the descriptive findings, focusing on all respondents collectively tends to obscure important differences between the two types of physicians.

Figure 4.

Plot of Efficacy Scores for Whole Medical Systems by Standardized Predicted Values



Regression Analyses by Physician Type

These differences are readily apparent, for example, in regression analysis of efficacy scores for whole medical systems by physician type. While the full regression model accounts for almost 64 percent of the variance among the respondents collectively, it accounts for 29.8 percent of the variance among naturopaths and 38.1 percent of the variance among allopathic physicians. As can be seen in Table 25, spirituality ($\beta = .391$, $p < .001$) is the most influential variable in the full model for naturopaths with nature of

medicine ($\beta = .329$, $p < .001$) the second most influential. These variables exert greater influence in the model for allopathic physicians, but the order is reversed with nature of medicine ($\beta = .443$, $p < .001$) the most influential variable and spirituality ($\beta = .425$, $p < .001$) the second most influential. Sex is statistically significant in the full model for naturopaths; being female is associated with a .176 increase in efficacy scores ($p < .001$). Neither years in practice nor race is significant for naturopaths. None of the controls are statistically significant in the full model for allopaths.

Table 25

Comparison of the Influence of Worldview on Perceived Efficacy Scores for Whole Medical Systems among Allopathic and Naturopathic Physicians

| | <u>Allopaths</u> | <u>Naturopaths</u> |
|-------------------------------------|------------------|--------------------|
| <i>Components of Worldview</i> | | |
| Component 1 – Spirituality | .425*** | .391*** |
| Component 2 – Deep Ecology | .346*** | .227*** |
| Component 3 – Nature of Medicine | .443*** | .329*** |
| Component 4 – Critique of Science | .258*** | .203*** |
| Component 5 – Diagnosis & Treatment | .123** | .134** |
| <i>Controls</i> | | |
| Years in Practice | -.055 | .016 |
| Sex | -.031 | .176*** |
| Race | .066 | -.016 |
| Adjusted R-Square: | .381 | .298 |
| F | 34.17*** | 19.50*** |

*** $p < .001$; ** $p < .01$; * $p < .05$

Worldview and biologically-based practices by physician type. Only three of the principal components – deep ecology ($\beta = .252$, $p < .001$), spirituality ($\beta = .157$, $p < .01$), and nature of medicine ($\beta = .124$, $p < .05$) – make statistically significant contributions to the regression model for efficacy scores of biologically-based practices among naturopathic physicians. (See Table 26, next page.) None of the control variables make a

statistically significant contribution. The full model accounts for 10.1 percent of variance among naturopaths. The pattern of influence is slightly more complicated among allopathic physicians with four of the components contributing to the model. Deep ecology ($\beta = .201, p < .001$), the most influential variable in the model for naturopaths, is the least influential in the model for allopaths. Spirituality ($\beta = .375, p < .001, p < .001$) is the most influential variable in this model; nature of medicine ($\beta = .347, p < .001$) is second. Critique of science ($\beta = .208, p < .001$) is the third most influential variable in the model. None of the controls make statistically significant contributions. The model explains 22.4 percent of the variance in efficacy scores for biologically-based practices among the allopathic physicians.

Table 26

Comparison of the Influence of Worldview on Perceived Efficacy Scores for Biologically-Based Practices among Allopathic and Naturopathic Physicians

| | <u>Allopaths</u> | <u>Naturopaths</u> |
|-------------------------------------|------------------|--------------------|
| <i>Components of Worldview</i> | | |
| Component 1 – Spirituality | .375*** | .157** |
| Component 2 – Deep Ecology | .201*** | .252*** |
| Component 3 – Nature of Medicine | .347*** | .124* |
| Component 4 – Critique of Science | .208*** | .03 |
| Component 5 – Diagnosis & Treatment | .071 | -.015 |
| <i>Controls</i> | | |
| Years in Practice | .006 | -.047 |
| Sex | .028 | .106 |
| Race | .063 | -.031 |
| Adjusted R-Square: | .224 | .101 |
| F | 16.76*** | 5.87*** |

*** $p < .001$; ** $p < .01$; * $p < .05$

Worldview and manipulative/ body-based therapies by physician type. As can be seen in Table 27 (next page), the full regression model accounts for slightly more than twice as much variance in efficacy scores for body-based therapies among allopathic (25.3 percent) compared to naturopathic physicians (12 percent).

Among allopathic physicians, all five principal components are statistically significant. Spirituality ($\beta = .305$, $p < .001$) and deep ecology ($\beta = .304$, $p < .001$) are the most influential components in the model among allopaths; nature of medicine ($\beta = .271$, $p < .001$) is third. Critique of science ($\beta = .169$, $p < .001$) is the fourth most influential variable. Diagnosis and treatment ($\beta = .148$, $p < .001$) is the least influential component in the model among allopaths. Sex is the only control variable that makes a statistically significant contribution to the model. Being female is associated with a .175 increase in efficacy scores for body-based therapies ($p < .001$).

Three principal components – spirituality, deep ecology and nature of medicine – exercise statistically significant influence in the model for body-based therapies among naturopathic physicians. Spirituality ($\beta = .227$, $p < .001$) is the most influential component for naturopaths. The nature of medicine is the second most influential ($\beta = .122$, $p < .05$); Deep ecology ($\beta = .109$, $p < .05$) is the third most influential component among naturopaths. Diagnosis and treatment ($\beta = .101$) is marginally significant at the .051 level. Sex is the only statistically significant control variable ($p < .001$); being a female naturopath is associated with a .204 increase in efficacy scores for body-based therapies.

Table 27

*Comparison of the Influence of Worldview on Perceived Efficacy Scores
for Manipulative/Body-Based Practices among Allopathic and Naturopathic Physicians*

| | <u>Allopaths</u> | <u>Naturopaths</u> |
|-------------------------------------|------------------|--------------------|
| <i>Components of Worldview</i> | | |
| Component 1 – Spirituality | .305*** | .227*** |
| Component 2 – Deep Ecology | .304*** | .109* |
| Component 3 – Nature of Medicine | .271*** | .122* |
| Component 4 – Critique of Science | .169*** | .039 |
| Component 5 – Diagnosis & Treatment | .148*** | .101 |
| <i>Controls</i> | | |
| Years in Practice | -.077 | .015 |
| Sex | .175*** | .204*** |
| Race | -.074 | .045 |
| Adjusted R-Square: | .253 | .120 |
| F | 20.19*** | 6.93*** |

*** $p < .001$; ** $p < .01$; * $p < .05$

Worldview and energy medicine by physician type. Interestingly, energy medicine is the only domain of complementary medicine for which the model explains more variance in efficacy scores among naturopaths (24.9 percent) than allopaths (17.5 percent). (Table 28, next page.) Spirituality ($\beta = .439$, $p < .001$) is by far the most influential variable in the full model among naturopaths. The nature of medicine ($\beta = .252$, $p < .001$) is the second most influential; although diagnosis and treatment ($\beta = .094$, $p < .05$) is the least influential of the five principal components in the model. Sex is the only statistically significant control variable among naturopaths; being female is associated with a .153 increase in efficacy scores for energy medicine ($p < .01$). Among allopathic physicians, nature of medicine ($\beta = .353$, $p < .001$) is the most influential variable; spirituality ($\beta = .317$, $p < .001$) is second. Again, just as it is for naturopaths, diagnosis and treatment ($\beta = .130$, $p < .01$) is the least influential of the five principal

components. None of the control variables are statistically significant in the model for efficacy scores for energy medicine among allopathic respondents.

Table 28

Comparison of the Influence of Worldview on Perceived Efficacy Scores for Energy Medicine among Allopathic and Naturopathic Physicians

| | <u>Allopaths</u> | <u>Naturopaths</u> |
|-------------------------------------|------------------|--------------------|
| <i>Components of Worldview</i> | | |
| Component 1 – Spirituality | .317*** | .439*** |
| Component 2 – Deep Ecology | .195*** | .109* |
| Component 3 – Nature of Medicine | .353*** | .252*** |
| Component 4 – Critique of Science | .147** | .154** |
| Component 5 – Diagnosis & Treatment | .130** | .094* |
| <i>Controls</i> | | |
| Years in Practice | .051 | -.013 |
| Sex | .022 | .153** |
| Race | .038 | .039 |
| Adjusted R-Square: | .175 | .249 |
| F | 13.01*** | 15.57*** |

*** $p < .001$; ** $p < .01$; * $p < .05$

Worldview and mind-body therapies by physician type. Spirituality ($\beta = .459$, $p < .001$) is the most influential of the principal components among allopaths in the model examining efficacy scores for mind-body therapies (Table 29, next page). The nature of medicine ($\beta = .316$, $p < .001$) is second, and deep ecology ($\beta = .249$, $p < .001$) is third. Sex is the only statistically significant control variable in this model. Being a female allopathic practitioner is associated with a .096 increase in efficacy scores for mind-body therapies ($p < .05$). The model accounts for 29.7 percent of the variance in efficacy scores for mind-body therapies among allopaths. Spirituality ($\beta = .427$, $p < .001$) also plays a major role among naturopathic physicians in this model. The nature of medicine ($\beta =$

.246, $p < .001$) is the second most influential variable, and deep ecology ($\beta = .099$, $p < .05$) is third. Neither of the other two principal components is statistically significant in this model among naturopaths. Sex is the only significant control variable. Being female is associated with a .124 increase in efficacy scores for mind-body therapies among naturopathic physicians ($p < .05$).

Table 29

Comparison of the Influence of Worldview on Perceived Efficacy Scores for Mind-Body Therapies among Allopathic and Naturopathic Physicians

| | <u>Allopaths</u> | <u>Naturopaths</u> |
|-------------------------------------|------------------|--------------------|
| <i>Components of Worldview</i> | | |
| Component 1 – Spirituality | .459*** | .427*** |
| Component 2 – Deep Ecology | .249*** | .099* |
| Component 3 – Nature of Medicine | .316*** | .246*** |
| Component 4 – Critique of Science | .112** | .070 |
| Component 5 – Diagnosis & Treatment | .122** | .066 |
| <i>Controls</i> | | |
| Years in Practice | -.064 | -.021 |
| Sex | .096 | .125* |
| Race | .054 | .034 |
| Adjusted R-Square: | .297 | .226 |
| F | 25.03*** | 13.74*** |

*** $p < .001$; ** $p < .01$; * $p < .05$

Worldview and personal CAM use by physician type. The majority of respondents report using a CAM therapy. Of the 949 respondents whose physician category was known, 736 (77.55 %) indicated they had personally used at least one type of CAM therapy while 213 (22.44 %) indicated they had not. Interestingly, approximately 95 percent (202) of the respondents who said they had never personally used a CAM therapy were allopathic physicians. Pearson Chi-square with continuity

correction indicates a statistically significant, but moderate correlation between type of doctor and this dichotomous measure of CAM use (Chi-square = 151.356, $p < .001$, $\Phi = -.402$) with allopaths less likely to have used CAM.

