TRANSFORMATIONAL LEARNING IN HEALTH CARE STUDENTS THROUGH INTERNATIONAL SERVICE IN DEVELOPING WORLD ENVIRONMENTS

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Abstract of Dissertation

Transformational Learning in Health Care Students Through International Service in Developing World Environments

Health care and health care education are in dynamic transition in attempting to address the increasing demands of a diverse global population across a widening gap in health resource constraints. Health care students must be prepared to care for a much wider patient population across a diverse spectrum of cultures, economics, and technologic facilities with resourceful approaches. Individual students and practitioners of the healing arts, and the educational system that supports them, should undergo transformational learning to address these new realities in expanding paradigms of health and health care.

This study was designed to observe health care students and practitioners in the setting of international medical missions in the developing world. Almost all of the participants reported changes characteristic of transformational learning brought about through encounters with developing world patients, and most qualified these changes in both perceptions and practices as profound, life-changing experiences. These reported changes were measured with a previously validated quantitative instrument, Perceptions of an International Healthcare Mission Questionnaire, with responses correlated with demographics and answers to semistructured qualitative questions in essays and follow-up interviews.

On the basis of these positive findings, it can be recommended that the opportunity of international health care missions be made more widely available for students. The students themselves benefit, as well as the developing world patients who

receive care. These very patients appear to be the agents of the transformational learning experience. Institutionalization of medical mission opportunities would enhance health care education by providing the transformational kind of learning that is needed to address the diverse demands required in reforming global health care.

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CHAPTER 1:

INTRODUCTION

Health care and health care education are at a peculiar humanitarian crossroad at this first decade in a new millennium. In the developed world, never has modern medicine been so capable of doing so much for a privileged population so little satisfied with the humanitarian compassion of their care. In this "golden age of medical and surgical advance," the vast majority of health care resources are devoted to the surfeited few who might be suffering least, while the vast majority of the globe's population suffers neglect as well as the highest burden of disease and impoverishment. As an example, "fully 90 percent of the world's surgical needs are outside of the U. S. A. and Europe," where the majority of such care and expertise is found (Blanchard et al., 2001). What can be done to achieve more equitable care, as well as understanding by health care personnel of the health and humanitarian concerns of the global population?

Ignorance about the health problems of the majority of the world's inhabitants is understandable, since medical education offers almost no exposure to the global population. If entry-level health care students, such as medical students, were made aware of the global population in need, they might better appreciate their problems and potentials. If such students were to be guided through a reflective learning experience outside of the developed world, they might have a better understanding of environments where health care resources are constrained but health and humanitarian problems abound (Blanchard et al., 2001). Such a contextualization of humanity and its habitat, as well as the role of the healing arts in addressing humanitarian concerns, might make the global realities of human health and opportunities to address it through health care much

more vivid to students than the traditional laboratory biomedical science model, which is heavily emphasized in most medical education.

The confrontation of first-world health care education and developing world health care needs usually focuses sharply on the students' original motives for choosing the healing and helping professions. Nearly all applicants to schools in the health professions indicate in application essays and interviews that their interest in obtaining a health care education is to "help mankind." This generic statement usually is made without recognizing or appreciating the real-world needs of a large part of mankind.

The biomedical science-based curriculum emphasizes analytic objective thinking and rewards compulsive memorization of large volumes of information pertaining to mechanisms of disease but is generally devoid of the human context of illness. This reductionist thinking pattern may be carried over into early clinical encounters, with most students considering patients as more or less "just like me," since identification is a potent incentive toward mastery of subject matter and self-efficacy in its practice (Bandura, 1977). It is a much further remove to consider patients very different in lifestyle, environmental context, and health stresses in adaptation to circumstances foreign to the experience of nearly every health care student.

Patients encountered in these environments exert a profound emotive effect on the students that has often been highly effective in transformational experiential learning, adding intense affective and behavioral dimensions to the cognitive learning in achieving health care efficacy. Anecdotal testimony abounds as to the power of this kind of experiential learning. Why is this potent means for intensive transformational health care

experiential learning not made more generally available and advocated widely through institutional recognition?

Various authors have considered that patients are better teachers of medical students than are medical faculty and are much better at transforming and redirecting the lives of health care students and practitioners (Purtillo & Haddad, 1996). This is particularly true of some patients who may not even be aware of the turning points they offer in the educational, professional, and personal experience of health care students. Many of these patients are "subcultural giants" who have suffered inflictions in good grace and courage, often in particularly poignant and puzzling problems of illness, poverty, and disadvantage.

Problem Statement

We do not know how to best facilitate transformational learning in health care education. However, iterative reporting of student experiences has shown that international medical missions have been life-changing and should be better understood and implemented as a way to enhance health care education and the health care mastery experiences that follow from it (Taylor, 1986). Taylor concluded that it is important for health care students to not only study the mechanisms of disease but develop an appreciation for the human condition in which all health and illness is contextualized. It has been suggested that a potent means for this transformation is international health care service (Taylor, 1992). Other authors have concluded that as potent as such educational encounters might be, there is a paucity of understanding of this kind of experiential

learning when the patients are so different in background and living circumstances from the learners (Bateman, Baker, Hoornenborg, & Ericsson, 2001).

There is an acknowledged need in health care and the helping professions for a new way of viewing the world that does not involve just "pushing more rice sacks out of the back of more planes." It is a heavy burden to take on the reform of the medical education system of the developed world, let alone change the global health and medical well-being of others, most especially the "bottom billion" of the planet's poorest peoples. But, it is equally apparent in the magnitude of the problems being faced and the limited quantity of resources devoted to their solution that transactional learning by increments will never catch up to the runaway magnitude of the global problems requiring resolution, often urgently.

But, health care is a very good model of the kind of "helping profession" that can treat the "other" despite a large number of often contrived differences or the givens of cultural, linguistic, religious, and even more arbitrary and capricious economic gulfs between the caring professions and those cared for. If there is value in studying transformational learning in the somewhat more familiar "laboratory" of work in humanitarian relief, there may be wider applicability of this model in health care education and other educational and social development systems in which there are similar needs unequal to the transactional resources devoted to it. But this research is not intended to design a template to address the macro level of humanitarian change required. However, there might still be hope that insights into health care transformation, individually and as a desired objective for health care education, might be in some ways a

generalizable model for more equitable "treating" of human needs wherever they may be found and addressed through transformational learning.

Purpose of the Study

The purpose of this research study is to measure and describe the transformational international medical education experience of health care students. What is there about encounters with patients in the developing world and their associated problems that constitutes so important an educational experience? How can we describe, enhance, broaden exposure to, and intensify these medical education experiences?

Research Questions and Hypotheses

The study was guided by four research questions:

Research Question 1: What new biomedical, health, and cultural knowledge is gained by health care students in an international medical mission?

Subquestion A: Do the students' thinking/cognitive skills change in an international medical mission experience? If so, in what way?

Subquestion B: Do the students' opinions change with the experience of international medical missions? If so, how much?

Subquestion C: Does the students' self-confidence change following a medical mission experience? If so, how much?

Subquestion D: Does the students' opinion of their efficacy and efficiency in performing professional tasks change in the course of the international medical mission? If so, how much?

Subquestion E: Do the students' attitudes and feelings change in the course of an international medical mission experience? If so, how much?

Research Question 2: Has the international medical mission experience been a "life-changing" learning experience for the students? If so, how?

Subquestion A: How do the students describe the experience and its effect on their attitudes, beliefs, outlooks, emotional reactions, and abilities?

Subquestion B: What is the students' assessment of the change, if any, in their abilities in the course of an international medical mission?

Subquestion C: What recognition of limitations and personal shortcomings, if any, did international medical missions contribute to the health care students?

Research Question 3: What is the linkage, if any, between experiential learning in international health care and the transformational nature of the learning experience?

Research Question 4: Does the impact, if any, of the international medical mission on students persist sustainably after the mission?

Hypotheses were developed, as follows:

H1a: Students increase their substantive knowledge following an international medical mission.

H1b: Students increase their sympathetic appreciation of patients and the magnitude of their problems following an international medical mission.

H2a: Students express a greater self-efficacy following an international medical mission.

H2b: Students express a change in their professional behavior following an international medical mission.

H2c: Students express a change in their personal growth in the context of health care following an international medical mission.

H3a: Students express a change in how they view U.S. health care and resource allocation following an international medical mission.

H3b: Students express a change in confidence as a health care professional following an international medical mission.

H3c: Students express a change in their ability to work with and gain respect for others in a multicultural environment following an international medical mission.

H4: Students report the same H1a through H3c effects for months to years following an international medical mission.

Statement of Potential Significance

The study is intended to help illuminate the transformational medical education process in the context of international health care missions. A study of the effectiveness and efficiency of medical educational experiences may help in counseling individual health care students as well as assist in the design and evaluation of curricula. Although anecdotal reports abound as to the effectiveness of such experiences, the transformational nature of such education has not been well described. As Coulehan and Williams (2001) suggested, an investigation of how this phenomenon impacts the lives of the learners and their future mindset in approaching health and healing would be a contribution toward the transformation of the student of biomedical sciences into a "humane healer."

"Professionalism" is one of the principal goals of medical education in the experience of transition through and beyond medical school (Suchman et al., 2004). A

major premise in the construct underlying health care students' beliefs, behaviors, and practice is that poor patients in the international context are highly effective mediators toward medical students' transformational learning, may bring about a shift in their underlying life-view, and may be facilitators of the professionalism process. This process may not be accomplished solely or even very efficiently by lectures, reading, and assignments or even by modeling or mentoring. On the other hand, transformational learning comes as a genuine adult learning experience, from within, and is sustainable and transmissible from the transformative point forward. It may not come about by way of any other experience with such emotive impact as it does by direct encounters with large human health problems through the persons encumbered by them. How can the practical application of this Mezirow construct of transformational learning (Mezirow, 1991) be enhanced and used with greater efficiency and efficacy in the humanitarian practice of health care science?

In the investigator's experience of more than four decades in medical education, nothing has been as effective in rapid and radical transformational learning as the encounter with people living in the third-world isolation of poverty, illness, and ignorance. The peoples so affected are usually quite different in circumstances from the health care student volunteers. The exchange is moving for both the patients and the volunteers in the encounter, but the health care students often become overwhelmed at first when asked to reflect critically on their exposure to the scale of the problems faced by their patient population and how they would address them. One of the components of their disorienting dilemma (Mezirow, 1991) is the mismatch between their rudimentary skills and the widespread suffering. The other very humbling aspect of the encounter is

the stoic courage, grace, and generosity of spirit among many of those whose first impulse would not be expected to be "helping their helpers." "Gifts from the poor" (Geelhoed, 2000) is a second powerful component of the disorienting dilemma experienced by those who had come presumably to help those less well off.

Through their experience, students are helped to distinguish between health problems that can be addressed and those that cannot be cured or sustainably relieved within the constraints of our practice. Yet, they learn that even when efforts seem futile, a caring approach is warranted—both in the developing and the developed worlds. They also develop new views on their home environment. For example, in the author's prior mission trips, students have reported that the "culture shock" was greater on "re-entry" into the first world environment (Gaw, 1995) than it had been on arriving in the developing world. They expressed some degree of disgust over the "triviality," "superficiality," and "superfluous redundancy and waste" they now had come to recognize as characteristic of first-world health care practices. It is highly unlikely that such an appraisal could have been made by those who had never left the first-world setting or that the impression would have been so intense had they not had the destitution of another world to compare.

With the new health care construct and this "global transformation" in perspective, students who set out to "save the world" may find that their disorienting dilemma has given way to an appreciation of the common humanity and each person's strengths and deficits. In the single most important capacity both student and education institution give lip service obeisance—namely, the caring capacity of humanitarian compassion—there is no measure of learning. A description and analysis of the

transformational learning process may help us refine and reform the medical education process and institutionalize this primary process within medical education.

Another Perspective: Addressing What Others Have Reported About Medical Mission Experiences

The literature, both professional and popular, is full of "short stories" about encounters of helpers with the disadvantaged and the life-changing results on either end of such transactions. These anecdotes, either individual or collective, seem to address some need within us to want to try to help in some "do-good" capacity as we seem to know we should. There is an incentive toward thinking about and wishing to do—or at least read about—similar missions of mercy: witness the outpouring of proxy support for the victims of the tsunami, Kashmiri earthquake, Hurricane Katrina, and those caught in the crossfires of conflict and warfare. Whole industries are based on the public relations appeal of outreach efforts toward the needy and desperate, suffering from the synergistic effects of poverty, hunger, and disease, from the Red Cross, USAID, and UN agencies to more specific medical aid volunteer groups like Operation Smile, Medical Ministries International, Doctors Without Borders, and Physicians for Peace, to name just a few groups with which the researcher has collaborated in medical missions.

Cynics might be justified in some of their views of the mixed agenda such humanitarian aid efforts always carry. First, there may be more people living *off* such aid than *because* of it (the "medical-industrial complex") (Hancock, 1997). Second, almost all major aid projects are donations to the *donors* as well, in full employment for an at-home constituency, creating an obligate market for export products (Farah, 1999). Third,

the third world may serve as a lower-risk experimental laboratory for human research or a dumping ground for excess or obsolete products with less concern about safety (an all-too-frequent fear expressed by developing world populations, accounting for potential inertial reluctance for uptake of some family planning, vaccination, and HIV retroviral programs and popularized in the mass media, including the film *The Constant Gardener,* 2005).

We know that there are few unambiguous human interventions that qualify as an unmitigated good (Geelhoed, 1999b), yet we know we *must* attempt to do something to help those distressed planetary citizens through some kind of humanitarian aid. Health care personnel feel this impulse as strongly as any other concerned citizenry, and many feel a compelling obligation to extend their periscope out of the self-absorbed submarine society imposed by the intensity of medical education. There have been mixed messages about how effective they might be in what they might contribute, and they can feel ambivalent about what impact such attempts at service learning might have upon themselves. How can ambivalence about medical mission service be clarified with evidence gathered for its effect on the human beings on either end of such experience? Anecdotal evidence abounds, much of it dismissed by both students and educators as "news stories." As a basis for rational decision-making on whether to invest self and valuable curriculum time in such an undertaking, more than selected anecdotes are needed for both health care students and faculties. There is a need for quantitative data in sifting beneficial evidence from the anecdotal to evaluate the learning that occurs in encounters freighted with so many other agendas.

There is an assumption in health care science that the somewhat messier compassionate concern should always "trump" the statistical rigor of experimental design in the purity of scientific inquiry (the "Martin Arrowsmith Phenomenon" after the Sinclair Lewis hero), softening, on principle, the reliability of the conclusions that can be drawn from data accrued in humanitarian causes. To study a phenomenon across a power asymmetry always leads to an ethical quandary in human experimentation, whether in the healing arts or in education. Immanuel Kant provided a guiding dictum: All human beings are to be regarded as an end in themselves and should never be used as a means to an end. In view of this morally precarious starting point, attempting to begin on the summit of this high ground, how can the health care educator, from the asymmetric power perspectives of the healer, teacher, and investigator, gather valid and ethical information about student learning in encounters with desperate poor patients? Attempting a scientific study of the health care learning process by means that may be based in some reliably collected and analyzed data rather than depending solely on qualitative descriptive means of individual "case reports" is a model adopted from clinical health care research that has resulted in considerable advances in our understanding of health care itself. If such means might be applied to the health care education process, learning might be less described as "numerator" data of only the few remarkable or "best case" results, and a more balanced judgment of the sample populations drawn from the "denominator" of all participants included in a health education process under study. These quantitative correlations may make possible predictive projections empowering the processes of both health care education and some variant examples of its setting, such as international medical missions.

