SOCIAL LEARNING BIASES IN THE USE OF

COMPLEMENTARY AND ALTERNATIVE MEDICINE

by

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ABSTRACT

In the United States, the use of complementary and alternative medicine (usually referred to as CAM) has increased dramatically over the last three decades. However, theoretically informed explanations about why people decide to use CAM therapies are lacking. The purpose of this study is to determine if there is enough statistical evidence to justify additional research on the relationship between social learning and the decision to use CAM. Working on the assumption that people make decisions based on information they have or can obtain, I applied the concept of learning bias in order to examine the ways in which people gain information about CAM. I used a subsample of n=9991 from the 2012 National Health Interview Survey (NHIS) and results from 12 semi-structured contextual inquiry interviews in a mixed-methods approach. Statistical evidence from Chi-square tests of independence indicated that a relationship between CAM and social learning bias does exist. However, results also indicated that the relationship is dependent on the type of therapy used. Additionally, the contextual inquiry interviews revealed that upbringing influences later-in-life predispositions towards learning biases favorable to CAM usage. I also found that individuals differentiate between recommendations from friends and co-workers as well as those from parents and other family members. These differences are not made clear in the standard models of learning bias. I discuss how the results of this study illuminate people's decisions to use CAM, they relate to the way bias is modeled, and use of this knowledge to inform future studies.

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LIST OF ABBREVIATIONS

ALT	Adult Alternative Medicine
AMA	American Medical Association
CAM	Complementary and Alternative Medicine
CDC	Centers for Disease Control and Prevention
DSHEA	Dietary Supplement Health and Education Act of 1994
FDA	Food and Drug Administration
NCCAM	National Center for Complementary and Alternative Medicine
NCCIH	National Center for Complementary and Integrative Health
NCHS	National Center for Health Statistics
NHIS	National Health Interview Survey
NIH	National Institutes of Health
OAM	Office of Alternative Medicine
SPSS	Statistical Package for the Social Sciences

CHAPTER ONE: INTRODUCTION

Understanding Why People Use Complementary and Alternative Medicine

In the United States, the use of complementary and alternative medicine (usually referred to as CAM) has dramatically risen over the last three decades. In 2012 alone, 59 million people spent $30.2 billion dollars on some kind of alternative or complementary health product or service (Nahin, Barnes, and Stussman 2016). This type of expenditure by such a large portion of the population leads both public policy makers and the health industry to be interested in discovering why people decide to forgo or complement conventional medical treatment with traditional, homeopathic, natural, and alternative medical options. During the last three decades there have been multiple debates around CAM, including when, how, or if CAM-related therapies should be incorporated into the education of medical students, the efficacy of CAM therapies, safety of CAM for public use, need for more stringent FDA guidelines, and methods for targeting public service messages (Bausell 2007; Ernst 2000; Ernst 2004; Ernst 2007; Niggemann and Grüber 2003; Owen, Lewith, and Stephens 2001; Ventola 2010a; Ventola 2010b; Ventola 2010c).

Although researchers have sought correlations between the use of CAM therapies and specific subjects such as chronic pain, education levels, and ethnic backgrounds, there has been a lack of theoretically informed explanations about how or why people decide to use CAM therapies (Barnes et al. 2004; Carboon 2008; Clarke et al. 2015). My study addresses this deficiency by using the cultural evolution theoretical framework of

social learning hypotheses to examine people's decision to use CAM therapies. This has additional significance because studies of social learning biases – largely under the umbrella of cultural evolutionary theory – have emphasized theoretical modeling over empirical inquiries. This study combines the theoretical framework of cultural evolution with empirical analyses of decisions to utilize CAM, adding theoretical power to studies of CAM and empirical data to cultural evolutionary theory.

Definitions

Complementary and Alternative Medicine (CAM) refers to those medical and health services, treatments, activities, or practices that do not require a licensed medical doctor's involvement, approval, and/or input (e.g., yoga, acupuncture, faith healing, shamanism, Pilates, diet fads, massage, etc.) or those products which do not require prescriptions that are used to treat or prevent medical and health problems and issues (e.g., magnets, non-vitamin supplements, herbal remedies, folk medicine, homeopathic substances, teas, extracts, infusions, etc.).

Social Learning, also referred to as cultural transmission, is information passed between people through copying, learning, or teaching rather than through genetic transmission or individual learning (i.e., learning through trial and error).

Learning bias, also referred to as transmission bias, is the differential preference for information resulting from preferences for one source over another.

Purpose of Study

Acting on the assumption that people make decisions based (partially or fully) on information they have or can acquire either through trial and error (individual learning) or from others, I decided to examine the ways in which people gain information about CAM

from others. Cultural evolutionary theory posits that information is transmitted through three channels: individual learning, genetic inheritance, and social learning. Examples of social learning include language, teaching, and imitation (Henrich and McElreath 2007; Mesoudi, Whiten, and Dunbar 2006; Richerson and Boyd 2005). This process of non-genetic information transfer is referred to as either cultural transmission or social learning. Cultural evolutionary theory further posits that some types of information are favored over others (i.e., are biased). This differential treatment of information is referred to as either cultural transmission bias or social learning bias.

Social learning biases can be generally categorized as either content or context biases. Figure 1.1 illustrates the organization of the various forms of social learning mechanisms. Content biases arise when people acquire behaviors, ideas, beliefs, or values which act like mental templates. A person may be more likely to acquire a certain new idea, behavior, value, or belief because it "fits" this template. In other words, content bias is a learning bias based on what is being learned depending on the content of the idea, skill, or value (Boyd and Richerson 1985; Henrich and McElreath 2003; Henrich and McElreath 2007).

Context bias is preferential learning from other people based on source of information (the "model"), or how common the behavior or idea is ("frequency"). In other words, an individual may preferentially learn from a skilled, successful, or prestigious person rather than from someone who is not. Individuals may also show a preference for learning from models who share some similarity with themselves. This similarity may be shared ability, background, gender, social status, ethnicity, or language, among a host of other potential markers. On the other hand, a person may show a

preference toward simply learning a common behavior, or conversely, preferring a rare

behavior or trait (Henrich and McElreath 2007)
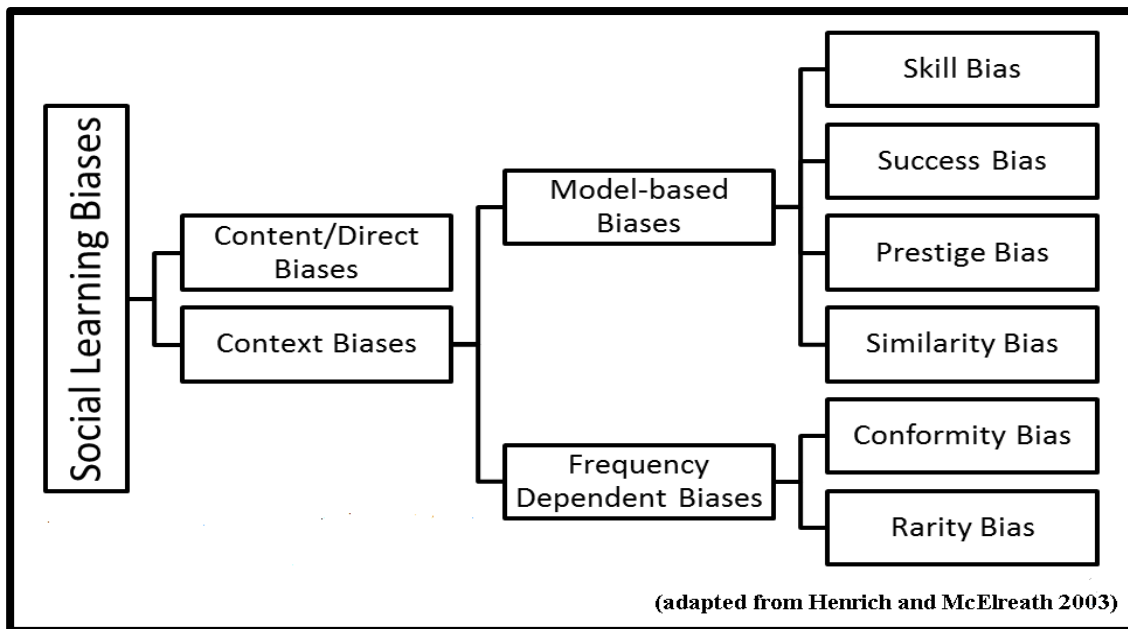
Figure 1.1   Organizational Diagram of Learning Biases

If there is no relationship between CAM use and social learning, or if the

relationship has no significant value, then in-depth studies run the risk of wasting both

time and money. Therefore, I am taking a first step in understanding the relationship

between learning biases and the use of CAM by determining if there is enough evidence

to justify additional further research.

Research Question and Hypotheses

The general research question that guides this study is whether the source of

information influences the use of CAM. I looked for evidence that learning biases were

generally associated with people's decisions to use CAM and that people's decisions to

use specific therapies are dependent on the information source (e.g., a person may use

acupuncture because a friend recommended it but drink herbal tea because one's mother

recommended it). Specifically, I explored two hypotheses: (1) If biased social learning is

influencing people's decisions to use CAM, then there will be a significant association between social learning biases and the use of CAM therapies in general; (2) If people are differentially using information dependent on the type of CAM therapy then individual therapy types will be significantly associated with different types of learning biases.

Significance of Study

Historical Context

Historically, the use of CAM therapies arose concurrent with the rise of modern medicine. In the 1800s the use of homeopathy began to increase as a direct response to the perceived inadequacies of modern medical techniques and practices until its use dwindled in the 1930s and then subsequently experienced a semi-revitalization in the 1990s (Haller 2005). The use of other forms of alternative and unconventional types of medical treatments also appeared to show an increase in the 1990s. Whether this was a response created by public perception about the limits of conventional modern medicine or was due to some other reason is unknown, although some scholars have tied it to the concurrent rise of the "New Age" movement (Baer 2003). Beginning in the late 1980s to early 1990s, both health professionals and policy makers began to seriously investigate CAM and gather statistical information on costs and use. Unfortunately, there is no systematic gathering of information on CAM expenditures other than the CDC's National Health Survey Alternate Health Supplement. Beginning in 2002, the supplement is attached to the main survey every fifth year. This means that information is sporadic and cannot be considered as completely accurate comparisons because each researcher had a different focus and used different criteria.

CAM Use and Expenditures by The Public

The economic impact and rising popularity of complementary and alternative medicine (CAM) over the last three decades has created a need to understand the use of CAM by the U.S. public. In 1990, Americans made more visits (425 million) to CAM providers than to primary care physicians (355 million). They also spent almost $10.3 billion out-of-pocket on CAM products, comparable to $12.8 billion spent on all hospitalizations in the United States (Eisenberg et al. 1993). Since that time, use of CAM has continued to expand, keeping pace with the explosive growth of conventional medical care.

Out-of-Pocket Expenditures 1990-2012

——— CAM (services and products)　——— Medical Doctors

(graph: Expenditures (in billions) on y-axis from $0.0 to $50.0; Year on x-axis: 1990, 1997, 2007, 2012)

(data from Centers for Medicare and Medicaid Services 2018)
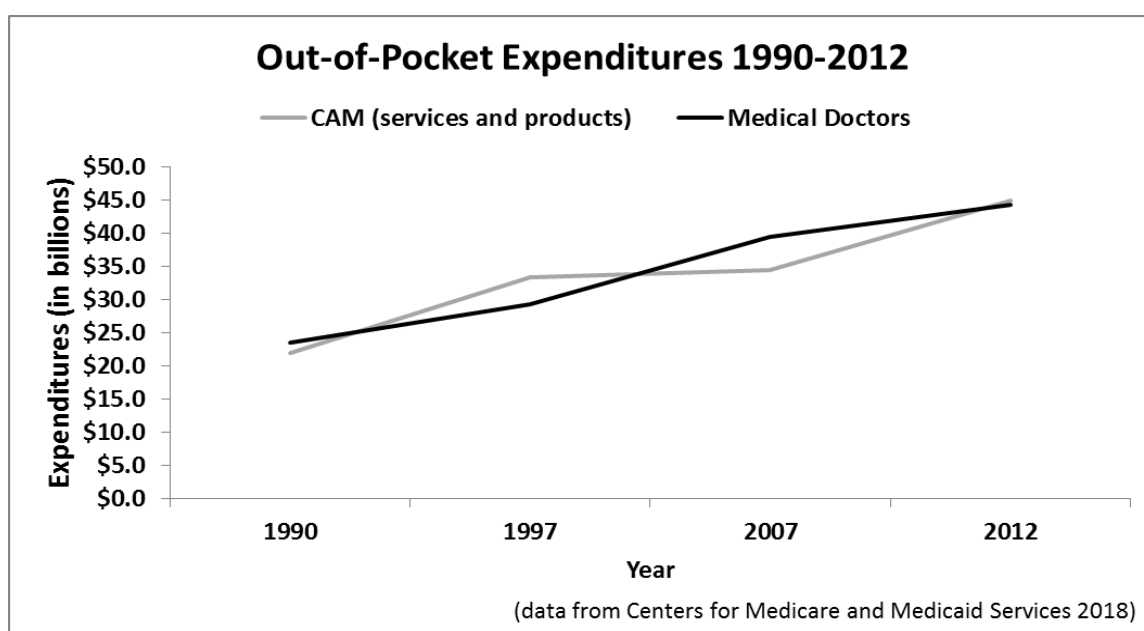
Graph 1.1　　1990-2012 Expenditure Comparison: CAM vs Physician

Between 1990 and 1997, use of CAM increased by 25% and total out-of-pocket expenditures increased by approximately 45%. In 1997, more money was invested in CAM than conventional medicine: out-of-pocket expenditures for all U.S. physicians reached $29.3 billion, while the estimated total for out-of-pocket expenditures on CAM therapies was $33.4 billion (Eisenberg et al. 1998). Although the spending rate of CAM

therapies and products seemed to slow or level off after a surge in the late 1990s, a 2004

study examining data from the 2002 National Health Interview Survey (NHIS)

determined that 62% of adults over 18 had used CAM at least once in the prior 12 months

(Barnes et al. 2004). This would indicate that the use of CAM was continuing to be

prevalent.

Table 1.1   1990-2012 Conventional Medicine and CAM Comparison

Year	Conventional Medicine			CAM			
		out-of-pocket expenditures			out-of-pocket expenditures		
	Physician Visits (millions)	Physician and Clinical $ (billions)	Hospital $ (billions)	Cam Provider Visits (millions)	Cam Provider $ (billions)	Cam products $ (billlions)	Study
1990	388	23.5	12.8	425	$11.7	$10.3	(Eisenberg 1993)
1997	386	29.3	11.0^3	629	$12.2	$21.2	(Eisenberg 1998)
2002		30.9^2	15.3^1				
2007		39.4^2	22.8^1	354.2	$12.4	$22.0	(Nahin 2009)
2012		44.3^2	31.8^1		$14.7	$30.2	(Nahin 2016)
1. NHE Tables -Table 07 (Centers for Medicare and Medicaid Services 2018).							
2. NHE Tables -Table 09 (Centers for Medicare and Medicaid Services 2018).							
3. CMS National Health Expenditure Data, CY 1960-2016 (Centers for Medicare and Medicaid Services 2018).							

In 2007, 83 million adults spent $33.4 billion out-of-pocket on complementary

and alternative medicine, which equated to 11.2% of total out-of-pocket expenditures on

health care (Nahin et al. 2009). CAM expenditures seemed to have leveled out by 2012

with more recent studies indicating that 38.3% of all adults in the U.S. reported some

type of expenditure for CAM therapies or products at an estimated cost of $30.2 billion

dollars (Nahin, Barnes, and Stussman 2016). This is still a very large segment of the

population spending a significant amount of money, which is one of the reasons

understanding CAM use has become an area of interest for health professionals, scholars, and policy makers.

<u>CAM Expenditures at the National Level</u>

The amount of money spent by the public indicates that something is occurring regarding healthcare decisions among a significant portion of the populace. However, not only do individuals spend billions each year on CAM therapies and products, but also government expenditures are quite significant. During the last three decades, Congress has steadily increased appropriations to investigate and disseminate information about CAM, reflecting the continuing interest of policy makers in understanding the relatively widespread and growing use of CAM therapies.

Recognizing a need to address the public's interest and use of CAM, in 1991 the U.S. Congress provided two million dollars in funding to evaluate and investigate unconventional medical practices (NIH 2017). Then in 1992, the Office of Alternative Medicine (OAM) was officially created to study and evaluate complementary and alternative medicine and to make that information available to the public. Toufexis (1993) remarked that OAM was created "under pressure from a Congress alarmed by the soaring costs of high-tech healing and the frustrating fact that so many ailments – AIDS, cancer, arthritis, back pain – have yet to yield to standard medicine" (para. 3). In 1998, the OAM budget had increased to $19.5 million dollars annually. Additionally, the OAM was renamed the National Center of Complementary and Alternative Medicine (NCCAM) and elevated to an independent National Institutes Health Center (NCCIH 2016b; NIH 2017). In a 2014 omnibus budget measure, NCCAM's name was changed to the National Center for Complementary and Integrative Health (NCCIH) with an

increased funding of $124 million. In 2017, the budget for NCCIH expanded to $130.5

million.
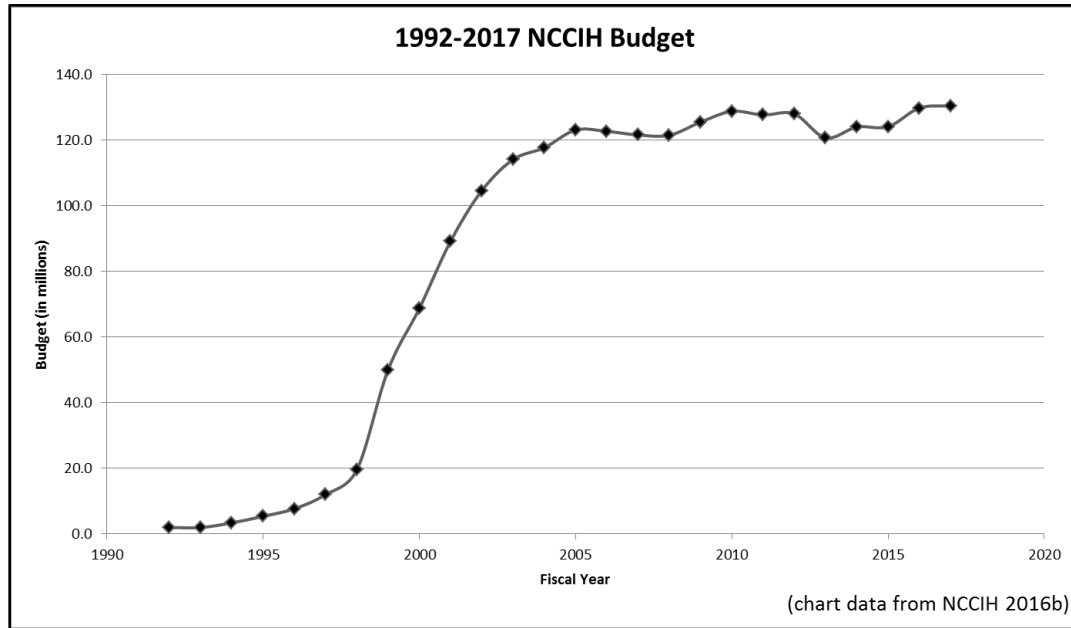
Graph 1.2   1992-2017 NCCIH Funding

<u>Implications</u>

Beyond understanding why people take herbal supplements or practice Yoga

instead of consulting a medical doctor, exploring the decision making process about

health has a much greater reach. Identifying how health decisions are made may also help

address greater questions about why people decide to circumvent other conventional

modern medical treatments such as vaccinations (Tafuri et al. 2014). Public policy

makers have also been concerned with underserved and vulnerable populations using

CAM instead of conventional medicine (White House Commission on Complementary

and Alternative Medicine Policy 2002). Understanding how to address these concerns

requires understanding the reasons and influencing factors in making these decisions.