Respondents, of course, were given an option on the questionnaire of listing up to three CAM therapies they had personally used. Examining these responses further illuminates the relationship between CAM use and physician type. Almost 92 percent (91.73 %) of all naturopathic physicians indicated they had personally used at least three different CAM therapies. Only about 29 percent (28.90 %) of allopathic respondents indicated they had used this many CAM therapies. Pearson Chi-square indicates a statistically significant and noticeably more robust association between doctor type and the total number of CAM therapies used (Chi-square = 370.416, $p < .001$, and $\Phi = .625$).

What influence does worldview have on this relationship? Overall, the Pearson correlation between Cultural Worldview Index and the total number of CAM therapies used is .537 ($p < .01$, two-tailed) for all respondents. But a much more complicated picture emerges when the data is analyzed by physician type. The Pearson correlation drops to .085 among naturopaths and this relationship is not statistically significant. Among allopathic respondents the Pearson correlation between Cultural Worldview Index and total number of CAM therapies used is .346, and the relationship is statistically significant at the .01 level (two-tailed).

To highlight the tangled threads of this relationship, the same regression models used to study the relationship between worldview and perceived efficacy of various CAM domains are applied this problem. The five principal components of worldview are used

as independent variables; total CAM use is the dependent variable. Years in practice, sex and race are used as controls. The data is analyzed by physician type.

Looking first at the relationship among naturopaths, none of the principal components are statistically significant in the full model. One control variable – years in practice ($\beta = -.153$, $p < .01$) – makes a statistically significant contribution to the model. (See Table 30).

Among allopaths, all five principal components make statistically significant contributions to the model. Spirituality ($\beta = .290$, $p < .001$) is the most influential variable in the model; nature of medicine is the second most influential ($\beta = .273$, $p < .001$). Sex is the only significant control variable; females use slightly more CAM therapies ($\beta = .161$, $p < .01$). The full model explains 16.5 percent of the variation in total CAM use among allopathic physicians.

Table 30

Comparison of the Influence of Worldview on Total CAM Use by Allopathic and Naturopathic Physicians

| | <u>Allopaths</u> | <u>Naturopaths</u> |
|-------------------------------------|------------------|--------------------|
| <i>Components of Worldview</i> | | |
| Component 1 – Spirituality | .290*** | .069 |
| Component 2 – Deep Ecology | .149** | .018 |
| Component 3 – Nature of Medicine | .273*** | .071 |
| Component 4 – Critique of Science | .172*** | .004 |
| Component 5 – Diagnosis & Treatment | .126** | .043 |
| <i>Controls</i> | | |
| Years in Practice | .014 | -.153** |
| Sex | .161** | .009 |
| Race | -.060 | .035 |
| Adjusted R-Square: | .165 | .017 |
| F | 12.18*** | 1.74 |

*** $p < .001$; ** $p < .01$; * $p < .05$

Summary of Quantitative Analysis

Two-step cluster analysis shows 26 attitudinal items on the Worldview Survey for Physicians neatly separate respondents into two distinct clusters. Ninety-five percent of members in one of these clusters are naturopathic physicians; 95 percent of the members in the other are allopathic physicians. A principal components analysis of these items reveals five components. Based upon the items on which they most heavily load, these components are identified as – spirituality, deep ecology, nature of medicine, critique of science, and diagnosis and treatment of disease. Discriminant function analysis confirms these components are effective substitutes for the 26 items. And t-tests verify there is a statistically significant difference in mean scores for each of these components between allopathic and naturopathic physicians.

Regression analyses reveal these components exercise a fascinating pattern of influence upon perceived efficacy of various CAM domains, a kaleidoscopic pattern in which different components loom larger than others as you turn from one domain and practice type to another. They also hint at an intriguing relationship between worldview and personal use of CAM therapies.

CHAPTER 6 INTERPRETATION OF QUANTITATIVE RESULTS

As every social scientist knows, the study of social systems presents its own unique set of problems. Even the tools of the trade can be problematic, for there are no laboratories equipped with specially calibrated beakers for precisely measuring social capital before adding it to a bubbling cauldron of anomie to observe the resultant reaction. What is more, the relationship between variables of interest in sociology is likely to be one of interdependence with variables acting upon each other, rather than the traditional model of exogenous and endogenous factors.

There are paths out of the morass, however. Max Weber blazed one with the use of ideal types as hypothetical exemplars against which social phenomena can be analyzed. Drawing upon everything from Eastern mysticism to East Elbian demographic data, his work is an intellectual *tour de force*. Ironically, working almost a century before the invention of the micro-chip, the technique he pioneered is tailor-made for personal computers running factor and cluster analysis software.

Certainly this study follows Weber's methodological path to *verstehen*. It begins with a presupposition that there are two fundamentally different ways of seeing – and being in – the world. These worldviews are then described as ideal types; that is as hypothetical exemplars, abstractions, against which the real world can be analyzed. The traits of these ideal-typical Apollonian and Dionysian worldviews inform the construction of 60 Likert-scale attitudinal items on the Physician Worldview Survey, each of which is rooted in literature and theory. This furnishes the data from which the desktop technology

unavailable to Max Weber works its magic. And while it may not be a specially calibrated beaker, this technology does offer an intriguing degree of precision when analyzing and measuring the influence of ideal types.

A Pattern of Difference

A steady stream of information flows from respondents into the data and through the analyses of this study, gradually revealing and highlighting a pattern of differences between naturopathic and allopathic physicians.

Raw survey results, for example, show differences about even some of the most basic aspects of medicine. Consider ideas about what constitutes good health.

Naturopaths show a greater affinity for descriptions of health that resonate with an appreciation of vitalism, a concept that historically has been important to naturopathy. Almost 70 percent of naturopaths – compared to 36.5 percent of allopaths – indicate they strongly agree health is an optimum state of being. This is an understanding of health as something much more than an absence of dis-ease. Indeed, naturopaths are more likely than allopaths (44.9% to 33.3%) to strongly agree that good health is a goal to be pursued, not something that simply happens.

Beyond these ideas about what constitutes good health, differences are also manifest in attitudes about other fundamental aspects of medicine such as therapeutic intervention and the causes of disease. Naturopaths are more likely to believe that like cures like, that an appreciation of the life force should be the foundation of medical practice, and that diagnosis and treatment are patient specific. Allopathic respondents are twice as likely as naturopaths to strongly agree the root cause of disease is organic;

conversely, naturopaths are almost twice as likely as allopaths to strongly agree that the root cause of disease is psycho-social.

It's the Pattern that Counts

There is nothing earth shattering, of course, in the fact that naturopaths and allopaths might hold differences of opinion about various aspects of medicine. Such differences of opinion abound even among the ranks of allopathic practitioners; anyone who has ever worked in a hospital has a repository of anecdotes reflecting differences between hard-driving surgeons and more contemplative specialists. However, in this study it is the *pattern* of differences – across basic aspects of medical practice and across items probing ecological, spiritual, philosophical and metaphysical issues – that counts.

This pattern of differences, which repeatedly emerges from the data, conforms to the predicted ideal typology. Attitudinal items on the questionnaire are crafted and coded in such a way that higher scores indicate a more Dionysian outlook, lower scores an Apollonian viewpoint. Time and again, allopathic physicians answer survey questions in ways that reflect an Apollonian penchant for reason, certainty, order and control over nature. Naturopathic physicians respond in a more Dionysian fashion that signals a celebration of the natural order as well as a comfort with intuition, ambiguity, and paradox. And as a t-test for equality of means (Table 8) demonstrates, there is a statistically significant difference between physician groups in average scores for questionnaire items as a whole and across each dimension probed.

Again, this pattern of differences emerges from the two-step cluster analysis. This statistical technique identifies 26 items that neatly divide survey respondents into two clusters, one overwhelmingly (95.1 percent) comprised of naturopaths and the other overwhelmingly (95.7 percent) comprised of allopaths. Average scores for each of these items reflect a more Dionysian orientation among the naturopathic cluster and a more Apollonian orientation among the allopathic cluster. However, this analysis also ranks the importance of each item to cluster membership. By comparing the relative importance of these items across clusters, one can develop a more nuanced understanding of differences between the clusters, adding color and texture to the by-now familiar pattern.

For example, the most important item for the naturopathic cluster is the statement that an appreciation and understanding of the life force should be the foundation of medical practice. After all, *vis medicatrix naturae* – the belief that the “human body possesses the inherent ability to restore health” and the physician’s role is simply to facilitate this process – is a central tenet of naturopathy (Southwest College of Naturopathic Medicine 2008). This belief in the restorative and recuperative power in nature, this conviction that the natural world is benevolent and beneficent, is definitely Dionysian. By way of contrast, the most important item for the allopathic cluster is the statement declaring healing properties of energetic fields to be more pseudoscience than medicine. This statement is an Apollonian assertion, a reaffirmation of certitude in a conventional approach to medicine rooted in Newtonian science. It is more concerned with the known and predictable than with a chimera such as auric therapy arising from the shadows of uncertainty that lie at the heart of quantum physics.

The second most important item for the naturopathic cluster is the statement that treatments not based on the scientific method are useless. This item is reverse coded, so higher average scores on the part of naturopaths actually indicate greater disagreement with the statement. This item ranks sixth in importance for the allopathic cluster, a sign that disagreement with this statement is more important for the naturopathic cluster than agreement is for the allopaths.

And so it goes across all 26 items with each adding depth and nuance to what might otherwise be a flat, dichotomous analysis. Not only do centroid scores follow the predicted Apollonian or Dionysian tendencies, rankings of importance indicate how each individual piece of tile fits into a larger mosaic. The overall pattern fits the familiar form, but the resulting images offer a subtlety of insight. Even items upon which attitudes seem relatively close sometimes turn out to have starkly different levels of importance in separating the two clusters. Take the statement that we will destroy the earth if we keep living as we do. The average score for this statement among the naturopathic cluster is 6.49; among the allopathic cluster it is 5.73. Yet, this item is nineteenth in importance among naturopaths and twenty-fourth among allopaths. As with any mosaic, it is not simply the intensity of color but where the tile is placed that makes the design.

In this analysis, juxtaposition of items between clusters based upon importance reveals as much as the positioning of responses on the Apollonian-Dionysian continuum. For example, by-variable importance shows sharp differences between the two clusters for some items reflecting ideas about ecology. Not only do naturopaths express more strongly Dionysian sentiments about the statement that the earth is a giant living organism, it ranks sixth in importance in the naturopathic cluster compared to twelfth in

the allopathic. Similar differences of importance can be found for items concerning spirituality, science, and the role of reason.