Conceptual Framework

The constructs for this research are transformational learning and international health care (see Figure 1-1). The domains of the theoretic framework are an attempt at understanding the adult learning of health care personnel under special circumstances. The interrelationships between the constructs for the individual health care student are suggested by this framework and expanded in the overall consideration of transformational learning in health care education reform and efficacy in developing

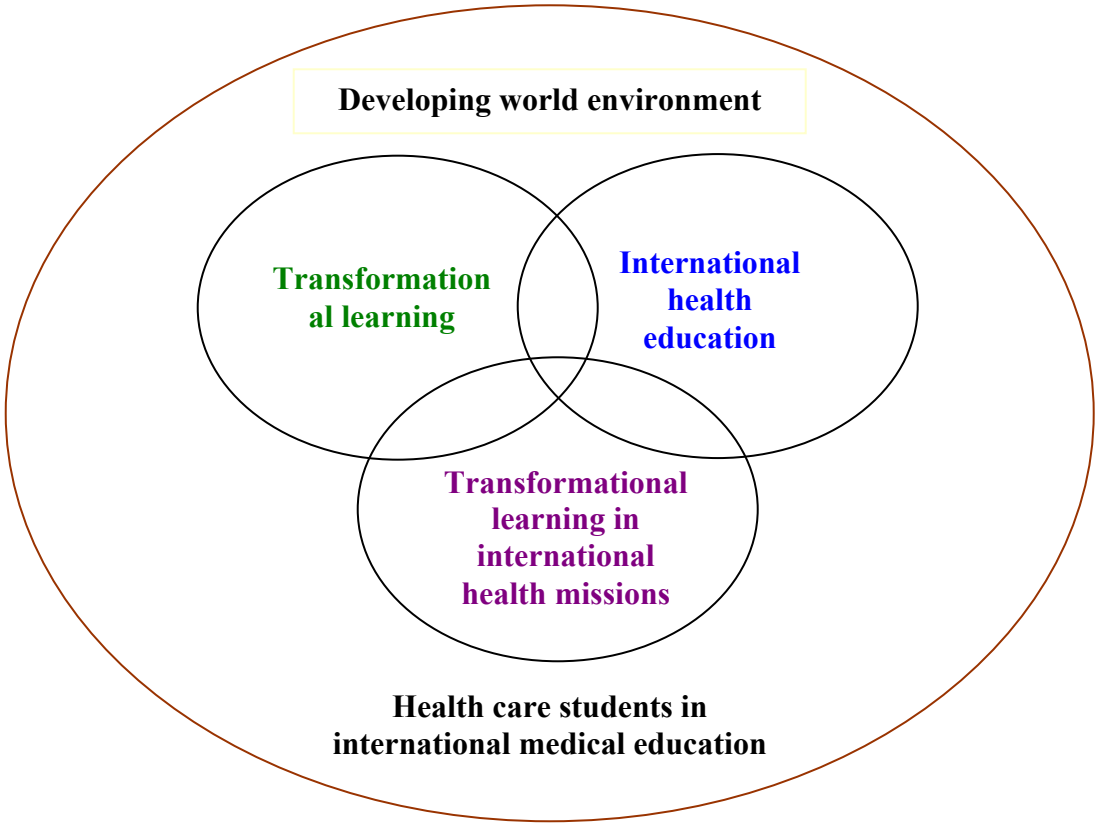

Figure 1-1. Conceptual framework for the study.

world practice shown in Figure 1-2. The relationship between transformational learning and the student's perceived efficacy in practice, as shown in Figure 1-1, may lead to recommendations for the same dynamic for health care education reform illustrated in the conceptual framework portrayed in Figure 1-2.

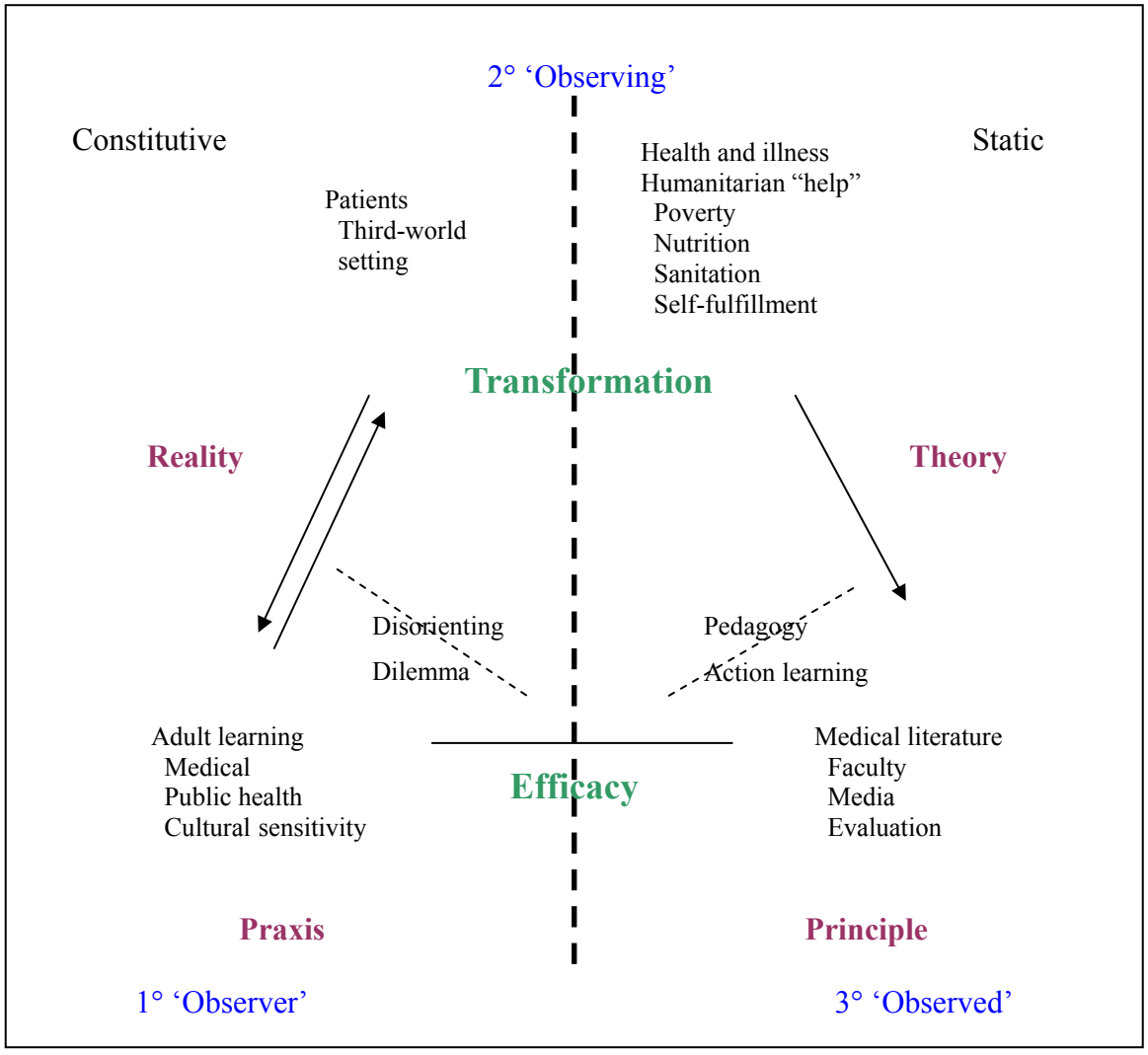

Figure 1-2. Phenomenologic observation of transformational learning in health care students treating developing-world patients.

Transformational Learning

The Mezirow (1978, 1983, 1991) theory of transformational learning has been applied to adult learning and has been a nearly universal model of andragogy. Change occurs in the structure of underlying beliefs, attitudes, practices, and further perceptions of both the instructor and the learner in individual learning processes. From the original description of the transformative learning experience (Mezirow, 1978), the theory has been further modified into a "comprehensive and complex description of how learners construe, validate, and reformulate the meaning of their experience" (Cranton, 1994, p. 23). The theory has three common themes: (1) the centrality of experience, (2) critical reflection, and (3) rational discourse (Taylor, 1998). The Mezirow theoretic base is founded in psychoanalytic theory (Boyd & Myers, 1998) and critical social theory (Scott, 1997).

Mezirow described a process whereby learners change "their meaning schemes (specific beliefs, attitudes, and emotional reactions)" (1991, p. 167) through an experience that resulted in critical reflection on the experience that was changing them, which then led to a perspective transformation:

> Perspective transformation is the process of becoming critically aware of how and why our assumptions have come to constrain the way we perceive, understand, and feel about our world, changing these structures of habitual expectation to make possible a more inclusive, discriminating, and integrating perspective, and, finally, making choices or otherwise acting upon these new understandings. (Mezirow, 1991, p. 167)

In the case of health care students on international mission trips, the elements for transformative learning are present. Students have powerful experiences interacting with people across boundaries of culture, economics, geography, and technology, and these

experiences seem to result in a disorienting dilemma during a formative period of health care education. The art of guiding the student through this transformational learning experience often employs the questions of "action learning" (Marquardt, 2005) to draw out their insights.

Transformational Learning During International Mission Trips

In prior personal experience and in the observed experiences of many others, the unique setting of the developing world and the patients who populate it are highly effective motivators toward the transformation experience in the classic Mezirow pattern of disorienting dilemma and resolution through the development of a qualitatively different mindset.

The medical education system can be an effective agent in transformational learning if it is structured appropriately. Two elements that are needed are supportive faculty, who appreciate the value of such exposure in an already crowded medical curriculum; and the needy patient, who is often a more effective teacher by posing problems and issues that seem overwhelming to the fledgling practitioner. Over time, the transformation may result in a professional identity and demeanor on the part of the health care student, one whose caring competence is enhanced, not incapacitated, by compassion.

The transformational learning achieved in the mission trips has, in prior experience, typically resulted in growth that was qualitatively different than other forms of medical education. Experiencing the real human problems of the planet and recognizing the healing role of the junior health care worker by expanding both

consciousness and capability is qualitatively different from the incremental expansion of the information base necessarily acquired to "treat others"—which is how much of medical education could be described. Transformational learning is not simply a "nice thing to have experienced"; it is virtually required to address the major unsolved problems in health care and humanitarian help that burden the majority of the global population.

The implications of these encounters relate to pedagogy in adult learning, invariably in an "action learning" setting; to principles of health and illness in social settings and development programs; to medical education in principle and in practice; and, most critically, toward the psychology of transformational learning.

Summary of the Methodology

The perceptions of health care students and practitioners in encounters with patients in the setting of the developing world were measured through a validated quantitative instrument, Perceptions of International Healthcare Mission Questionnaire (PIHMQ) (Gallagher, 2004). The PIHMQ was modified for application to medical missions from a prior instrument on international encounters (Wilson, 1993). While the PIHMQ is a reliable measure of the experiences to be investigated, it has a lesser track record than other instruments that were not specifically designed for international health missions.

The results of this semiquantitative analysis, which used Likert-scaled responses, were triangulated with directed interviews for further elucidation of the transformational learning process of the health care mission experience. This mixed-method approach was

expected to be better than either quantitative or qualitative methods alone to answer the research questions and develop recommendations for medical education.

Limitations and Assumptions

Limitations Related to the Survey and Interviews

With respect to the PIHMQ (Gallagher, 2004), it was assumed that students' responses to the questions were thoughtful and correctly reflected their beliefs and experiences. The intensity of reflective consideration may have varied among the respondents, depending on their motivations and behavior patterns and their stage in the professionalization process. However, health care students are typically ranked high in directed goal-oriented behavior, and there should be little incentive toward misrepresenting their views since respondents remained anonymous at data entry. Although such risks remained with the qualitative portion of the study, the researcher's long experience in this process has made him aware of his own biases as well as students' propensities to want to please an instructor who may be grading them or providing recommendation letters for residency programs.

Multiple medical missions were held with different leaders. While leadership was *not* a construct in the interactions, it was a potential confounding variable, and a "silent code" was used to identify the leader in case it later proved to be significant. Students develop lasting relationships with mentors who help them learn the art of healing, and such relationships can be strong in the intensive environment of a medical mission. Among the many students I have taught, some have continuously maintained contact after graduation. The bonding might influence both questions and responses and may

confuse the teacher/student influence with the impact of the mission and its patients. Although the leadership of a mission undoubtedly affects students' experiences, students from various institutions and under the auspices of different mission team leaders have all had encounters with similar patients in environments that are comparable, although seldom identical. In these cases, identification with mission leaders of varied experience, charismatic leadership styles, or role model compatibility seems to have had less impact on these students than the powerful presence of the patients.

Issues Beyond the Scope of the Study

A subject as global as humanitarian care for the disadvantaged and education related to such service involves scores of considerations that were not explored in this study. The health care component itself has been explored and the approaches to healing across significant barriers to understanding illustrated (Geelhoed, 2005). The method by which such care might be administered in adaptation to the special constraints of the developing world was described in that recent work.

"Program evaluation" is frequently employed by government, multilateral, or nongovernment voluntary agencies to assess the effectiveness of aid programs. This research did *not* seek to evaluate the care administered, although improvement of the quality of care is a continual concern. There is but one "standard of care" for health care worldwide: the best care we can possibly render with whatever resources we can dedicate to it. The Golden Rule remains as relevant to the practice of health care as to all other life worlds (Geelhoed, 1999). In addition, patient follow-up in the evaluation of care is problematic in the developing world due to curtailed record keeping, transient contact,

and inability to recall patients for repeated observations. Again, this study was not designed to focus on patient outcome, even though it remains a primary concern of the health care team.

This research, instead, focused on the other side of the health care interaction: the beginning caregivers, learning new skills in a foreign environment. The focus of this study was on the interaction and the effects seen on the "helper" side of the encounter.

This study was *not* designed to address health care in the developed world and the ambivalent relationship of the "consumers and providers" (to use the debasing, more measurable economic terms of this "covenant" relationship). It may be true that the assumptions of benevolent care underlying developing world health care service and education would also apply to the developed world (Taylor, 1986). However, this research focused on the health care students' medical education experiences in the setting of the *developing* world.

Researcher Objectivity and Epoché

Finally, it must be noted that I can hardly be considered a neutral *tabula rassa*, since I have devoted much of my professional life to passing on the kind of transformational experience that changed my worldview. As an aspiring learner with intent to become a professional humanitarian helper and a benefactor for others, I became a professional educator to facilitate the international mission experience for others. I have been convinced of the value of medical mission experiential learning—and not just from a single original experience in my own life, but in close observation/participation with hundreds of others over four decades.

It is true for almost any subject, but particularly for those in which one has a passionate interest, that the real object of study is self. It would be difficult, for example, to be a journalist covering sectarian violence with dispassion if one was a "true believer" of one of the faiths at issue, whether it be in the setting of the Sunni Triangle of Iraq, the Catholic quarter of Belfast, or running amok in Zamboanga—or, an international mission among the disadvantaged poor, of which the globe has no shortage. But, one of the primary features of the caring professions is the antithesis of narcissism. The issues of *libertie, egalitie, fraternitie* in "normal" circumstances must be trumped immediately by health- or life-threatening disadvantages to one of the members of the dyadic association, and that one instantly becomes the "other."