Having a theoretical basis for understanding why people reject or supplement

standardized treatments viewed by those in the medical field as good common sense (and necessary for public and individual health) may help formulate proper responses to these types of issues. Additionally, studying health decisions through the framework of social learning not only applies theory to real world problems but also imparts greater insight into the mechanisms of social learning.

CHAPTER TWO: REVIEW OF LITERATURE

Complementary and Alternative Medicine

History, Context, and Definition

A universal definition of CAM is not available, although medical practices not conforming to the current standards of the medical community are referred to variously as "traditional," "unconventional," "complementary," "alternative," or "unorthodox" (Helms 2006; Kantor 2009; Mpinga et al. 2013; NCCIH 2016a; Ventola 2010a). CAM is often defined negatively, that is as not being a health therapy, product, practice, or service considered to be within the purview of mainstream conventional medicine.

The division between conventional medicine and CAM began in the U.S. in the early to mid-1800s when alternative medical practitioners began to compete with professionals who practiced "conventional" medicine. Intentionally offering "safe" and "natural" therapies based on theories of healing that stressed the emotional and spiritual aspects of health to distinguish themselves from practitioners of conventional medicine, such practitioners appealed to many people. This led to active and often contentious competition between alternative and conventional medical practitioners for status, recognition, patients, and patronage (Kantor 2009).

In the early to mid-20th century, the application of licensure laws, federal drug regulations, mandatory education, clinical trials, and rigorous scientific inquiry gave conventional medicine dominance over alternative medicine. However, public interest in CAM was renewed in the 1970s and intensified during the 1990s. The increased interest

and use of CAM is partially the paradoxical result of the successes of conventional treatments, drugs, and therapies. People expected that conventional medicine would be capable of combating any illness or health problem. When conventional medicine could not cure or solve their health issues, people turned to CAM for solutions (Kantor 2009; U.S. Senate 1998, 80). In addition, as the prevalence of chronic conditions has increased, along with a growing dissatisfaction with the perceived impersonalization and commercialization of conventional medicine, the use of CAM has continued to grow. In a hearing on Support Strategies for Clinical Research and Alternative Medicine Research at the NIH before the Subcommittee on Public Health and Safety, Dr. Gordon H. Williams stated that the public's increased interest in and use of CAM indicated that "there is a revolution going on in medicine and in health care in this country" (U.S. Senate 1998, 80).

"Complementary" and "alternative" medicine have been the most terms used to describe unconventional therapies since the 1990s. However, defining exactly whether a therapy is a CAM therapy is contested mainly because determining what is considered conventional or "mainstream" medicine is not always clear and the acceptance and perception of therapies can change over time (Dittman 2004; Institute of Medicine 2005). For example, chiropractic therapies are now considered both mainstream and complementary, although the American Medical Association (AMA) once viewed chiropractic therapy as an "unscientific cult" and even created a Committee on Quackery to eliminate the practice (Johnson et al. 1946, 406). To complicate matters even more, "Complementary and Integrative Medicine" is the term currently being used by the NIH to separate therapies used *in conjunction with* conventional medicine from "alternative"

therapies used *in place of* conventional medicines (NCCIH 2016a). For the purpose of this study, the more historically common term "Complementary and Alternative Medicine" or "CAM" will be used when discussing unconventional medical therapies and products. I am defining CAM as *those medical and health services, treatments, activities, and practices that do not require a licensed medical doctor's involvement, approval, and/or input and any product used for health reasons or treatment that does not require a prescription*. This definition includes a wide variety of therapies including yoga, acupuncture, faith healing, shamanism, Pilates, diet fads, massage, magnets, non-vitamin supplements, herbal remedies, folk medicine, homeopathic substances, teas, extracts, and infusions among many others. Although vitamins are technically a CAM product, they are treated as mainstream by the majority of health professionals and most researchers. Studies often present dual results with vitamins included and excluded as CAM products (Nahin et al. 2009).

Policy, Regulations, and the National Health Survey

Believing that conventional medicine was ignoring the potential of alternative medicine, Sen. Tom Harkin (D-Iowa) added a $2-million-dollar provision that established the Office of Alternative Medicine to Title 404E, Section 601 of the 1991 Public Health Service Act (Ember 1998; NIH 1998). The mandate of this newly formed office was to "facilitate the evaluation of alternative medical treatment modalities" (NIH 1998, para. 2).

In 1994, the Dietary Supplement Health and Education Act (DSHEA) created a new regulatory framework for dietary supplements. This moved supplements from the category of "drug" to that of "food" and the Food and Drug Administration was "not

authorized to review dietary supplement products for safety and effectiveness" (FDA 2017b, para. 2). In addition, the FDA's responsibility was downgraded to simply "taking action against any adulterated or misbranded dietary supplement product after it reaches the market" (FDA 2017a, para. 3). The distributors and manufacturers now evaluated the safety and effectiveness of their own products, and as long as they properly labeled those products with disclaimers and ingredients, they were essentially free to market them as they saw fit. There was now no official means of determining the efficacy of most supplements, and there were doubts regarding compliance with safety protocols and documentation. This concern would seem to be justified: supplements that used new (post-1994) ingredients were supposed to have safety data submitted to the FDA, but as of 2012, adequate notification was only received for 170 new ingredients, while the number of supplements marketed skyrocketed from an estimated 4,000 to over 55,000 (Cohen 2012). Whether or not those 170 reported ingredients were used to manufacture the additional 51,000 products, or if new ingredients were used and not reported to the FDA, is beyond our concerns here.

Recognizing inadequacy in available large-scale data, in 2002 the Centers for Disease Control (CDC) added a Complementary and Alternative Medicine Supplement (conducted every five years) to the yearly National Health Interview Survey (CDC 2017). This supplement gathers data on the use of CAM and combines it with other data on health and demographics, allowing researchers, policy makers, and medical experts to "identify and address health issues [and]… to help guide public health and health policy decisions" (CDC 2017, para. 1).

Research Post-1991

Much of the research since 1991 has focused on demographics, treatment efficacy, and correlations with specific medical conditions. This focus on descriptive statistics, clinical trials, and proximate explanations was partially due to three factors: the language of OAM's mandate, the drive of conventional and CAM practitioners to either disprove or prove the efficacy and safety of CAM, and the need of both policy makers and medical professionals to understand why people were using CAM. However, despite a purported concern for reasons people use CAM, studies have actually addressed two questions: who uses CAM, and are CAM treatments effective.

Focus on Efficacy - St. John's Wort as an Example

Much of the research performed by medical professionals has focused on efficacy and safety. One of the first studies conducted post-1994 examined the effectiveness of *Hypericum perforatum* (St. John's wort) in treating major depression. Linde et al. (1996) conducted a meta-analysis of 23 randomized trials that were performed between 1979 and 1984. Not one of these trials had been publicized in the U.S., and the authors of the meta-analysis noted they also found issues with double publication, lack of proper referencing to prior publication, authorship acknowledgement, lack of information on long-term side effects, and inconsistent herbal extract preparation, as well as inconsistency and vagueness in the classification of depression. The authors of the meta-analysis remarked, "Given the large number of possible sources of variation on one side and the relatively small number of trials, we refrained from performing subset analyses" (Linde et al. 1996, 257). Despite these issues, the authors concluded that "We believe there is good evidence

that *hypericum* is better than placebo in treating some depressive disorders" (Linde et al. 1996, 257).

The results of a clinical trial funded by NCCIH (then NCCAM) were publicized in 2002 that pointed out the same issues the meta-analysis documented as well as noting that subsequent studies had similar issues. This eighteen-month, randomized, double blind, placebo-controlled trial (n=340) tested the efficacy and safety of *H. perforatum* for treating major depression disorder between 1998 and 2000 (Hypericum Depression Trial Study Group 2002). Results indicated no significant difference between *H. perforatum* and placebo, leading to the conclusion that the study failed to support the efficacy of St. John's wort in treating depression (see Appendix A for the actual statistical results). The NCCIH website states that St. John's wort is not consistently effective for treating depression and warns the public that use can be potentially life threatening because of drug interactions. They refer to the 2002 study as their main source for this determination (NCCIH 2018).

Although St. John's wort is just one of the hundreds of supplements available, it is a prime example of the focus of medical studies on the effectiveness and safety of CAM treatments. However, studies on treatments other than supplements are not as heavily focused on efficacy.

Focus on sociology, demographics, and medical conditions

An examination of who uses CAM has been the focus of study in the search for understanding the use of CAM in the United States. A review of the literature shows that even when researchers specifically state they are examining reasons for people using CAM, they are actually determining who uses CAM (Astin 1998; Barnes, Bloom, and

Nahin 2007; Grzywacz et al. 2007; Upchurch and Rainisch 2012; Ernst 2000; Clarke et al. 2015; Field et al. 2009)

Using data from the 2007 National Health Survey, Barnes, Bloom, and Nahin (2007) examined CAM use in the previous 12 months. Their report focused almost entirely on sociodemographics and described who was more likely to use CAM, what therapies were selected most often, and what medical conditions were treated most frequently (Barnes, Bloom, and Nahin 2007). For example, Grzywacz et. al (2007) looked at age and ethnicity, Field et. al (2009) found that that women with breast cancer who used CAM were more likely to have a higher education level, and Clarke et. al (2015) published a report on trends in CAM use indicating that supplements were most popular.

In addition to looking at therapy being used, type of person using it, and condition being treated, further studies attempt to explain CAM use through social affiliation or ideology. The best example of this type of study is Dr. John A. Astin's 1998 national study in which he sought to understand why people used CAM. He stated that there was "no clear or comprehensive theoretical model to account for the increasing use of alternative forms of health care" (1548). He tested three hypotheses (which he referred to as theories): (1) Dissatisfaction with conventional treatment; (2) Need for personal control; and (3) Philosophical congruence (i.e., CAM was compatible with a person's existing worldview, values, or beliefs). The results indicated that dissatisfaction with conventional treatment did not predict use of CAM, but having poorer health and a higher education did, and that people did in fact use CAM because it was compatible with their philosophical worldview (Astin 1998). The philosophical worldview that Astin used as a

model was derived from sociologist Dr. Paul H. Ray's concept of "Cultural Creatives," people who adhere to what he terms a trans-modernism worldview (Ray 1997). Trans-modernism includes values and beliefs that embrace ideologies such as feminism, environmentalism, equality, spiritualism, social activism, and globalism. This corresponds quite closely with thought styles that other sociologists label "new age."

Of particular interest in this study is that Astin (1998) thought that the potential influence of others on people's decision to use CAM was a limitation in his study. Indeed, he notes that it made prediction "quite difficult" (Astin 1998, 1553). Of all the literature I reviewed, Astin's study came closest to recognizing that social learning could be influencing people's decisions to use CAM. Unfortunately, no research has yet explored the role social learning plays. In fact, the Institute of Medicine (2005) reported that

> It has widely been reported that *information about CAM is often spread by word of mouth within social networks and that referral by lay individuals is common* [emphasis added]…the committee found no study that investigated the impact of one person's CAM involvement on that person's immediate family or larger social network (58).

Social Learning

Logically, if there are concerns about people using CAM, then research should focus on process in making those decisions and influences upon them. However, current and past studies have focused on proximate causes: demographics, costs, and efficacy of therapy types. Although these studies promote our general understanding of CAM usage, they do not have a unifying theoretical stance that may explain how people are making these decisions in the first place.

I suggest that cultural evolutionary theory gives us a unifying framework through which we can examine how people are making decisions about their health in general but more specifically about using CAM. Cultural evolutionary theory posits that information is transmitted through different channels: genetic inheritance, individual learning, and social learning (Henrich and McElreath 2007; Henrich and McElreath 2003; Moya and Henrich 2016; Boyd and Richerson 1985; Richerson and Boyd 2005). I am not going to address or explain genetic inheritance or individual learning in this thesis as the focus of this study is on the third channel – *social learning*. Social learning is the transmission of information through methods such as language, teaching, and imitation. Cultural evolutionary theory also postulates that certain types of information may be favored or *biased* over other types of information, and that people acquire information through different pathways (Takahasi 1998; Henrich and McElreath 2003; Henrich and McElreath 2007; Richerson and Boyd 2005). When discussing different ways information is transmitted socially through learning, copying, and imitating, we are referring to the learning biases in play.

As I discussed previously in Chapter One, learning biases are characterized as either *content* or *context* biases. Content biases are based on *what* is being learned. People acquire behaviors, beliefs, values, and ideas through social learning that may act as a contextual cue or mental template. When introduced to a new behavior or concept, a person may more likely accept and acquire it because it fits with this mental template or triggers the cue (Kutty, Kumar Shee, and Pathak 2007; Mesoudi and Whiten 2008; Richerson and Boyd 2005).

Content Bias - learning preference based on **WHAT** is being learned or can test the idea/skill and find its better.

Figure 2.1   Content Bias

Context biases, however, are based on *who* something is being learned from (i.e., the "model") or how *common* something is. These types of biases utilize cues from the people being learned from. These people are used as models (templates) rather than the thing learned. Because information is costly to acquire, individuals may do better if they have a preference for learning and paying attention to other people who are more skillful, have high status or prestige, or are highly successful. Individuals who selectively learn from other people who are more likely to have adaptive skills or knowledge may be more likely to outdo individuals who do not selectively learn from others (Henrich and McElreath 2007, 558).

Context Bias - learning preference based on **WHO** something is being learned from, how common something is, or similarity.

Figure 2.2   Context Bias

Context biases that are preferentially acquired based on cues triggered by the characteristics of the model, are sub-classified as model-based biases (see Figure 2.3). These are biases based on the skill, success, or prestige of the model. They may be also based on shared similarities such as ability, language, ethnicity, age, or gender (Henrich and McElreath 2007). Skill-based bias relies on direct knowledge or observation of the model's skill or competence. An individual may observe two different people performing the same skill; if one person is more skillful than the other, then that person is the preferred model. For example, each of two different people is each building a shelter; the first builder's shelter leaks, has gaps in the walls, and is unsteady. The other builder's

shelter has a good roof, does not have gaps in the walls, and is very sturdy and safe. In

this situation, the theoretical framework of social learning biases posits that an individual

observing the difference in skill will preferentially learn from the more skillful builder.

This type of preferential learning is much less costly than learning from just anyone or

learning through trial and error (Boyd and Richerson 1985; Henrich and McElreath 2007;

Moya and Henrich 2016).

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Model-based Biases

Skill-based Bias – Preferential acqquistion of information from an individual, or "model", based on the model's skill or competence.

Success-based Bias – Preferential acquistion of information from a model based on level of success (determined by social context).

Prestige-based Bias – Preferential acquistion of information from a model based on level of presitige or deference.

Other model-based biases – Preferential acquistion of information from a model based on other characteristics (e.g., similarity-based bias is the preferntial acquistion of information from a model based on the similarity of certain traits).

</div>

Figure 2.3   Model-based Biases

Success-based cues are less direct and rely more on assumption (i.e., if someone

is successful, we assume they have better skills). These cues may be symbols of wealth or

health and vary depending on the particular social context. In one society, success may be

measured by the car a person drives, where in another by the number of wives a person

has. Thus, the social context then relates to skill domain. By preferentially acquiring the

behaviors or skill of a successful model that relate to a particular skill domain, an

individual can avoid the costlier learning of trial and error. Success-biased learning can

be less costly than skill-based biased learning because competence may at times be

difficult to discern, in which case cues of success more accurately identify who to learn from (Boyd and Richerson 1985; Henrich and McElreath 2007; Moya and Henrich 2016).

Prestige-based learning bias also can indirectly evaluate a model's competence and save on learning costs. If successful and skillful models are in high demand, then individuals will need to compete for access to them. This creates selection pressure on learners to show deference to those models that are determined to have the best information or be of the most benefit (i.e., have the most adaptive information). In exchange for preferred access and learning assistance, learners show deference in many forms, such as public praise, doing favors or providing gifts. In novel situations, naïve learners may not have information on the competence or success of potential models. However, they can use cues from existing patterns of deference to determine underlying skill and competence (Atkisson, O'Brien, and Mesoudi 2012; Boyd and Richerson 1985; Gibson and Lawson 2014; Henrich and Gil-White 2001; Henrich and McElreath 2007).

Learning can also be biased based on similarity. A learner may be concerned with the compatibility of their newly gained knowledge with their own abilities, experiences, limitations, or circumstances. This may change preferences, giving those models who are more similar to the learner more "weight." For example, a novice female business major may give preference to learning from a successful female model over learning from a male model because the learner may perceive that the female model shares more experiences (Henrich and McElreath 2003; Henrich and McElreath 2007).

Frequency-based biases reflect how common a particular skill, trait, behavior, or idea is among other individuals in a particular setting. In information-sparse

environments, the least costly learning mechanism for adaptive learners may be to copy

the majority. Henrich (2007) gives the following example:

> Suppose every individual is given a noisy signal (a piece of information) from the
> environment about what the best practice is in the current circumstances. This
> information, for any one individual, might give them a 60% chance of noticing
> that blowguns bring back slightly larger returns than bows. Thus, using individual
> learning alone, learners will adopt the more efficient hunting practice with
> probability 0.60. But, if an individual samples the behaviour of 10 other
> individuals, and simply adopts the majority behaviour, his chances of adopting the
> superior blowgun technology increase to 75% (563).

This logic can be applied to supplement an individual's imperfect information about the

relative success of potential models. Although some individuals are able to selectively

copy successful models, they will be unable to accurately determine levels of success. By

adopting the traits and behaviors of the majority, a second group can still take advantage

of the information acquired by a first group (Henrich and McElreath 2007).

Boyd and Richerson (1985) have meticulously tested the reasoning underlying

learning bias through analytical modeling. Such reasoning has also been tested using

evolutionary simulations of more complex environments (Henrich and Boyd 1998;

Kameda and Nakanishi 2002; Muthukrishna, Morgan, and Henrich 2016). But although

there were ample formal mathematical modeling and simulations performed on learning

biases, there have been fewer empirical tests of those models (Acerbi and Alexander

Bentley 2014; Boyd and Richerson 1985; Henrich and Boyd 1998; Henrich and

McElreath 2007; Ihara 2008; Kameda and Nakanishi 2002; Muthukrishna, Morgan, and

Henrich 2016; Takahasi 1998). The purpose of my study is not to add to the already

extensive body of mathematical modeling but to explore the dynamics of social learning

by applying real data to existing models. This allows me to empirically test hypotheses

about the relationship between CAM use and social learning biases to determine if future

in-depth study and testing on that relationship is feasible.

CHAPTER THREE: METHODOLOGY

Mixed Methods

To examine the role learning biases may play in decisions to use CAM, I chose to use a mixed methods approach. Mixed methods can be defined as "research in which the investigator collects and analyzes data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or a program of inquiry" (Tashakkori and Creswell 2007,4). Mixed methods is a pragmatic, question driven approach that utilizes induction, deduction, and abduction to discover patterns, test hypotheses, and uncover the best explanations for understanding results (Creswell 2003; Johnson et al. 2004).

Specifically, I used an explanatory sequential mixed methods design (QUAN $\rightarrow$ qual). In this type of design, quantitative data is collected first and informs the collection of the qualitative data. Qualitative data in turn helps explain the findings from the quantitative data (Creswell et al. 2011).
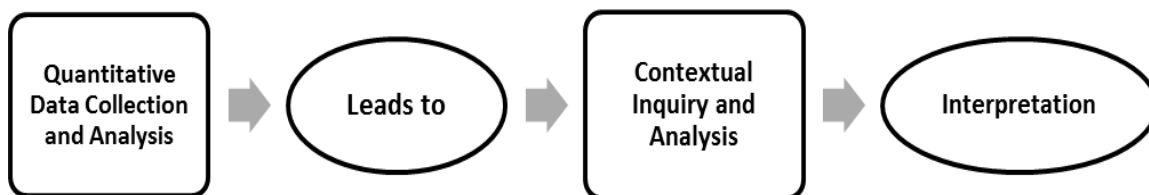
Figure 3.1   Explanatory Sequential Design

In the first, quantitative phase of the study, existing data was acquired from the 2012 National Health Interview Survey to test how learning biases relate to the use of

CAM. The second, qualitative phase was conducted to gain a deeper perspective on individual perceptions about CAM and who influenced its use. In this phase, the relationship between social learning and the use of CAM was explored in-depth with 12 interviewees from the greater Boise, Idaho area. The exploratory follow-up intends to help explain or build on initial quantitative results (Creswell and Plano Clark, 2011). A mixed methods approach was essential to this study because the survey data, while suitable for quantitative analysis, left many details unclear. The follow-up with contextual interviews provides in-depth descriptions of individual experiences and decision making process. Once all the data was analyzed, I integrated the findings and formulated the conclusions.