This two-step cluster technique moves the broader analysis of Apollonian-Dionysian ideal types beyond the realm of on-the-one hand and on-the-other hand comparisons to a more robust exploration of worldview as expressed through responses to the survey items. Given a Cronbach's alpha of .907 and Guttman Split-Half coefficient of .848, the 26 items identified by the two-step cluster analysis show strong internal consistency. These items, I would argue, are indeed measuring worldview across the questions posed and measuring it consistently. However, the number of items identified by cluster analysis is too unwieldy for use in subsequent regression analyses to measure the influence of worldview. To solve this dilemma, I turned to principle components analysis because it offers the dual benefits of reducing the 26 items to a more manageable number of components while also shedding light on what might be called the infrastructure (or underlying structural dimensions) of physician worldview as expressed through this scale.

Connecting the Dots: The Components of Worldview

Statistics is a metaphor, and the principle components analysis uses this metaphorical tool to connect very real data points. If we think of worldview as a pointillist painting, two-step cluster analysis pulls us toward the work until we can clearly identify the colors used and the relative placement of the dots that constitute the image. Principle components analysis shifts the analytical perspective, moving us back across the gallery so that we see the work full frame. From this vantage point, carefully

juxtaposed bits of color seem to blend into a smoother, sharper image. Individual data points meld into more meaningful representations of their underlying structure.

In this study, the data points generated by more than 900 physicians meld into five representations – five principle components – reflecting an underlying structure of the 26 items identified in the two-step cluster analysis. These five components are spirituality, deep ecology, medical ontology, critique of science and diagnosis and treatment. They arise not out of thin air, but out of the survey items and responses to them. They also serve, as the results of the discriminant function analysis show, as an effective proxy for the 26 items from which they are derived.

And what of the infrastructure – the underlying structural dimensions – reflected by these five components? Each of them is, in effect, a composite of bits and pieces, *i.e.* factor loadings, on each item. Each component, in turn, is identified by those items that load most heavily on it. For instance, the spirituality component is so named because of the 26 items the ones which load most heavily on it are statements dealing with issues of spirituality and transcendence. Thus, in the very act of condensing these 26 items into a more manageable number of components, we reveal underlying structural dimensions of physician worldview as expressed through the responses to this scale.

Ultimately, the image emerging from this analysis reflects the pattern that consistently reappears in this study. Naturopathic physicians demonstrate a more Dionysian outlook, as expressed by mean factor scores, across each of the five principle components. Allopathic physicians demonstrate a more Apollonian outlook. Independent sample t-tests confirm these differences are statistically significant. Not surprisingly, the same holds true when summing principle component scores to create a Cultural

Worldview Index. Allopathic respondents tend to have lower, more Apollonian scores on this scale, while naturopaths tend to have higher, more Dionysian scores. Again, t-tests reveal these differences are statistically significant. The worldview of allopathic and naturopathic physicians, as expressed through the items in this survey, does conform to the predicted Apollonian/Dionysian ideal typology.

The Influence of Worldview

My exploration of the influence of worldview began with a Pearson correlation. While this test certainly does not establish causation, it is an effective way to gauge correlation, and this analysis highlights a strong and positive relationship ($r = .732$) between worldview and belief in the efficacy of complementary and alternative medicine. Higher, more Dionysian scores on the Cultural Worldview Index are associated with higher CAM efficacy scores. Indeed, this relationship explains more than half of the variation in efficacy scores,

Still, correlation is not causation. A deeper understanding of the influence of worldview upon beliefs about alternative medicine requires different tools. Multiple regression offers the benefits of being direct, allowing assessment of the impact of each component of worldview, and allowing for control of factors like sex and years in practice which might confound the relationship. But as I ran my series of regression models, the depth and complexity of the relationship between worldview and perceived efficacy of complementary and alternative medicine became increasingly apparent.

Initially I was struck by the amount of variance explained, then by the impact of the polarity of worldviews between the two groups of physicians – and then by the ways

in which this emphasizes the pattern so clearly discernible in earlier analyses. When the responses for all physicians are collectively grouped, the percentage of variance in perceived efficacy in CAM ranges from a low of 37.5 percent for mind-body therapies to a colossal 63.8 percent for whole medical systems. And worldview is pulling the load; rarely do the control variables make statistically significant contributions to the model. When the controls are significant, Beta coefficients indicate the weight of their influence is small. As can be seen in Table 23, in the case of whole medical systems, all but approximately one percent of the 63.8 percent of perceived efficacy explained by the model is due to effects of the five principle components. In no CAM category are all three controls significant.

To be sure, the components represent a greater number of questions so it stands to reason they would account for a much bigger percentage of variance in perceived CAM efficacy *relative* to the controls. But it is also important that the controls seem to exert little effect on the principle components. Adding them to the model produces no major changes in Beta coefficients for the principle components – nor does it radically alter significance levels for the components.

It appears worldview counts, and it counts big. Maybe, even too big; regression models explaining almost 64 percent of a phenomenon in the social sciences suggest remarkable insight; or, more likely, statistical anomalies like multi-collinearity. However, as noted in the results chapter, diagnostics do not indicate the components are hopelessly entangled in one another. The model does explain an almost mysteriously large amount of the variance for perceived efficacy of CAM therapies among respondents.

The solution to this mystery appears when the data are plotted on a graph with standardized predicted values on the X-axis and actual efficacy measures on the Y-axis. Data points – labeled to indicate whether they represent the responses of an allopathic or naturopathic physician – cluster tightly around a steep-sloped regression line. The clue that unlocks the case is the way in which the data points are aligned. Allopathic responses are arrayed along the lower – more Apollonian -- regions of the graph. Naturopathic responses are arrayed along the upper – more Dionysian – regions. The resulting image is a graphic representation of the dichotomous pattern that has emerged out of every analysis in this study, a snapshot of the polarity of worldviews of the two types of physicians. In this case, a line drawn through the center of all the data points definitely has a steep slope. Worldview counts.

A Surprising Turn

Another sociological mystery solved; but as is so often the case in sociology, the solution generates new mysteries. The slopes of regression lines drawn through the center of each dichotomous cluster of data points is not nearly as steep as a single line drawn through all the data points. And a line drawn through the cloud of allopathic data points has a steeper slope than one drawn through the naturopathic data points. Worldview counts, but it counts differently for allopaths and naturopaths.

Take the case of perceived efficacy for whole medical systems. Worldview accounts for almost 64 percent of variance when responses are examined collectively. Divide responses by practice type, however, and the amount of variance the model explains among naturopaths declines to almost 30 percent. Still a powerful model to be

sure, but r-square is roughly half that derived by applying the model to all respondents. Interestingly, worldview accounts for more variance in perceived efficacy of whole medical systems among allopaths (38.1 percent) than naturopaths.

This finding – that worldview explains a larger percentage of variance for perceived efficacy scores among allopaths than naturopaths – turns out to be the rule rather than an exception. Energy medicine is the only CAM category in which worldview exercises more influence on naturopaths than on conventional physicians. While in two categories, biologically-based practices and manipulative/body-based therapies, the model explains twice as much variance among allopathic physicians.

At first blush, this finding that worldview is a more powerful explanatory force for allopaths than naturopaths seems counterintuitive. After all, naturopaths as a group have higher average efficacy scores for each CAM domain *and* they have higher, more Dionysian scores on each of the principle components. Yet, despite this more strongly Dionysian outlook, the five principle components account for less variation in the regression models among naturopaths than among allopaths.

The Weight of Experience

Perhaps an answer for this unexpected anomaly lies in things not seen, or at least not measured, in the Worldview Survey for Physicians. Naturopathic respondents in this study are all graduates of four-year naturopathic medical schools. Their first two years of training closely mirrors that of their allopathic colleagues. But there is a distinct difference in the last two years of their training as naturopathic students learn about CAM therapies and witness the practice of these therapies during clinical rotations. The

naturopaths then incorporate what they have learned into their own medical practice, observing and evaluating CAM approaches as they care for their patients. Thus, they have extensive firsthand opportunities to form impressions about efficacy of the various CAM domains, impressions based upon education and clinical experience as well as worldview. Allopathic physicians, because they lack experience and formal training with CAM, must rely on other resources to develop their perceptions about the efficacy of various complementary and alternative medical therapies. In the absence of more formally developed signposts, they rely on worldview to navigate these uncharted waters. The psycho-logic that gives them a basic orientation to the world guides them through this realm as well.

Unfortunately, the survey does not capture the full impact of this difference in training and experience. However, the questionnaire does ask respondents to list up to three CAM therapies they have personally used and to rank their satisfaction with each of them on a scale from one for strongly dissatisfied to seven for strongly satisfied. These responses are summed to create a variable called CAM satisfaction, a *de facto* measure of both utilization and satisfaction. Scores can range from zero to 21, and as can be seen in Table 31 (next page), the two types of physicians report very different personal experiences with CAM. The mean CAM satisfaction score for naturopaths is 18.39; moreover, 37.60 percent of them report a perfect satisfaction score of 21. While the mean score for allopaths is 7.52, and 37 percent have never used a CAM therapy.

Table 31

| <u>Personal Satisfaction with CAM Therapies</u> | | | |
|---|---------|------------------|--------------------|
| | | <u>Allopaths</u> | <u>Naturopaths</u> |
| N | Valid | 546 | 396 |
| | Missing | 4 | 3 |
| Mean | | 7.52 | 18.39 |
| Median | | 6.00 | 20.00 |
| Mode | | 0.00 | 21.00 |

This variable is certainly no substitute for a formal measure of clinical experience and training, but it at least indicates some frame of experiential reference which might influence perceptions of CAM efficacy. And it allows for a *post hoc* analysis to test whether experience with CAM actually reduces the influence of worldview among allopaths upon beliefs about the efficacy of complementary and alternative medical therapies. This test is done by simply adding satisfaction with CAM to the full regression model used in previous analyses and using total CAM efficacy, a variable computed by summing efficacy scores for each of the five CAM domains, as the dependent variable. If direct experience does weaken the role of worldview, adding satisfaction with CAM to the regression model should make a statistically significant contribution to the variance explained by the model and reduce the Beta coefficients for each of the five principle components.