I am both teacher and healer, and each of these roles reflects a power imbalance relative to the observed students and patients. A self-conscious epoché should not be disabling for any conclusion to be drawn from that perspective from which I cannot resign to be effective in each. There are innumerable differences among men and women, often described in terms of "power," but it is this imbalance that calls out the "professionalism" (Geelhoed, 1967) in the caregiver to seek empowerment of the disadvantaged. To do so more effectively, I need to seek empowerment of my own to go beyond description, however "thick," of observations of transformational learning in these students to allow generalizable conclusions toward recognition and empowerment for both patients and students in medical education policy.

Definition of Key Terms

Culture: Patterns of learned perceptions, behaviors, attitudes, and beliefs shared by a culturally identifiable group (Martin, 2001).

Developing world environments: Regions of third-world economic circumstances; it is important to note that there may be "third world" environments within or across national boundaries, frequently encountered with developing world neighborhoods inside more affluent nations' slums or rural marginal lands, for example (Geelhoed, 2005).

Efficacy: Health care students' impressions of their own ability to rise to and manage a life situation that they might be encountering for the first time or in a different environment, according to their mindset or acquired approach to the unknown (Button, Mathieu, & Zajac, 1996; Sherer, 1982; Sherer & Adams, 1983).

Experiential learning: Simply, "learning by doing combined with reflection" (Priest & Gass, 1997, p. 136); the term is generally used to refer to experiences in which students are actively involved in exercising their knowledge and skills.

"First world," or "developed world": A nation or region as an economic demographic unit in which the gross domestic product (GDP) is rising per capita, as the population in more or less controlled growth is rising less rapidly, such that there is an increasing standard of living, e.g., the United States or the European Union (Geelhoed, 2005).

Health care education: The formal curriculum, clinical rotations, preceptorships, clerkships, elective experiences, and informal experiences contained within accredited institutions in which matriculated students pursue degree certification in order to become

professional health care practitioners. In this study, the context is U.S. medical schools in universities that are members of the Association of American Medical Colleges.

Health care personnel: Doctors, nurses, allied health professionals, and those who have been certified by some standard-setting professional organization to be licensed to deliver health care.

Health care students: Students enrolled in educational institutions in curricula heading toward certification as health care personnel.

Humanitarian service: Benevolent social service that includes health care often applied to needy population beneficiaries with a motive of beneficence rather than profit.

International health care service: A period of health care practice in an environment other than the one in which the primary education and training were achieved, often referring to health care practice in the developing world.

International medical education: Medical education across national boundaries, particularly focusing on the peculiar problems of health care manpower supply in the developing world.

Mastery experience: Experience on the part of a recent learner that achieves confidence in performance, enhancing self-efficacy (Bandura, 1977).

Medical students: Students enrolled in an accredited school of medicine seeking to graduate as doctors of medicine or osteopathy.

Participant observation: A phenomenological technique often used by anthropologists in which the observer is also a direct participant in the actions being observed.

"Second world": A nation or region as an economic demographic unit in which the GDP is stable with respect to the population, such that the living standard remains relatively constant, as population increase does not outstrip the rise in GDP, e.g., Mexico or India (Geelhoed, 2005).

"Third world," or "developing world": Destitute nations or regions or an economic demographic unit in which the GDP is falling with respect to the rate of population increase, such that there is a decrease in the per capita standard of living and an increase in human misery scale, e.g., Congo, Somalia, Malawi (Geelhoed, 2005).

Transformational learning: A learning experience in which the beliefs, models, and constructs undergo a fundamental change, often after encounter with new facts that cannot be assimilated in the prior life world of experience and often through a disorienting dilemma (Mezirow, 1991).

Summary

This study investigates the phenomenon of transformational learning in international health care missions, as described in this introductory chapter. Chapter 2 reviews the literature on prior investigations into this phenomenon, many dealing with the question through qualitative methodology alone. Chapter 3 addresses the study's research design, the quantitative statistical analysis of the data, and the correlations with qualitative responses for testing the hypotheses. In chapter 4, the results of the study are put forward with the analysis of these findings. In chapter 5, these results are interpreted and conclusions drawn from the data analysis, with recommendations for how these findings may be used in reforming health care and health care education.

CHAPTER 2:

LITERATURE REVIEW

This review of the literature is organized according to the constructs that frame the study. It concentrates on transformational learning: its origins, its grounding in the experiences of the individual learner, and its expression in rational discourse after a period of reflection. Transformational learning is considered in the context of the developing world, where the medical missions are conducted. The benefits of enhancing transformational learning are then considered for the pedagogy and practice of students and for medical education and health care delivery.

The library resources of the George Washington University at the Ashburn and Foggy Bottom campuses were used to search the literature for the constructs and concepts pertinent to the research. Computer-based search engines were also used to find and search through constructs using Google and other generic searches with specific concepts pulled from books, periodicals, and dissertations reviewed. Many sources existed only online, with some obtained in conferences and presentations.

An Overview of Transformational Learning

The horizon set by prior experience is the framework through which each of us perceives new encounters and functions in a changing world—until the old paradigms that have structured our experience lead to disorienting contradictions. This view is based on the psychoanalytic perspective of Mezirow's work in the early 1990s. Mezirow called this crisis in the turning point of attitudes and belief systems a "disorienting dilemma," a cognitive dissonance in which prior rules for living and judging the inputs of the life-

world “do not compute” and a new perspective has to be reached to restore a functional congruity of the new view of reality.

Mezirow later downplayed the need for a major crisis. He indicated that a cataclysmic psychic event was not always required; sometimes a more gradual revolution in conceptualization occurred, and those with such experiences often had as profound a change in their perspective as those who had a sudden epiphany.

Mezirow described a process that is rational, analytic, and cognitive (Grabov, 1997, pp. 90-91), with an “inherent logic.” But, as grounded in the rationality of psychoanalysis, the experience is first and foremost experiential. An early criticism of Mezirow’s theory was that it did not include affect, but both other theorists and Mezirow himself later came to appreciate the large role of emotions in the disorientation as well as the intellectual restructuring (Mezirow, 1995). The purely intellectual enigmatic quandary that resulted in the disorienting dilemma and the development of a new set of assumptions could not entirely explain the power of the transformation. Later theorists (Boyd & Myers, 1988) have filled in the affective pieces of the transformative learning experience as an “intuitive, creative, emotional” process (Grabov, 1997, p. 90).

Transformational learning is a very real “adult learning” experience and is reflected not just in perceived attitudes or professed beliefs, but in behavioral change and in “praxis,” “the creative implementation of purpose” (Mezirow, 1991). Mezirow’s theory of transformational learning contains the cardinal features of this special “higher” learning function: it (1) is experiential, (2) requires reflection, and (3) is expressed in discourse (Mezirow, 1978, 1983). The discourse phase helps those experiencing the transformation, and others around them, recognize a “passage” in life.

One of the three constituent features of learning described in Mezirow's terms as "transformational" is that it is transmitted to another in expressing the change that the learner has undergone (Mezirow, 1983). This is not an unconscious change, nor is it private, but is transmitted and becomes a part of further discourse. In this and other studies, the data collection devices themselves involve measures of transformation, since the participants voluntarily communicate their fundamentally changed perspective in their responses to questions, and even more compellingly in unsolicited reports made spontaneously or in the essays describing their experiences. The transmittal of their reflections on how the experience changed their perspectives was how their entry into the study was recorded. There would be no way to know if a student did, or did not, undergo a transformational learning experience without a report of the experience. Since data from every participant who signed the consent form and filled in the questionnaire were analyzed, the transmittal of this information should be independent of its result.

The perspective change brought about in a transformative learning experience is not a minor modification of existing systems to accommodate one or two dissonant data inputs. Rather, it is a fundamental change involving the totality of an individual's cultural and contextual meaning structures that influence how he or she behaves and interprets events, including the transformative learning experience itself and all subsequent experience (Taylor, 1998). Changing the way one integrates new facts into an existing meaning structure is the "normal science" (Kuhn, 1996) that is the stuff of everyday education and training; that does not require a radically new paradigm. Akin to the Kuhn view of epochal change in the fundamental mindset in the traditions of scientific systems, the new personal paradigm is a revolutionary change in which the world is viewed

differently from that point forward. This change has consequences for behavior in the one who now carries new convictions after the overturn of the prior conventional learning consensus.

Such fundamental change, whether dramatic or gradual, is a conscious process. The conversion experience is often tied to an event that gave rise to the disorienting dilemma, which is painful and disorienting enough to usually prove quite memorable, as is the eager embrace of the new paradigm that leads the way out of this discomfort. The restructuring is often expressed in forms like this remark: "I will never be the same again and from this point forward will always look at matters through the difference this experience has brought about in me" (feedback of a medical student who accompanied the researcher on her inaugural mission, April 2004).

Transformational Learning in Students on International Health Missions

In medical education—which is all, nearly by definition, "adult learning"—"experiential learning" has long been the rule rather than the exception. There is literature on medical education experiments (Community-Campus Partnerships for Health, 1993; Keppell, Kennedy, Elliott, & Harris, 2001). A large number of reports of international medical experiences have shown the educational value of the cross-cultural encounter. In the collections of published anecdotal reports, there is a tacit acknowledgment of the power of this encounter and the benefits conferred upon the first-world volunteers, but without a systematic study of volunteers' reactions to the developing world experience as a transformational learning encounter.

Some authors have focused on the attempt to achieve self-efficacy as the educational component (Bandura, 1977). The process of a student metamorphosing into a professional is a matter of development of self-efficacy. The student assumes the identity of a healer as he or she recognizes the patient outcome results of actions that have successfully or otherwise influenced patients' lives. This process of gradual accumulation in self-efficacy begins nearly unconsciously (Bandura, 1978) before it is later reflected upon in trying to understand the changes in behavior and approach to the frightening experience of confronting serious health problems as observed closely in others. The health care student aspirant to professional status may have made a predetermination that he or she is going to be an effective interventionist in the process of illness, but that decision does not automatically equip him or her with the capability to do so effectively nor remove the protective revulsion that most normal people share about close contact with illness or injury. As the learner participates in the process as preceptor, a cognitive as well as an emotive process takes place that goes toward the development of a new perception that "I, too, could do this," and an identification takes place as experience becomes closer to the patient and problem that "Hey, I *did* this!" (Bandura, 1993).

A great flurry of photographs is always taken of the student in scrub apparel (often instructed for the first time in how to put it on) standing with the patient in a completed operation, at which the student may have at most been a rather intimidated witness. The implication is clear in the picture: "I did, or at least might have done, this, and I am acting like the doctor I had only imagined until now." The reality may have been quite different, since first-time encounters with the incision and bleeding have often resulted in syncope, but no pictures were taken or requested during those events, since the

identification is with the posture of having overcome personal fear and having attempted to be part of the solution for another's problem. This "borrowed efficacy" becomes "self-efficacy" over time as the student begins the charade of convincing others—the friends back home and the next patients in the queue—that he or she is an effective professional, until the charade begins to be convincing to self (Bandura, 1997).

The process of assimilating this professionalism entails the exercise of the "locus of control" (Bandura, 1997). This concept of control and its principal fulcrum stem from an earlier basis in the work of Rotter (1966), in which an external control center (in this case the professional who is the preceptor) gradually devolves to an internalized control center and the assumption of the empowerment of the profession. This is often accompanied by a thrill of empowerment when the learners realize that they will not always be dependent upon a preceptor for the decision or action taken under supervision, but may soon be able to carry on such decisions and actions on their own—a frisson of exhilaration as well as fear. The shift of this locus of control brings to consciousness the gradual process of self-efficacy development, and it comes along with a sense of responsibility for one's actions and decisions. The fundamental act of professionalism (in this case, of health or medical care) is the assumption of responsibility for another.

Third-world experience may include the component of self-efficacy, as well as the learning of human skills (Burnard, 1991), but the principal constituents are more than these basics, which may occur in any setting. Kitchener and King (1990) specifically indicated that the transformational learning piece accounted for most of the sustainable outcomes from such experiences. Purtillo and Haddad (1996) pointed out that it is principally the patient who is the teacher in the encounter.

Suchman et al. (2004) insisted that transformational learning can be taught; others have insisted that the setting be made available in which transformational learning can occur (Community-Campus Partnerships for Health, 2003; Higgs, 1993). Although various "teaching aids" are available to facilitate this kind of experience (Keppell et al., 2001), the most effective is the direct encounter with suffering patients in their own settings (University of California, San Francisco, n.d.). Through this contact, the medical student "internalizes" the motivational and transformational components of this experience (Misch, 2002).

I have witnessed transformational learning in many students on medical missions, with the classic Mezirow model of the "disorienting dilemma." I have seen many strong and stable students at the point of tears confronting the mismatch between their own meager health care skills and the overwhelming burdens of their patients' illness and poverty, as well as the cognitive dissonance of their own hopes to "set the world right" through their volunteer work. When the setting was more "unlike" or "foreign," the rate of learning seemed to be faster, at the risk of frustrations accumulating more rapidly and the tensions of the "disorienting dilemma" appearing, particularly among the least experienced health care students. At about the third to the fifth day, a decompressing session was held with all students, one on one, in which we would go on a "walkabout" to have them ventilate their feelings about what they had been experiencing. We would get out of the clinic, student and preceptor, and make an almost tourist-like stroll through the village or market, and the students would be asked about the questions, problems, or feelings that might be bothering them. They would often begin by relating some minor complaint, which they would then dismiss as trivial and not what was really bothering

them, and nearly always conclude that they had worked very hard and spent an enormous amount of resources getting to this point in their life and yet could help so few people with the limited skills they had acquired. They were counseled and supported and returned to full duties after each of them could express this out of the presence of either patients or colleagues. Even the men could express their lack of confidence in their healing skills and show an emotional reaction to the experience in a more private setting. Through careful support and mentoring through this crisis, students have adapted through their transformation to a newer perspective about the limits and potential for health care service as one of many humanitarian approaches to aid these disadvantaged peoples.

The students often described their transformation as "personality altering"; some described themselves as a "new person" afterwards. As one sophomore medical student wrote following a trip to Africa: "Before this mission experience, I have been a spoiled brat; those days will now be behind me, since I have encountered people with far less who are much greater people than I had been with all the unequal advantages I had taken for granted."

Potential Effects of Mission-Related Transformative Learning on Society

The overall goal in the transformational learning experience is to produce more thoughtful and reflective humanitarian students of medicine (Taylor, 1986) and more "reflective" practitioners (Schon, 1988) who can reflect on the thoughtful experience in and through practice (Tate & Sills, 2004). This kind of transformation has been described nearly universally, including in India (Timmons & Alur, 2004) and Tibet (Taylor, 1992).

Participation in medical missions has other advantages beyond these as well, such as incorporating global human issues into medical education (Bateman et al., 2001). It might even be capable of transforming society, as such practitioners begin to elevate the consciousness of their patients and those around them (Russell, 2002).

Transformational learning inside the medical education system can be a mitigating influence on health care administration, imparting a more human face to the caring professions (Clement & Wan, 1997). It can also relieve the weariness of health care workers by injecting a rewarding continuous learning back into the workplace (Remen & Ellis, 2005)—no longer "vanquishing virtue" in medical education (Coulehan & Williams, 2001).