Quantitative Analysis

<u>Data Source</u>

For the quantitative analysis, this project used data from the 2012 National Health Interview Survey (NHIS) Adult Alternative Medicine (ALT) supplement and the Family Core and Sample Adult components. The NHIS is a cross-sectional, nationally representative household interview survey with various components and supplements. It is conducted continuously by the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS) to produce annual estimates of health for the U.S. civilian noninstitutionalized population. These interviews are conducted in homes using a computer-assisted personal interview questionnaire. All personal identifiers are removed, and the data are made public. A detailed description of the NHIS survey questionnaire and sample design is available elsewhere (NCHS 2012).

The NHIS Family Core and Sample Adult components collect general health and demographic information about each member of all families within a sampled household. Further, one adult aged 18 and older is randomly selected for the collection of additional information. Each household, family, and individual is assigned a unique identifier, whereby data can be cross-referenced and merged from different components of the NHIS. Although the NHIS releases yearly health estimates, the Adult Alternative Medicine supplement is only produced every five years. For the purpose of this study, the 2012 data was the most current dataset on CAM available from the NCHS.

Safety of Human Subjects

For the quantitative portion of this study, existing data available from the CDC's 2012 National Health Interview Survey (NHIS) was used. All personal identifiers had already been removed. No recruitment or interaction with human subjects was necessary as the data had already been collected, is maintained, and is made publicly available by the CDC. Exempt IRB status was requested and granted by the Boise State University Office of Research Compliance (IRB Protocol Number: 028-SB17-070).

Data Cleaning and Recoding

This study examined learning bias as it relates to CAM. Since only a portion of all NHIS participants were chosen to participate in the ALT supplement, only those adults who participated in the supplement were used in this study. Participants who used CAM identified a first, second, and third top therapy; questions about CAM were asked in terms of those therapies (e.g., told personal health care provider about use of first top therapy, used second top therapy for specific health problem). I used the Statistical Package for the Social Sciences (SPSS) version 25.0 (SPSS Inc., Chicago, IL, USA) to

merge data from the NHIS 2012 ALT supplement with demographic and general health information from the Household, Family Core and Sample Adult components. This produced a sample of *n*=34,525 adults aged 18 and over who answered 782 supplemental questions on CAM in addition to the standard questions from the Household, Family Core, Sample Adult components.

Once the data was merged, time was taken to ensure a complete data set. This required that I examine the data for inconsistencies as well as make decisions about incomplete data and data cleaning. I deleted all cases in which a proxy adult answered questions for individuals unable to answer for themselves; this left 33, 413 cases remaining. I also needed to decide which of the 872 available questions pertained to this study and should be used in my analyses. Besides keeping basic demographic information, I was guided by my research question and the general paradigm of learning bias in determining data to include in the final subset. After recoding and cleaning the data, I had a subset of *n*=9991 adults with 27 variables. See Appendix B: Cleaning Recording of NHIS Data for the procedures, which ensures that my analysis can be replicated.

After the cleaning and recoding was complete, I had five questions remaining about CAM use (see Table 3.1) and 11 top therapies (see Table B.1). One question was whether the top therapy was chosen because it was part of the respondent's upbringing.

Table 3.1   Variables for Use as Proxies for Learning Biases

TP1_RS9	Used/saw practitioner for top therapy because it was part of your upbringing
TP1_REC1	Used/saw practitioner for top therapy because it was recommended by a medical doctor
TP1_REC2	Used/saw practitioner for top therapy because it was recommended by a family member
TP1_REC3	Used/saw practitioner for top therapy because it was recommended by a friend
TP1_REC4	Used/saw practitioner for top therapy because it was recommended by a co-worker

The other four questions related to whether a therapy was chosen because it was recommended by a particular person. While cleaning the data I decided that I would use "Used/saw practitioner for top therapy because it was part of your upbringing" as a proxy for content bias. To review, content bias involves people acquiring information through social learning, which then acts as a contextual cue or mental template. One way an individual can acquire a "template" is through the information they acquire as they are growing up, i.e., their upbringing.

Information acquired from family, friends, and co-workers could be classified as conformist bias, but family could arguably also be considered as proxy for content bias. Similarly, friends and co-workers could alternately be considered skill or success based bias depending on context. Information acquired from a medical doctor could be classed prestige, success, or skill-based bias. Thus, attaching a specific bias type to each source of information influencing CAM use was not possible. However, irrespective of specific bias type, the questions are still proxies for general learning bias. It is important to note that the five questions were not merged in the cleaning and recoding process because all, one, some, or none of the questions could be answered affirmatively by the same participant. Therefore, I decided to keep these five questions separate in my analysis and determine which specific bias they represented in my final interpretation.

<u>Descriptive Statistics</u>

I used 10 variables for descriptive statistics. Besides standard demographics like age, race, sex, marital status, education, and income, I also chose other variables from the NHIS survey such as family size, number of children in the household, and the number of

elderly family members living in the household. I thought these additional variables

might be of interest and give a more detailed identification of CAM users (see Table 3.2).

Table 3.2   Additional Variables Chosen for Descriptive Statistics

AGE_P	Age
SEX	Sex
RACE	Race
R_MARITL	Marital Status
FM_SIZE	Size of family
FM_KIDS	# family members under 18 years of age
FM_ELDR	# family members aged 65 and older
EDUC1	Highest level of school completed
INCGRP3	Total combine family income
HOUSEOWN	Home tenure status

Definitions of Therapy Types

Naturopathy– An umbrella term for natural therapies using natural products.

Other Exercise – Exercise techniques such as Pilates, Feldenkrais, Alexander Technique,

Trager Psychophysical Integration, etc.

Healers – The use of traditional healers like Native American Healers, Medicine Men,

Shamans, Hueseros, Yerberos, etc.

Acupuncture - The use of needles to alleviate pain and treat medical conditions.

Homeopathy –Miniscule doses of natural substances that in a healthy person would

produce symptoms of a disease are used to treat an existing disease.

Diets –The Akins Diet, Vegan, Vegetarian, or other specialized diets for health reasons.

Mind-Body –A wide range of mind-body therapies such as hypnosis, hio-feedback,

mantra meditation, mindfulness meditation, spiritual meditation, guided imagery,

progressive relaxation, etc., used for general health and to treat medical conditions.

M-B Exercise – Mind-body exercise techniques such as Tai Chi, Qi Gong, Yoga, etc. used for health reasons.

Massage – The manipulation of the muscles and tissues of the human body, including craniosacral massage.

Chiropractic – The manipulation of the joints and spine, including osteopathy.

Herbal – Non- vitamin herbal remedies used for medical conditions and general health.

<u>Statistical Analysis</u>

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0 (SPSS Inc., Chicago, IL, USA). I used chi-square hypothesis tests of independence to compare eleven different CAM therapies with five questions about use. Because I was interested in patterns and relationships between categorical data and all assumptions of independence, and expected counts were met, chi-square was my best choice (Field 2013). This resulted in 55 separate 2 x 2 contingency tables with a corresponding significance level (p-value). Only 2 x 2 contingency tables were generated, so the Pearson's Chi-square test statistic was used with Odds Ratio (OR) to determine effect size (Field 2013; Kim 2017). Because of the number of tests (55), I decided to print the contingency tables in the appendices and only present the Chi-square statistics and odds ratios in five short summary tables (organized by the previously discussed five questions) in the body of thesis. This allows interested readers access to contingency tables with expected counts, percentages, and standardized adjusted residuals without flooding the body of the text with page after page of tables.

Qualitative Analysis: Contextual Inquiry

<u>Data Source</u>

I used semi-structured interviews to obtain information about the context of use. Participants were first asked a set of standard questions and then as the interview continued, additional questions were posed to clarify or expand on the original. This allowed a greater in-depth contextual understanding of how and why participants interpreted and perceived their actions and decisions: "Qualitative study is an inquiry process of understanding a social or human problem, based on a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting" (Creswell 2009).

Recruitment Flyers were posted in public areas where CAM users congregate (public boards at health food stores). Twelve individuals were recruited through social networks, word of mouth, and other participants' referrals. When I first began recruiting informants for interviews, I contacted three individuals whom I knew through past conversations to be CAM users. After being interviewed, these informants were asked if they would be willing to give my contact information to other CAM users. These informants were not paid and their help in recruitment was voluntary. This is a variation of both the snowball and respondent-driven sampling methods (Bernard 2011, 147-149). In snowball sampling, the informant gives the interviewer a list of other potential informants, and those new informants in turn list even more potential informants, thus creating a "snowball" effect. In respondent-driven sampling, one or a few key informants are generally paid for being interviewed and are then asked to recruit up to three others.

Eight interviews were conducted in the privacy of the informants' homes at their request (they were given a choice between a public location of their choice within the Boise area or their home). One informant insisted on being interviewed at a pub during a social gathering. This unexpected request resulted in an active conversation and concurrent semi-structured interviews with three other informants. Utilizing the social networks available resulted in a total of n=12 informants participating in the semi-structured interviews.

Safety of Human Subjects

Careful consideration was given to approval of methods regarding human subjects. Interviewing for the qualitative data collection began in December 2017 and continued until February 2018. Approval for the study was received from the Boise State University Office of Research Compliance before administration to the public occurred (IRB Protocol Number: 028-SB17-209). All subjects gave verbal informed consent in the research. See Appendix C Human Subject Protocols for all materials relating to the approval process.

Organization and Analysis of Findings

Data collected from the interviews was organized and coded by topics, issues, similarities, and differences. Once I had coded topics, I used a thematic analysis because I wanted to understand how a participant experienced the process of deciding to use CAM, and I wanted to try to see the experience from that person's perspective (Miller and Brewer 2003; Sutton and Austin 2015). This type of research "has 2 basic tenets: first, that it is rooted in phenomenology, attempting to understand the meaning that individuals ascribe to their lived experiences, and second, that the researcher must

attempt to interpret this meaning in the context of the research" (Sutton and Austin 2015, 228). I looked for commonalities and differences in statements informants made and then organized these by semantic themes (see Figure 3.2).
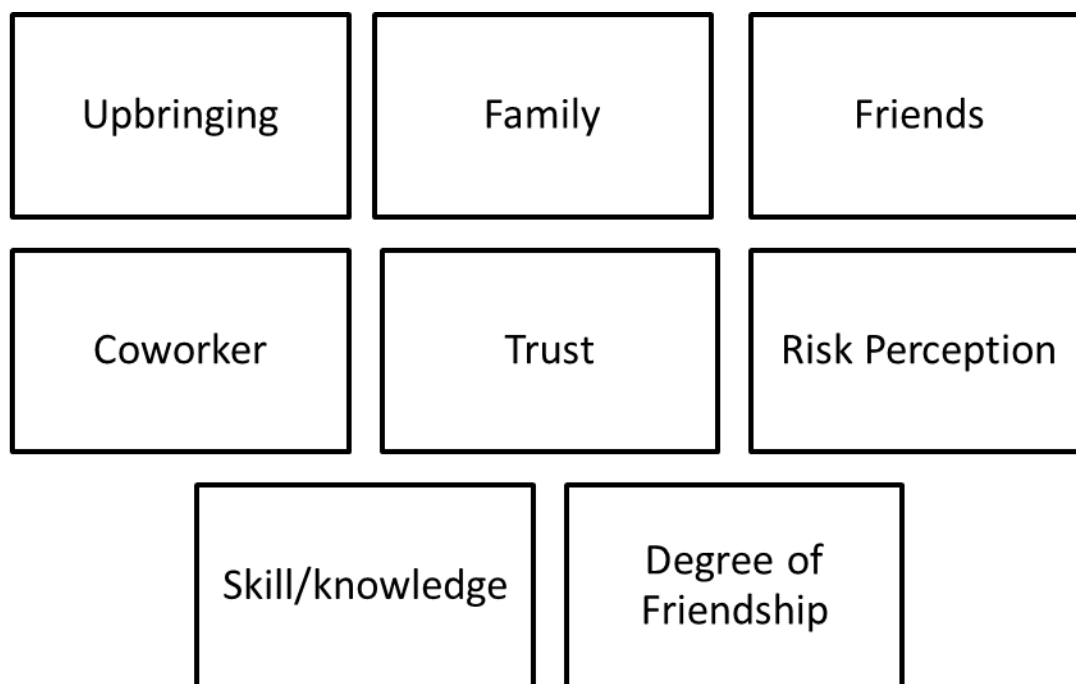
Figure 3.2   Themes

Once the data was organized by theme, I compared the findings to the results from the qualitative analyses and the broader picture of the learning bias framework. I used paraphrased excerpts of the informants' statements as examples to underscore particular points.

Delimitations and Limitations

Delimitations – Factors That Were Controlled by the Researcher

First, I acknowledge that more sophisticated tests may have been performed for both quantative and qualitative analyses. However, I used tests and comparisons that I was experienced in using and understood how to interpret. Secondly, self-reporting in the interviews may have resulted in over- or under-estimates. The participants were asked to

recall distant events and so there may have been some recall bias, although I have no reason to suspect this.

Limitations – Factors That Were Not Under the Control of the Researcher

I acknowledge several study limitations. First, the data from the NHIS looked at only the most common CAM therapies. Second, inferences about causality depend on individuals' accurate assessments of their own decision-making processes. However, in general, it seems reasonable to judge that most participants believed they used CAM for the reasons they provided. Data were self-reported and recall error is a possibility. However, the recall period was limited to the previous 12 months, which was likely to limit bias. Lastly, obviously, this study makes no claims about the efficacy of any CAM therapy. The data I used for my study did not permit an analysis of efficacy.

CHAPTER FOUR: RESULTS

Descriptive statistics were created and statistical analyses conducted using the

Statistical Package for the Social Sciences (SPSS) version 25.0 software (SPSS Inc.,

Chicago, IL, USA). I deleted all records outside the domain of interest (CAM users) in

order to work with a smaller data file and facilitate faster processing time. However,

NHCHS warns that running complex sample analyses for subsetted datasets may yield

unreliable estimates and that "in general, software packages that correctly analyze

complex survey data cannot compute accurate standard errors for subsetted data" (NCHS

2012; NCHS 2016,6). My study uses a subset, CAM users (n=9991). Observing the

NCHS warning, I decided that I would not use complex sample analyses but rather run all

analyses on the unweighted data.

Descriptive Statistics

Based on the 2012 NHIS data, females were reported to use CAM at a higher ratio

(61.7%) than males (38.3%). This compares with only a slight difference between female

(53.3%) and male (46.7%) non-CAM users (see Figure 4.1). For Marital Status, 44.6%

are married with the spouse in the household, 22.5% have never been married, and 15.2%

are divorced, while only 5.9% and 2.3% are either living with a partner or separated

respectively (see Figure D.3). CAM users who self-identify as White (78.8 %) outnumber

all other races combined (see Figure D.4).

Sex Ratio of CAM vs. non-CAM users

■ Male □ Female

Graph showing Percentage on y-axis (0.0% to 70.0%) and CAM Use on x-axis:

- CAM Only (n=9,991): Male 38.3%, Female 61.7%
- Non-CAM Only (n=23,422): Male 46.7%, Female 53.3%
- Total (n=33,413): Male 44.2%, Female 55.8%
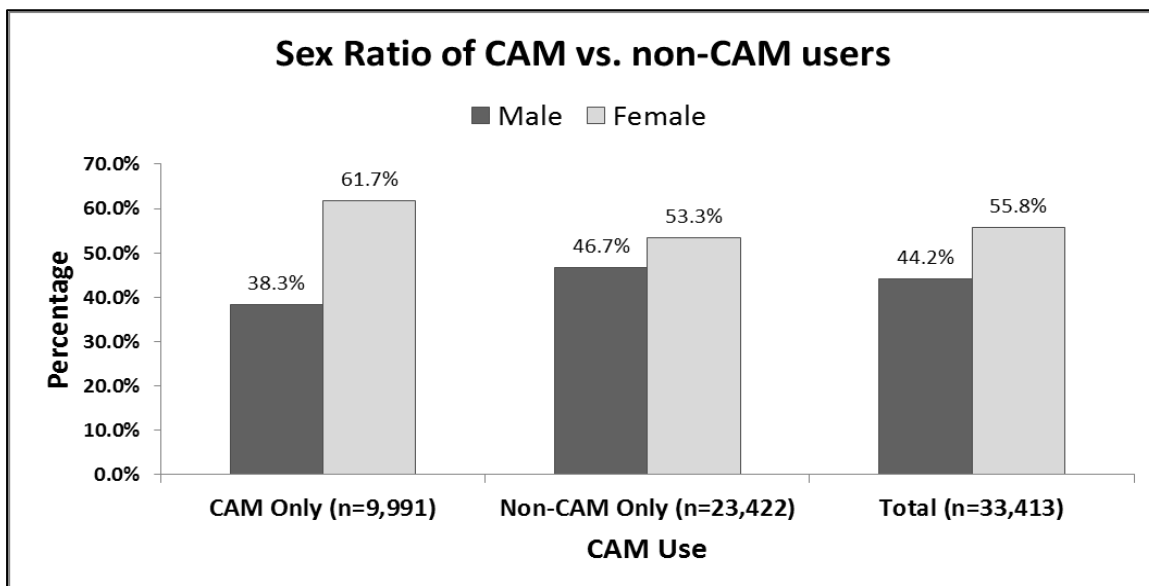
Graph 4.1   Sex Ratio of CAM vs. Non-CAM Users

Education Level of CAM vs. Non-CAM Users

■ CAM Only (n=9,991)   □ Non-CAM Only (n=23,422)

Graph showing Percentage on y-axis (0.0% to 50.0%) and Highest Educational Level Obtained on x-axis:

- 0 -K only: 0.2%, 0.6%
- Any Elementary School (1-6): 1.1%, 3.8%
- Any Middle School (7-8): 1.2%, 2.9%
- Any High School, No Diploma: 4.6%, 12.1%
- Diploma or GED: 19.0%, 28.7%
- Some college, no degree: 21.3%, 19.4%
- Vo-Tech Certificate: 7.9%, 6.6%
- Any College Degree: 44.6%, 25.5%
- Don't know: 0.2%, 0.4%

Graph 4.2   Education Level of CAM vs. Non-CAM Users

Most CAM users are between the ages of 34 and 61. They are also well-educated. 44.6% had a college degree, 21.3% had at least some college, and another 19% either graduated from high school or obtained a GED, whereas only 4.6% dropped from high school (see Figure 4.2). Most either live by themselves (36.4%) or with only one other person (33.4%), while another 27.9% live with 2 - 4 others. Very few CAM users have

children (73.8%), whereas the ones who do have children usually have only 1-3 (24.7%).

Less than 2% had four or more children, but 77% reported that someone over the age of

65 lived with them (see Appendix D).

These statistics seem to indicate that the majority of CAM users are not using

CAM because they cannot afford it or because of the lack of education. They are white

educated individuals with small families who have either an older partner or a parent

living with them. These results are supported by previous studies on the characteristics of

CAM users (Ernst 2000; Tait et al. 2013; Institute of Medicine 2005).