As can be seen in Table 32 (next page), this is exactly what happens. Adjusted r-square climbs from .472 to .507, a statistically significant increase. Standardized Beta coefficients drop for each principle component of worldview. Control variables are non-significant. In effect, this simple experiential measure increases the model's ability to predict total CAM efficacy scores – and alters the influence of worldview in the equation. Clearly, worldview still counts. It explains 47 percent of the variance in perceived

efficacy for CAM therapies, and that is no small thing. But that influence wanes with increases in personal satisfaction with CAM. One cannot help wondering how much impact a more sophisticated measure of formal training and clinical experience might have on perceived efficacy scores among allopaths – and upon the influence that worldview exerts in the model.²

Table 32

| <i>Impact of Personal Satisfaction with CAM upon Influence of Worldview Among Allopaths</i> | | | |
|---|----------------|----------------|---------------|
| <i>Independent Variables:</i> | <u>Model 1</u> | <u>Model 2</u> | <u>Δ in β</u> |
| Component 1 – Spirituality | .515*** | .447*** | -.068 |
| Component 2 – Deep Ecology | .352*** | .315*** | -.037 |
| Component 3 – Nature of Medicine | .480*** | .411*** | -.069 |
| Component 4 – Critique of Science | .252*** | .213*** | -.039 |
| Component 5 – Diagnosis & Treatment | .150*** | .121** | -.029 |
| Personal Satisfaction with CAM | | .212*** | |
| <i>Controls:</i> | | | |
| Years in Practice | -.055 | -.058 | -.003 |
| Sex | .078* | .040 | -.020 |
| Race | .026 | .047 | .021 |
| Adjusted R-Square | .472 | .507 | |
| F | 47.221*** | 48.153*** | |

*** p<.001; ** p<.01; * p<.05

What is more, this revised regression model has the same impact when applied to naturopathic respondents. As can be seen in Table 33 (next page), when personal satisfaction with CAM is introduced there is a slight but statistically significant increase in the variance explained and a decline in the values of Beta coefficients for each of the five principle components. The impact of worldview – already less influential than it is for allopaths – further declines in importance among the naturopaths with the introduction of a variable that, however crudely, begins to tease out an experiential difference between the two types of physicians

Table 33

Impact of Personal Satisfaction with CAM upon Influence of Worldview Among Naturopaths

| <i>Independent Variables:</i> | Model 1 | Model 2 | Δ in β |
|-------------------------------------|-----------|-----------|---------------------|
| Component 1 – Spirituality | .464*** | .439*** | -.025 |
| Component 2 – Deep Ecology | .194*** | .185*** | -.009 |
| Component 3 – Nature of Medicine | .296*** | .279*** | -.017 |
| Component 4 – Critique of Science | .149** | .138** | -.011 |
| Component 5 – Diagnosis & Treatment | .101* | .089* | -.012 |
| Personal Satisfaction with CAM | | .139** | |
| <i>Controls:</i> | | | |
| Years in Practice | -.002 | .008 | .01 |
| Sex | .198*** | .191*** | -.007 |
| Race | .023 | .023 | 0.00 |
| Adjusted R-Square | .332 | .349 | |
| F | 22.681*** | 21.743*** | |

*** $p < .001$; ** $p < .01$; * $p < .05$

Perhaps this *post hoc* analysis actually glimpses in shadow form the complex ways in which worldview influences action. Stephen Kalberg (2004:142) argues Weber believed worldviews “possess an active capacity; they place into motion a certain causal impulse” Focusing as he often did on the influence of religion, Weber argues that ideational impulses set into motion by worldviews create a sort of pre-condition for action (Kalberg 2004). Weber, of course, was far too worldly – and too good a sociologist – not to recognize that a number of earthly factors might intervene to either support or hinder the transformation of intention into action.

Applying this Weberian construct to the *post hoc* analysis, we can see that worldview might serve as a necessary pre-condition to belief in the efficacy of CAM therapies. A physician with a strongly Apollonian worldview might immediately question the efficacy of such therapies; one with a more Dionysian outlook might be more open to the possibility. Thus, worldview exercises an active capacity, placing into motion a

certain causal impulse, in this case perceived efficacy of CAM therapies. Granted, Weber was concerned with the connection between worldview and more overt action while this *post hoc* analysis examines its link with perceived efficacy. Yet, despite differences in the dependent variable, the process seems the same. Other fuels may stoke the furnace, but worldview is the kindling that initially ignites the flame. In the absence of other fuel, it is the main source of heat. Consequently, when it comes to perceived efficacy of CAM, worldview plays a larger role for allopaths who lack naturopathic physicians' more extensive formal training and clinical experience in CAM.

Worldview in Flux

Another intriguing aspect of the regression analyses is that the five principle components exercise different degrees of influence within the models depending upon physician type and CAM domain. In the case of whole medical systems, for example, the medical ontology or nature of medicine component makes the greatest contribution to the model ($\beta = .443, p < .001$) among allopathic physicians. The importance of this component makes sense given that this category of CAM encompasses whole systems such as naturopathy, ayurveda and traditional oriental medicine. Perceptions of their efficacy would certainly be influenced by one's attitudes toward the underlying nature of medicine itself, attitudes probed by survey items questioning beliefs about the strength of biomedicine and the value of treatments not based on scientific studies. Yet, for naturopaths the nature of medicine is the second most influential component in the model ($\beta = .329, p < .001$). Spirituality ($\beta = .391, p < .001$) dominates the model for this CAM domain among naturopaths.

Regression results for perceived efficacy of biologically-based practices by physician type reveal another example of this fascinating flux in which importance of principle components shifts from one domain and physician type to the next. This CAM category includes herbal therapies, and deep ecology is the most influential component in the model among naturopaths ($\beta = .252, p < .001$). Given that deep ecology moves beyond a green is nice sentimentality to incorporate fundamental ideas about the beneficence of nature, it seems fitting there would be a resonance between this principle component and the efficacy of biologically-based practices. But deep ecology drops to third place in terms of influence in the model ($\beta = .201, p < .001$) among allopathic physicians. Spirituality is the most influential component ($\beta = .375, p < .001$), and nature of medicine is second in importance ($\beta = .347, p < .001$) among the allopaths.

The relative influence of spirituality – among both types of physicians and across several CAM domains – is another intriguing result from the regression analyses. The importance of this component is not too surprising since it accounted for the largest share (13.46 percent) of total variance in the principle components analysis. The more unpredictable aspect is the way in which this component shifts in importance by physician type from domain to domain. Spirituality is the most important principle component in four CAM domains for naturopaths. These domains are: whole medical systems ($\beta = .391, p < .001$), manipulative/body-based therapies ($\beta = .227, p < .001$), energy medicine ($\beta = .439, p < .001$) and mind-body therapies ($\beta = .427, p < .001$). Among allopaths, however, spirituality is the dominant principle component in only two CAM domains – biologically-based practices ($\beta = .375, p < .001$) and mind-body therapies

($\beta = .459$, $p < .001$). Spirituality it seems is a powerful component in this model, but more powerful when the model is applied to naturopaths than allopaths. And it is most powerful of all when explaining the perceived efficacy of mind-body therapies.

Domain by domain this fascinating flux in the importance of various principle components creates a kaleidoscopic effect in which juxtaposition of these components creates different patterns of influence by physician type. In this fashion a limited number of principle components can combine to create quite different pictures of understanding. For example, spirituality may be the most important component among both allopaths and naturopaths when the regression model is used to examine perceived efficacy scores for mind-body therapies. But all five principle components make statistically significant contributions to the model for allopaths. Only three components – spirituality, nature of medicine and deep ecology – make statistically significant contributions among naturopaths, and the contribution of deep ecology is very modest ($\beta = .099$, $p < .05$). At this level of analysis, it becomes clear that worldview counts, but it counts in an equation of great subtlety.

A Final Surprise

Analyzing the relationship between cultural worldview and total CAM use by physicians generates another surprise. Pearson correlations show a positive and statistically significant association between cultural worldview index and personal CAM use for allopathic physicians ($r = .346$, $p < .01$ two-tailed). However, while naturopathic physicians are much heavier users of CAM, the correlation plummets in this group ($r = .085$) and is not even statistically significant.

Does this strange turn of events turn everything upside down? Or, is this an ultimate expression of the differing levels of influence worldview has upon the two types of physicians? Possibly; but most likely it is an anomaly spawned by the way the total use variable is created. The questionnaire provides opportunities for respondents to list up to three CAM therapies they have personally used. This turned out to be adequate for the allopathic physicians who tend to use CAM much less frequently. However, naturopathic respondents were much more likely to scribble additional therapies into the margin of the survey. Three blanks were not enough for many of the naturopaths and artificially truncated potential responses. Hence, 91.7 percent of naturopaths report using at least three CAM therapies, a red flag that distribution of the variable is skewed. Frequency statistics for this variable demonstrate just how skewed. With potential values ranging from zero to three, the median for the variable is 2.84; the mean and mode are both 3.00. Understandably, a linear relationship fails to materialize when personal CAM use by naturopathic physicians is plotted against cultural worldview index.

Because there is no statistically significant linear relationship between the variables among naturopaths, multiple regression analysis is inappropriate. However, there is a linear relationship between cultural worldview and total CAM use among allopathic physicians. Therefore, the same model used to explore the relationship between worldview and perceived efficacy of various CAM domains is applied to this analysis with total CAM use as the dependent variable. Worldview weighs in again. All five principle components make statistically significant contributions to the model which explains 16.50 percent of the variance in total CAM use by allopathic physicians. Sex is

the only statistically significant control variable; being female is associated with a .161 increase in total CAM use ($p < .01$).

The worldview model does perform as expected for allopaths who have a somewhat broader array of scores. The problem in the naturopathic analysis seems to lay not so much in the influence of worldview but in the data collection.

Referring back to the earlier discussion about Weber's idea that worldview possesses an active capacity, the allopathic analysis offers a clear test of the influence of worldview upon an action – total CAM use – as opposed to a belief, *i.e.* perceived efficacy. There are many things beyond worldview that might influence whether someone uses a CAM therapy including availability of CAM practitioners, busy schedules, and the cost of therapies that are normally paid out of pocket. Yet, worldview still accounts for 16.5 percent of the variance in total CAM use among allopathic physicians. That seems to indicate that worldview does possess an active capacity.

CHAPTER 7 QUALITATIVE REVIEW OF FINDINGS

Interesting findings emerge from the quantitative analysis. But, in an exploratory study such as this, one always wonders if the findings are real or simply mathematical phantasms rising like mist from the data. The proof of their validity, of course, lies in the experience of physicians whose lifeworld is plumbed by this research. They are the ones whose professional life uniquely qualifies them to pass judgment upon – and more fully inform – the results of this study. They are the experts who can best comment on its validity. Consequently, this study uses an expert panel of three naturopathic and three allopathic physicians to review the quantitative findings outlined and discussed in the previous chapters.