International Health, Care, Education, Research

International Health

There exists an abundant literature on international health as a field of study, which has been recently renamed "global health" as the world becomes more fluid in interchange and rapidly integrated at the same time its peoples seem to become more diverse in their lives and methods of coping with health problems. A frequent focus of global health is on protectionism from influx of disease that is sought to be contained, with secondary longer-term efforts at controlling exotic illnesses at their sources, with whole institutions designed to find and follow such "transits through human geography" as the science of epidemiology might be subtitled (CDC, 2008). Some early pioneers in the newer discipline of international health (Taylor, 1992) viewed as positive property of global humankind amid the disparities of health care have advocated for a much more

integrated and proactive concept of a planetary population. It is not beyond hope that the term "world health" might become a meaningful concept implying rational programs towards its realization (Taylor, 2009; Geelhoed, 1999b).

International Health Care

One of the hallmarks of international health care is the late stage of "presentation" of patients and the illnesses they bear. Because of the advanced stage of the illnesses, diagnosis is rarely a dilemma: it is *treatment* that is the challenge (Geelhoed, 2005). This kind of "*curative care*" is a preemptory urgency and often displaces attention and funding from the longer-term but more efficient processes of disease prevention through population-wide public health measures, which are, in essence, the development programs of whole civilizations.

As examples of this advanced treatment for later-stage diseases, the World Health Organization classifies goiter (an enlargement of the thyroid gland, often due to iodine deficiency) into four stages, determinable on quick and easy physical examination and requiring no technologic tools of assessment: WHO-0, no goiter present, the thyroid gland is of normal adult human size; WHO-I, goiter that is a palpably enlarged thyroid but not visible to the eye; WHO-II, goiter that is visible, but only when the neck is hyperextended; WHO-III, goiter that is grossly visible, even when the neck is flexed. As an example of the "unsubtle" conditions treated in the course of the medical/surgical missions in the frequently performed thyroidectomies done for relief in these populations in this series of missions, we have done only WHO-III goiters, many with intrathoracic extension—a tricky therapeutic challenge that requires little more than a glance to

confirm the diagnosis and little in the way of interpretation of subtle inferential findings on a further battery of tests (Geelhoed, 1999a).

The same is true for another procedure frequently performed for reconstruction of neglected congenital malformations—cleft lip and palate repairs. In this series of missions, many "adult clefts" have been repaired, which would have been corrected early in infancy in the developed world but went lifelong without access to repair (Magee, 2008).

Hernias are higher in prevalence in the developing world than in the developed world, not because their incidence is necessarily higher, but because they have often gone unrepaired for the life of the individual that bears this often-congenital abnormality, and consequently, the magnitude and complication rate is much higher. Rarely in the developed world does one encounter a "scrotal hernia" (one in which the bowel has escaped the abdominal cavity and made its way down the inguinal canal to reside in the scrotum) unless one might be encountered in a patient who might have been a recluse not discovered until admission to a nursing home. In the developing world, such scrotal hernias are more the rule than the exception, bringing along with this later more advanced stage of the deformity the much higher risk of "incarceration" (the bowel gets "trapped" outside the abdomen), which leads to bowel obstruction and the next emergency stage, "strangulation," a life and death emergency of infarction of the obstructed bowel. This nonelective emergency repair is among the most common of the urgent surgical conditions encountered among males in the developing world and is one of the essential surgical repair techniques taught to each health care practitioner trained in this series of missions (Geelhoed, 2005). Thus, in the absence of effective preventive methods, and in

the occasional total absence of any form of public health programs as too often is the case in failed states, health care must start with confrontation of the more serious, advanced-stage illness that is more urgent.

High-technology diagnostic and intensive care equipment is capital-intensive, rapidly obsolete, and subject to the continuous "bracket creep" of its own "technologic imperative." It is the hallmark of first-world health care techniques and carries both bane and blessing (Geelhoed, 2002). The developing world is acutely aware of the abundance of such "miracle machines" in the developed world and the virtual absence of functioning high technology in the third world setting. The blessings of a "materials-intensive society" are well known and devoutly sought on each side of the economic boundaries, but the curse such care also carries is less well appreciated on either end of the development scale (Farah, 1999). As a substitute for technologic testing, "labor (and, especially, *ingenuity)* intensive societies" are capable of caring for many if not most of the health care problems faced with far fewer high capital-requiring machines at their disposal (Geelhoed, 2005). The further implications of this difference in health care techniques may be considered in the efficiency and cost of care in suggestions from international health care experience for the reform of health care on either side of the economic divide (see chapter 5).

International Health Care Education

One implication of the distinction outlined above is the incongruity of bringing the developing world practitioners into the setting of developed world medicine practices to learn to "cure one evil with another." Should the aspiring health care student adapt

readily to the system of redundancy and overuse of high technology—whatever protestations to the contrary about "learning advanced health care techniques in order to go back and serve my people," which is a staple in the request of almost all eager applicants to this researcher in his shuttling back and forth between the very different worlds—such first-world accommodation would render him or her a misfit for any meaningful service in the milieu of origin and virtually require immigration for any acquired skills to be useful (Blanchard, 2001).

It is the reverse of this "time travel" that is more valuable in international health care education; i.e., both first and third worlders learning more adaptive techniques of improvisation and ingenuity in substitution for vast expenditures not available for one group and likely to be constrained for the other. If one should pause in consideration of a question that this researcher has often asked himself of individual patients in settings of destitution in which there are some first worlders scattered among a much larger population of third worlders in remarkably close proximity: "What century are you living in?"

In discussion with the then-ambassador Donald Jett in Maputo, Mozambique, an unusual response to this question was suggested. Before he became president of the University of Florida and when he was still U.S. ambassador to Mozambique, Jett responded:

> Yes, looking around us, you can be sure that this is not the 20th century [the year 1996 of my senior Fulbright fellowship in southern Africa]; it is not even the 17th century or medieval. What is a higher probability one should have to consider is that this is a representation of the 23rd century and may be a close proximity to a model of our future as a civilization, as our "progress" in all things technologic is outstripped by population pressures, environmental degradation, and global climate change, with its implications for food and water security and other

> resource shortages. If so, learn all you can about how these people in the *Dumba Yingi* [illegal smugglers' markets of the World Bank–designated "informal sector" of the underground economy] have learned to cope. (Jett, 1996)

If this might sound Malthusian, for many of the world's citizens that future has already arrived (Friedman, 2004). It is unlikely that there will be a continuous expansion on the same steep slope of the first world's health care economy, as it threatens to bankrupt the largest economy the world has ever seen on its current trajectory toward one fifth of the U.S. gross national product, even as there has been contraction in most other economic sectors.

The first world has much to learn from "those who cope" in trying to maintain some standards of health care delivery and education in an era of increasing global resource constraint (Farah, 1994). It is suggested that small successful models of improvisation (Geelhoed, 2005) may be the best learning opportunities available to prepare us for increasing care with decreasing resources, a lesson to be learned by the first world from the third in this reversal of international health care education.

International Health Care Education Research

In any asymmetric power relationship, the potential for exploitation is present (Freire, 1985). There is a dilemma in what follows from inadequate resource distribution "to go all the way around." One such dilemma is "whom to treat, when not all can be treated" (Geelhoed 1999a). A second dilemma is "Now what do you do with the data that may result from observation of those treated and those who could not be." Aid agencies carry such accounting practices in analysis in order to press for more resources to assure continuation or expansion of the programs in which they are engaged. This is less

research than analysis with a strategy for sustainability—if not for the subject population, at least for the program allegedly caring for them. “It is a series of short steps from advocacy, to agency, to ownership of a people and the problems they embody in proprietary programs” (Geelhoed, 1999a).

For continuing observations after treatment programs intended to prevent endemic hypothyroidism (congenital cretinism and goiter in adults) and reporting the difference in the results, the present author ran afoul vested interests which claimed “ownership” of a population considered a “poster population” of worst-case endemic hypothyroidism. Professional ethicists were solicited as to their opinion in print (Geelhoed, 1999a) on “medical imperialism” and “exploitation in human experimentation of the oppressed” from describing the effects of an incomplete population treatment program on both the good and bad effects of those treated or not possible to treat. Response to these editorial opinions (Geelhoed, 1999b), which took the form of an unusual request for an “author’s editorial,” revealed the threat to programmatic security, whatever the effect on the subject population’s health status. Through this experience, the author learned that research into public health and policy is interference in the dynamic of international political agencies, which often have a vested interest in failure. If the problem among the population for whom they are allegedly advocates were to be resolved, that would do away with their established agency, contrary to their plans for expansive extensions of influence.

In research involving international health, it is easier to do the accounting of “denominator data”—how many bags of rice, how many dollars, how many deaths—than evaluation of “numerator data”—the alleged humanitarian benefit such expenditures and efforts are said to be intending to achieve for a population other than the caregivers of the

agency. It is often the case that "mixed methods" are employed: quantitative analysis for the denominator with determinative specificity, and qualitative descriptions for the numerator with anecdotal descriptions of best-case examples, while the enterprise continues to raise funds and awareness of its humanitarian intent. Sensitized by this dichotomy in the literature review of reports of international health and health care education, this researcher sought to achieve quantitative results in both numerator and denominator—the humanitarian outcome measured with somewhat similar specificity as the programmatic input measures—to avoid the apples and oranges comparisons of many literature reports of some similar education programs.

Cultural Sensitivity in International Health Settings

Dr. Huda Ayas had studied medical students at George Washington University with an instrument for reviewing the students' own perceptions of their cultural sensitivity and the effect on measurements of this sensitivity and their own perceptions of it in the context of whether or not they had engaged in an international health mission (Ayas, 2007). I had followed this study with interest and learned much about the study process. I was rather surprised by the data when the results were analyzed, as was the author. It appeared that these medical students had a higher estimate of their cultural sensitivity than the tests revealed them to have, and that there appeared to be no impact on whether or not the students had engaged in an international medical mission.

Both the process and the outcome of this study were of interest to this researcher as he was conducting his own investigation of a somewhat related aspect of experiential learning. It may be that the adult stage at which this learning experience is entered makes

for a preselection bias by those who choose to carry out such a medical mission experience. This is a similar finding as reported by Dr. Bea Carson in her study of transformation in first-time marathoners—a subject group close to the heart of the present researcher as well (Carson, 2005). It appears that predisposition and self-selection were determinative in the transformational experience in this group of high-effort achievers (Carson, 2005).

The results of these two literature reports gave a cautionary note to the high probability of selection bias going in for all those who voluntarily choose to take on such an all-consuming commitment as a marathon or international health mission, which this researcher has done in nearly equal numbers, allowing that observation to percolate through an epoché of his own.

Transformation as an Ongoing Process

The durability of transformation has been investigated by Dr. Edmina Bradshaw in her observations of ten subjects determined to commit to a permanent change in weight control (Bradshaw, 2008). The longer-term commitments expressed in this study of the individuals whose transformations would be reflected in new perspectives in attitudes and practices after the experience of an international health care mission will draw upon the lessons learned in the Bradshaw study in longer-term follow-up years after their experience was recorded for this study. In terms familiar to our Executive Leadership Doctoral Program (ELDP) Cohort 16, "think 'ing'" is the transitive process of transformational learning. It is as much a preselection, willingness, and commitment to

undergo such transformation in a medical mission, marathon, or weight control lifelong status change.

What Is "Adult" About This Learning Process?

This lifelong commitment to ever-growing and expanding learning processes is one mark of androgogy. It is not "training," in that it is anything but a receptive process repeated often enough to be confused with a self-stimulated seeking out of changed perspective (Caffarella, 1993). Through the courtesy granted this researcher by Dr. Sharon Confessore in special consultations, a greater awareness of the higher-level mindset, which is not a static plateau achieved through some epiphany that raises awareness a notch but a realization of the continuous process of nuanced and ever investigative tentative conclusions in search of further refinement, marks the adult learning experienced in both the international medical missions and, coincidentally, in the ELDP itself. Only after a better understanding of this adult education process in terms learned through this experience could pedagogy be understood as a continuing education process (Dewey, 1988).

And What Makes This Learning "Active"?

In the tutorials that are a nightly occurrence in the course of an international medical mission, in the counseling before, during, and after the mission itself, and in the Perceptions of an International Healthcare Mission Questionnaire (PIHMQ), the method of pedagogy is that of "action learning," in which the fundamental way to draw out the responses from the learner is a series of ever-refining guiding questions to which the learners poses newer and still more nuanced questions of their own (Marquardt, 2005).

The technique has been highly effective within the international medical missions as a means of "adult action learning."

Qualitative Versus Quantitative Methods for Closing in on Answers to the Study Questions

A Heuristic Disagreement

As an observer deserting from one camp of C. P. Snow's "Two Cultures" (Snow, 1965), the present researcher has often asked what qualitative research methodology yields in the useful feature of predictive power, and has been immediately shushed as too simplistic. The predictive power of natural sciences, I had been told (East, 1990), is merely iterative and unsophisticated as in predicting on the basis of astronomic observation that tomorrow morning the sun will rise, even if the time can be predicted with some precision. "As a social scientist, the much deeper and more meaningful act is of *explanation* and *interpretation"* (East, 1990). "But what of the economists who claim to explain economic trends with some hope of predictability?" "That is why it is called the '*dismal science.'"*

Perhaps psychoanalysis may also be so characterized, since it also attempts to explain and interpret, but most often fails to predict in so complex an object of human scrutiny as the observer. And, psychoanalysis gave rise to the interpretation of "transformational learning" (Mezirow, 1984).

So, herewith is what postmodernists would say of my dilemma is "problematized": I have consistently, even predictably, observed a learning phenomenon, reflected by measurable responses in before-and-after questionnaires, tests, interviews,

and behavioral observation, of "transformational learning" by beginning health care students in encounter with the "other"—patients across wide gulfs in social, cultural, economic, language, geographic, political, religious, political differences, in international medical missions. This has nearly always resulted, after an initial disorienting dilemma of impotence and ambivalence, in a transformational learning experience in which a closer approximation is achieved of what it is to be essentially human and caring for others who are disadvantaged by illness, poverty, and misunderstanding. This phenomenon, with which I have no small experience in both direct and personal encounters and in observing a large number of "others" undergoing the same transformation, is one that is poorly described, characterized, appreciated, facilitated, or extrinsically evaluated or rewarded. How can I "get at" the essence of this experience?

This might seem to demand a qualitative study to "get at the essence" of this experience, counseled my advisor (Marquardt, 2006), and some have attempted similar phenomenologic studies using approaches of Mezirow in transformational learning (Bradshaw, 2008) and Moustakas in transcendental phenomenology (Mateu, 2004). The recent effort that had been a model for a phenomenological approach (Mateu, 2004) has been studied, and she has been contacted for advice.

What has been learned from further exploration of the Moustakas phenomenologic method? The method is an attempt to capture the "essence" of a given phenomenon under observation at the point of a given person, space, and time, and is *in no way to be generalizable* for the further use in any theoretic application of interpretation outside the data of the given set of observations. The soft data that come from such study must yield even softer conclusions, which are nearly all predictable just

on the prerequisites of the methodology itself (Miles & Huberman, 1994). For example, the observations and the conclusions are dependent upon the *context.* Certainly, it is already conceded that the conclusions are not to be generalized. The quality of the observations depend to a great extent on the completeness of the epoché and emptying out or at least acknowledgment by the observer of all assumptions and prejudices and any prior information, with acknowledged tribute to a large host of theorists who may have preceded any observations in later historic time with their own presumptions that the theories they may have generated would *not* similarly suffer from constraints on their generalization.