Chi-Square Analyses

Statistical analyses were conducted using the Statistical Package for the Social

Sciences (SPSS) version 25.0 software (SPSS Inc., Chicago, IL, USA). All data I used

from the NHIS to test my hypotheses were categorical and each test examined the

relationship between two variables. Therefore, I used Pearson's chi-square test of

independence with 2 x 2 contingency tables to assess if the proportion choosing CAM

varies based on type of learning bias. For example, are those using homeopathy

(compared to not) more likely to have learned about it when growing up? Adjusted

standardized residuals and odds ratios were used to determine directionality and effect

size (Field 2013; McHugh 2013). Because I conducted 55 analyses, contingency tables

for significant results are listed in Appendix E; non-significant results are not listed.

Figure 4.3 is a summary graph displaying the learning bias percentage per top therapy

used.

Learning Bias Percentage for Each Top Therapy
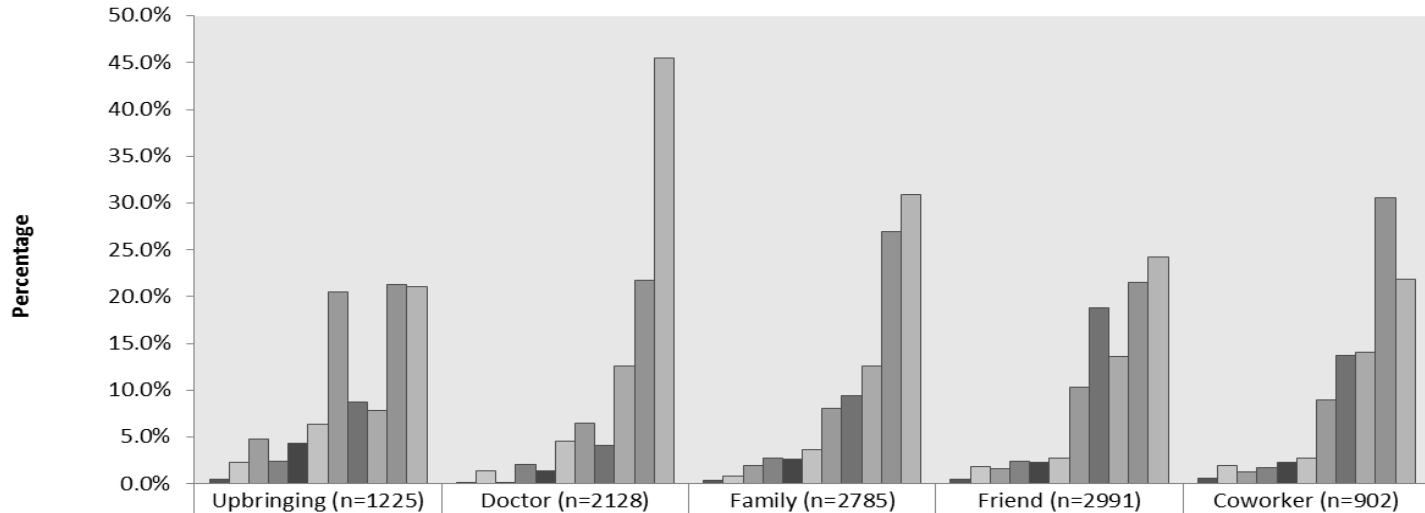
	Upbringing (n=1225)	Doctor (n=2128)	Family (n=2785)	Friend (n=2991)	Coworker (n=902)
■ Naturopathy	0.5%	0.1%	0.4%	0.5%	0.6%
▢ Other Exercise	2.3%	1.4%	0.9%	1.8%	2.0%
▨ Healers	4.7%	0.2%	1.9%	1.6%	1.3%
▨ Acupuncture	2.4%	2.0%	2.7%	2.4%	1.8%
■ Homeopathy	4.3%	1.4%	2.6%	2.2%	2.3%
▢ Diets	6.4%	4.6%	3.7%	2.8%	2.8%
▨ Mind-Body Therapy	20.5%	6.4%	8.1%	10.4%	9.0%
▨ M-B Exercise	8.7%	4.1%	9.4%	18.9%	13.7%
▨ Massage	7.8%	12.5%	12.6%	13.6%	14.1%
▢ Chiropractic	21.3%	21.7%	26.9%	21.6%	30.6%
▢ Herbal	21.1%	45.5%	30.9%	24.3%	21.8%

Learning Bias*

*Respondents could choose more than one source . Percentages are calculated for individual bias not total biases .

Graph 4.3   Learning Bias Percentage for Each Top Therapy

Used Top Therapy Because it was Part of Your Upbringing

Results from the Chi-square tests indicated there was no significant relationship between Upbringing and Naturopathy, or Upbringing and Acupuncture. However, the relationship between Upbringing and the use of Traditional Healers was highly significant and based on the odds ratio CAM users were 9 times more likely to use a Traditional Healer if it was part of their upbringing, $\chi^2(1) = 179.51$, $p < .001$, (OR 9.03). Significant results were also found for Homeopathy, which was 2.7 times more likely to be used if it was part of upbringing, $\chi^2(1) = 40.6$, $p < .001$, (OR 2.73). Table 4.1 shows that Special Diets, Mind-Body Therapy, and Other Exercises were also more likely to be used if they were part of upbringing.

Mind-Body Exercise, Massage, Chiropractic, and Herbal Remedies also indicated a significant relationship with upbringing. However, for those therapies, the odds ratios indicated that if the top therapy was part of their upbringing, that therapy is less likely to be Mind-Body Exercise, Massage, Chiropractic, or Herbal Remedies.

Table 4.1   Chi-Square and Odds Ratios for Upbringing

Upbringing			
Therapy	X^2	p-value	Odds Ratio
Naturopathy	0.048	0.826	1.101
Healers	179.513	<.001	9.027
M-B Exercise	22.020	<.001	0.610
Homeopathy	40.595	<.001	2.727
Acupuncture	0.001	0.970	1.008
Diets	25.346	<.001	1.912
Mind-Body	273.514	<.001	3.657
Other Exercise	7.673	0.006	1.179
Massage	34.209	<.001	0.528
Chiropractic	10.173	0.001	0.790
Herbal	48.711	<.001	0.600
N=9991, df=1, 95%CI			

Used Top Therapy Because it was Recommended by a Medical Doctor

The Chi-square tests indicated that if the top therapy were recommended by a medical doctor, that therapy is less likely to be Naturopathy, Traditional Healers, Mind-Body Exercises, Homeopathy, Mind-Body Therapy, or Chiropractic. However, results indicated that Special Diets are 1.30 times more likely to be used if recommended by a medical doctor, $\chi^2(1) = 4.88$, $p = .03$, (OR 1.30); and Herbal Supplements are 2.47 times more likely to be used, $\chi^2(1) = 328.21$, $p < .001$, (OR 2.47). Acupuncture, Other Exercise, and Massage were non-significant. See Table 4.2.

Table 4.2   Chi-Square and Odds Ratios for Medical Doctor

Medical Doctor			
Therapy	X^2	p-value	Odds Ratio
Naturopathy	5.774	0.016	0.263
Healers	19.631	<.001	0.143
M-B Exercise	189.011	<.001	0.235
Homeopathy	5.044	0.025	0.637
Acupuncture	1.293	0.255	0.824
Diets	4.883	0.027	1.303
Mind-Body	12.169	<.001	0.714
Other Exercise	0.000	0.995	0.999
Massage	0.784	0.376	0.937
Chiropractic	15.627	<.001	0.794
Herbal	328.209	<.001	2.466
N=9991, df=1, 95%CI			

Used Top Therapy Because it was Recommended by a Family Member

Naturopathy, Acupuncture, Special Diets, Mind-Body Therapy, Massage, and Herbal Supplements had non-significant results. If the top therapy were recommended by a family member, that therapy is less likely to be Mind-Body Exercise or Other Exercise. Traditional Healers were more likely to be used, $\chi^2(1) = 28.36$, $p < .001$, (OR 2.72), as

was Homeopathy, $\chi^2(1) = 7.80$, $p = .01$, (OR 1.52), and Chiropractic, $\chi^2(1) = 7.37$, $p = .01$, (OR 1.15). See Table 4.3.

Table 4.3   Chi-Square and Odds Ratios for Family Member

Therapy	X^2	p-value	Odds Ratio
Naturopathy	0.265	0.607	0.836
Healers	28.358	<.001	2.720
M-B Exercise	44.330	<.001	0.617
Homeopathy	7.802	0.005	1.516
Acupuncture	1.954	0.162	1.219
Diets	0.096	0.757	0.964
Mind-Body	0.151	0.697	0.969
Other Exercise	8.380	0.004	0.527
Massage	1.041	0.307	0.934
Chiropractic	7.368	0.007	1.148
Herbal	3.099	0.078	1.089
N=9991, df=1, 95%CI			

Used Top Therapy Because it was Recommended by a Friend

Naturopathy, Homeopathy, Acupuncture, and Massage were all non-significant. Top

therapies most likely to be used if recommended by a friend were Traditional Healers,

$\chi^2(1) = 10.60$, $p = .001$, (OR 1.28), Mind-Body Exercises, $\chi^2(1) = 130.96$, $p < .001$, (OR

1.99), Mind-Body-Therapy, $\chi^2(1) = 24.23$, $p < .001$, (OR 1.45), and Other Exercises $\chi^2(1)$

$= 5.61$, $p = .02$, (OR 1.51). If the top therapy were recommended by a family member,

that therapy is less likely to be Special Diets, Chiropractic, or Herbal Supplements. See

Table 4.4.

Table 4.4   **Chi-Square and Odds Ratios for Family Member**

Friend			
Therapy	X^2	p-value	Odds Ratio
Naturopathy	0.68	0.41	1.29
Healers	10.60	0.001	1.28
M-B Exercise	130.96	<.001	1.99
Homeopathy	1.72	0.190	1.22
Acupuncture	0.06	0.812	1.04
Diets	12.13	<.001	0.65
Mind-Body	24.23	<.001	1.45
Other Exercise	5.61	0.02	1.51
Massage	0.77	0.38	1.06
Chiropractic	26.91	<.001	0.76
Herbal	57.86	<.001	0.69
N=9991, df=1, 95%CI			

Table 4.5   **Chi-Square and Odds Ratios for Co-worker**

Co-Worker			
Therapy	X^2	p-value	Odds Ratio
Naturopathy	0.24	0.63	1.26
Healers	0.69	0.41	1.29
M-B Exercise	0.53	0.47	1.08
Homeopathy	0.69	0.41	1.21
Acupuncture	1.44	0.23	0.73
Diets	2.84	0.09	0.70
Mind-Body	0.63	0.43	1.10
Other Exercise	2.43	0.90	1.48
Massage	0.80	0.37	1.09
Chiropractic	16.56	<.001	1.36
Herbal	28.56	<.001	0.64
N=9991, df=1, 95%CI			

Used Top Therapy Because it was Recommended by a Co-worker

All results for co-worker except for Chiropractic (*more* likely) and Herbal Supplements (*less* likely) were non-significant. If the top therapy was recommended by a family member, that therapy is less likely to be Herbal Supplements. Chiropractic was 1.36

times more likely to be used if recommended by a co-worker, $\chi2(1) = 16.56$, $p < .001$,

(OR 1.36). See Table 4.5 above.

Qualitative Findings - Interviews

I began each interview by asking participants to review a list of CAM therapies

(see Figure C.4). Beginning with the first therapy they indicated they had used, I asked

them to recall how they had learned about that therapy and what they thought influenced

them to use it. As the interview progressed, I asked them to expand on subjects I thought

might have any bearing upon social learning or influence on CAM use. See Appendix F

for a list of highlights for each participant.

Upbringing

Eleven out of twelve participants stated that they were open to trying CAM

therapies because of exposure during childhood or as a youth. As an example, participant

#1 stated that her grandmother used herbal and folk remedies on a constant basis as well

as prayer and faith healing. She continued (without prompting) and stated that she

believed that is why she was willing to try most CAM therapies (Participant #1 also used

the most therapies, eight in total). Another example came from participant #2, who

commented that she had been raised in her grandmother's home and everyone that she

knew when growing up used folk medicines and herbal remedies. Participant 1 also

volunteered that she used a "particular" herb for muscle spasms, because her

grandmother had used the same herb for headaches. She also stated that her grandmother

use to "rub her" when she was child to relieve pain and stress, and when a friend

recommended craniosacral therapy, she thought it sounded like getting a "head rub."

When asked what influence, if any, her upbringing had on her use of CAM today, she was very disdainful and stated that "of course" that was the reason she used CAM.

The other participants had similar stories about childhood. Experiences ranged from learning about meditation from an uncle when a teenager to being introduced as a small child to a "healthy" vegetarian diet by a stepparent.

<u>Family</u>

One of my baseline questions concerned the participants' definition of the word family. During the interviews, I discovered that the concept of "family" was very subjective and that the definition changed through life. Eight participants defined family as people they live with now, and siblings, parents, and grandparents. Nine participants stated they had close friends whom they considered to be family (see Appendix F).

When asked if they had responded to questions about the influence of friends upon CAM use, only one participant (#5) stated having included that friend as a "friend," but she thought of her as family. Eleven participants stated they had "aunts and uncles" when growing up that they discovered were not related when they were older; they were actually friends of their parents or other adults in the home. Those same eleven participants stated that when they think of their childhood "family," it includes all relatives they felt "close to," adults in the household and family friends. Most respondents specifically included grandparents. To gain more understanding, I asked subjects, "What influence does your "family" (past or present) have on your choices about CAM use". Participants responded that "it depends" or "usually do"; several times these statements succeeded one another.

Participant #4 provides an example, "Well it depends ya know. I mean umm sure. I mean uh... like uh yea if they said hey try this, I'd do it. Usually. Maybe it depends. Depends on what it is."

"Could you explain? I don't understand."

"Well like umm it depends like if they know sunt-in [something] bout it or if they dun it demself or like if you know they know its safe n stuff, ya know?"

When asked why they would follow a family member's recommendation to try a CAM therapy (or product), all participants stated because they trusted them and "most" of the time they knew what they were talking about. Only two participants (#2 and #10), stated they did it to specifically to make a family member happy (happy as in honestly wanting to please), and two people stated they did it to make their spouse "shut up" or "shut the hell up about it." Four people (#5, #7, #8, and #12) stated the same thing (shutting her up) about their mothers.

Participant #6 stated he was not raised around CAM products but as he got older (adult, divorced twice, currently married and with three children), his father started taking herbal supplements and his health improved. When participant #6 started having health problems, his wife convinced him to start taking a supplement; he said he did it because it seemed to work for his dad.

Friends

Friends were subjectively categorized by participants as "work friends, "normal friend," "party friends," "school friends," "old friend," "acquaintances,"" just a friend," "close friend" "family friend" "friend like family" and "business friend". When organizing the separate themes, I classified "work friend" and "business friend" as "co-

workers." Depending on how the participant perceived closeness of friendship, participants were either more or less likely to follow that friend's recommendation. Of specific interest was that eight participants stated they had tried a new therapy temporarily simply to please someone whom they wanted to "become closer to." When asked why they did not name that therapy as one they used, the usual reply was they did not consider it as counting, they forgot about it, it was not important, it was just something they did once or twice, or because they only did it to make the other person "happy."

Four people stated that they had tried a therapy that a friend recommended to "shut them up" or get them to "stop nagging me," but then they stopped doing it after a while. When asked what their friend thought about their quitting, three people said they were not happy they quit but were happy they tried. The other participant stated they never told them; they just quit doing it.

Co-workers

All participants clearly distinguished "friend" from "co-worker", not considering them to be in the same category. All except #5 and #12 stated that sometimes co-workers could become friends but "it depended." Answers were vague and participants did not seem to know how to explain how a person's co-worker becomes a friend. However, the consensus seemed that such a change was based on trust levels and similar interests and/or goals. Participant #1 said she married her co-worker after they became friends. So now, they "were family and not a friend any more."

Number 12 made it clear he did not consider a boss to be a co-worker. He also stated that he had done Tai Chi for a while to make his boss happy but that it did not

count because he "just did it so I'd get a raise. But I didn't get it and then he went somewhere else and so I quit doing it." Participants #1, #2, #3, #4, #6, #8, #9 and #11 all stated that they wouldn't try something that was risky based on a co-worker's recommendation unless other information was available.

Degree of Friendship, Risk Perception, Skill/Knowledge and Trust

These categories all act as qualifiers. Regardless of upbringing or who recommended a CAM therapy, the participants all used one of these qualifiers to judge the *quality* of information. As stated earlier, participants would not try something potentially risky or harmful as a co-worker suggested, but as levels of trust and perception of skill/knowledge increased, they were more likely to follow recommendations.

Medical Doctors

All the participants originally told me they trusted their doctor's opinion, but all participants also stated in varying degrees later on in the interview that doctors couldn't be trusted for a variety of reasons, including the "doctor is in it for the money," "it's all about the money," "they don't really care," "I'm just a number to them," and "they only listen to me cause I have good insurance".

Participant #1 described trying a diet supplement because the doctor said it would help. She also stated that it did not help and she would not try anything else like it suggested in the future. When asked about talking to the doctor about that, the reply was no. When asked why, she said, "Oh, hell, he don't care. He got my money. Besides, he don't got time. Why bother? I'll just ask someone next time or look it up myself. There *is* always the internet."

Participants #2, #4, #7, #9, #11, and #12 all stated they would trust their doctor's recommendation on diets and herbs, because, as participant #12 stated ,"they know if it's going to kill me or not".

CHAPTER FIVE: DISCUSSION

Summary and Conclusion

The main object of this study was to determine if there is a relationship between CAM use and social learning. The chi-square analyses revealed that learning bias and CAM use were, in some way, related to each other. When examining chi-square results, one sees that out of 55 tests performed, 26 had significant results. However, significance alone shows only that a relationship exists. I also needed to know effect size and directionality. I used the odds ratio (OR) rather than Cramer's V to determine effect size because relatively weak effects are all that can be expected when the outcome is only partially dependent on the independent variable (McHugh 2013). Preliminary tests using Cramer's V showed that very small numbers were in fact returned, suggesting that the use of CAM was only partially dependent on learning bias. Since the goal of this study was only to determine the existence of a relationship and not to establish causation, the odds ratio gave a much clearer picture of both effect size and directionality (more or less likely). I can only speculate at this juncture about other variables that may be influencing CAM use, although previous studies have suggested that medical conditions and world view may be other influencing factors (Astin 1998; Barnes, Bloom, and Nahin 2007; Baer 2003; Clarke et al. 2015).

In testing my second hypothesis (people differentially using information dependent on the type of CAM therapy), I looked at upbringing as a proxy for content bias and delayed assigning proxy status to the other variables (family, friends, co-

workers, medical doctor). When looking at the relationship between upbringing and the different CAM therapies, we see that most of the relationships are significant but directionality is mixed. For four therapies, the odds ratios indicated that if a top therapy were part of a person's upbringing, it is less likely that therapy is Mind-Body Exercise, Massage, Chiropractic, or Herbal Supplements. However, for five other therapies (Traditional Healers, Homeopathy, Special Diets, Mind-Body Exercise, and Other Movement/ Exercise Techniques), it was more likely that a person would use that CAM therapy if it was part of a person's upbringing.

Reviewing those treatments that were more likely to be be used if they were part of a person's upbringing, we see that the use of Traditional Healers, such as a Shaman or Medicine Man, was nine times more likely. In support of the statistical relationship, two participants in my interviews indicated that they had used a Traditional Healer because they were raised with an acceptance of that type of treatment. For those whose top therapy was Mind-Body therapy (e.g., bio-feedback, hypnosis, energy healing, etc.), they were more likely to say it was part of their upbringing (30%) than those whose top therapy was something else (only 10%). Here again, interviewees indicated they had used the therapy (hypnosis) because they knew someone as they grew up who had been hypnotized. Homeopathy is a treatment in which a person is treated for a disease or condition with a minute amount of a natural substance that creates the symptoms similar to those of the disease, based on the idea that "like cures like." The analysis indicated that if the top therapy were part of upbringing, people were almost three (OR2.73) times as likely to state that it was Homeopathy.