One key finding of this study emerged from the cluster analysis. Indeed, this idea that 26 of the 60 items on the Physician Worldview Survey neatly divide respondents into overwhelmingly allopathic or naturopathic clusters is a critical foundation for the subsequent analyses. Clearly, the algebra does not lie; these items do divide these respondents. But what are we to make of that division? The overwhelming consensus of the expert panel is that naturopathic and allopathic physicians, in general, do differ in their perspectives on these items (Table 34, next page). When asked if they thought most allopaths and naturopaths would disagree on most of these 26 items, only one member of the panel (ND1) said no.

Table 34

Opinions of Physician Panel Regarding Twenty-six Items Identified by Cluster Analysis

Based on your experience, do you think most allopathic and naturopathic physicians disagree on most of these items?

| <u>Physician:</u> | <u>Response:</u> |
|-------------------|------------------|
| ND1 | No |
| ND2 | Yes |
| ND3 | Yes |
| MD1 | Yes |
| MD2 | Yes |
| MD3 | Yes |

Their replies, while supporting the finding, also provide a degree of subtlety and nuance impossible to capture in a traditional survey. For example, geography emerged as an important consideration in their observations. Two allopathic physicians (MD1 and MD3) noted that while they believe naturopaths and allopaths tend to hold different attitudes about most of these 26 items, based on their own experience they also believe the gulf is not so wide in areas like the Pacific Northwest, or parts of California, as in other areas of the country.

“I am one of six doctors in [her] clinic,” explained MD1, noting two physicians in her clinic do not practice any CAM, while three others do. “Two of my colleagues are certified yoga instructors. I have another colleague who is passionate about Ayurvedic medicine.”

ND1 said her belief that naturopaths and allopaths disagree on some, but not *most* of these 26 items is based in large part upon her own experience in the Pacific Northwest. She pointed to an NIH Funded Alternative Medicine Research Program at the Oregon Health Sciences University as one cross-disciplinary example, explaining the presence of this program in a region that is home to naturopathic, chiropractic and oriental medicine

schools helps create an environment where conventional and alternative practitioners can learn from one another. “They [allopathic physicians] have had to at some point consider the work that we do, and we share patients, so we are not as far apart as we are in other [parts of the country].”

A personal geography

However, ND1 does suspect the attitudinal divide between allopaths and naturopaths is probably greater in other areas of the country where there is less interchange between the two types of physician. Her premise and the opinions expressed by MDs 1 and 3 seem reasonable. There are certainly differences in political and social attitudes between different regions of the country. It is not surprising, therefore, that there might be attitudinal differences among physicians at the regional level, especially in areas where naturopaths and allopaths might have more professional interaction.

Of course, the question of whether these insights by ND1, MD1, and MD3 are reflected by respondent attitudes can be statistically tested. By summing responses to the 26 items identified in the cluster analysis, it is possible to create a variable that reflects a “score” on these items. The respondents also can be grouped regionally based upon the states in which they practice. For purposes of this analysis, the grouping is a west-coast region consisting of California, Oregon and Washington versus the rest of the United States. However, T-tests reveal no statistically significant difference in mean scores between allopathic respondents on the west coast and their colleagues in the rest of the United States.

It is entirely possible that a statewide-level of analysis is too broad to capture the phenomenon described by ND1 and MD1. Perhaps attitudinal differences between allopaths and naturopaths in selected areas of California or the Northwest are less pronounced than other areas of the country but the trend is masked by data from more conservative areas in those states.

Beyond questions of regional geography, however, these comments by ND1, MD1 and MD3 also raise intriguing possibilities for future research about attitudinal differences within the geography of personal networks. The assumptions held by these physicians are shaped by the terrain of their daily experience. Aware of attitudinal differences between allopaths and naturopaths in other areas of the country but embedded in networks in which they have frequent contact with doctors who tend to share their worldview, these physicians may generalize that the context of their own personal network more broadly reflects a trend peculiar to their geographic region. In this fashion the contours of personal space become perceived landmarks of communal territory; micro-level experience influences assumptions about the broader environment.

Five dimensions of worldview

Members of the panel unanimously agree that allopaths and naturopaths do see the world differently along the five dimensions of worldview that emerge from the principal components analysis (Table 35, next page). During interviews, the physicians were reminded of the five principal components identified by the analysis – spirituality, deep ecology, the nature of medicine, critique of science and diagnosis/treatment. The interviewer explained the items that loaded most heavily on each component. Every

physician then answered in the affirmative when asked if based upon their experience they thought allopathic and naturopathic physicians really see the world differently along these dimensions. One physician (MD2) summed up his perceptions about the importance of these worldview dimensions by saying, “I think these five areas are core and reflective [of physician worldview].”

Table 35

Opinions of Physician Panel Regarding the Five Dimensions of Worldview

Based on your experience, do you think most allopathic and naturopathic physicians really see the world differently along these dimensions?

| <u>Physician:</u> | <u>Response:</u> |
|-------------------|------------------|
| ND1 | Yes |
| ND2 | Yes |
| ND3 | Yes |
| MD1 | Yes |
| MD2 | Yes |
| MD3 | Yes |

Interestingly, panel members also expressed a belief that the gulf between allopathic and naturopathic physicians is greater on some of these dimensions of worldview than others. ND2, for example, said he thought differences between the two groups are greatest on the last three dimensions (nature of medicine, critique of science and diagnosis/treatment). He noted that differences regarding the critique of science are especially evident in the movement towards evidence-based medicine. Evidence of efficacy, he said, can come in two forms. There is evidence generated through tightly structured clinical trials in which results are statistically gauged against probability, and there is evidence generated by observation over time.

“In my opinion science should be some of both,” ND2 said. “We [naturopaths] tend to rely on the latter where it is observation over time.” Yet, he notes there are certainly elements of allopathic practice based upon this same standard of evidence:

And, then, when you look at alternative medicine – chiropractic, acupuncture or massage – my sense is everything that is done under those disciplines is going to have to go under scientific tests in order to be accepted [by many advocates of evidence-based medicine]. So, the double standard is that what is being totally done without scientific support in allopathic medicine is okay. But what hasn’t been proven by scientific medicine [in natural medicine] is not ok.

MD2 also said the greatest difference in attitudes between the two groups is reflected across these same three dimensions. There also are differences, he says, with reference to spirituality and deep ecology. However, he believes the picture is more complex with regards to these two dimensions because, based upon his own experience, he thinks there is more within group variation on these two topics.

Allopaths who break with orthodoxy and have an active interest in CAM often are very open-minded about spirituality, according to MD2. “The doctors most open about CAM are probably the most open spiritually,” he said. “I definitely see that conventional doctors [allopaths] interested in alternative medicine close to uniformly have an interest in alternative spirituality as well.”

Physicians also were asked if there were any dimensions of worldview they felt were important, but which did not emerge in this analysis. Two physicians suggested additional dimensions. ND1 thought holism was an important dimension – and one on which allopaths and naturopaths differed. She thinks holism is more central to worldview of naturopaths than allopaths. MD2 suggested an economic dimension, believing there is

a difference in the relative importance of economic factors to each physician category. Allopaths, he said, were more concerned about money than naturopaths.

The Influence of Worldview

One of the most intriguing aspects of this study was the finding that worldview – and each of the five dimensions of it – provides differing levels of influence upon physician beliefs about the efficacy of various complementary and alternative medical systems. Examining efficacy scores for mind-body medicine among allopaths, for example, all five dimensions of worldview are statistically significant. They account for 30 percent of the variance in the data. However, only two dimensions are significant when the model is applied to naturopaths, and it accounts for 23 percent of the variance in the data. In effect, worldview counted, but it counted differently depending upon type of physician and type of CAM therapy.

Physician panelists were intrigued by this finding, but not necessarily taken aback (Table 36, next page). Four of the six explicitly stated they were not surprised. “No, that is not at all surprising,” said MD2, adding he thought a similar pattern might even emerge among a sample of allopathic physicians with the dimensions of worldview exercising different influence for various CAM therapies by type of specialty.

Two panelists, however, were more equivocal in their answers. “I’m not really sure what to make of these patterns,” said MD1. “Surprised? Maybe.” ND2 sensed a potential wealth of meaning in these results. “Boy, I’m not really sure how to tackle that one, actually,” he said. “Can I have six months to answer that one?”

Table 36

Opinions of Physician Panel Regarding Complicated Patterns of Influence of Worldview

Are you surprised by this complicated pattern of shifting influence among components of worldview by physician category and type of therapy?

| <u>Physician:</u> | <u>Response:</u> |
|-------------------|------------------|
| ND1 | No |
| ND2 | Uncertain |
| ND3 | No |
| MD1 | Maybe |
| MD2 | No |
| MD3 | No |

Interestingly, two panelists saw in this finding a cause for optimism about the possibilities for integrative medicine. One interpreted these shifting patterns of influence as evidence that the wall supposedly separating conventional and alternative medicine might not be so rigid after all. “Maybe there is hope,” said ND3. “Maybe there is more cross-pollination than you think.” The other panelist, MD3, interpreted the findings in a broader philosophical frame, seeing in them a source of hope that, despite differences, the two approaches were united by a common desire to help people. “My hope is that these questions get at why people went into medicine in the first place,” he said. “I looked at it and said good; we are doing better as a community than I thought.”

When Worldview Counts the Most

Another finding that emerges from the regression analyses is that worldview accounts for more variance in efficacy scores among allopaths than naturopaths for every CAM category except energy medicine. This finding runs counter to expectations, but the panelists agree it can be explained as a reflection of medical training and experience

(Table 37). Naturopaths have a more thorough clinical education in these CAM therapies than do allopaths; their views, therefore, are more grounded in this experience. Allopaths on the other hand, lacking this formal clinical training, rely on their basic orientation – their worldview – to judge CAM therapies.

Table 37

Opinions of Physician Panel Regarding the Role of Worldview in Shaping Attitudes of Allopaths toward the Efficacy of CAM Therapies

In every category except energy medicine, the worldview models account for more variance among allopathic than naturopathic physicians. Allopaths have less clinical training and experience in these complementary and alternative therapies. Do you agree that their perceived efficacy for these therapies is, therefore, more dependent upon underlying worldview?

| <u>Physician:</u> | <u>Response:</u> |
|-------------------|------------------|
| ND1 | Yes |
| ND2 | Yes |
| ND3 | Yes |
| MD1 | Yes |
| MD2 | Yes |
| MD3 | Yes |

“When you look at it, many of them [allopaths] have no formal exposure to CAM. If they are accepting of it, their worldview allows them to be more accepting,” said ND3.

“Absolutely,” agreed MD3, adding that not only were CAM therapies missing from the allopathic curriculum, but allopathic faculty were often openly skeptical of alternative medicine. “Most of our mentors pooh-pooh that stuff.”