I might be back in the uncomfortable frying pan of the prior postmodernist objections of the human scientists (Dilthey, 1976): you can never make any untainted observation of any phenomenon, and since your experience is just that—*your experience*—almost any claim you make to have observed in the phenomenon about you tells more about your own psychic processing of *intentionality* than it ever can about the essentiality of *anything* under observation—so we will credit you with just this one thing: a perhaps interesting observation, to you at least, or a unique, nongeneralizable near miss of anything approaching essentiality of a one-time-only phenomenon from which no epiphenomenon can be derived that will be persuasive in any other circumstance. Such conclusions as may be drawn will be unedifying except insofar as a bit of psychic introspection on your own preconstrained and idiosyncratic process of "scientizing" might help you know better the limits of your own ability to learn about the ambiguous contingent world of phenomena. This "uncertainty principle" harkens back to trees falling

in the forest which do not exist, because they may have been conjured up just by walking through or imagining such woods.

The Mateu thesis explores the phenomenon of expatriate perceptions in a culture to which they can relate at least through the language. After an extended epoché built upon the conceptual framework of many of the same theorists just cited, Mateu set to an arduous data collection in three 90-minute Seidman recall interviews (Seidman, 1998) for each of eight subjects, with verbatim transcriptions running over 2,200 pages read several times for a coding process that runs the acknowledged risk of being somewhat contrived, with the danger of being even more arbitrary and capricious than the observations themselves. Then, with this encoded data base to conclude that—after so monumental an effort, a soft, even if thick, description of this experience is not to be generalized over any other for a very limited learning experience, except for the process itself and how cautious, circumspect, and delimited we should be about any conclusion except our own ambiguity. I might congratulate this effort, but it might not get me to where I had hoped to be after such an investment.

In a prior program in the human sciences, I had previously declined an opportunity to explore Foucault and subjectivity, Derrida and the limits to learning, feminism and the constraints of power distance because I wanted to look into a subject of liberating empowerment that I have witnessed first hand and often. I have been discouraged by reading Moustakas' methodology and theses based upon it, because it is nearly all focused on the subjectivity process with most of the conclusions referring back to the reflections on epoché at the beginning, with the learning process, like psychoanalysis, mostly being about how many more layers of the onion remain to be

stripped off one's self in the research process. The "otherness" is hardly addressed except as a fulcrum from which to stand outside and introspect again, a recycling loop that could result in solipsism.

An interpretive study, no matter how "thickly" described in depth, could be dismissed as describing only unique instances, anecdotal and isolated selected success stories, perhaps, but not compelling. In the extreme, such a report might be dismissed altogether because the caveats of the epoché might entail simply the proselytizing of one who had experienced something unique, and therefore now sees all others as having gone through the same "conversion experience." The interpretative approach might be quite unpersuasive as simply describing the interpreter and not the phenomenon purported to be observed in others. The enormity of the descriptive interpretive task, long on carefully qualified bias identification and short on conclusive powers, witnessed in other qualitative data collection could be shrugged off as a zealot's crusade with less scholarship than enthusiasm, and the larger context of the life-work might be regarded as a more or less interesting anecdotal biography viewed through one man's quirky opinion.

A Quantitative Instrument for the Measurement of Experiences

This researcher then searched extensively, if not exhaustively, for at least a semiquantitative instrument as one possible cure for this deficit in an all-qualitative inquiry, even though he recognized the limited value of the interpretive method as a dissection of meaningfulness, in scholarship with a good deal of effort to assure rigor, albeit with less quantifiable appreciation of its transferability. In this process, I have been helped by Lisa Allen of the Ashburn Campus at George Washington University assigned

to assist the ELDP cohorts in matters of "mental measurement," and encouraged by my advisor and dissertation chair, Prof. Michael Marquardt. I had sought other leads in the search for an appropriate instrument after rejecting several as too confining, having not investigated several only because they were quite proprietary, some even requiring an initiation course and testing certification before I could apply them. I even launched the prospect of the development of my own instrument, with the long period necessary for the validation of the instrument compounding the time before its use in application.

The Selected Instrument—the PIHMQ

Through the introduction by Dr. Lawrence Conway, emeritus professor of the University of Toledo and president of the Medical Mission Hall of Fame, I met Dr. Martha Gallagher, who had devised an instrument for quantitative evaluation of an international health mission experience. With the help of Lisa Allen at the George Washington University Library Ashburn, Virginia, campus, through ProQuest, I had obtained the completed thesis entitled: "The Impact of an International Healthcare Mission on Participating Healthcare Professional Students" with an included instrument developed for this largely qualitative study based for much of its validity in mixed-method methodologic triangulation. It is this validated instrument, described in greater detail in the following chapter on methodology, which has been selected and has been employed in application in this study.

Summary

Transformational learning is the primary construct of this study of students' perceptions after participating in international medical missions. The very fertile

conceptual framework offered by Mezirow (1978, 1983) based in psychoanalytic theory states that transformational learning is experiential, follows critical reflection, and is expressed in rational discourse. A "disorienting dilemma" had been classically described by Mezirow as a stimulus to the process of transformational insight, later modified to a more gradual resolution of incongruencies with prior accepted conceptual frameworks that were then revised to accommodate the newer experience after reflection. A substantial emotive aspect has been added (Boyd & Myers, 1988) to the rational base of transformation.

The unique patient population in the developing world as context for the wrenching change in the health care students contributes to the transformational learning process and helps the students eventually achieve some degree of mastery in self-efficacy in this new context (Bandura, 1977). The learning students can achieve in this context involves more than accruing additional information in transactional processing; it actually requires a transformation (Suchman et al., 2004) to internalize and professionalize a new health care mindset (Misch, 2002). A long-lasting effect of this transformational learning experience is suggested (Taylor, 1986) to produce better, more humanitarian health care providers, even after they return to the developed world. This study evaluates the changes in the student volunteers and contributes to the literature by providing additional support for institutionalizing the mission experience based on the transformational learning and its impact on medical education and practice.

CHAPTER 3:

METHODOLOGY

This chapter begins with a discussion of the research design chosen to best address the research questions. This is followed by descriptions of the population and sample of the study and procedures for data collection and data analysis. The chapter concludes with a discussion of ethical issues.

Research Design

A mixed-methods approach that added qualitative inquiry to a quantitative research study was chosen for this study. The research questions were personal ones addressing life-changing issues for the students, so having rich descriptions was considered useful while also documenting the varied experiences of over 100 students in ways that were clear, generalizable, and replicable.

The quantitative element consisted of administering a modified version of the pretested survey instrument, the Perceptions of an International Healthcare Mission Questionnaire (PIHMQ), to participating students on their return flight from their first international health mission trip. Additional information on the PIHMQ is provided in the data collection section below.

The qualitative element consisted of triangulating survey results with qualitative observations and interviews. The qualitative component employed the phenomenology methods of Moustakas (1994) and interpretive interviews of Seidman (1998), asking the kinds of questions learned from Bandura's (1994) mastery experiences and self-efficacy impressions and their changes before and after the medical missions. This "live action"

participant observation provided "video" in contrast to two "snapshot stills" before and after, so that the highs and lows of the participants' experience might be appreciated. This approach differs from that of some earlier studies (Gallagher, 2004), in which the questionnaires and interviews were analyzed without any observations of the students during the mission trip. It was hoped that the participant/observer research design employed in this study would, in the linguistic anthropology terms of Kenneth Pike (1993), provide a richer enhanced analysis through an "emic" as well as an "etic" perspective, even if it did pose the possibility of another layer of bias.

The conflict between the "wholist and partist" approaches in the sciences is problematic (Geelhoed & Hsu, 2000). The goal here was to achieve a better way to answer questions of real *significance*—not just the mathematical probability model seen in statistics, but in the more humanitarian sense of the term as it involves meaning in the lives of the study subjects.

Pilot Study

Before this study began, the researcher had conducted pilot phenomenologic studies of missions to Mindanao (involving four students) and Rwanda (involving seven evaluable students among the 12 who completed the questionnaires). In addition, the researcher had extensive experience accompanying and evaluating students during missions. Based on this experience, an archival collection of reports was available, with a focus on the educational evaluation of the effect on the individual learners, and this information was used to guide the study.

In addition, others' studies were considered in planning the methodology. For example, Ayas (2006) noted that students who were interviewed following a mission experience commented that the event had only recently been "inserted" into a discontinuous part of their education. They had hardly had time to fully process the experience and incorporate it into the quite different setting of first-world medical education. This insight guided the timing of the interviews.

Study Population

The population of subjects was health care students at entry level in international health who agreed to participate in any of the medical missions that the researcher planned. Students included not only medical students but also premedical applicants, along with other health care students such as nursing or medical technology students. Medical students typically participated after their freshman year in medical school or in senior elective periods. More of the entry-level students were involved in medical screening clinics in the summer before their sophomore year, and more of the senior elective-period students were involved in the surgical clinics.

The students invited to participate were from The George Washington University, as well as from institutions in which the researcher had been previously involved as a consultant in setting up health care students' international health missions. Not all the students had gone out with only the primary researcher, and some were accompanied by other preceptors known to the primary researcher.

These health care students were asked to volunteer to participate in this research study and gave their informed consent (see Appendix A). All those who gave their

consent were administered the PIHMQ questionnaire. A subset of those subjects also participated in qualitative interviews.

Sample Size

This estimate of a more than adequate sample size required for valid estimation when analyzing the yield of quantitative data was projected with the following calculations. For the hypotheses listed in chapter 1, one method for determining the necessary sample size is to use the formula:

$$n = (z_{\alpha/2}\sigma /D)^2$$

where $z_{\alpha/2}$ is the value of the standard normal distribution such that $P(z > z_{\alpha/2}) = \alpha/2$; D is the distance between the observed sample mean and the unknown population mean at a $(1 - \alpha)$ level of confidence; and σ is the population standard deviation for the variable of interest specification (Kupper & Hafner, 1989).

The above sample size formula requires knowledge or a good estimate of σ. Since σ varies by the variable of interest for a particular hypothesis and the number of Likert items comprising that variable, the conservative approach would be to find an estimate of σ that is an upper limit across all hypotheses. An upper limit for σ can be obtained by assuming that the responses to each Likert question are uniformly distributed on the 1 to 5 scale and using the minimum number of six items comprising the variable of interest. Such assumptions yield an estimate of $v2/v6 = 0.577$. If it is desired that the sample mean fall with a distance of 0.2 of the unknown population mean at 95% confidence, then the required sample size is:

$$n = (z_{\alpha/2}\sigma /D)^2 = (1.96(0.577)/0.2)^2 = 32$$

Note that the required sample size would be greater if more precision (smaller D) or a higher level of confidence was required (greater $z_{\alpha/2}$).

For assistance in predicting sample size for differing levels of variance, the researcher engaged the consulting services of Professor Donald B. White, chairman of the mathematics department at the University of Toledo and director of the University of Toledo's Statistical Consulting Service. In estimating the sample size for variances within the quantitative responses for significant analysis, a sample size of over a hundred respondents was estimated to be required.

In her study of the PIHMQ, Gallagher (2004) also interviewed nine participants and reached saturation at six, with no new themes emerging after that number. The number of subjects for the present study was designed to furnish confidence in the quantitative analysis alone; the qualitative analysis was applied to yield valid analysis as a bonus, even if lower numbers of subject entries might be required for such validity in qualitative methodology.

Selection of a Subgroup for In-Depth Qualitative Analysis

Candidates for the qualitative interviews (Seidman, 1998) were selected from the respondents to the PIHMQ, with a deliberate selection of those both "typical" in the normal distribution as well as "outliers" to see what particular features of their experiences may have spread out their positions at the margins of the normal distribution. Individuals were also interviewed based on certain demographic characteristics or previous experiences. For example, first-time returnees to the ancestral homeland for African Americans or first-generation Asian Americans are groups that have intrigued the

investigator, since "our genes outlast our cultures." This allowed methodologic triangulation of even greater focus, since it used the internally verified data of substantive change to be further characterized, taking into account those who might have been less superficially changed by the experience. Using the kind of data suggested in Mateu's (2004) focus on returned expatriate residents of Japan who spoke the language, the study thus took into account those who may have experienced the medical mission more intensively or differently—if, for example, they were fluent in the local tongue or had lived in other countries. Previously, the investigator had found that former Peace Corps volunteers who then became medical students had a very different kind of appreciation of the medical mission experience, focusing more on the impact of the medical and public health consequences than on the impact on themselves of a first encounter with poverty or a foreign culture with a language barrier.

Candidates for the interviews were more likely to be drawn from the researcher's own institution to minimize travel, although some distant follow-up was carried out with other participants by telephone interview or e-mail correspondence.

Willingness to be selected for further intensive participation after the preliminary investment of only a 20-minute filling out of the PIHMQ might identify a special group through self-selection, and both researcher and participant were aware of that potential source of bias.

Final Sample

All international health mission participants over a 2-year period—numbering nearly 200—were invited to participate in the study. Of that group, 148 both gave

informed consent and submitted PIHMQs. Two dozen medical students signed informed consent forms, but the secretary who accompanied them on the mission to Haiti "totally forgot" the questionnaires she was given, and consequently none of them could be included. In addition, several students had filled out the PIHMQ completely but declined to sign the informed consent, so their questionnaires were not included in the analysis..

Of the 148, 119 completed at least the demographic and quantitative data entries. The remaining turned in incomplete PIHMQs (with over a dozen skipping the quantitative data in the Likert-scale questions), failed to return the questionnaire despite repeated reminders, or were unreachable when attempts were made to track them on return.

The activities and venues available for mission experiences within this time frame included general screening clinics, medical/pediatric clinics, or predominantly surgical clinics in Eritrea, Malawi, Ethiopia, Somaliland, Rwanda, Sudan, Haiti, Afghanistan, Nicaragua, Guatemala, Cambodia, and the Philippines. The medical missions that were selected for inclusion were typically set up by a medical faculty practitioner who had familiarity with and affinity for a given mission site. Some leaders were born in the country to which they were "giving back" and also had an intimate knowledge of the environment, including the local language. As an example, a number of these missions were carried out in the Philippines, with native-born U.S.-naturalized citizens who used not only the lingua franca Tagalog but also the local language, such as Ilicano in northern Luzon. They may have had family and professional and political connections there that facilitated the arrangements for transportation into, permission to use, and

accommodation in the local facilities. Each one of them had conducted previous medical missions before they led the ones in which the health care students participated.

Most study participants came from the George Washington University School of Medicine and Health Sciences, with additional participants recruited from the University of Florida, Medical University of Ohio of the University of Toledo, and University of California as needed.

Data Collection

Data were collected on student participants at three time points: during the mission trip (through observation and interviews), on the flight home from the mission trip (through surveys), and, for a subset of participants, after the missions (through observations of their presentations and interviews). The quantitative method is discussed first, followed by the qualitative methods.