People who stated that their top therapy was part of their upbringing were almost twice (OR1.91) as likely to state that it was Special Diets. The findings from my interviews support the statistical results wherein one interviewee stated that he was a vegetarian because his family didn't eat meat when he was a child. Other Exercise and Movement Techniques include Pilates, a popular exercise regime that can be done at home. Other Exercise had an almost even (OR1.19) odds ratio, suggesting that the likelihood of its being reported as part of their upbringing (20%) was the same as the average of all other categories combined.

Content bias is experience-driven. Once a person is exposed to a particular concept, skill, idea, or behavior, then that person has a template against which they can judge similar information. It presupposes that exposure to or acceptance of information in the past will influence the decision to preferentially accept similar information in the future. Therefore, the literature on content bias is focused primarily on positive associations between learning bias and information acquisition or preferences for certain information, skills or behavior (Henrich and McElreath 2003; Henrich and McElreath 2007; Mesoudi, Whiten, and Dunbar 2006; Mesoudi and Whiten 2008; Smith et al. 2008). I think that using upbringing as a proxy for content bias influencing CAM choice is appropriate because it presupposes that being introduced to CAM when growing up will influence the decision to use certain CAM therapies later in life. Interview findings suggest that upbringing does in fact create a mental model in which the acceptance and use of CAM during childhood becomes the norm and thus when reaching adulthood makes it more likely that the person will use CAM again.

Using CAM therapy because a medical doctor recommended it could potentially fall under one of several bias categories – success, prestige, or skill/knowledge. These are all model-based biases and technically, as long as evidence supports the existence of a relationship, my hypothesis is supported. However, I also wanted to know which specific bias were in play. Before the statistical tests were run and before I performed the interviews, I was ambivalent about which category Medical Doctor would fall under. If people were making success-biased decisions, then people would most likely be following their doctor's recommendations because they view their doctor as successful (going to medical school is hard but he/she made it through and doctors make a lot of money so he/she must be successful.)

On the other hand, they may perceive that being a doctor is prestigious, i.e., a person perceives that doctors are important people. Because they see doctors as being important (prestige-bias), they are more likely to follow his/her recommendations. Last is skill-based bias. The statistical analyses indicated that highly significant relationships exist among all but three of the therapies and a doctor recommending that therapy. Only two therapies with significant results had positive effects: Special Diets, which were almost one and a half (OR1.30) times more likely to be used, and Herbal Supplements, which were nearly two and a half (OR2.43) times more likely.

The interviews I conducted helped shed some light on this. These two therapies in particular could potentially cause harm, sickness, or death; they have potential of bad side effects; they can negatively affect current health conditions; they can have serious negative interactions with other medications; and in the case of supplements, they can even cause death if taken incorrectly. People expected their doctors to know about these

potential issues and to tell them. In other words, the interviews indicated that using a therapy based on a medical doctor's recommendation was knowledge-based (skill-based).

Family, friends, and co-workers were also classifications about which I was ambivalent as to type of bias represented, but they were not as easy to categorize. Conformist bias (a frequency dependent bias) predicts that individuals are disproportionally more likely to imitate the most common behavior (Boyd and Richerson 1982). Unlike frequency dependent bias, which relates to the commonality of a behavior or idea, model-based biases relate to from whom (i.e., the model) we acquire a behavior or idea. The results of the statistical analyses did not clarify which bias was in play, it only indicated that a relationship existed.

Among top therapies used because they were recommended by a family member, four therapies showed positive significant relationships: Traditional Healers, which were over two and half (OR2.72) times more likely to be the top therapy; Homeopathy, one and half (OR1.52) times; and Acupuncture (OR1.22) or Chiropractic (OR1.15) with only slightly above even odds. These figures only show the strength of the relationship; they do not supply any information about which biases may be in play.

Similarly, when participants state that the top therapy were recommended by a friend there is slightly above even odds that Traditional Healers (OR1.28) were the top therapy; Mind-Body Exercise (OR1.99) were about twice as likely; and Mind-Body Therapy (OR 1.45) or Other Exercises (1.51) were about one and half times more likely. The co-worker category only had two therapies with significant relationships, of which only Chiropractic (OR 1.36) were more likely to be the top therapy selected.

The statistical analyses therefore only indicate that significant relationships do exist between CAM use and social learning. While this does support my first hypothesis that biased social learning influences people's decisions to use CAM, it does not entirely address my second hypothesis that people are differentially using information depending on the type of CAM therapy (i.e., different learning biases are being used). This is because the NHIS data does not give a good depiction of the specific biases are in play.

The interviews I conducted helped more than the analysis for understanding which biases may be operating. No participants indicated that their use of CAM was related to how commonly or often others used CAM. Rather, very specific reasons were given for use of CAM, all relating to relationship with other people (who that person was), that person's level of perceived trustworthiness and knowledge, and the degree of risk involved. Doctors, for example, were deemed very knowledgeable and initially were reported as being trustworthy, but further in – depth probing revealed an underlying distrust in the medical industry as a whole, and skepticism about medical practitioners in general. This suggests that risk and trust may be additional factors that have to be taken into account in any future studies.

Co-workers fared worse than did medical doctors. The majority of participants saw co-workers as having the potentiality of being trustworthy but not necessarily to the extent of their being trusted on health related topics. The exception was that when a co-worker suggested a top therapy, Chiropractic was more likely to be that top therapy. I speculate that this may be due to the context of shared environment and commonality. For this reason, I would argue that co-workers may be representing similarity bias but that a more in-depth study is necessary to determine if that is the only factor in play.

Friend's recommendations about CAM were usually followed if related to exercise or if it was already part of the participants' mental template as formed in their upbringing. Interviews indicated that friends' advice was likely to be followed if they had personal knowledge, experience, or skill in the use of the therapy being recommended. For this reason, "recommended by friend" could be put in the category of skill–based bias. However, it was also reported that participants used CAM therapies based on a friend's recommendations because they were conforming (making their friend "happy").

Recommendations from family members were the most difficult category to classify. Not only were people's definitions of family subjective but also time-dependent (family defined as a child vs. family defined as an adult). If a person followed a recommendation from a family member that was part of their upbringing, this would be content bias. On the other hand, if followed because of knowledge or skill, then the choice would be classified as a skill-based bias. Once again, looking at the findings of the interviews, I perceived that interviewees stated that in most cases they followed family recommendations because such a recommendation was similar to CAM use they had been introduced to as children. The exceptions occurred when a family member had direct knowledge or experience about a CAM therapy, in which case the interviewee would try the therapy because of trust in the family member. Because I cannot determine motivation or circumstance from the statistical data, I am unable to separate which bias is occurring, content or context. Therefore, I am categorizing family recommendations as a general learning bias. Overall, I think that except for upbringing, which does seem a good fit for content bias, the other categories cannot be definitively categorized into specific learning biases but rather as general context biases.

Subsequently, I have evidence, both contextual and statistical, that learning biases do in fact have some positive influence on the use of CAM. I have not addressed however, results that show a significant relationship but negative effect (OR < 1.00). When looking at Table 5.1, one can see that there seems to be an apparent pattern: when a top therapy is chosen, it is more likely to be stated to be because of one reason, and less likely to be stated it was chosen because it was of another (or it has no relationship at all). For example, if someone uses a top therapy because of a doctor's recommendation, that selection is more likely to be Special Diets or Herbal Supplements and less likely to be that of Healers. This is an inherent feature of the structure of the data. It reveals when proportions are higher or lower than average, so if some categories are high, others must be low.

Table 5.1   Positive and Negative Effects of the CAM-Bias Relationship

	Odds of being more or less likely to use CAM				
	Upbringing (Content)	Doctor (Skill)	Family (General)	Friends (Skill)	Coworkers (Similarity)
Naturopathy		0.26	0.84		
Healers	9.03	0.14	2.72	1.28	
M-B Exercise	0.61	0.24	0.62	1.99	
Homeopathy	2.73	0.64	1.52		
Acupuncture			1.22		
Diets	1.91	1.30		0.65	
Mind-Body	3.66	0.71		1.45	
Other Exercise	1.18		0.53	1.51	
Massage	0.53				
Chiropractic	0.79	0.79	1.15	0.76	1.36
Herbal	0.60	2.47		0.69	0.34

As I mentioned previously, interviewees stated they perceived some therapies had higher risk factors than others, which in turn influenced whom they were most likely to listen, based on skill or knowledge. I speculate that social learning biases are influencing

the use of CAM *but* that the relationship is being moderated by a third variable.

Moderation occurs when the interaction of a third variable affects the strength or

directionality of the relationship between two variables (Field 2013).
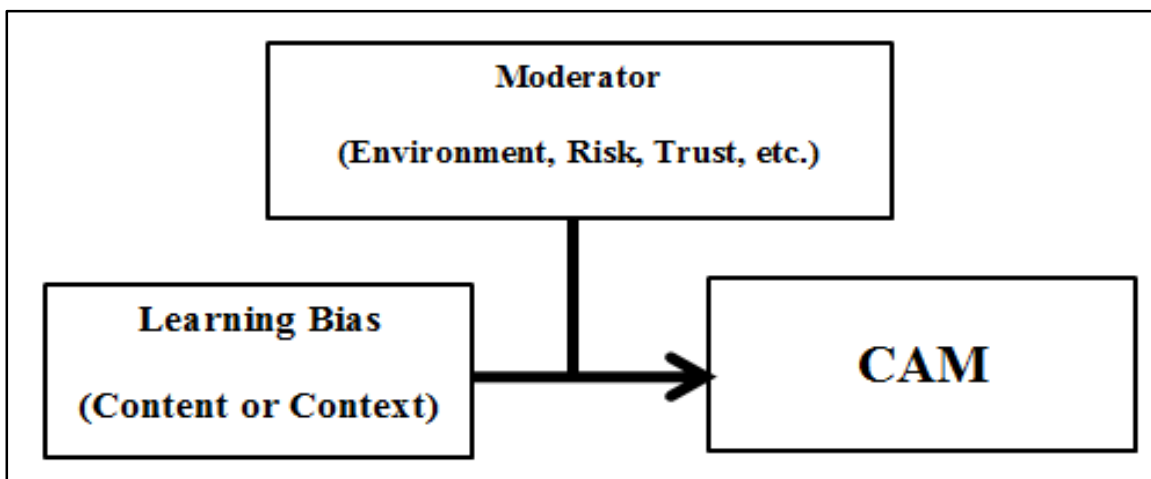
Figure 5.1   Moderator Effect

I could not test post hoc for moderation because the data set from the NHIS does

not provide the necessary variables to perform the tests; future studies should explore

those possibilities. However, regardless of whether or not moderation explains effect size

and direction of the relationships, significant relationships do exist.

As I stated earlier, numerous studies on the relationships between the use of CAM

and subjects such as chronic pain, illness, philosophical worldviews, and demographics

have been conducted (Barnes, Bloom, and Nahin 2007; Berman, Hartnoll, and Bausell

2000; Ernst 2007; Niggemann and Grüber 2003; Owen, Lewith, and Stephens 2001).

However, there have been no theoretically informed explanations. My study used the

theoretical framework of social learning biases to perform empirical tests to examine how

people are deciding to use CAM. This approach had a two-fold value, in as an emphasis

on modeling over empirical inquiry has been an area of criticism (Gibson and Lawson

2014). My goal was to perform a pilot study to determine if enough evidence existed to

support in-depth future studies on the relationship between learning biases and CAM use. I think that my hypotheses are supported: social learning biases are influencing people's decisions to use CAM; and people are differentially using information depending on the therapy used; and that future studies should examine this relationship more closely.

Future Direction

As I have mentioned, possible moderator effects may be occurring. I would suggest that future studies keep this in mind and look for potential moderating variables like risk, trust levels, and social and environmental factors. I would also suggest combining both qualitative and contextual inquiry because, as my study indicated, purely statistical information does not always address the underlying questions. Additionally, future empirical testing of the relationship between learning biases and decision-making in regard to human health should be actively pursued. There are many questions about the decisions that people make regarding their health but the focus has been mainly on proximate explanations, or modalities and demographics, and like the research conducted on CAM, most of that research has no real theoretical underpinning.

Another possible area of study is examining whether the use of CAM, and the learning biases influencing that use, is adaptive. In other words, are people who are using CAM surviving and reproducing at a higher rate than people who are not? This too should be examined in context; previous studies have shown correlations between chronic health issues and CAM use (Moore et al. 1985; Thomson et al. 2014; Institute of Medicine 2005). Are people with these health issues surviving and reproducing at higher rates than people who have the same health issues and do not use CAM? This question may be especially pertinent for those individuals who do not use CAM as an alternative

to modern medicine but rather as a complement. This question has far-reaching potential

impact, as it would substantiate the claims that CAM users themselves have been making

for quite some time (U.S. Senate 1998; Kantor 2009).

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APPENDIX A

2002 St. John's Wort Clinical Trial Abstract with Results

Context Extracts of *Hypericum perforatum* (St John's wort) are widely used for the treatment of depression of varying severity. Their efficacy in major depressive disorder, however, has not been conclusively demonstrated.

Objective To test the efficacy and safety of a well-characterized *H perforatum* ex-tract (LI-160) in major depressive disorder.

Design and Setting Double-blind, randomized, placebo-controlled trial con-ducted in 12 academic and community psychiatric research clinics in the United States.

Participants Adult outpatients (n=340) recruited between December 1998 and June 2000 with major depression and a baseline total score on the Hamilton Depression Scale (HAM-D) of at least 20.

Interventions Patients were randomly assigned to receive *H perforatum*, placebo, or sertraline (as an active comparator) for 8 weeks. Based on clinical response, the daily dose of *H perforatum* could range from 900 to 1500 mg and that of sertraline from 50 to 100 mg. Responders at week 8 could continue blinded treatment for another 18 weeks.

Main Outcome Measures Change in the HAM-D total score from baseline to 8 weeks; rates of full response, determined by the HAM-D and Clinical Global Impressions (CGI) scores.

Results On the 2 primary outcome measures, neither sertraline nor *H perforatum* was significantly different from placebo. The random regression parameter estimate for mean (SE) change in HAM-D total score from baseline to week 8 (with a greater decline indicating more improvement) was –9.20 (0.67) (95% confidence interval [CI], –10.51 to –7.89) for placebo vs –8.68 (0.68) (95% CI, –10.01 to –7.35) for *H perforatum* (P= .59) and –10.53 (0.72) (95% CI, –11.94 to –9.12) for sertraline (P= .18). Full response occurred in 31.9% of the placebo-treated patients vs 23.9% of the *H perforatum*–treated patients (P=.21) and 24.8% of sertraline-treated patients (P=.26). Sertraline was better than placebo on the CGI improvement scale (P= .02), which was a secondary measure in this study. Adverse-effect profiles for *H perforatum* and sertraline differed relative to placebo.

Conclusion This study fails to support the efficacy of *H perforatum* in moderately severe major depression. The result may be due to low assay sensitivity of the trial, but the complete absence of trends suggestive of efficacy for *H perforatum* is noteworthy (Hypericum Depression Trial 2002,1807).

APPENDIX B

Cleaning and Recoding of NHIS Data

<u>Choosing variables</u>

For Familyxx.sav (126 questions, n=43345)
Clear All Variables except

HHX	Household Number
FMX	Family Number
FM_SIZE	Size of family
FM_KIDS	# family members under 18 years of age
FM_ELDER	# family members aged 65 and older
INCGRP3	Total combined family income (grouped)
HOUSEOWN	Home tenure status

Save As Family_edited.sav

For personsx.sav (602 questions, n=108131)
Clear All Variables except

HHX	Household Number
FMX	Family Number
FPX	Person Number (Within family)
EDUC1	Highest level of school completed

Save As Person_edited.sav

For samadult.sav (808 questions, N=34525)
Clear All Variables except

HHX	Household Number
FMX	Family Number
FPX	Person Number (Within family)
SEX	Sex
MRACBPI2	Race coded to single/multiple race group
AGE_P	Age
R_MARITL	Marital Status
PROXYSA	Sample adult status

Save As Samadult_edited.sav

For althealth.sav (782 questions, N=34525)

Clear All Variables except

HHX	Household Number
FMX	Family Number
FPX	Person Number (Within family)
ALT_TP31	First of top 3 most important therapies
TP1_RS9	Used/saw practitioner for first top therapy because: it was part of your upbringing
TP1_REC1	Used/saw practitioner for first top therapy because it was recommended by: a medical doctor

TP1_REC2   Used/saw practitioner for first top therapy because it was recommended by: a family member

TP1_REC3   Used/saw practitioner for first top therapy because it was recommended by: a friend

TP1_REC4   Used/saw practitioner for first top therapy because it was recommended by: a co-worker

Save As Althhealth_edit1.sav

Merging files and removing unnecessary variables

For Family_edited.sav
CONCAT HHX,FMX to FAM_RCD
Clear HHX, FMX

For Person_edited.sav
CONCAT HHX,FMX to FAM_RCD
Clear HHX, FMX

For Samadult_edied.sav
CONCAT HHX,FMX to FAM_RCD
Clear HHX, FMX

For Althealth_edit1.sav
CONCAT HHX,FMX to FAM_RCD
Clear HHX, FMX

MERGE add varables Family_edited.sav into to Person_edited.sav
one to many, key variable : FAM_RCD

For Person_edited.sav
CONCAT FAMRCD, FPX to ID
Clear FAMRCD, FPX
For Samadult_edited.sav
CONCAT FAMRCD, FPX to ID
Clear FAMRCD, FPX
For Althealth_edit1.sav
CONCAT FAMRCD, FPX to ID
Clear FAMRCD, FPX

Merge add variables Person_edited.sav into Samadult_edited.sav
Merge Samadult_edited into Althealth_edit1
Delete all cases where physical or mental condition prohibits response or status is
unknown.
        (PROXYSA<2 or>2)
Clear PROXYSA
Cases Remaining N=33,413
Delete all cases where ALT_CNT <1
Cases Remaining N=10,005
Delete all cases with missing value for ALT_TP31
Cases Remaining N=9991
Save As alth health_edit2

Recoding variables

Original values for ALT_TP31 - First of Top 3 most important therapies
  1   Chiropractic or Osteopathic Manipulation
  2   Massage
  3   Acupuncture
  4   Energy Healing Therapy
  5   Naturopathy
  6   Hypnosis
  7   Biofeedback
  8   Craniosacral therapy
  9   Traditional Healers
  10   [fill1: Herb 1 from CHB_TP21]
  11   [fill2: Herb 2 from CHB_TP22]
  12   Homeopathy
  13   [fill3: Mantra meditation/ Mindfulness meditation/ Spiritual
          meditation/Guided imagery/Progressive relaxation from CMB
  14   [fill4: Yoga/Tai Chi/Qi Gong from CYG_MOST]
  15   Special diets
  17   Movement or exercise techniques

Rename ALT_TP31 to ALT_TP_RCD
Recode 8 to 2, new Value "Massage and Craniosacral"
Recode 6 to 4, 7 to 4, 13 to 4, new Value "Mind-Body and Energy Therapy"
Recode 11 to 10, new Value "Herbal Supplements"
Reassign Value 14 Mindy-Body Exercises
Reassign Value 6 Other Movement and Exercise Techniques
Recode Variables 16 to 6, 15 to 7, 14 to 8, 12 to 11
Reassign Value 7 Special Diets
Reassign Value 8 Mind-Body Exercises
Reassign Value 11 Homeopathy

Values for ALT_TP_RCD - Top Therapy
  1   Chiropractic or Osteopathic Manipulation
  2   Massage and Craniosacral
  3   Acupuncture
  4   Mind-Body and Energy Therapy
  5   Naturopathy
  6   Other Movement or Exercise Techniques
  7   Special Diets
  8   Mind-Body Exercises
  9   Traditional Healers
  10   Herbal Supplements
  11   Homeopathy