ND1 actually saw in the one anomalous category – energy medicine – supporting evidence for the broader finding. It was not surprising, she thought, that worldview would play a greater role in shaping naturopathic attitudes toward the efficacy of energy medicine because it was the CAM system for which research evidence was most

problematic. “You can kind of demonstrate efficacy for most of those other modalities, whereas research on energy medicine has historically not been super fruitful,” she said, adding that new modalities and research strategies may someday change this but for now, “we are not relying on evidence for our belief in energy medicine.” In other words, faced with an area where uncertainty is greater, naturopaths like their allopathic colleagues let worldview be their guide.

Her comments about energy medicine also point to a fruitful area for further research – the ways in which worldview shapes application of research results to medical practice. She is doubtful that physician worldview would immediately yield to new evidence about energy medicine even if scientists could figure out more ways to produce research. “I don’t think that would suddenly make someone prescribe it who didn’t prescribe it before or didn’t believe in it before,” she said. “I could see that.”

Two Fundamentally Different Ways of Looking at the World

Collectively, the quantitative findings indicate naturopathic and allopathic physicians do have fundamentally different ways of looking at the world. Allopathic medicine is suffused with an Apollonian worldview; naturopathic medicine with a Dionysian worldview. It is an assessment with which the panelists unanimously agree (Table 38, next page).

“I concur. That defines it very well,” said ND3 of this Apollonian/Dionysian description of worldviews. “Very globally, yes; I think there is something to that,” said ND2. “It is simplistic, but also a reasonable caricature,” said MD2. “There is accuracy, there is truth in that.”

Table 38

Opinions of Physician Panel Regarding Apollonian and Dionysian Worldviews

Allopathic medicine is suffused with a worldview that is rational, sequential, seeks certitude, and believes in an objective reality that exists independently of our senses. It sees boundaries as valuable tools to establish order and meaning, and it seeks to control nature.

Complementary and alternative medicine is suffused with a worldview that is more intuitive, spontaneous, comfortable with the idea of ambiguity and comfortable with the idea of a subjective reality. It sees boundaries as an artificial barrier to holistic understanding, and it celebrates the natural world.

Based upon your experience as a physician, would you agree with this assessment?

| <u>Physician:</u> | <u>Response:</u> |
|-------------------|------------------|
| ND1 | Yes |
| ND2 | Yes |
| ND3 | Yes |
| MD1 | Yes |
| MD2 | Yes |
| MD3 | Yes |

Bridging the Divide: Towards a Truly Integrated Medicine

The value of a qualitative review of findings is that it allows the experts, the people who live the topic being studied, to directly address an issue from the standpoint of their own experience. The interviewer initiates the conversation; but if a dialog develops, the experts bring new insights and information to the study. For example, a frequently recurring theme in these interviews was the need to – and the possibility of – bridging the divide between these two worldviews to create a truly integrative medicine.

In the words of ND1:

People talk about integrated medicine and what they produce ends up being this medication plus this herb plus this meditation practice. It is a cut-and-paste, hodge-podge collage of treatments. It is supposed to be an integration of two types of medicine, but it is not really an integration of two philosophies. And I think bridging those two things you just described [Apollonian and Dionysian worldviews] is probably the best approach to care.

ND3 also sees value in acknowledging and drawing upon both Apollonian and Dionysian worldviews. “The fundamental foundation of medicine,” he said, “is art *and* science.”

“I can see value and fault in both [worldviews], if I were to critique them,” ND1 said, adding “it would be nice to just try to find a way to work together and respect both without discounting either. That would be a truly integrated – or integral – medicine.”

MD3, situated in an integrative medicine practice, sees permeability between the two worldviews. He believes patients will ultimately be the driving force pushing allopathic physicians across the barriers of worldview and into integrative medicine. As patients increasingly demand CAM therapies, their allopathic physicians will follow. “Patients drive all of this stuff [integrating CAM into their practice] for the allopaths,” he said. Primary care physicians are especially open to the trend, in part because they are so connected to their patients. “I think there is a greater tolerance level among primary care physicians than among specialists.”

MD1 describes the evolution of her own increasing openness to CAM as the byproduct of her professional experience and interaction with patients. “The more I’m in primary care, the more I realize how important it is to know the patient and what they believe. I think that makes me more open as a doctor to other modalities.”

She adds:

The more we talk about Western medicine, it occurs to me how complex certain illnesses can be and how the mind-body connection does matter. You see more and more how inadequate Western medicine is – or how inadequate having just a narrow perception of health and wellness can be.

MD2 believes it is “only a matter of time before allopaths become more accepting of alternative medicine.” Several factors are responsible for the transformation. For one thing, medical schools are now teaching their students more about CAM. Also, allopathic physicians are increasingly frustrated by the rushed, impersonal pattern that seems to dominate biomedical practice. They long for more interaction and time with their patients, qualities they believe are more abundant in alternative and integrative medical practice.

This transformation towards an integrative medicine is being shaped, at least in part, by medical practitioners who are consciously seeking to create something new and different, according to MD2. He thinks these practitioners are typical of the cultural creatives described by Paul Ray and Sherry Anderson (2000). The integration and acceptance of CAM “is a rapidly evolving circumstance,” he said. This sentiment is shared by MD3. “There are integrative systems all over the country now,” he said. “You know Harvard is publishing things, NIH is pushing it, and there are PBS specials on it.”

ND2 thinks there may already be more overlap in terms of actual practice between primary care allopaths and naturopaths than many people suspect. His ideas are based upon his experience in a program where he and allopathic colleagues took turns spending a half day in their respective clinics. He found his allopathic colleagues, especially in family medicine and gynecology, were taking a more holistic approach to caring for their patients than he expected. He thinks that, ultimately, the bridge across the two differing worldviews may simply be concern for providing the best care possible for patients.

Summary of Qualitative Analysis

The physician panel agrees naturopathic physicians have a more Dionysian worldview while allopathic physicians have a more Apollonian worldview. They also concur that the 26 items identified by the two-step cluster analysis are appropriate tools with which to probe these differences in worldview. And the physicians unanimously agree that most allopathic and naturopathic really do see the world differently along the five dimensions of worldview emerging from the principal components analysis.

Based upon their personal experience, these physicians are not surprised by the complicated pattern of influence each dimension of worldview exercised upon perceived efficacy of various CAM domains, a pattern in which the importance of a dimension often differs for each category of physician depending upon the CAM domain in question. Panel members also agree with the assessment that worldview tends to exercise more influence on perceived CAM efficacy among allopaths because they lack the formal training in these therapies that their naturopathic colleagues have. In the absence of more formal, concrete education and experience, allopaths let worldview be their guide.

Thus, it seems worldview does differ between the two categories of physicians – and that these differences are important. Certainly, the interviews reveal they are part of the lived experience of panel members. And the interviews highlight the context in which these differences are experienced by the panel members as well as their sense that both medicine and patients could benefit by bridging this division.

CHAPTER 8 CONCLUSIONS

Allopathic and naturopathic physicians have different worldviews, different ways of seeing – and being in – the world. The former are more Apollonian in their outlook with all that implies; the latter are more Dionysian. And these worldviews count, sometimes in unexpected ways, within the socio-cultural systems known as allopathic and naturopathic medicine. Its influence, for example, affects perceived efficacy of various CAM domains. In turn, the dimensions of worldview exercise differing degrees of influence on perceived CAM efficacy, depending upon physician type and the therapy being evaluated. This pattern of differences emerging from the study is a reaffirmation that how you see the world helps determine how you act in it.

The Apollonian and Dionysian typology upon which the study rests has already been outlined in greater detail. Suffice it to say that these two ideal types are fundamentally different orientations to the world. A central hypothesis of this study was that naturopathic physicians are more likely than their allopathic colleagues to agree with values and beliefs that reflect a Dionysian worldview. Conversely, allopathic doctors were more likely than naturopaths to agree with values and beliefs that reflect an Apollonian worldview. Quantitative analysis confirmed these hypotheses, and in-depth, qualitative interviews support this finding. Naturopaths are more Dionysian; allopaths more Apollonian.

Understanding this is very important for anyone seeking to fully comprehend allopathic and naturopathic physicians and the socio-cultural medical systems of which they are a part. It illuminates the terrain of misperception, miscommunication and missed opportunity that lies between the two systems. It explains epistemological and ontological differences that helped fuel past professional, economic and political rivalries. Contrary to the French proverb, to know all may not be to forgive all; but unless one understands the worldviews that suffuse naturopathy and allopathy, it is impossible to unite these two approaches in a truly integrative fashion.

Indeed, such an understanding is a critical step toward creating the sort of health care millions of Americans want and are currently attempting to cobble together for themselves, an integrative approach to medicine that moves beyond find-and-fix to care-and-cure. Such an approach would combine the best of conventional biomedicine and CAM, using the safest, least expensive and invasive therapy necessary to treat – or prevent – a medical problem. In the words of James S. Gordon, the first chairman of the advisory council of the National Institutes of Health's Office of Alternative Medicine, this new approach to medicine:

...appreciates the great value of surgery and drugs but sees them as last resorts, not first choices. It makes use of the most sophisticated modern diagnostic techniques and research studies, but also puts value on the learning and experience that humans in all parts of the world have accumulated over millennia. It is a synthesis of modern technology and perennial wisdom, of powerful and definitive treatment and compassionate care, of Western and Eastern, high technology and indigenous and folk healing traditions (1996: 17).

Knowledge of the differences in underlying worldviews of allopathic and naturopathic physicians also helps explain differences in perceived efficacy of CAM therapies. Another hypothesis of this study was that, among allopaths, attitudes toward

CAM would correlate with Dionysian worldview. That is, the more strongly an allopathic physician agreed with Dionysian values and beliefs, the more favorably disposed they would be toward CAM. Quantitative analysis certainly supported this hypothesis. There is a direct and positive correlation between Dionysian scores and perceived efficacy for CAM therapies ($r = .576$) among allopathic respondents that explains 33 percent of the variance.

Multiple regression analyses reveal further – and more intricate – details of this association between worldview and the perceived efficacy of various CAM domains, details that sweep one further down the path from correlation to causation. In these analyses it is clear worldview counts for allopaths even when controlling for socio-demographic factors that might influence the relationship. Indeed, worldview explains a larger percentage of variance of perceived efficacy among allopaths than naturopaths for most CAM domains. These findings suggest – and the physician panel agrees – that allopathic physicians, lacking the formal training of their colleagues in these areas, rely more heavily upon underlying worldview when assessing CAM efficacy.