Survey

A slightly modified form of Gallagher's (2004) PIHMQ survey was administered to all students who met the criteria for the study and agreed to participate. This questionnaire (see Appendix B) gathers basic demographic data and asks participants to give responses on a 5-point Likert scale indicating if the mission experience had led to substantive knowledge, perceptual understanding, personal growth, interpersonal networking, mastery experiences, and perceived self-efficacy in cognitive and affective processes. Additional open-ended questions asked about the factors that influenced the respondent's decision to participate in the mission; the issues, ambiguities, and fears encountered; and how the mission experiences may have changed the respondent. The

questionnaire was brief to limit respondents' burden of time and effort. Table 3-1 shows how the PIHMQ questions link to each of the study's hypotheses.

Table 3-1
Relationship Between Hypotheses and PIHMQ Questions

Hypothesis	PIHMQ questions
H1a: Students increase their substantive knowledge following an international medical mission.	1 a-e; 2 a, b, d, f-k
H1b: Students increase their sympathetic appreciation of patients and the magnitude of their problems following an international medical mission.	7 a-f
H2a: Students express a greater self-efficacy following an international medical mission.	1 a-e; 2 a-l; 4 a-f; 5 a-e, h-k; 6 a, c-g; 7 a-f, 8 a-c, e-j
H2b: Students express a change in their professional behavior following an international medical mission.	5 a-g
H2c: Students express a change in their personal growth in the context of health care following an international medical mission.	4 a-f; 7 a-f; 8 a-d
H3a: Students express a change in how they view U.S. health care and resource allocation following an international medical mission.	3 a-f
H3b: Students express a change in confidence as a health care professional following an international medical mission.	4 a-f
H3c: Students express a change in their ability to work with and gain respect for others in a multicultural environment following an international medical mission.	5 h-k; 6 i; 8 e-j
H4: Students report the same H1a through H3c effects 3 to 6 months following an international medical mission.	All of the above

Observations and Interviews

The researcher conducted interviews with participants during their application and orientation. Interviews were also conducted during the mission itself. In addition, over the course of the mission, the students were observed in their daily interaction with patients as preceptees of the mission leader/clinical supervisor and also in their nightly

participation in the didactic reviews in which they discussed cases and their learning opportunities. Students were evaluated and graded.

At the end of the international mission, students gave PowerPoint presentations to their classmates and the public. These summary presentations, which were reflections on and evaluations of their experience, were held 6 weeks or more after they had returned home.

In-depth interviews (Seidman, 1998) were later held with a subset of the participants. The questions addressed in the semistructured interviews focused on whether transformational learning occurred through the medical mission experience. The goal was to characterize the what, why, and how for the changes the students thought had occurred. Particular attention was paid to statements such as the following: "Now I have been made to realize . . . my own real place in life and the profession, . . . making changes in my professional, personal, residency and career plans . . . life-altering changes in perspective."

Each interaction with the researcher generated written notes, audiotapes, and transcriptions of selected proceedings. This qualitative investigation was meant to add depth and triangulation to the findings from the PIHMQ quantitative results.

Determination of Whether Perspective Transformation Had Occurred

Transformation, if it has occurred, may not be at a point in time as a Pauline epiphany, but may occur over the course of successive experiences that sum to a collected body of experiential evidence, which upon reflection leads the learner to the newer understanding. The questionnaire was administered at a single point in time, after

the experience had been concluded, as the learners were returning back into an environment more familiar to them. A before-and-after administration of the questionnaire was requested, but the instrument was denied for this use, and it must be agreed that the students could hardly be expected to make comments on what they had learned from an experience they had not yet had. But this makes for a "snapshot" at a single point in time, rather than a "video," as the experience is ongoing or even bracketed.

However, the regular tutorials and supervision in the clinics and continuing follow-up made possible observations of the dynamic of the transformational process, which occurred at different rates and varied in the settings in which the students had been immersed. Evidence continues to unfold, as the follow-up interviews are being done beyond a year after the international mission experience, with the vividness of the learning persisting in reports on the qualitative analysis of their later feedback.

Data Analysis

Surveys

Completed PIHMQs were forwarded unread to the Statistical Consulting Service, where data were entered by graduate students in mathematics and analyzed using the statistical software package SPSS. Univariate tests were conducted for hypotheses H1a through H3c using the Likert-scaled questions identified for each hypothesis. An effect was declared positive if, at a specified level of significance, it was found that the population average response was greater than 4 on the 5-point scale.

Using the statistical package Minitab 15.1, which plots out the distribution of responses for each question, the responses for each hypothesis' related PIHMQ questions

were plotted and their mean and median 95% confidence intervals given. Distributions in the modalities were tested by the Anderson-Darling normality test to check if the distributions were normal and whether normality was unimodal, bimodal, or with any given respondents falling into consistent outlier patterns.

Qualitative Data

Notes and transcripts produced through the qualitative analysis were summarized and coded using initials or numbers for participants; those results were later pooled.

Blind Codes

Blind codes were added for certain variables—the leader of the mission, whether the student had participated in an earlier mission, and whether the participant had traveled to, lived in, or even been born in the environments visited—so that data from those participants could be separated out, if needed. As mentioned, the latter variables were considered in selecting some students for interviews.

The role of leadership was a possible variable in the process and outcome of the study, since some of the students interviewed in pilot studies reflected on experiences they described as being "tossed into this foreign and often hostile environment and abandoned to fend for ourselves." For students from other institutions in other missions, the directed leadership of the mission may influence the results. To express the researcher's bias up front, it was hoped that the real transforming instructors were the developing world patients common to each of the mission environments and that the compelling power of the mission experience was not that of modeling or a "personality cult" following a given instructor.

Human Participants and Ethics Precautions

All of the regulations of the Office of Human Research at the George Washington University were complied with. Through multiple visits to this office for consultation, the new regulations were prospectively incorporated in the application. Many of the evaluation methods were component parts of the regular educational process and were thus exempted by the institutional review board, and those that might be considered additional to the standard educational evaluation process were approved. The informed consent form (see Appendix A) was reviewed and signed by all students who participated.

CHAPTER 4:

RESULTS

This chapter presents the results for the four main research questions of the study:

1. What new biomedical, health, and cultural knowledge is gained by health care students in an international medical mission?
2. Has the international medical mission experience been a "life-changing" learning experience for the students? If so, how?
3. What is the linkage, if any, between experiential learning in international health care and the transformational nature of the learning experience?
4. Does the impact, if any, of the international medical mission on students persist sustainably after the mission?

As indicated in chapter 3, 148 of the 196 health care students offered the option of participating in this study as a voluntary component of an international health care mission gave their consent. One hundred twenty-four of these participants returned the Perceptions of an International Health Mission Questionnaire (PIHMQ) forms; one was unsigned and was not considered, and of the remaining 123, 119 completed at least all of the demographic data and quantitative entries for evaluable analysis—two dozen after repeated promptings to return the form up to 2 months after the mission.

All 119 of the PIHMQs with demographic and quantitative information completed were included in the analysis, despite some early knowledge that some individuals would probably represent outliers. As an example, one individual stated that his form would be less than useful, since he had accompanied the mission only because of an interest in one of the other participants. He was one of the least knowledgeable and the poorest

performer during the daily presentations and testing of information, eschewing a learning role since he was already "an established health care practitioner." He reported that he had learned nothing from the mission, having known it all before after training in the army as a chiropractor and added that the tropical medicine principles illustrated in this Equatorial African mission were all so elementary that he might have forgotten them as they were considered insignificant in his practice. Correlation of such information made for simple triangulation in view of the qualitative essay and interview data but widened the spread in the responses on the quantitative scales, which were otherwise weighted toward the positive end.

The chapter begins by summarizing the participants' demographic data and then reviews participants' responses on the PIHMQ. These results are then correlated with the hypotheses, and additional bivariate and multivariate analyses are described. The qualitative results are correlated with the four open-ended essay questions appended to the PIHMQ quantitative questions, and the coded responses are compared with the quantitative correlations in a summary of the findings.

Demographic Data

As indicated in chapter 3, all eligible student volunteers were invited to participate in the study, and data were analyzed from all those who both gave informed consent and completed the PIHMQ. These participants included 77 women and 47 men; 52 were under 25 years of age, and 33 were 35 or older. Fifty-eight of the respondents were medicine undergraduates or graduates, and 24 were nursing undergraduates or graduates. In self-declared ethnicity, 86 claimed Caucasian designation; 18, Asian; and

10, African. In religious affiliation, 46 were Protestant; 27, Catholic; and about a dozen each, Muslim, "other," and "none." Besides English, a dozen spoke Arabic, 31 spoke Spanish, and three dozen spoke other native tongues.

In ranking health care professional education level, a steady decrease from first (29), second (15), third (10), to fourth year (7) was almost matched in total by those in "other" categories (54). For 79 respondents, this was their first international medical mission; for others, this represented their second (11), third (7), or fourth or more mission (18). Twice as many respondents (66) had encountered impoverished populations before this mission as those who reported they had not (35). Among the countries listed on the form, the Philippines had hosted the most recent medical missions (17), while Haiti represented 8, and 66 were scattered in other primarily Latin and African venues.

These demographic data are detailed in Table 4-1.

Table 4-1
Demographic Data*

Variable	**N**
Gender	
Male	47
Female	77
Age range	
20-24	52
25-29	28
30-34	10
35 or more	33
Health care discipline	
Nursing graduate	14
Nursing undergraduate	10
Medicine graduate	38
Medicine undergraduate	20
Physician assistant	5
Pharmacy	2
Public health	1
Other	30

Variable	N
Ethnic group	
Native American Indian/Alaska Native	0
Asian or Asian American	18
African or African American	10
Hispanic or Hispanic American	1
Native Hawaiian or other Pacific Islander	0
Caucasian	86
Other	6
Religious denomination	
Buddhist	2
Catholic	27
Hindu	2
Jewish	2
Muslim	11
Protestant	46
Other	16
No religious affiliation	14
Language spoken fluently	
Arabic (including Farsi and Urdu)	12
Spanish	31
French	6
Chinese (any dialect)	2
Indian (any dialect)	2
Other	28
English	123
Number of international medical missions	
One	79
Two	11
Three	7
Four or more	18
Year in study in health care program at time of *initial* mission experience	
First year	29
Second year	15
Third year	10
Fourth year	7
Other	54
Year in study in health care program at time of *current* mission experience	
First year	18
Second year	9
Third year	7
Fourth year	7
Other	51

Variable	N
How long ago did you participate in your last international health mission	
Within the last month	67
1-3 months ago	3
4-6 months ago	0
7-9 months ago	3
10-12 months ago	2
Over a year ago	14
Travel to an impoverished population (in or outside the USA) prior to first mission	
Yes	66
No	35
Country hosting most recent mission	
Haiti	8
Dominican Republic	2
Rwanda	0
Malawi	0
Somaliland	0
Eritrea	0
Philippines	17
Other	66

*Numbers do not add up to the total number of participants in each category, since respondents did not answer every question.

Results for Questions 1 to 8 of the PIHMQ

Question 1: New Knowledge

With respect to the first question in Part 2 of the PIHMQ regarding how much new knowledge had been learned during the mission, the vast majority reported "significant" or "tremendous change" about a different country (78%), health care in another country (84%), a different culture (78%), health beliefs in another culture (57%), and health professionals in another country (61%) (see Table 4-2). A single individual, as he had notified the researcher before submitting the PIHMQ, consistently reported no change in any of these areas.

Table 4-2
PIHMQ Results for Question 1

New knowledge learned from participating in the IHM	None 1	Mini-mal 2	Mod-erate 3	Signi-ficant 4	Tremen-dous 5
a. A different country	0%	6%	16%	44%	34%
b. Health care in another country	1%	5%	10%	48%	36%
c. A different culture	1%	2%	19%	45%	33%
d. Health beliefs in another culture	1%	10%	32%	40%	17%
e. Health care professionals in another country	2%	11%	26%	37%	24%

Question 2: Thinking/Cognitive Skills

Similar responses were obtained in reference to thinking/cognitive skills improvement, scoring in the top two quintiles for gathering a variety of information—patient health history (53%), pertinent information about the patient's environment (47%), economic status (58%), support system (36%), resources available (58%)—as well as in ease in using previously learned physical assessment skills (54%), finding new uses for physical assessment skills (47%), learning other health care disciplines' strengths (59%), learning roles in the health care team (50%), learning about tropical diseases not typically found in the U.S. (77%) and treatments unfamiliar in the U.S. (62%), and considering alternatives to traditional "Western" medicine (44%) (see Table 4-3).

Table 4-3
PIHMQ Results for Question 2

Thinking/cognitive skills improved from participating in the IHM	None 1	Mini-mal 2	Mod-erate 3	Signi-ficant 4	Tremen-dous 5
a. Gathering patient health history information	10%	22%	15%	40%	13%
b. Collecting pertinent information about the patient's environment	5%	21%	27%	37%	10%
c. Considering information about a patient's economic status	5%	11%	26%	33%	25%
d. Gathering information about the patient's support system	10%	22%	32%	25%	11%
e. Considering other resources available to the patient	7%	11%	24%	37%	21%
f. Ease of using previously learned physical assessment skills	8%	15%	23%	33%	21%
g. "New" uses for learned physical assessment skills	8%	19%	26%	25%	22%
h. Learning about the strengths of other health care disciplines	7%	13%	21%	43%	16%
i. Learning your health discipline's role on the health care team	9%	18%	23%	30%	20%
j. Learning about diseases not typically found in the U.S.	3%	4%	16%	34%	43%
k. Learning about treatments not typically considered in the U.S.	6%	9%	23%	37%	25%
l. Considering alternatives to traditional "Western" care	8%	22%	26%	26%	18%

Question 3: Opinions on Health Care Systems

A large percentage of respondents improved their view of U.S. health care after the mission related to the U.S.'s resources (67%), quality (73%), and availability (56%). Responses varied in terms of the U.S.'s treatment of the indigent or those from other countries, but most of those views did not become more negative (see Table 4-4).

Table 4-4
PIHMQ Results for Question 3

Views changed after participating in the IHM	Strongly disagree 1	Disagree 2	Not sure 3	Agree 4	Strongly agree 5
a. My view of the U.S. health care resources became more positive	8%	9%	16%	45%	22%
b. My view of U.S. health care quality became more negative	36%	37%	13%	12%	2%
c. My opinion of U.S. health care availability became more positive	6%	21%	17%	35%	21%
d. My beliefs on health care availability for the indigent in the U.S. became more negative	28%	31%	25%	11%	5%
e. My opinion of U.S. health care services for persons from another country in the U.S. became more positive	17%	17%	23%	31%	12%
f. My belief that people from another culture or country receive quality health care in the U.S. has changed	23%	23%	23%	25%	6%

Question 4: Self-Confidence

Experience in the international health mission changed respondents' self-confidence in working with patients (65%), working with a multidisciplinary team (71%), working in a multicultural health care team (67%), and working with families from cultures other than one's own (69%). Working as a health care professional was more confidently entertained (70%), as was helping others work with people of other cultures (76%) (see Table 4-5).