Recode to different variable ALT_ TP_RCD if =1 to CHIRO 1 to 1

Recode to different variable ALT_ TP_RCD if=2 to MASSAGE 2 to 1
Recode to different variable ALT_ TP_RCD if=3 to ACUPUNC 4 to 1,
Recode to different variable ALT_ TP_RCD if=4 to ENERGY 4 to 1,
Recode to different variable ALT_ TP_RCD if=5 to NATURO 5 to
Recode to different variable ALT_ TP_RCD if=6 to MOV 6 to 1,
Recode to different variable ALT_ TP_RCD if=7 to DIETS 7 to 1,
Recode to different variable ALT_ TP_RCD if=8 to XCER 8 to 1,
Recode to different variable ALT_ TP_RCD if=9 to HEALERS 9 to 1,
Recode to different variable ALT_ TP_RCD if=10 to HERBAL 10 to 1,
Recode to different variable ALT_ TP_RCD if=11 to HOMEO 11 to 1,
Recode to same variable CHIRO missing to 2. Value 1 yes, 2 No
Recode to same variable MASSAGE Missing to 2 Value 1 Yes, 2 No
Recode to same variable ACUPUNC missing to 2. Value 1 Yes, 2 No
Recode to same variable ENERGY missing to 2. Value 1 Yes, 2 No
Recode to same variable NATURO missing to 2. Value 1 yes, 2 No
Recode to same variable MOV missing to 2. Value 1 Yes, 2 No
Recode to same variable DIETS missing to 2. Value 1 Yes, 2 No
Recode to same variable XCER missing to 2. Value 1 Yes, 2 No
Recode to same variable HEALERS missing to 2. Value 1 yes, 2 No
Recode to same variable HERBAL missing to 2. Value 1 Yes, 2 No
Recode to same variable HOMEO missing to 2. Value 1 Yes, 2 No
Recode to same variable all missing or unknown ,refused ,don't know (values=>89) to
        value 2, "No" for TP1_RS9, TP1_REC1, TP1_REC2, TP1_REC3, TP1_REC4
Recode to same variable – remaining variables - All missing, don't know, not
        ascertained, refused, unknown, no answer to 9 or 99 "Unknown"
Save as Allcases.sav
Delete all cases not chosen for samadult survey

Final Cleaned, Recoded, and Renamed - Variable Names and Labels

ID   HHX, FMX, FPX
ALTTPRCD   Top Therapy
SEX   Sex
AGE_P   Age
R_MARITL   Marital Status
FM_SIZE   Size of family
FM_KIDS   # family members under 18 years of age
FM_ELDR   # family members aged 65 and older
EDUC1   Highest level of school completed
MRACBPI2   Race coded to single/multiple race group
INCGRP3   Total combined family income (grouped)
HOUSEOWN Home tenure status
        TP1_RS9   Used/saw practitioner for top therapy because: it was part of your upbringing
        TP1_REC1   Used/saw practitioner for top therapy because it was recommended by a medical doctor
        TP1_REC2   Used/saw practitioner for top therapy because it was recommended by a family member
        TP1_REC3   Used/saw practitioner for top therapy because it was recommended by a friend
        TP1_REC4   Used/saw practitioner for top therapy because it was recommended by a co-worker
CHIRO   Chiropractic or Osteopathic Manipulation
MASSAGE   Massage and Craniosacral Therapy
ACUPUNC   Acupuncture
ENERGY   Mind-Body and Energy Therapy
NATURO   Naturopathy
MOV   Other Movement or Exercise Techniques
DIETS   Special Diets
XCER   Mind-Body Exercises
HEALERS   Traditional Healers
HERBAL   Herbal Supplements
Save As altheath_final.sav

Table B.1   Coding Key for Top Therapies

Coding Key					
Variable	Name	SPSS Label			
NATURO	Naturopathy	Naturopathy			
HEALERS	Healers	Traditional Healers			
XCER	M-B Exercise	Mind-Body Exercises			
HOMEO	Homeopathy	Homeopathy			
ACUPUNC	Acupncture	Acupuncture			
DIETS	Diets	Special Diets			
ENERGY	Mind-Body	Mind-Body and Energy Therapy			
MOV	Other Exercise	Other Movement or Exercise Techniques			
MASSAGE	Massage	Massage and Craniosacral Therapy			
CHIRO	Chiropractic	Chiropractic or Osteopathic Manipulation			
HERBAL	Herbal	Herbal Supplements			

APPENDIX C

IRB Approval For Interviews

BOISE STATE UNIVERSITY

VOLUNTEERS WANTED
FOR A RESEARCH STUDY

Social Learning in the Use of
Complementary and Alternative Medicines (CAM)

Are you over the age of 18 and have tried or are currently using
Complementary and Alternative Medicine (CAM)?

We are conducting a research study about how where you learned about CAM
may have influenced your decisions and are looking for your input!

The purpose of this research is gain a greater understanding of how social
learning influences the decision to use CAM. We will be conducting interviews
that will take approximately an hour. In this interview you will be asked about
what types of CAM you currently use or have used in the past. You will also be
asked about where you got the information about CAM. You may also be asked to
clarify terms and concepts that you use. You will **NOT** be asked about your
medical history or condition.

You must be age 18 and older, and either a current or past user of CAM to
participate. If you are interested in participating, please contact the principal
investigator at denellletourneau@boisestate.edu or (208) 484-6633. You may also
contact Dr. Kristin Snopkowski at ksnopkowski@boisestate.edu for any questions
or concerns about your participation in this study.

*Social learning is learning or getting information from other people in your life. Complementary and
Alternative Medicine (or CAM) covers a wide range of health related treatments that do **NOT** require a
prescription or a medical doctor's involvement. These include but are not limited to: herbs, supplements,
special diets, acupuncture, massage, yoga, meditation, bio-feedback, faith-healing, Tai-Chi, and Pilates.*

This research is conducted under the direction of Denell Letourneau, Anthropology Department, Boise
State University. (IRB number: #028-SB17-209)

Approved IRB Protocol Number: 028-SB17-209

Figure C.1   Recruitment Flyer

Recruitment Script

On the Phone:

"HI, my name is Denell Letourneau. Thank you for contacting me. I am a researcher at Boise State University. I am conducting a research study about how social learning influences choices on the use of complementary and alternative medicine. I was wondering if you would be willing to let me interview you. It should take about 60 minutes to complete the interview.

If you would be interested in participating in this interview, we can set up a time now or you can let me know when a good time would be to schedule it."

If interested, investigator will set up date, time, and a place of subject's choosing to hold the interview and will provide subject with investigator contact information.

"I have you scheduled for an interview on _____ at _____. If you have questions, I can be reached at 208-426-3023 or at Denellletourneau@boisestate.edu. Thank you for your help."

If not interested, investigator will end the call:

"Thank you for your time."

Face-to-Face:

"Hi, my name is Denell Letourneau. I am a researcher at Boise State University. I am conducting a research study about how social learning influences choices on the use of complementary and alternative medicine. I was wondering if you would be willing to let me interview you. It should take about sixty minutes to complete the interview.

If you would be interested in participating in this interview, we can set up a time now or you can let me know when a good time would be to schedule it."

If interested, investigator will set up date, time, and a place of subject's choosing to hold the interview and will provide subject with investigator contact information.

"I have you scheduled for an interview on _____ at _____. If you have questions, I can be reached at 208-426-3023 or Denellletourneau@boisestate.edu. Thank you for your help."

If not interested, investigator will end the call:

"Thank you for your time."

If they need clarification I will explain that social learning means "I am interested in understanding where you get your information about CAM and in general terms from whom. I will also ask you, your perception of 'family,' 'upbringing,' 'the internet,' and so on. I may ask you to talk about what these words or ideas mean to you. I will NOT ask you about your medical history or ask for information that is personally indentifible."

Approved IRB Protocol Number: 028-SB17-209

List of Complementary and Alternative Medicines Handout

Study on Social Learning in the Use of Complementary and Alternative Medicines

Have you <u>ever</u> used any of the following for health reasons?

Massage	Craniosacral Therapy
Acupuncture	(massage of the skull and base of skull)
Energy Healing Therapy	Naturopathy
Hypnosis	Bio-feedback
Ayurveda	Chelation Therapy
Chiropractic manipulation	Osteopathic manipulation
A Faith-healer	A Native American Healer
A Medicine Man	A Shaman
A Curandero	A Parchero
A Yerbero	A Hierbista
A Sobador	A Huesero
Herbal Remedies	Herbal or Non-vitamin Supplements
Folk Remedies	Homeopathy
Mediation	Guided Imagery
Progressive Relaxation	Mind-body Therapy
Yoga	Tai Chi
Qi Gong	Vegetarian (including vegan) Diet
Macrobiotic Diet	Atkins Diet
Pritikin Diet	Ornish Diet
Feldenkrais	Alexander Technique
Pilates	Trager Psychophysical

Approved IRB Protocol Number: 028-SB17-209

Consent Cover Letter

INFORMED CONSENT
Study on Social Learning in the Use of Complementary and Alternative Medicines (CAM)

We are from the Boise State University and we are asking you to be in a research study. We do research studies to learn more about how the world works and why people act the way they do. In this study, we want to learn about how you learned about Complementary and Alternative Medicine(CAM) and why you decided to use it.

What is Complementary and Alternative Medicine?
Complementary and Alternative Medicine or CAM includes things like herbal supplements, yoga, acupuncture, and meditation. Any adult can choose to use CAM and you do not need to have a medical doctor to use it. CAM also does not require any prescription. We can show you a list of all the different types of CAM. You may keep a copy of the list if you want.

What we are asking you to do:
We would like to interview you. The interview should last about an hour (1 hour). If you have a lot information to tell us, it may last for an hour and a half (1 ½ hours). In the interview, you can skip any question if it makes you uncomfortable. You may decide to stop the interview at any time. There is no penalty if you decide to quit or not answer a question. We will not ask you about your medical history, prescriptions, or medical condition.

Do I have to be in this study?
You do not have to participate in this study. It is up to you. You can say no now or you can even change your mind later. No one will be upset with you if you decide not to be in this study.

Will being in this study hurt or help me in any way?
Being in this study will bring you no harm. There are no direct benefits to you for participating in this study. We hope that this study will help us learn more about how people make decisions to use CAM.

What will you do with information about me?
We will be very careful to keep what you said in the interview private. We will not use your real name and we will not keep any personally identifiable information about you. Before and after the study we will keep all information we collect about you locked up and password protected.
The people on the research team and the Boise State University Office of Research Compliance (ORC) may access the information we keep. The ORC monitors research studies to protect the rights and welfare of research participants.

Your name will not be used in any written reports or publications which result from this research, Data will be kept for three years (per federal regulations) after the study is complete and then destroyed.

If you want to stop doing the study, contact Denell Letourneau at 208-938-9551 or denellletourneau@boisestate.edu. Participation in this study is voluntary. If you choose to stop before we are finished, we will destroy any information you already gave us. There is no penalty for stopping. If you decide that you do not want your materials in the study but you already turned them in, just let Denell Letourneau know.

If you have any questions or concerns about your participation in this study, you should first contact the Principal Investigator, Denell Letourneau at denellletourneau@boisestate.edu or at (208) 426-3023. You may also contact Dr. Kristin Snopkowski at ksnopkowski@boisestate.edu for any questions or concerns about your participation in this study.

If you have questions about your rights as a research participant, you may contact the Boise State University Institutional Review Board (IRB), which is concerned with the protection of volunteers in research projects.
You may reach the board office between 8:00 AM and 5:00 PM, Monday through Friday, by calling (208) 426-5401 or by writing:
Institutional Review Board
Office of Research Compliance
Boise State University
1910 University Dr.
Boise, ID 83725-1138

Approved IRB Protocol Number: 028-SB17-209

Interview Script

Study on Social Learning in the Use of Complementary and Alternative Medicines
(CAM)

Investigator will review the Consent Form with participant, gain verbal consent, and give them a copy of the Consent Form

"Thank you for agreeing to speak with me today."

"The purpose of this interview is to get your input on how you decided to use Complementary or Alternative Medicine, or CAM, and where you got your information. This will allow us to reach a better understanding about social learning and decision-making in general. Specifically, we want to understand what influenced you to try CAM. We want to understand where you get your information and how or why you decide to use the information you get."

"The underlying assumption that we are working with is that people choose which information to use, and that who or where they get that information from is a determining factor. People, like you, make decisions based on many different reasons. We believe that people are influenced by different things in different circumstances. We want to hear from you on what *you* believe to be the reason you made the decision to use CAM. Some of these reasons may be based on *who* you got your information from. Other reasons may be based on *where* you got your information."

"I'd like to remind you that in order to protect your privacy, all transcripts will be coded with pseudonyms. I would also like to remind you, that we do not need to know anything about your medical history or condition."

"The interview will last about an hour and I will audiotape the discussion to make sure that it is recorded accurately."

"Do you have any questions for me before we begin?"

Begin semi-structured questioning.

"I'd like you to take a look at this list and tell me which of the treatments listed you have used."

Hand participant the List of Complementary and Alternative Medicines. For each treatment they indicate they have tried, the following specific question will be asked. Participant may keep a copy of the list if they wish.

1. *"Ok, I'd like you to tell me about when you first used _____"*

Clarifying and follow-up questions

2. "How did you learn about_____"

3. "Did you ask about it or did they volunteer the information?"

4. "How did learning about _____ from _____ influence you to try _____"

5. "Could you expand on that, please."

6. "This may seem obvious, but you said it was part of your upbringing, what exactly does that mean to you?"

7. "You said it was a family member, I don't want names but could you expand on that please?"

If they indicate they got information from a source such as a magazine, book, CD, advertisement, television, radio broadcast or the internet.

8. "You said you got the information from_____, can you expand that please?"

9. "Did you use/go/read/watch/listen to _____ specifically to get information on ___?"

10. "You said you just 'came across it' what happened after that?"

11. "Did someone recommend that you get information on _____ from_____?"

If the participant indicates the information source was recommended then the clarifying and follow-up questions will be asked.

After the Interview but before leaving.

"Thank you for participating. This information will be very helpful. If you'd be willing I can leave you a flyer to give to anyone you think may also be interested in participating."

Interview end, Interviewer leaves.

Approved IRB Protocol Number: 028-SB17-209

APPENDIX D

Descriptive Statistics

CAM vs. Non-CAM Users
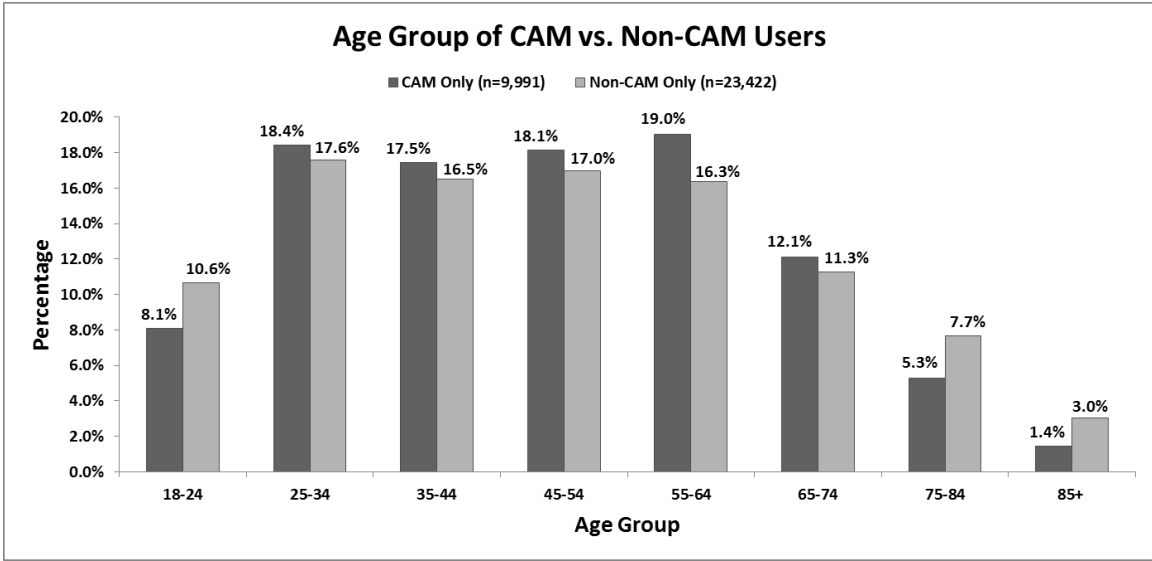
Graph D.1   Age Group of CAM vs. Non-CAM Users
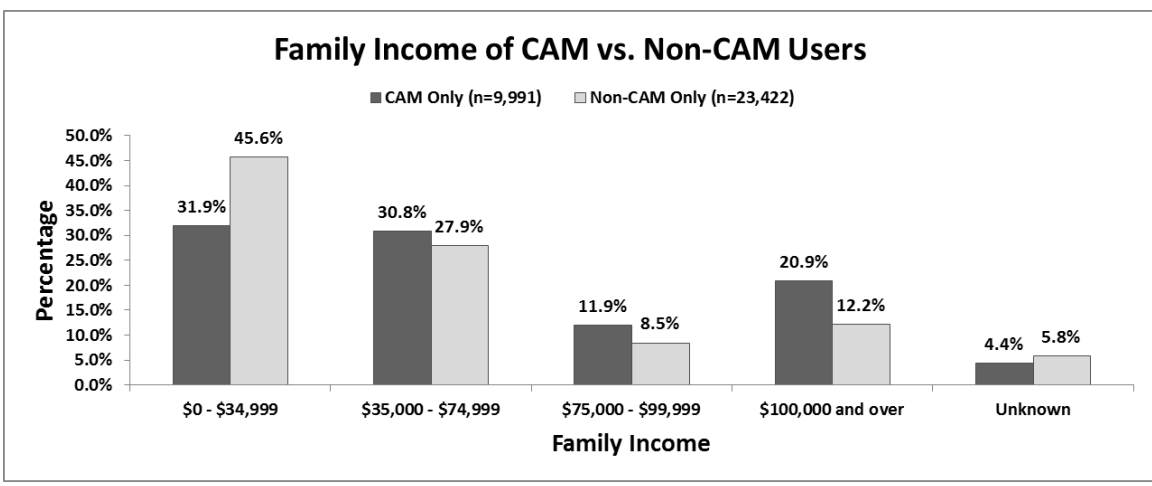
Graph D.2   Family Income of CAM vs. Non-CAM Users

Marital Status of CAM vs. non-CAM Users

■ CAM Only (n=9,991)   ■ Non-CAM Only (n=23,422)   □ Total (n=33,413)