The regression analyses also reveal that various dimensions of worldview exert different degrees of influence depending upon the CAM domain in question. For example, spirituality exerts greater influence among allopaths in the analytical model for mind-body therapies, a CAM domain that includes prayer and yoga, than it does upon perceived efficacy for whole medical systems like naturopathy and homeopathy. Furthermore, the relative importance of each worldview dimension in the analytical models varies by physician type. For instance, spirituality is the most important dimension for allopaths in the model for biologically-based CAM therapies ($\beta = .375$,

$p < .001$), while it is the second most important dimension in the model for naturopaths ($\beta = .157, p < .01$). Worldview counts, but it counts differently depending upon context, an observation that opens a line of inquiry for future studies.

Finally, this study hypothesized there would be a direct and positive relationship between Dionysian worldview and personal CAM use by allopathic physicians; that is, the more Dionysian their outlook, the more likely these physicians are to personally use CAM. Quantitative analysis supports this hypothesis. There is a direct and positive, although modest ($r = .346, p < .01$ - two-tailed), correlation between Cultural Worldview Index and total number of CAM therapies used for allopathic physicians. Interestingly, spirituality ($\beta = .290, p < .001$) appears to be the dominant worldview dimension shaping this relationship when the analytical regression model is applied to personal CAM use by allopaths. The nature of medicine ($\beta = .273, p < .001$) is the second most influential dimension. Clearly, worldview seems to be at work again – even if its influence is part and partial of a host of potentially, moderating, mediating and confounding factors. Outlook remains both prelude and predicate to action.

Apollo and Dionysius in the Digital Age

It may seem odd at the dawn of the Digital Age to draw upon the gods of antiquity for inspiration to cast the ideal types that lend insight into conventional and alternative medicine. But these gods have never been so far removed from medicine as we often suppose. One thinks of the opening words of the Hippocratic Oath: “I swear by Apollo, Asclepius, Hygeia and Panacea . . . to keep according to my ability and my judgment the following oath.”

Certainly, traits the Greeks associated with Apollo and Dionysius illuminate the worldviews that suffuse contemporary medical practice and in so doing help explain key features of conventional and complementary/alternative medicine. The Apollonian ideal sheds light on mysteries of the allopathic order such as the almost religious fervor with which it embraces the evidentiary worth of inferential statistics and its tendency to divide the body into unceasingly finite divisions to foster understanding. Evidenced-based medicine with its promise of numerical precision appeals to the Apollonian quest for scientific certitude. Increased specialization reflects a conviction that intellectual boundaries breed knowable domains. In a similar vein the Dionysian ideal offers insights into key features of complementary/alternative medicine such as its faith in the healing power of nature or its belief that medical care benefits most from a holistic approach which acknowledges patients are an amalgam of mind, body and spirit.

Thus, these classically inspired ideal types bring into bas relief differences between two major currents in the mainstream of American medicine. They provide a successful framework for analyzing the hegemonic worldviews of biomedicine and complementary/alternative medicine. They also provide a touchstone for tracking any changes in these predominant worldviews. And there is a theoretical basis for such shifts; because, while worldviews are enduring they are not immutable. If the dominant worldview of a socio-cultural system is an emergent phenomenon arising from interactions of the constituent parts of that system, then significant enough change in those composite elements can generate changes in the hegemonic worldview.

This process is especially important in light of comments by members of the physician review panel. As MD2 noted, integration and acceptance of CAM “is a rapidly

evolving circumstance.” In the words of MD3: “There are integrative systems all over the country now. You know Harvard is publishing things, NIH is pushing it, and there are PBS specials on it.” Indeed, CAM seems increasingly present in the enacted worlds of medical professionals and public alike. A PubMed search for complementary alternative medicine produces more than 14,000 references; a Google search for the same term generates 109 million hits. If there is enough change among the constituent components of these social-cultural systems, the dominant worldview emerging from CAM and/or biomedicine also can change. Apollonian and Dionysian ideal types serve as reference points from which to analyze this change.

Potential Weaknesses of the Study

This study is a sprawling, exploratory reconnaissance of the worldview of allopathic and naturopathic physicians. It attempts to chart a relatively unexplored terrain – and that is the source of its potential strengths and weaknesses. Because it moves onto new ground, it cannot incrementally build upon closely similar studies, carefully capitalizing on the successes while avoiding the pitfalls of its predecessors. This makes it difficult to provide the sort of absolute control for confounding variables – known and unknown – that is the golden ideal of all research but the sole province of antiseptic laboratories. Given the nature of the study topic, however, it seems worthwhile to venture into a new frontier while still doing everything possible to ensure precision and minimize error, including subjecting the findings to review by a panel of physicians whose lifeworld is plumbed by this research.

This study also runs headlong into concerns about response rate, an issue common to physician surveys and increasingly common, for a number of reasons, to surveys of the general population as well. Everyone longs, of course, for a marvelous response. But response rates alone do not make for a marvelously *representative* response (Grooves 2006; Merkle and Edelman 2002; Curtin, Presser and Singer 2000; Keeter et al. 2000). The telling issue is whether responders and non-responders differ on the statistic of interest. Using late responders as a proxy for non-responders, an analysis shows no statistically significant difference between early and late responders for an index measuring cultural worldview. Nor are there any statistically significant differences along demographic variables. Consequently, sample response certainly seems adequate for an exploratory study like this one.

Future Research

By establishing that naturopathic physicians hold beliefs more consistent with a Dionysian worldview on a series of items while allopaths express more Apollonian values – and determining principle components of worldview based on these items – this study lays the groundwork for an intriguing line of research. Most immediately, thanks to a series of questions on the Physician Worldview Survey, the data can be used to examine the relationship between worldview and perceived efficacy for several major allopathic therapies. Will an exploration of the relationship between worldview and perceived efficacy for cardiac catheterization, for example, present a mirror image of the patterns of difference that emerged between allopaths and naturopaths when examining perceived CAM efficacy? That is, will worldview account for more variance among the naturopaths

than among the allopaths in attitudes about the efficacy of allopathic therapies and interventions like cardiac catheterization? And which dimensions of worldview will exercise the greatest influence in the regression models?

Then, returning to the relationship between worldview and perceived CAM efficacy, the database is robust enough to support further analysis. Structural equation modeling, for example, might provide insight into the way the various dimensions of worldview influence perceived CAM efficacy.

The 26-item Physician Worldview scale developed in this study also generates interesting possibilities for psychometric testing over a more intermediate time frame. Comparisons of this instrument to the Organicism Mechanicism Paradigm Inventory (Germer, Efran and Overton 1982) would seem a logical starting point. In a similar vein it would be interesting to administer the scale to various allopathic specialties to explore potential differences in Apollonian/Dionysian worldview by medical specialty. Likewise, it would be interesting to administer the scale to different types of CAM practitioners – chiropractors, acupuncturists, massage therapists, etc. – to see if these practitioners differ in Apollonian/Dionysian worldview.

In the long term, as the survey instrument is refined and studies generate more knowledge about variations in worldview, the necessary pieces can be assembled to build a foundation for even more detailed research about the worldview of conventional and CAM practitioners. The current study shows that worldview counts, but its influence is contextual. A goal for future research is to unravel that context. Perhaps social cognitive theory (Bandura 1986) with its emphasis on reciprocal determinism might provide a useful theoretical framework for this task. Worldview could be seen as one of several

personal factors that interact with elements in the enacted world to shape behavior such as likelihood to incorporate a therapy into one's practice.

While the current study focuses on the worldview of medical practitioners, applying the worldview concept to the study of health beliefs and behaviors of individuals is certainly intriguing. Using worldview in the context of social cognitive theory might help explain health behavior as an emergent phenomenon arising from the interaction of self, environment and experience.

More broadly, work with worldview seems tailor made for trans-disciplinary research incorporating psychology and cognitive neuroscience. For the study of worldview and its effects upon behavior is essentially an inquiry into a triadic relationship between an outer objective world, our inner subjective thoughts and our actions. Framed in this light, worldview, as a stable, but not immutable way of seeing – and being in – the world, can be seen as a manifestation of established neural pathways laid down over time in response to environment and experience. Worldview, it seems, is a product of cognitive allostasis. It can be thought of as a sort of mental infrastructure crafted by the interplay of neural, psychological, and socio-cultural factors. Exploring that interplay requires the combined expertise of neuro scientists, psychologists and sociologists.

Practical Applications

The lessons learned in this study are interesting in their own right, but they also have practical applications. As someone who worked in the American healthcare system for nearly two decades, I have seen just how marvelous – and wrong-headed – it is.

Medicine has advanced to level of the miraculous in surgery, critical care, treatment of trauma and the promise of genetic and molecular therapies. No one should deny the value of these contributions, nor discourage their continued progress. But the system focuses on miracles when our most common health problems are mundane and chronic.

We spend more than any other nation on health care, but get less for our money (from doctors and nurses to hospital beds per capita) than most industrialized nations (Anderson et al. 2005). Nor is our overall health status anything to brag about. One in three American adults has high blood pressure (American Heart Association 2009). Nearly one-in-five adults has arthritis (Arthritis Foundation 2009). An estimated 20 million Americans have asthma (NCEH 1999), with asthma accounting for one-fourth of all emergency room visits in the United States (NCHS 2001). These numbers and others like them paint a statistical portrait of a *sick care* – not a health care – system.

As we approach the 100th anniversary of the Flexner report, American medicine may well be on the cusp of a second transformation of health care, a transformation from a fragmented disease/event approach to one focused on predicting and preventing disease in individuals (Snyderman 2009).

Curing our health care system will not be an easy task. But the Obama administration has declared that health reform is both a moral and fiscal imperative, pointed to the gathering forces pushing for action, and stated “if we come together and work together, we will finally achieve what generations of Americans have fought for and fulfill the promise of health care in our time” (Obama 2009). That bold plan will require a greater emphasis on primary care to prevent and successfully manage the mundane but major illnesses that strike most Americans. However, primary care

physicians are an increasingly scarce commodity in our sick care system as older physicians retire and fewer young doctors go into primary care. Alarming, in one survey, only two percent of 1,200 first-year medical students expressed a desire to go into a general primary-care practice (Hauer et al. 2008).

A new vision for primary care – an integrative approach that centers on patients and embraces new ways of delivering care – is essential to deal with this critical shortage. Quite simply the old paradigm of primary care exclusively delivered by allopathic physicians in their office, or increasingly through emergency rooms, is no longer sustainable. This creates a unique opportunity for naturopathic physicians (and other CAM practitioners) whose style of practice is especially suited to prevention and management of chronic illnesses.

Building a truly integrative model requires dismantling the wall between allopathic medicine and CAM. That task, in turn, requires knowledge about the worldviews that suffuse both socio-medical systems. It is not enough to simply change reimbursement schemes, allopathic and CAM providers have to develop an appreciation and trust for one another rooted in mutual appreciation and respect. And that requires practitioners in each camp have a clear understanding of how the other views the world. Nor is it enough to simply demand that insurance companies and other third-party payers start allocating scarce resources to cover CAM therapies. These third-party payers must be shown that their money is going to pay for effective treatment. And that requires an understanding of the worldviews of conventional and CAM practitioners, especially the ways in which those worldviews influence ideas about outcomes and outcomes research.