Table 4-5
PIHMQ Results for Question 4

The IHM experience changed my confidence….	No change 1	Improvement			
		Minimal 2	Mod-erate 3	Signifi-cant 4	Tremen-dous 5
a. Working with patients	9%	11%	15%	42%	23%
b. Working on a multi-*disciplinary* health team	10%	6%	13%	43%	28%
c. Working on a multi-*cultural* health care team	11%	8%	14%	42%	25%
d. Working with families from cultures other than mine	11%	7%	13%	38%	31%
e. Working as a health care professional	12%	6%	22%	34%	26%
f. Helping others work with people from other cultures	6%	5%	13%	39%	37%

Question 5: Professional Tasks

The international medical mission experience changed respondents' ability to perform professional tasks in assessing patient health problems (49%), assessing patient needs (54%), planning treatments (50%), providing patient education (49%), providing patient treatments (47%), evaluating plans of patient care (36%), evaluating results of patient education (22%), effectively working on a multidisciplinary team (68%), working with patients and families from cultures other than one's own (64%), and helping coworkers understand the needs of people from other cultures (59%) (see Table 4-6).

Table 4-6
PIHMQ Results for Question 5

The IHM experiences changed my ability to…	No change 1	Improvement			
		Mini-mal 2	Mod-erate 3	Signifi-cant 4	Tremen-dous 5
a. Assess patient health problems	11%	11%	29%	38%	11%
b. Assess patient needs	6%	14%	26%	39%	15%
c. Plan patient treatment(s)	6%	20%	24%	30%	20%
d. Provide patient education	17%	20%	14%	35%	14%
e. Provide patient treatment(s)	8%	22%	23%	30%	17%
f. Evaluate plan of patient care/treatment(s)	13%	22%	29%	19%	17%
g. Evaluate results of patient education	32%	21%	25%	13%	9%
h. Effectively work on a multidisciplinary team	8%	12%	12%	40%	28%
i. Effectively work on a multicultural team	10%	6%	16%	38%	30%
j. Work with patients/families from cultures other than my own	8%	6%	22%	38%	26%
k. Help coworkers understand the needs of patients or people from another cultures	5%	10%	26%	36%	23%

Questions 6 to 8: Awareness and Opinions

Awareness changed considerably according to evaluations in the top two quintiles on the culture of a different country (76%), a different type of health care (75%), the influence of culture on health (76%), the influence of the individual (50%), the influence of economic status on health (75%), the influence of support systems (66%), preconceptions of individuals from another country (52%), and the need to mediate for individuals of another culture in the U.S. (57%) (see Table 4-7)

Table 4-7
PIHMQ Results for Question 6

Degree that participating on an IHM increased awareness of…	No change 1	Mini-mal 2	Mod-erate 3	Signifi-cant 4	Tremen-dous 5
a. The culture of a different country	3%	6%	15%	39%	37%
b. A different type of health care	1%	4%	20%	41%	34%
c. The influence of culture on health	3%	7%	14%	38%	38%
d. The influence of environment on health					
e. The influence of individual beliefs on health	9%	10%	31%	32%	18%
f. The influence of economic status on health	4%	6%	15%	34%	41%
g. The influence of support systems on health	4%	10%	20%	40%	26%
h. My preconceptions of individuals from another country	11%	12%	25%	31%	21%
i. The need to mediate for individuals of another culture in the U.S.	12%	12%	19%	35%	22%

The international medical mission changed feelings about empathy towards others upon return from the missions (58%), ability to be sensitive to the needs of those from a different culture (65%) or different country (66%), ability to be patient with non-U.S. citizens (62%), tolerance towards beliefs other than one's own (57%), and the learner's own adaptability in different situations (73%) (see Table 4-8).

Table 4-8
PIHMQ Results for Question 7

Degree that participation in an IHM changed my . . .	No change 1	Improvement			
		Mini-mal 2	Mod-erate 3	Signifi-cant 4	Tremen-dous 5
a. Empathy towards others on return from the IHM	6%	14%	22%	38%	20%
b. Ability to be sensitive to the needs of those from a different culture	4%	10%	21%	39%	26%
c. Ability to be sensitive to the needs of those from a different country	4%	10%	20%	41%	25%
d. Ability to be patient with non-U.S. citizens	11%	11%	16%	36%	26%
e. Tolerance towards beliefs other than my own	10%	13%	20%	32%	25%
f. Adaptability in different situations	3%	7%	17%	35%	38%

The international health mission experience helped the learners who responded in the top two quintiles with respect to learning about themselves (64%), connecting with the emotions of caring for and comforting individuals in the nontechnologic aspects of care (71%), and recognizing patients as unique individuals (57%). It also helped them gain respect for different groups: other health care team members (72%), peers (75%), patients (67%), people from other cultures (73%), people from other religions (49%), and people from other economic classes (67%) (see Table 4-9).

Table 4-9
PIHMQ Results for Question 8

Degree that participating in the IHM helped me . . .	No change 1	Mini-mal 2	Mod-erate 3	Signifi-cant 4	Tremen-dous 5
a. Learn about myself	1%	12%	23%	43%	21%
b. Reflect on my beliefs	2%	13%	22%	42%	21%
c. Connect with the emotions of caring for and comforting individuals, or nontechnological aspects of care	2%	7%	20%	41%	30%
d. Recognize patients as unique individuals	8%	11%	24%	41%	16%
e. Gain respect for other health care team members	4%	6%	18%	35%	37%
f. Gain respect for my peers	6%	4%	15%	44%	31%
g. Gain respect for patients	9%	5%	19%	35%	32%
h. Gain respect for people from other cultures	9%	5%	13%	35%	38%
i. Gain respect for people from other religions	18%	11%	22%	29%	20%
j. Gain respect for people from other economic classes	10%	7%	16%	31%	36%

Advanced Analyses Based in Descriptive Statistics

Several models were used for further analyses of the data input including the generalized linear model, the Pearson correlation coefficient, and cluster distances, each contained within the SPSS software package. These were applied for analysis of variance (ANOVA), correlation analysis, and cluster analysis.

In a first cut, the variances were checked within groups and then compared with other groups, searching for stronger associations and checking out those with statistical significance in order to investigate further the meaningfulness of such associations. The preliminary analyses of variances ran such examples as seen in the three-way ANOVA illustrated in Table 4-10 and the correlation analysis in Table 4-11. Question 1a related to

learning about a different country; 1b, learning about health care in another country; 1c, learning about a different culture; 1d, learning about health beliefs in another culture; and 1e, learning about health care professionals in another country.

Table 4-10
Three-Way Analysis of Variance for Questions 1a, 1b, and 1c

Source	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	154.680*	30	5.156	3.523	.000
Intercept	192.712	1	192.712	131.666	.000
@1a	2.257	3	.752	.514	.674
@1b	1.779	4	.445	.304	.875
@1c	28.044	5	5.609	3.832	**.003**
@1a * @1b	3.468	4	.867	.592	.669
@1a * @1c	1.965	3	.655	.448	.720
@1b * @1c	9.599	3	3.200	2.186	**.095**
@1a * @1b * @1c	2.278	2	1.139	.778	.462
Error	136.118	93	1.464		
Total	1091.000	124			
Corrected total	290.798	123			

*r^2 = .532; adjusted r^2 = .381.

Table 4-11
Pearson Correlation Analysis for Questions 1a-1e (n = 124)

Question	Pearson correlation				
	1a	1b	1c	1d	1e
1a	1.000	.881*	.898*	.795*	.778*
1b	.881*	1.000	.835*	.834*	.816*
1c	.898*	.835*	1.000	.845*	.816*
1d	.795*	.834*	.845*	1.000	.837*
1e	.778*	.816*	.816*	.837*	1.000

*Correlation is significant at the 0.01 level (two-tailed).

The linear model showed a strong and significant correlation between the respondents' Likert-scale rankings when expressing the great amount of learning they experienced from the international mission about a different country. Such associations were not surprising for these intuitively likely colearning features. In running multiple iterations of these analyses, patterns of associations were observed, and the kinds of "information behind the numbers" were checked for interesting variances. Many patterns were predictable if not intuitively obvious.

Use of PIHMQ Data to Analyze Hypotheses

As described in chapter 3, the statistical package Minitab was used to analyze the PIHMQ data with respect to each hypothesis.

Nearly all respondents—with the distinct aberration of the one respondent already mentioned—reported a very highly significant learning experience, with most of those characterizing the learning as a transformational experience, with high significance and confidence intervals for this association in the data.

Hypothesis 1a

Hypothesis 1a stated that students increase their substantive knowledge following an international medical mission; this hypothesis linked to questions 1 a-e and 2 a, b, d, f-k. As shown in Figure 4-1, hypothesis 1a was accepted with high significance.

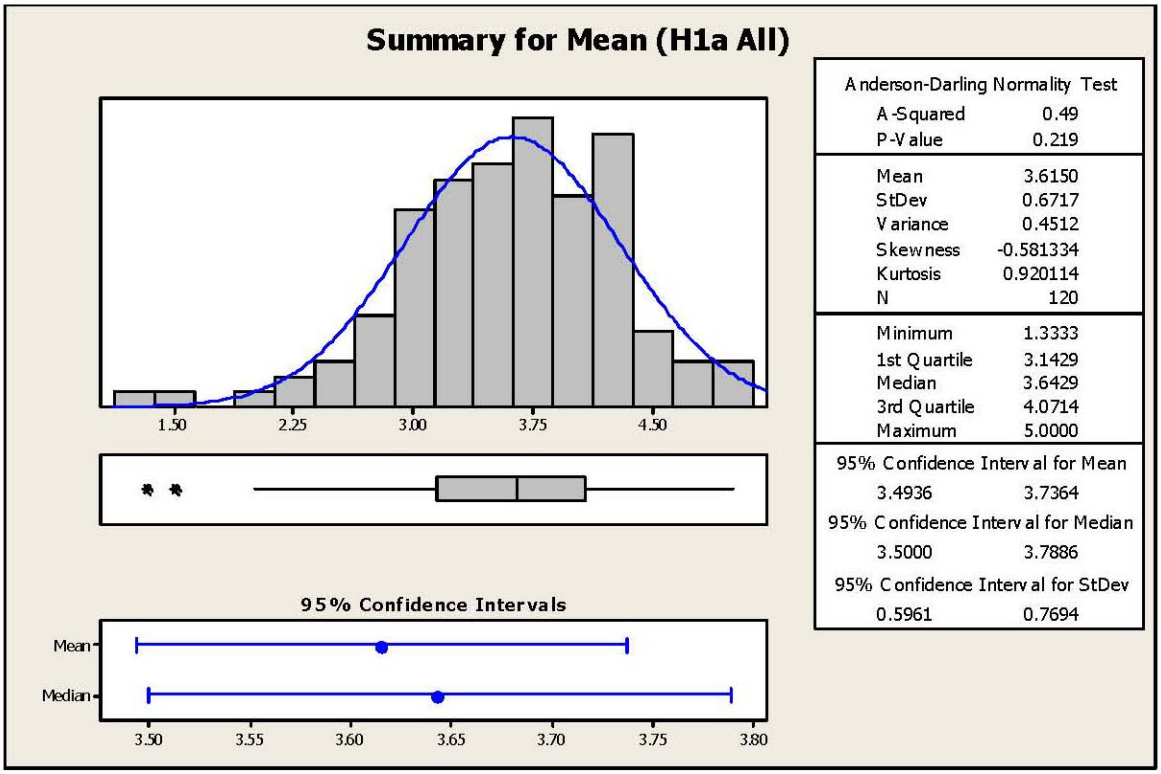

Figure 4-1. Results for hypothesis 1a.

Hypothesis 1b

Hypothesis 1b stated that students increase their sympathetic appreciation of patients and the magnitude of their problems following an international medical mission; this hypothesis linked to questions 7 a-f. This hypothesis also scored very high in statistical significance, and the null hypothesis was rejected (see Figure 4-2). The sparse outliers on the negative end of the curve could not disturb the more heavily weighted positive end of the distribution.

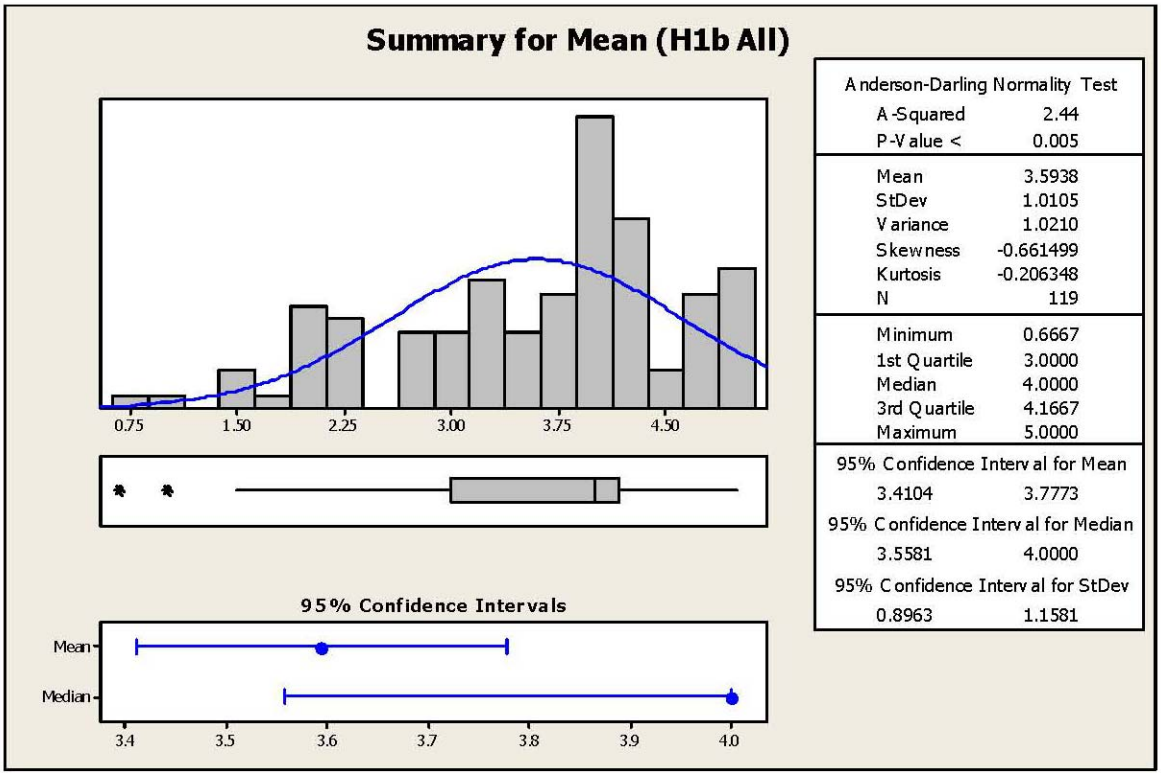

Figure 4-2. Results for hypothesis 1b.

Hypothesis 2a

Hypothesis 1b stated that students express a greater self-efficacy following an international medical mission; this hypothesis linked to parts or all of seven of the eight PIHMQ questions: 1 a-e; 2 a-l; 4 a-f; 5 a-e, h-k; 6 a, c-g; 7 a-f; and 8 a-c, e-j. There might have been a suggestion of bimodal distribution in parts 5 and 7, which failed proof. The summary, however, showed high significance (see Figure 4-3). Summaries for the components of questions 1, 2, 4, 5, 6, 7, and 8 are separately presented in Appendix C.