	Married - spouse in household	Married - spouse not in household	Widowed	Divorced	Separated	Never married	Living with partner	Unknown marital status
■ CAM Only (n=9,991)	44.6%	1.4%	7.7%	15.2%	2.3%	22.5%	5.9%	0.2%
■ Non-CAM Only (n=23,422)	40.6%	1.7%	10.0%	13.4%	3.3%	24.5%	6.3%	0.2%
□ Total (n=33,413)	41.8%	1.6%	9.3%	14.0%	3.0%	23.9%	6.2%	0.2%
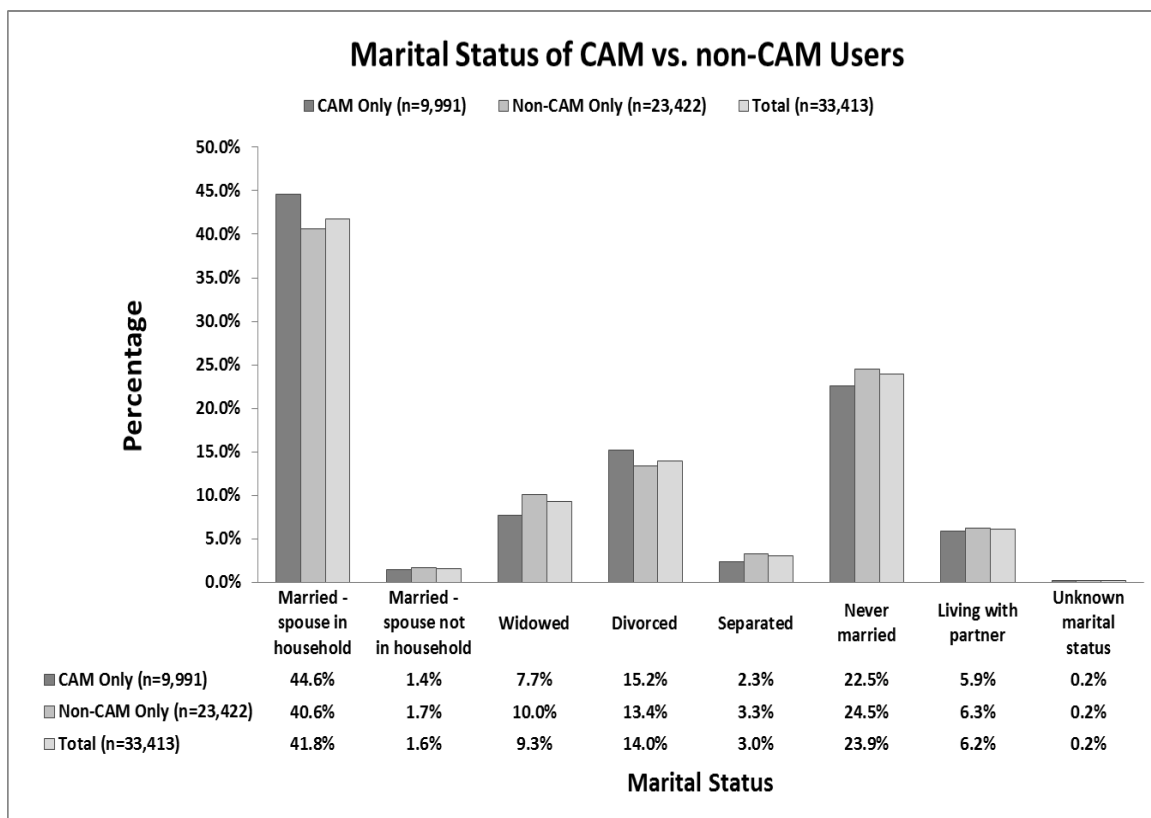
Marital Status

Graph D.3   Marital Status CAM vs. Non-CAM Users

Racial Identity of CAM vs. Non-CAM Users

■ CAM Only (n=9,991)   ■ Non-CAM Only (n=23,422)

White: 78.8%, 67.3%
Black/African American: 9.0%, 18.1%
Indian (American): 1.0%, 1.0%
Chinese: 1.5%, 1.2%
Filipino: 1.2%, 1.5%
Asian Indian: 1.6%, 1.0%
Other race: 6.4%, 9.4%
Multiple race: 0.6%, 0.5%

Race - Self Identified
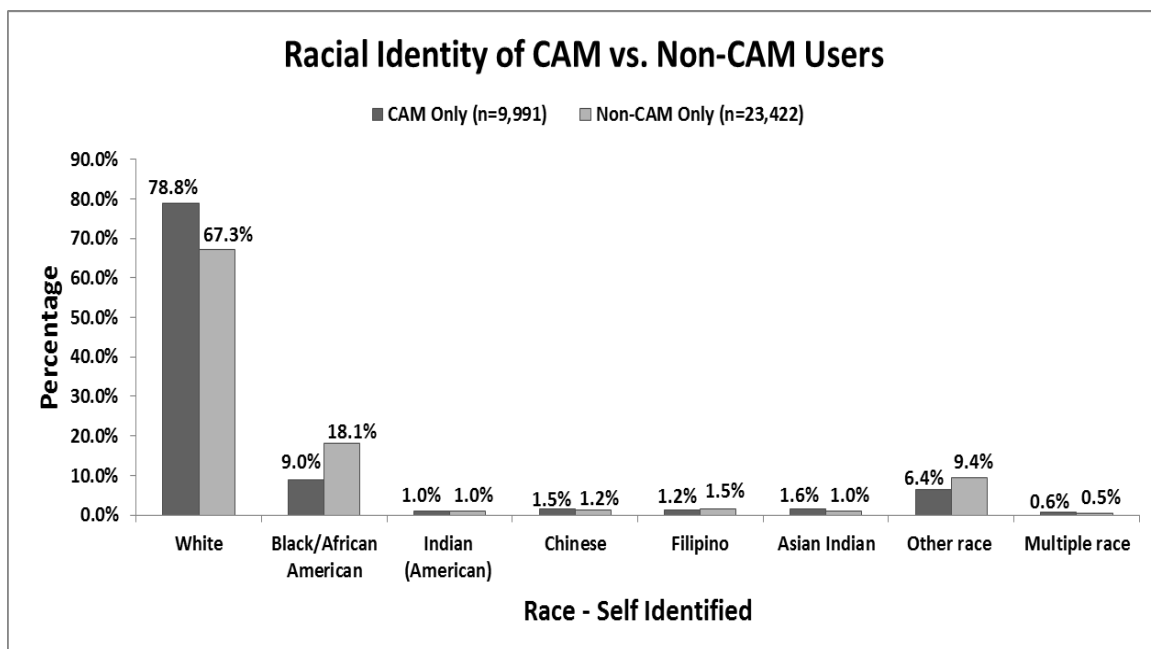
Graph D.4   Self-Identified Race of CAM vs. Non-CAM Users

Other Descriptive Statistics

Table D.1   Top Therapy

Top Therapy		
Therapy Type	Frequency	Percent
Herbal Supplements	2956	29.6
Chiropractic or Osteopathic Manipulation	2498	25.0
Massage and Craniosacral	1311	13.1
Mind-Body Exercises	1296	13.0
Mind-Body and Energy	828	8.3
Special Diets	379	3.8
Acupuncture	235	2.4
Homeopathy	196	2.0
Other Movement or Exercise techniques	141	1.4
Traditional Healers	106	1.1
Naturopathy	45	0.5
n=9991		

Graph showing "Top Therapy Percentage for All Learning Biases*" with bars:
Naturopathy 0.4%, Healers 1.7%, M-B Exercise 11.4%, Homeopathy 2.4%, Acupuncture 2.3%, Diets 3.9%, Mind-Body Therapy 10.0%, Other Exercise 1.5%, Massage 12.4%, Chiropractic 23.9%, Herbal 30.0%

*(n=10,031) Respondents could choose more than one source
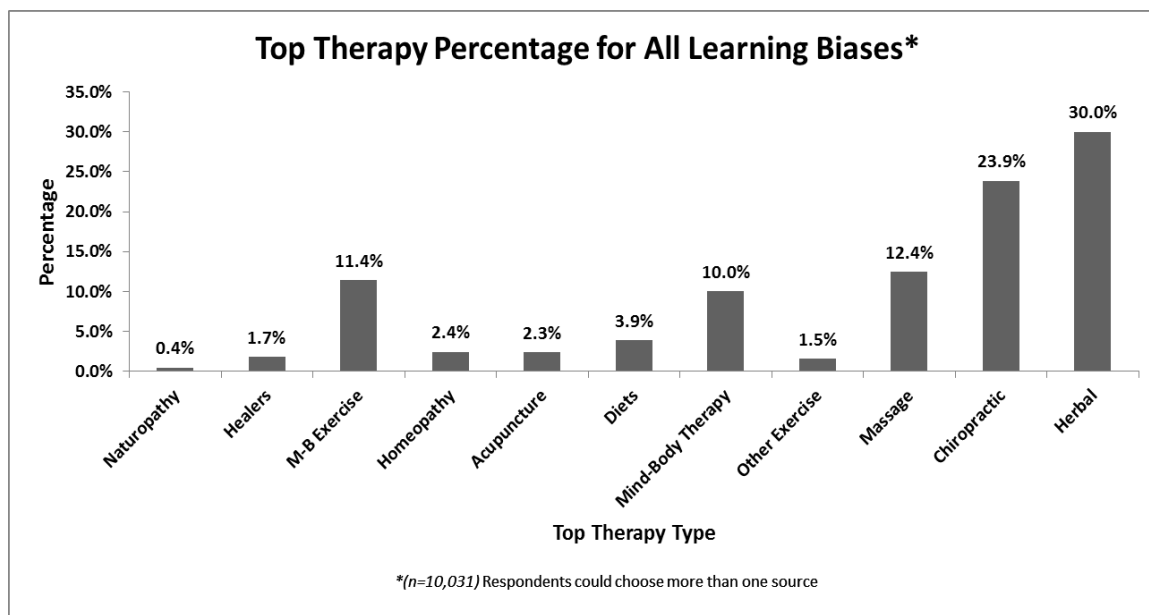
Graph D.5   Top Therapy Percentage for All Learning Biases

Learning Bias Percentage for All Top Therapies

Percentage

35.0%
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%

| Upbringing | Doctor | Family | Friend | Coworker |

12.2% — 21.2% — 27.8% — 29.8% — 9.0%

Source of Influence*

(n=10,031) Respondents could choose more than one source
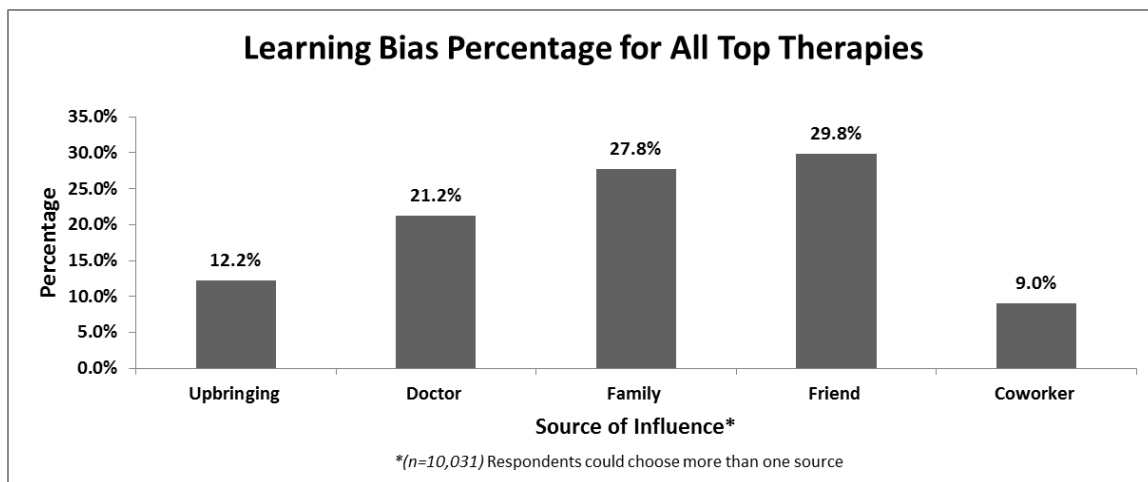
Graph D.6   Learning Biases Percentage for All Top Therapies

APPENDIX E

Contingency Tables

Contingency Tables for Upbringing

Table E.1   Upbringing and Traditional Healers

Crosstab			Traditional Healers		Total
			Yes	No	
Used/saw practitioner for top therapy because: it was part of your upbringing	Yes	Count	58	1167	1225
		Expected Count	13.0	1212.0	1225.0
		Adjusted Residual	13.4	-13.4	
	No	Count	48	8718	8766
		Expected Count	93.0	8673.0	8766.0
		Adjusted Residual	-13.4	13.4	
Total		Count	106	9885	9991
		Expected Count	106.0	9885.0	9991.0

Table E.2   Upbringing and Mind-Body Exercise

Crosstab			Mind-Body Exercises		Total
			Yes	No	
Used/saw practitioner for top therapy because: it was part of your upbringing	Yes	Count	107	1118	1225
		Expected Count	158.9	1066.1	1225.0
		Adjusted Residual	-4.7	4.7	
	No	Count	1189	7577	8766
		Expected Count	1137.1	7628.9	8766.0
		Adjusted Residual	4.7	-4.7	
Total		Count	1296	8695	9991
		Expected Count	1296.0	8695.0	9991.0

Table E.3   Upbringing and Homeopathy

Crosstab			Homeopathy		Total
			Yes	No	
Used/saw practitioner for top therapy because: it was part of your upbringing	Yes	Count	53	1172	1225
		Expected Count	24.0	1201.0	1225.0
		Adjusted Residual	6.4	-6.4	
	No	Count	143	8623	8766
		Expected Count	172.0	8594.0	8766.0
		Adjusted Residual	-6.4	6.4	
Total		Count	196	9795	9991
		Expected Count	196.0	9795.0	9991.0

Table E.4   Upbringing and Special Diets

Crosstab			Special Diets		
			Yes	No	Total
Used/saw practitioner for top therapy because: it was part of your upbringing	Yes	Count	78	1147	1225
		Expected Count	46.5	1178.5	1225.0
		Adjusted Residual	5.0	-5.0	
	No	Count	301	8465	8766
		Expected Count	332.5	8433.5	8766.0
		Adjusted Residual	-5.0	5.0	
Total		Count	379	9612	9991
		Expected Count	379.0	9612.0	9991.0

Table E.5   Upbringing and Mind-Body Therapy

Crosstab			Mind-Body Therapy		
			Yes	No	Total
Used/saw practitioner for top therapy because: it was part of your upbringing	Yes	Count	251	974	1225
		Expected Count	101.5	1123.5	1225.0
		Adjusted Residual	16.5	-16.5	
	No	Count	577	8189	8766
		Expected Count	726.5	8039.5	8766.0
		Adjusted Residual	-16.5	16.5	
Total		Count	828	9163	9991
		Expected Count	828.0	9163.0	9991.0

Table E.6   Upbringing and Other Exercises

Crosstab			Other Exercise Techniques		
			Yes	No	Total
Used/saw practitioner for top therapy because: it was part of your upbringing	Yes	Count	28	1197	1225
		Expected Count	17.3	1207.7	1225.0
		Adjusted Residual	2.8	-2.8	
	No	Count	113	8653	8766
		Expected Count	123.7	8642.3	8766.0
		Adjusted Residual	-2.8	2.8	
Total		Count	141	9850	9991
		Expected Count	141.0	9850.0	9991.0

Table E.7   Upbringing and Massage

Crosstab					
			Massage Therapy		Total
			Yes	No	
Used/saw practitioner for top therapy because: it was part of your upbringing	Yes	Count	96	1129	1225
		Expected Count	160.7	1064.3	1225.0
		Adjusted Residual	-5.8	5.8	
	No	Count	1215	7551	8766
		Expected Count	1150.3	7615.7	8766.0
		Adjusted Residual	5.8	-5.8	
Total		Count	1311	8680	9991
		Expected Count	1311.0	8680.0	9991.0

Table E.8   Upbringing and Chiropractic

Crosstab					
			Chiropractic or Osteopathic		Total
			Yes	No	
Used/saw practitioner for top therapy because: it was part of your upbringing	Yes	Count	261	964	1225
		Expected Count	306.3	918.7	1225.0
		Adjusted Residual	-3.2	3.2	
	No	Count	2237	6529	8766
		Expected Count	2191.7	6574.3	8766.0
		Adjusted Residual	3.2	-3.2	
Total		Count	2498	7493	9991
		Expected Count	2498.0	7493.0	9991.0

Table E.9   Upbringing and Herbal Supplements

Crosstab					
			Herbal Supplements		Total
			Yes	No	
Used/saw practitioner for top therapy because: it was part of your upbringing	Yes	Count	258	967	1225
		Expected Count	362.4	862.6	1225.0
		Adjusted Residual	-7.0	7.0	
	No	Count	2698	6068	8766
		Expected Count	2593.6	6172.4	8766.0
		Adjusted Residual	7.0	-7.0	
Total		Count	2956	7035	9991
		Expected Count	2956.0	7035.0	9991.0

Contingency Tables for Medical Doctor

Table E.10   Medical Doctor and Naturopathy

Crosstab					
			Naturopathy		
			Yes	No	Total
Used/saw practitioner for top therapy because it was recommended by a medical doctor	Yes	Count	3	2125	2128
		Expected Count	9.6	2118.4	2128.0
		Adjusted Residual	-2.4	2.4	
	No	Count	42	7821	7863
		Expected Count	35.4	7827.6	7863.0
		Adjusted Residual	2.4	-2.4	
Total		Count	45	9946	9991
		Expected Count	45.0	9946.0	9991.0

Table E.11   Medical Doctor and Traditional Healers

Crosstab					
			Traditional Healers		
			Yes	No	Total
Used/saw practitioner for top therapy because it was recommended by a medical doctor	Yes	Count	4	2124	2128
		Expected Count	22.6	2105.4	2128.0
		Adjusted Residual	-4.4	4.4	
	No	Count	102	7761	7863
		Expected Count	83.4	7779.6	7863.0
		Adjusted Residual	4.4	-4.4	
Total		Count	106	9885	9991
		Expected Count	106.0	9885.0	9991.0

Table E.12   Medical Doctor and Mind-Body Exercise

Crosstab					
			Mind-Body Exercises		
			Yes	No	Total
Used/saw practitioner for top therapy because it was recommended by a medical doctor	Yes	Count	87	2041	2128
		Expected Count	276.0	1852.0	2128.0
		Adjusted Residual	-13.7	13.7	
	No	Count	1209	6654	7863
		Expected Count	1020.0	6843.0	7863.0
		Adjusted Residual	13.7	-13.7	
Total		Count	1296	8695	9991
		Expected Count	1296.0	8695.0	9991.0

Table E.13   Medical Doctor and Homeopathy

Crosstab			Homeopathy		
			Yes	No	Total
Used/saw practitioner for top therapy because it was recommended by a medical doctor	Yes	Count	29	2099	2128
		Expected Count	41.7	2086.3	2128.0
		Adjusted Residual	-2.2	2.2	
	No	Count	167	7696	7863
		Expected Count	154.3	7708.7	7863.0
		Adjusted Residual	2.2	-2.2	
Total		Count	196	9795	9991
		Expected Count	196.0	9795.0	9991.0

Table E.14   Medical Doctor and Special Diets

Crosstab			Special Diets		
			Yes	No	Total
Used/saw practitioner for top therapy because it was recommended by a medical doctor	Yes	Count	98	2030	2128
		Expected Count	80.7	2047.3	2128.0
		Adjusted Residual	2.2	-2.2	
	No	Count	281	7582	7863
		Expected Count	298.3	7564.7	7863.0
		Adjusted Residual	-2.2	2.2	
Total		Count	379	9612	9991
		Expected Count	379.0	9612.0	9991.0

Table E.15   Medical Doctor and Mind-Body Therapy

Crosstab			Mind-Body Therapy		
			Yes	No	Total
Used/saw practitioner for top therapy because it was recommended by a medical doctor	Yes	Count	137	1991	2128
		Expected Count	176.4	1951.6	2128.0
		Adjusted Residual	-3.5	3.5	
	No	Count	691	7172	7863
		Expected Count	651.6	7211.4	7863.0
		Adjusted Residual	3.5	-3.5	
Total		Count	828	9163	9991
		Expected Count	828.0	9163.0	9991.0

Table E.16   Medical Doctor and Chiropractic

Crosstab				Chiropractic or Osteopathic		Total
				Yes	No	
Used/saw practitioner for top therapy because it was recommended by a medical doctor	Yes	Count		462	1666	2128
		Expected Count		532.1	1595.9	2128.0
		Adiusted Residual		-4.0	4.0	
	No	Count		2036	5827	7863
		Expected Count		1965.9	5897.1	7863.0
		Adiusted Residual		4.0	-4.0	
Total		Count		2498	7493	9991
		Expected Count		2498.0	7493.0	9991.0

Table E.17   Medical Doctor and Herbal

Crosstab				Herbal Supplements		Total
				Yes	No	
Used/saw practitioner for top therapy because it was recommended by a medical doctor	Yes	Count		968	1160	2128
		Expected Count		629.6	1498.4	2128.0
		Adiusted Residual		18.1	-18.1	
	No	Count		1988	5875	7863
		Expected Count		2326.4	5536.6	7863.0
		Adiusted Residual		-18.1	18.1	
Total		Count		2956	7035	9991
		Expected Count		2956.0	7035.0	9991.0