Expecting health administrators to create effective, integrated health organizations without an appreciation for the worldviews of the professionals they seek to lead is folly.

Half of America's health expenditures go to pay for the costs of five chronic conditions – mood disorders, diabetes, heart disease, high blood pressure and asthma (Weisfeld 2009). Our current approach of seven minutes with an MD plus a prescription is not working. Creating an integrated system focused on preventing these diseases, and effectively managing them when they do occur, requires an understanding of the worldviews that dominate conventional and alternative medicine.

Précis

Thanks to the digital age, this study examines worldview with a computational power that would be envied by residents of Mount Olympus. Factor and cluster analysis create possibilities for construction of ideal types that would amaze Max Weber. Thus, Apollo, god of clear boundaries, order and control over nature, and Dionysius, celebrant of nature, make their triumphal entry as vivid representations of the worldviews that suffuse allopathic and naturopathic medicine. They are Olympian reminders of differences in the ways allopathic and naturopathic respondents see the world, differences documented by quantitative analysis and supported by in-depth interviews.

As the socio-cultural perspective from which we craft answers to some of life's most important questions, worldview matters. It shapes every element of culture from music to medicine. And it is critical for anyone seeking true understanding – *verstehen* – of the differences between these two medical systems.

ENDNOTES

¹ This turn of phrase is borrowed from the title of Henry Plotkin's book, *The Imagined World Made Real: Towards a Natural Science of Culture*, published in 2002 by Rutgers University Press, New Brunswick, New Jersey.

² Almost 37 percent of the allopathic respondents indicated they had never personally used a CAM therapy. To ensure that this large segment of non-users was not skewing the results of the *post hoc* test, I ran the same analysis omitting those MDs who had never used a CAM therapy. The results were virtually indistinguishable from those reported, demonstrating that the large percentage of non-users did not unduly influence the results of the *post hoc* analysis. Results are available from the author.

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Appendix I

Naturopathic Medicine

The California Naturopathic Doctors Association provides the following information about naturopathy on its website (<http://www.calnd.org/education.asp>)

Naturopathic Medicine is a unique and distinct system of health care that emphasizes the use of prevention and natural therapeutics. The doctors who practice naturopathic medicine, called *naturopathic physicians* (NDs), are trained to serve as primary care general practitioners who are experts in the prevention, diagnosis, management, and treatment of both acute and chronic health conditions.

Naturopathic physicians are trained at accredited, four-year, post-graduate, residential naturopathic medical programs. The training consists of comprehensive study of the conventional medical sciences, including anatomy, physiology, pathology, microbiology, immunology, clinical and physical diagnosis, laboratory diagnosis, cardiology, gastroenterology, gynecology, etc, as well as detailed study of a wide variety of natural therapies.

Naturopathic physicians are guided by six principles: First, Do No Harm; The Healing Power of Nature; Find the Cause; Treat the Whole Person; Preventive Medicine; and, Doctor as Teacher. This set of principles, emphasized throughout a naturopathic physician's training, outlines the philosophy guiding the naturopathic approach to health

and healing and forms the foundation of this distinct health care practice.

Naturopathic physicians use a variety of natural and non-invasive therapies, including clinical nutrition, homeopathy, botanical medicine, hydrotherapy, physical medicine, and counseling. Many naturopathic physicians have additional training and certification in acupuncture and natural child birth. Naturopathic treatments are effective in treating a wide variety of conditions without the need for additional intervention. Naturopathic physicians are also able to function within an integrated framework, and naturopathic therapies can be used to complement treatments used by conventionally trained medical doctors. The result is a patient-centered approach that strives to provide the most appropriate treatment for an individual's needs.

In the United States, the naturopathic medical profession's infrastructure includes accredited educational institutions, professional licensing, national standards of practice, peer review, and a commitment to state-of-the-art scientific research.

Source: California Naturopathic Doctors Association.

Appendix II

Interview Script for Physician Worldview Study

Dr. *(last name)*, thank you very much for participating in my research project. As you know, I am conducting a study on the cultural worldview of physicians. This study is self-funded and is being conducted as part of my doctoral dissertation in medical sociology at the University of Alabama at Birmingham.

Worldview is a term sociologists use to describe a way of seeing – and being in – the world. It is a sort of global, or mega, paradigm that both directs and organizes one’s perceptions of the world.

My work is quite exploratory, so I am asking physicians like you to serve as a sort of review panel for my findings. I especially want to know if my findings conform to your own experience. And, if not, how are they different.

Before we get into my results, however, perhaps the best way to begin is for you to tell me how long you have been practicing and to briefly describe your own medical practice. *(If necessary, prompt by asking if they specialize; whether their patients are younger, older or across the board age-wise.)*

(# of years in practice)

Description: _____

Well, Dr. *(last name)*, a bit of background for my next question. As you know, I sent a rather lengthy questionnaire called the Physician Worldview Survey to a random sample of doctors. The first 60 items covered a number of topics drawn from the literature. Respondents were asked to express their opinions along a continuum ranging from totally disagree to totally agree. There was also a “don’t know/no opinion” option.

I assigned values – ranging from one to seven – to each of the responses along the continuum. Values for each of the 60 items were then summed. This created a total survey score ranging from 60 to 420. T-tests demonstrated that the difference in average survey scores for naturopathic and allopathic physicians was statistically significant.

A two-step cluster analysis then revealed 26 statistically significant items that seemed to divide the two groups. These 26 items are: *(For in person interviews, show respondent the list of items from the preliminary summary of findings. Refer them to faxed copy for phone interviews, or offer to read the list if they don’t have faxed copies handy.)*

Based on your own experience, do you think most allopathic and naturopathic physicians disagree on most of these items? *Yes* *No* *(circle answer)*

(Additional comments, if offered) _____

For the next step of my analysis, I did a factor analysis to map out the underlying dimensions this scale might be measuring. My results indicate the scale measures five dimensions of worldview. They are:

- 1) Spirituality – emphasizing the transcendent dimension of human experience and spiritual nature of healing
- 2) Deep Ecology – emphasizing ideas about the environment and humankind’s place in it
- 3) Nature of Medicine – emphasizing the fundamental foundations of medicine, a sort of medical ontology
- 4) Critique of Science – emphasizing the strengths and shortcomings of science
- 5) Diagnosis – focusing on the fundamental aspects of diagnosis and treatment

So, Dr. *(last name)* – spirituality, deep ecology, the nature of medicine, critique of science, and diagnosis. Based on your experience, do you think allopathic and naturopathic physicians really see the world differently along these dimensions?

Yes No *(circle answer)*

(Additional comments, if offered): _____

But the most interesting finding was that worldview – and these five components that we have been discussing – provide differing levels of influence upon beliefs about efficacy of various complementary and alternative medical systems. And not only does the influence change from one group of therapies to the next – it varies by physician category. For example, in the regression model exploring efficacy scores for biologically-based therapies like herbal remedies and high-dose megavitamins, spirituality and the nature of medicine are the most influential factors among allopathic physicians. But deep ecology is the most influential factor among naturopaths. A reflection, perhaps of a resonance between ecological sensibilities and herbal therapies. What is more, the model explains almost 23 percent of the variance among allopaths, but only 11 percent among naturopaths.

When examining efficacy scores among allopaths for mind-body medicine, all five dimensions of worldview are statistically significant. They account for 30 percent of the variance in the data. This category includes spiritual healing/prayer and yoga, so it is not too surprising that spirituality has the most influence of all worldview dimensions. The model accounts for 23 percent of the variance among naturopaths. But only two dimensions of worldview are significant for them. They are spirituality and the nature of medicine. Again, spirituality is the most influential.

Dr. (*last name*), are you surprised by this complicated pattern of shifting influence among components of worldview by physician category and type of therapy? And what do you think is at work here?

Dr. (*last name*), in every category except energy medicine, these worldview models account for more variance among allopathic physicians than among naturopathic physicians. My hunch is that this may reflect training and experience. Naturopaths receive a thorough clinical education about these therapies and are more apt to practice them on a daily basis. However, the allopaths have less clinical training and experience in the complementary and alternative therapies. Therefore, their perceived efficacy for these therapies is more dependent upon underlying worldview. Do you agree?

Yes *No* (*circle answer*)

(ask respondent to elaborate if they don't do so voluntarily) _____

Dr. (*last name*), returning for a moment to a more philosophical consideration of worldview, I believe my data analysis projects an outline of two fundamentally different ways of looking at the world.

One worldview is rational, sequential, seeks certitude, and believes in an objective reality that exists independently of ourselves. It sees boundaries as valuable tools to establish order and meaning, and it seeks to control nature.

The other worldview is more intuitive, spontaneous, comfortable with ambiguity, and comfortable with the idea of a subjective reality. It sees boundaries as an artificial barrier to holistic understanding, and it celebrates the natural world.

This first worldview seems to suffuse conventional biomedicine; the latter to suffuse complementary and alternative medicine.

Based on your experience as a physician, would you agree with this assessment?

Yes *No* (*circle answer*)

(Additional comments, if offered): _____

(If YES, but additional comments are not offered, say): Interesting, give me an example that illustrates why you think this? _____

Dr. (*last name*), thank you very much for your help. I know there are many demands upon your time, so I really appreciate your willingness to help with this research project.

APPENDIX III INSTITUTIONAL REVIEW BOARD DOCUMENTATION



Institutional Review Board for Human Use

Form 4: IRB Approval Form
Identification and Certification of Research
Projects Involving Human Subjects

UAB's Institutional Review Boards for Human Use (IRBs) have an approved Federalwide Assurance with the Office for Human Research Protections (OHRP). The UAB IRBs are also in compliance with 21 CFR Parts 50 and 56 and ICH GCP Guidelines. The Assurance became effective on November 24, 2003 and expires on October 26, 2010. The Assurance number is FWA00005960.

Principal Investigator: CLARK, CULLEN

Co-Investigator(s):

Protocol Number: **X060307006**

Protocol Title: *The Cultural Worldview of Allopathic and Naturopathic Physicians*

The IRB reviewed and approved the above named project on 1-23-09. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

This project received EXPEDITED review.

IRB Approval Date: 1-23-09

Date IRB Approval Issued: 1-23-09

HIPAA Waiver Approved?: N/A

Marilyn Doss, M.A.
Vice Chair of the Institutional Review
Board for Human Use (IRB)

Investigators please note:

The IRB approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

Any modifications in the study methodology, protocol and/or consent form must be submitted for review and approval to the IRB prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UAB or other participating institutions must be reported promptly to the IRB.

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