Contingency Tables for Family

Table E.18   Family and Traditional Healers

Crosstab			Traditional Healers		Total
			Yes	No	
Used/saw practitioner for top therapy because it was recommended by a family member	Yes	Count	54	2731	2785
		Expected Count	29.5	2755.5	2785.0
		Adjusted Residual	5.3	-5.3	
	No	Count	52	7154	7206
		Expected Count	76.5	7129.5	7206.0
		Adjusted Residual	-5.3	5.3	
Total		Count	106	9885	9991
		Expected Count	106.0	9885.0	9991.0

Table E.19   Family and Mind-Body Exercise

Crosstab			Mind-Body Exercises		Total
			Yes	No	
Used/saw practitioner for top therapy because it was recommended by a family member	Yes	Count	261	2524	2785
		Expected Count	361.3	2423.7	2785.0
		Adjusted Residual	-6.7	6.7	
	No	Count	1035	6171	7206
		Expected Count	934.7	6271.3	7206.0
		Adjusted Residual	6.7	-6.7	
Total		Count	1296	8695	9991
		Expected Count	1296.0	8695.0	9991.0

Table E.20   Family and Homeopathy

Crosstab			Homeopathy		Total
			Yes	No	
Used/saw practitioner for top therapy because it was recommended by a family member	Yes	Count	72	2713	2785
		Expected Count	54.6	2730.4	2785.0
		Adjusted Residual	2.8	-2.8	
	No	Count	124	7082	7206
		Expected Count	141.4	7064.6	7206.0
		Adjusted Residual	-2.8	2.8	
Total		Count	196	9795	9991
		Expected Count	196.0	9795.0	9991.0

Table E.21   Family and Acupuncture

Crosstab					
			Acupuncture		
			Yes	No	Total
Used/saw practitioner for top therapy because it was recommended by a family member	Yes	Count	75	2710	2785
		Expected Count	65.5	2719.5	2785.0
		Adjusted Residual	1.4	-1.4	
	No	Count	160	7046	7206
		Expected Count	169.5	7036.5	7206.0
		Adjusted Residual	-1.4	1.4	
Total		Count	235	9756	9991
		Expected Count	235.0	9756.0	9991.0

Table E.22   Family and Other Exercise

Crosstab					
			Other Movement or Exercise		
			Yes	No	Total
Used/saw practitioner for top therapy because it was recommended by a family member	Yes	Count	24	2761	2785
		Expected Count	39.3	2745.7	2785.0
		Adjusted Residual	-2.9	2.9	
	No	Count	117	7089	7206
		Expected Count	101.7	7104.3	7206.0
		Adjusted Residual	2.9	-2.9	
Total		Count	141	9850	9991
		Expected Count	141.0	9850.0	9991.0

Table E.23   Family and Chiropractic

Crosstab					
			Chiropractic or Osteopathic		
			Yes	No	Total
Used/saw practitioner for top therapy because it was recommended by a family member	Yes	Count	749	2036	2785
		Expected Count	696.3	2088.7	2785.0
		Adjusted Residual	2.7	-2.7	
	No	Count	1749	5457	7206
		Expected Count	1801.7	5404.3	7206.0
		Adjusted Residual	-2.7	2.7	
Total		Count	2498	7493	9991
		Expected Count	2498.0	7493.0	9991.0

Contingency Tables for Friend

Table E.24   Friend and Traditional Healers

Crosstab					
			Traditional Healers		Total
			Yes	No	
Used/saw practitioner for top therapy because it was recommended by a friend	Yes	Count	47	2944	2991
		Expected Count	31.7	2959.3	2991.0
		Adjusted Residual	3.3	-3.3	
	No	Count	59	6941	7000
		Expected Count	74.3	6925.7	7000.0
		Adjusted Residual	-3.3	3.3	
Total		Count	106	9885	9991
		Expected Count	106.0	9885.0	9991.0

Table E.25   Friend and Mind-Body Exercise

Crosstab					
			Mind-Body Exercises		Total
			Yes	No	
Used/saw practitioner for top therapy because it was recommended by a friend	Yes	Count	564	2427	2991
		Expected Count	388.0	2603.0	2991.0
		Adjusted Residual	11.4	-11.4	
	No	Count	732	6268	7000
		Expected Count	908.0	6092.0	7000.0
		Adjusted Residual	-11.4	11.4	
Total		Count	1296	8695	9991
		Expected Count	1296.0	8695.0	9991.0

Table E.26   Friend and Special Diets

Crosstab					
			Special Diets		Total
			Yes	No	
Used/saw practitioner for top therapy because it was recommended by a friend	Yes	Count	83	2908	2991
		Expected Count	113.5	2877.5	2991.0
		Adjusted Residual	-3.5	3.5	
	No	Count	296	6704	7000
		Expected Count	265.5	6734.5	7000.0
		Adjusted Residual	3.5	-3.5	
Total		Count	379	9612	9991
		Expected Count	379.0	9612.0	9991.0

Table E.27   Friend and Mind-Body Therapy

Crosstab					
			Mind-Body Therapy		Total
			Yes	No	
Used/saw practitioner for top therapy because it was recommended by a friend	Yes	Count	310	2681	2991
		Expected Count	247.9	2743.1	2991.0
		Adjusted Residual	4.9	-4.9	
	No	Count	518	6482	7000
		Expected Count	580.1	6419.9	7000.0
		Adjusted Residual	-4.9	4.9	
Total		Count	828	9163	9991
		Expected Count	828.0	9163.0	9991.0

Table E.28   Friend and Other Exercise

Crosstab					
			Other Movement or Exercise		Total
			Yes	No	
Used/saw practitioner for top therapy because it was recommended by a friend	Yes	Count	55	2936	2991
		Expected Count	42.2	2948.8	2991.0
		Adjusted Residual	2.4	-2.4	
	No	Count	86	6914	7000
		Expected Count	98.8	6901.2	7000.0
		Adjusted Residual	-2.4	2.4	
Total		Count	141	9850	9991
		Expected Count	141.0	9850.0	9991.0

Table E.29   Friend and Chiropractic

Crosstab					
			Chiropractic or Osteopathic		Total
			Yes	No	
Used/saw practitioner for top therapy because it was recommended by a friend	Yes	Count	645	2346	2991
		Expected Count	747.8	2243.2	2991.0
		Adjusted Residual	-5.2	5.2	
	No	Count	1853	5147	7000
		Expected Count	1750.2	5249.8	7000.0
		Adjusted Residual	5.2	-5.2	
Total		Count	2498	7493	9991
		Expected Count	2498.0	7493.0	9991.0

Table E.30   Friend and Herbal Supplements

<table>
<tr><td colspan="8" align="center">**Crosstab**</td></tr>
<tr><td></td><td></td><td></td><td colspan="2" align="center">Herbal Supplements</td><td rowspan="2">Total</td></tr>
<tr><td></td><td></td><td></td><td>Yes</td><td>No</td></tr>
<tr><td rowspan="6">Used/saw practitioner for top therapy because it was recommended by a friend</td><td rowspan="3">Yes</td><td>Count</td><td>726</td><td>2265</td><td>2991</td></tr>
<tr><td>Expected Count</td><td>884.9</td><td>2106.1</td><td>2991.0</td></tr>
<tr><td>Adjusted Residual</td><td>-7.6</td><td>7.6</td><td></td></tr>
<tr><td rowspan="3">No</td><td>Count</td><td>2230</td><td>4770</td><td>7000</td></tr>
<tr><td>Expected Count</td><td>2071.1</td><td>4928.9</td><td>7000.0</td></tr>
<tr><td>Adjusted Residual</td><td>7.6</td><td>-7.6</td><td></td></tr>
<tr><td rowspan="2">Total</td><td></td><td>Count</td><td>2956</td><td>7035</td><td>9991</td></tr>
<tr><td></td><td>Expected Count</td><td>2956.0</td><td>7035.0</td><td>9991.0</td></tr>
</table>

Contingency Tables for Co-worker

Table E.31   Co-worker and Chiropractic

<table>
<tr><td colspan="8" align="center">**Crosstab**</td></tr>
<tr><td></td><td></td><td></td><td colspan="2" align="center">Chiropractic and Osteopathic</td><td rowspan="2">Total</td></tr>
<tr><td></td><td></td><td></td><td>Yes</td><td>No</td></tr>
<tr><td rowspan="6">Used/saw practitioner for top therapy because it was recommended by a co-worker</td><td rowspan="3">Yes</td><td>Count</td><td>276</td><td>626</td><td>902</td></tr>
<tr><td>Expected Count</td><td>225.5</td><td>676.5</td><td>902.0</td></tr>
<tr><td>Adjusted Residual</td><td>4.1</td><td>-4.1</td><td></td></tr>
<tr><td rowspan="3">No</td><td>Count</td><td>2222</td><td>6867</td><td>9089</td></tr>
<tr><td>Expected Count</td><td>2272.5</td><td>6816.5</td><td>9089.0</td></tr>
<tr><td>Adjusted Residual</td><td>-4.1</td><td>4.1</td><td></td></tr>
<tr><td rowspan="2">Total</td><td></td><td>Count</td><td>2498</td><td>7493</td><td>9991</td></tr>
<tr><td></td><td>Expected Count</td><td>2498.0</td><td>7493.0</td><td>9991.0</td></tr>
</table>

Table E.32   Co-worker and Herbal Supplements

<table>
<tr><td colspan="8" align="center">**Crosstab**</td></tr>
<tr><td></td><td></td><td></td><td colspan="2" align="center">Herbal Supplements</td><td rowspan="2">Total</td></tr>
<tr><td></td><td></td><td></td><td>Yes</td><td>No</td></tr>
<tr><td rowspan="6">Used/saw practitioner for top therapy because it was recommended by a co-worker</td><td rowspan="3">Yes</td><td>Count</td><td>197</td><td>705</td><td>902</td></tr>
<tr><td>Expected Count</td><td>266.9</td><td>635.1</td><td>902.0</td></tr>
<tr><td>Adjusted Residual</td><td>-5.3</td><td>5.3</td><td></td></tr>
<tr><td rowspan="3">No</td><td>Count</td><td>2759</td><td>6330</td><td>9089</td></tr>
<tr><td>Expected Count</td><td>2689.1</td><td>6399.9</td><td>9089.0</td></tr>
<tr><td>Adjusted Residual</td><td>5.3</td><td>-5.3</td><td></td></tr>
<tr><td rowspan="2"></td><td></td><td>Count</td><td>2956</td><td>7035</td><td>9991</td></tr>
<tr><td></td><td>Expected Count</td><td>2956.0</td><td>7035.0</td><td>9991.0</td></tr>
</table>

APPENDIX F

Individual Participant Summaries

Participant #1

o Female, mid-30s
o Therapies Used
   1. Herbal remedies
   2. Herbal Supplements
   3. Massage
   4. Craniosacral
   5. Chiropractic
   6. Yoga
   7. Herbal Supplements
   8. Faith Healer
o Upbringing –
   ▪ Grandmother used Herbal and Folk Remedies
   ▪ Stated (without prompting) that she believed that (Upbringing) is why she were willing to try most CAM therapies
   ▪ Saw remedies work
   ▪ Grandmother used "rub" her (Massage)
o Doctor
   ▪ For new Herbal Supplements will ask doctor because of possible side effects with current medication (Risk Perception)
o Family
   ▪ Will ask their advice if something new doesn't seem dangerous (Risk Perception)
   ▪ Family – in one context means mother and others (Kin and Kith) who raised her up– still listens to advice on CAM therapies.
      ➢ Includes current close family friends
   ▪ When speaking about now – Family refers to husband and children –doesn't ask advice (or is given) about CAM therapies.
   ▪ Has a few family members who don't know what they talking about – no trust.
      ➢ Won't take their advice simply because they are family.
   ▪ Had "aunt" or "uncle" who wasn't actually related
o Friend
   ▪ Tried Yoga because friend asked her to go with
      ➢ Had asked before when they were "just co-workers" had said no
      ➢ Didn't like it. Didn't make her feel better. Won't try again
      ➢ Probably won't try other similar therapies if same friend recommends.
o Co-worker
   ▪ Trust levels
   ▪ Wouldn't try anything risky or dangerous based just on their recommendation
   ▪ Does not consider a co-worker as a friend
o Medical Doctor
   ▪ Diet supplement
   ▪ Didn't work
   ▪ Won't listen to them again
   ▪ Stated won't try future suggestions

- When asked if they talked to their doctor about that, they said no. When asked why she said "oh hell he don't care. he got my money. Besides he don't got time. Why bother. I'll just ask someone next time or look it up myself. There *is* always the internet"

Participant #2

o Female, late-40s to early-50s
o Therapies Used
  1. Hypnosis
  2. Native American Healer
  3. Folk Remedies
  4. Chiropractic
  5. Herbal Remedies
  6. Herbal Supplement
o Upbringing – Yes
  - Grandmother used herbal and folk remedies
    ➢ Stated that when growing up was too poor to go to a doctor.
    ➢ Everyone she knew used folk remedies
    ➢ Saw remedies work
o Family
  - Considers Family as those she was raised up with in childhood
  - Includes friends of other family members
  - Had "aunt" or "uncle" who wasn't actually related
  - Also current Family - stated that it depended context
    · Includes current close family friends
  - Have tried a therapy before to make grandmother happy
o Friend
  - Recommended Hypnosis
    ➢ Knew friend's father had tried and it worked
    ➢ Had "heard" that it works
    ➢ Didn't work. Thinks was her fault- Wasn't relaxed enough. Willing to try again
  - Tried Native American Healer
    ➢ Friend (Native American) recommended
    ➢ Figured he knew what he was talking about
    ➢ He used same therapy (Knowledge Based)
    ➢ Wasn't that close of friend- if not knowledgeable probably wouldn't have listened to him
o Co-worker
  - Wouldn't try anything risky or dangerous based just on their recommendation
o Medical Doctor
  - Diets and Herbs
    ➢ Perceived as Potentially Risky
    ➢ Trust Doctor's level of knowledge
Participant #3

- ○ Female, late-40s to early-50s
- ○ Therapies Used
    1. Folk Remedies
    2. Chiropractic
    3. Herbal Remedies
    4. Herbal Supplement
- ○ Upbringing – Yes
- ○ Family
    - ▪ Siblings, parents, grandparents, children
    - ▪ Had "aunt" or "uncle" who wasn't actually related
- ○ Co-worker
    - ▪ Trust levels
    - ▪ Wouldn't try anything risky or dangerous based just on their recommendation

Participant #4

- ○ Male, late-50s
- ○ Therapies Used
    1. Folk Remedies
    2. Herbal Remedies
    3. Herbal Supplement
- ○ Upbringing – Yes
- ○ Family
    - ▪ Siblings, parents, grandparents, children
    - ▪ Includes current close family friends
    - ▪ Had "aunt" or "uncle" who wasn't actually related
- ○ Co-worker
    - ▪ Trust levels
    - ▪ Wouldn't try anything risky or dangerous based just on their recommendation
- ○ Medical Doctor
    - ▪ Diets and Herbs
        - ➤ Perceived as Potentially Risky
        - ➤ Trust Doctor's level of knowledge

What influence does your family have on your decision to use a particular CAM therapy?
"well it depends ya know. I mean umm sure. I mean uh.. like uh yea if they said hey try this. I'd do it. Usually. Maybe It depends. Depends on what it is". "Could you explain? I don't understand" . "well like umm it depends like if they know sunt-in [something] bout it or if theydun it demself or like if you know they know its safe n stuff. ya know?"

Participant #5

- ○ Female, early 30s
- ○ Therapies Used
    1. Folk Remedies
    2. Chiropractic

   3. Herbal Remedies
   4. Herbal Supplement
- Upbringing – Yes
- Family
  - Includes current close family friends
  - Had "aunt" or "uncle" who wasn't actually related
  - Tried a therapy to make mom happy
  - Have tried to shut spouse shut up
  - Have tried to make mom shut up
- Friends
  - Have tried to make them happy/shut them up
  - Stopped doing it after a while
  - Wasn't happy quit but happy tried

Participant #6

- Male, Late 40's
- Therapies Used
  1. Herbal Supplement
- Upbringing - No
- Family
  1. Spouse, siblings, parents, grandparents, children
  - Wife recommended Herbal Supplement for Headache
  - Was willing to try because his dad (as an adult) uses supplements. Worked.
  - Would be willing to try a different Herbal Supplement in future
- Co-worker
  - Trust levels
  - Wouldn't try anything risky or dangerous based just on their recommendation

Participant #7

- Female, late-40s to early-50s
- Therapies Used
  1. Folk Remedies
  2. Chiropractic
  3. Herbal Remedies
  4. Herbal Supplement
- Upbringing – Yes
- Family
  1. Siblings, parents, grandparents, children
  2. Includes close family friends
  3. Had "aunt" or "uncle" who wasn't actually related
  4. Have tried therapy to make mom happy
  5. Have tried to make mom shut up
- Medical Doctor
  - Diets and Herbs

➤ Perceived as Potentially Risky
➤ Trust Doctor's level of knowledge

Participant #8

- Male, late-40s to early-50s
- Therapies Used
    1. Chiropractic
    2. Herbal Supplement
    3. Hypnosis
- Upbringing – Yes
- Family
    - Had "aunt" or "uncle" who wasn't actually related
    - Includes close family friends
    - Have tried therapy to make mom happy
    - Have tried to make shut up wife "shut the hell up about it"
    - Have tried to make mom shut up
- Friend
    - Have tried to make them happy/shut them up
    - Stopped doing it after a while
    - Wasn't happy quit but happy tried
- Co-worker
    - Trust levels
    - Wouldn't try anything risky or dangerous based just on their recommendation

Participant #9

- Female, late-50s
- Therapies Used
    1. Herbal Remedies
    2. Herbal Supplement
- Upbringing – Yes
- Family
    - Siblings, parents, grandparents, children
    - Includes current close family friends
    - Had "aunt" or "uncle" who wasn't actually related
- Co-worker
    - Trust levels
    - Wouldn't try anything risky or dangerous based just on their recommendation

Participant #10

- Female, late-20s
- Therapies Used
    1. Folk Remedies
    2. Herbal Supplement

- o Upbringing – Yes
- o Family
  - Siblings, parents, grandparents, children
  - Includes current close family friends
  - Had "aunt" or "uncle" who wasn't actually related
  - Did it to make sister happy
- o Medical Doctor
  - Diets and Herbs
    - ➢ Perceived as Potentially Risky
    - ➢ Trust Doctor's level of knowledge

Participant #11

- o Female, early-30s
- o Therapies Used
  1. Chiropractic
  2. Herbal Supplement
  3. Pilates
  4. **Faith Healer**
- o Upbringing **– Yes**
  - Was "raised around it"
- o Family
  - Includes current close family friends
  - The people who live with you
  - Had "aunt" or "uncle" who wasn't actually related
- o Friend
  - Have tried to make them happy/shut them up
  - Stopped doing it after a while
  - Wasn't happy quit but happy tried
- o Co-worker
  - Trust levels
  - Wouldn't try anything risky or dangerous based just on their recommendation
- o Medical Doctor
  - Diets and Herbs
    - ➢ Perceived as Potentially Risky
    - ➢ Trust Doctor's level of knowledge

Participant #12

- o Male, late-20s
- o Therapies Used
  1. Chiropractic
  2. Herbal Remedies
  3. Vegetarian Diet
  4. Tai Chi
- o Upbringing –Yes

- Family
  - Had "aunt" or "uncle" who wasn't actually related
  - Have tried to make mom shut up
- Friend
  - Have tried to make them happy/shut them up
  - Stopped doing it after a while
  - Never told them
- Co-worker
  - Not boss
  - Tried Tai-Chi to get raise
  - Didn't work
- Medical Doctor
  - Diets and Herbs
    - Perceived as Potentially Risky
    - Trust Doctor's level of knowledge
    - "they know if its going to kill me or not"