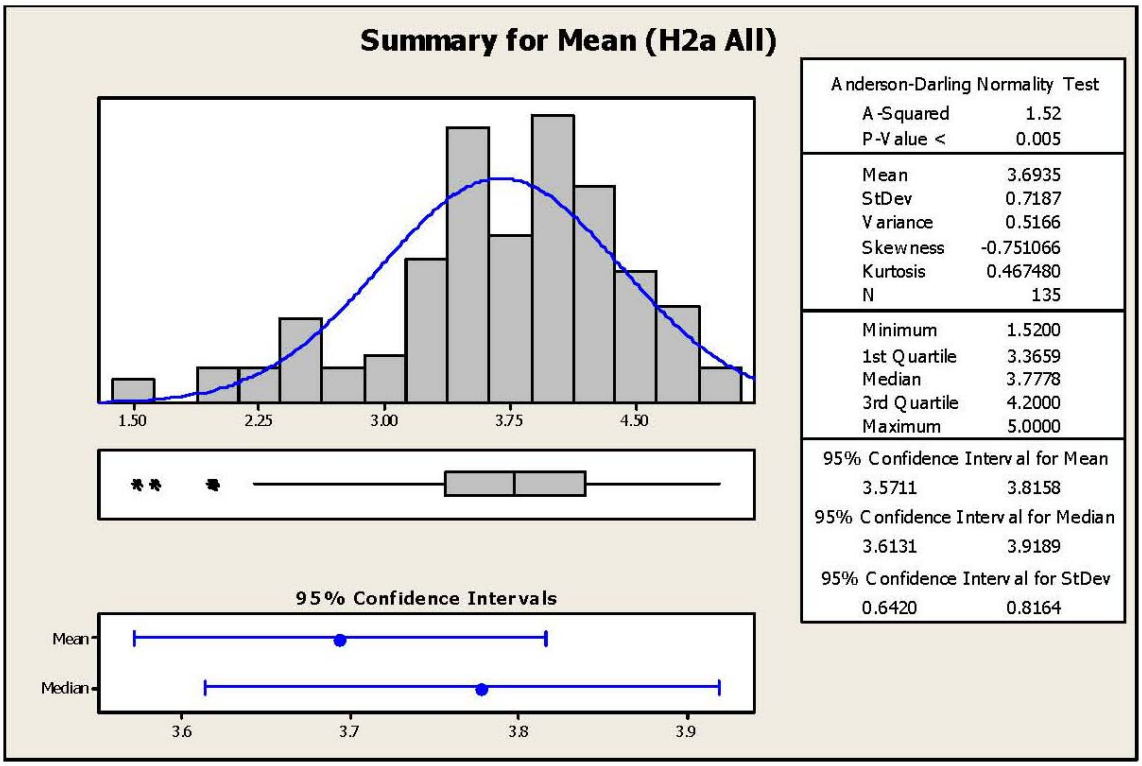

Figure 4-3. Results for hypothesis 2a.

Hypothesis 2b

Hypothesis 2b stated that students express a change in their professional behavior following an international medical mission; this hypothesis linked to questions 5 a-g. As shown in Figure 4-4, the distribution appeared to be normal and unimodal.

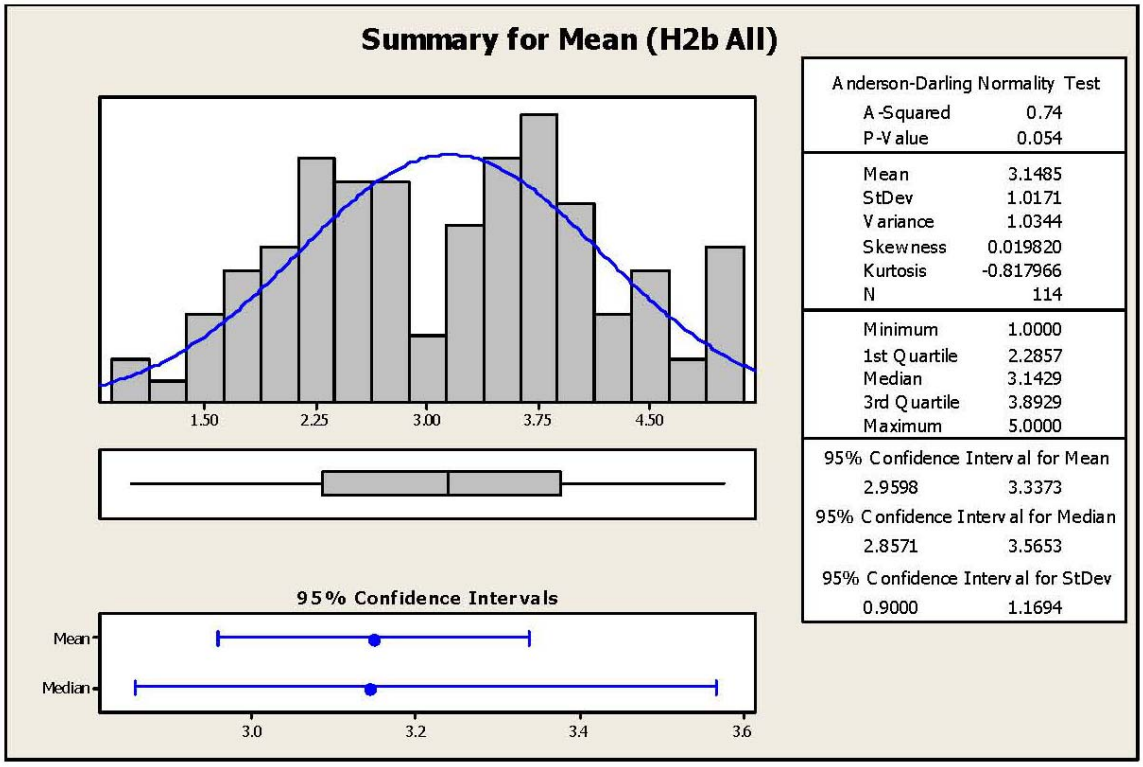

Figure 4-4. Results for hypothesis 2b.

Hypothesis 2c

Hypothesis 2c stated that students express a change in their personal growth in the context of health care following an international medical mission; this hypothesis linked to questions 4 a-f; 7 a-f; and 8 a-d. The overall result (see Figure 4-5) supported the hypothesis, showing statistical significance.

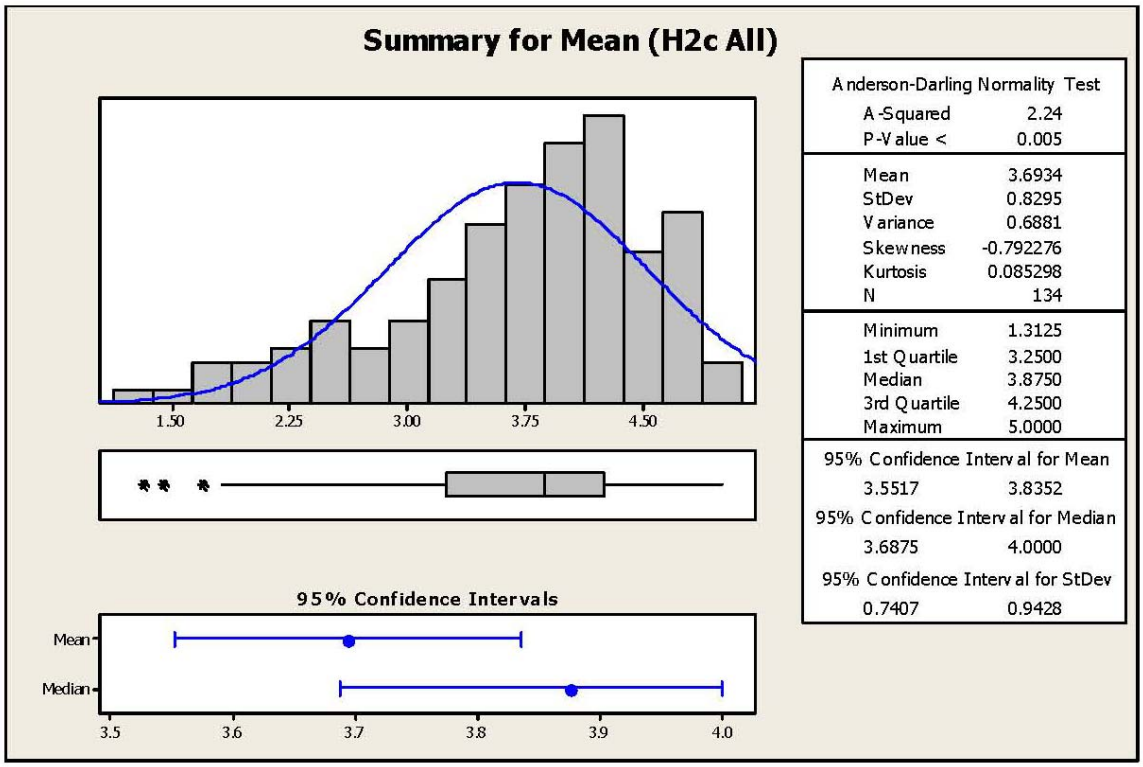

Figure 4-5. Results for hypothesis 2c.

Hypothesis 3a

Hypothesis 3a stated that students express a change in how they view U.S. health care and resource allocation following an international medical mission; this hypothesis linked to questions 3 a-f. The data distributions and the confidence limits around the correlation coefficients showed rejection of the null hypothesis (see Figure 4-6).

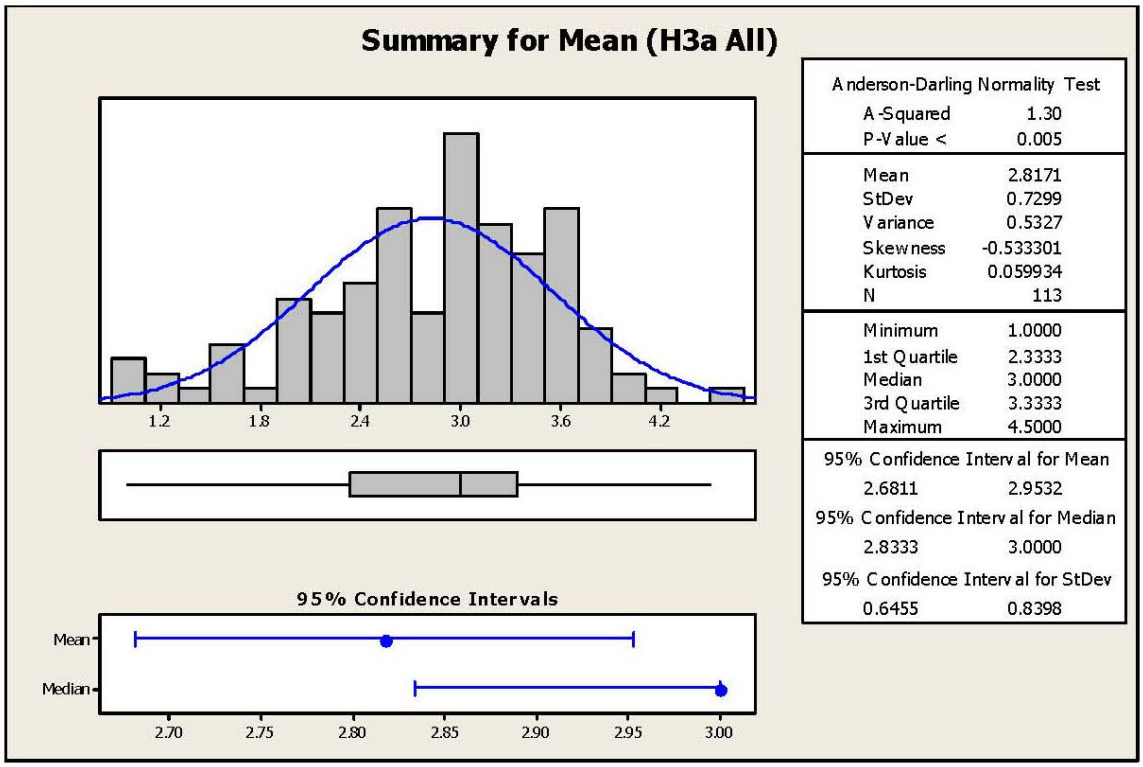

Figure 4-6. Results for hypothesis 3a.

Hypothesis 3b

Hypothesis 3b stated that students express a change in confidence as a health care professional following an international medical mission; this hypothesis linked to questions 4 a-f. Results tilted remarkably toward the upper limits of the Likert scale in giving overwhelming evidence in support of this hypothesis (see Figure 4-7).

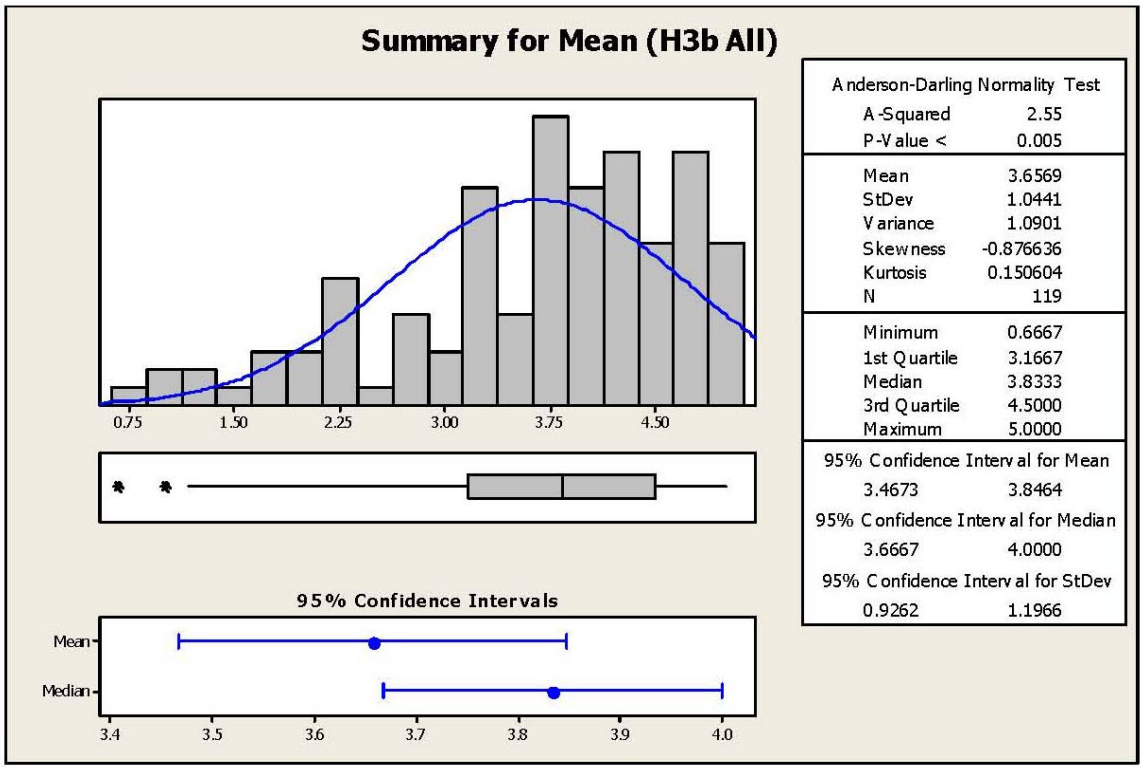

Figure 4-7. Results for hypothesis 3b.

Hypothesis 3c

Hypothesis 3c stated that students express a change in their ability to work with and gain respect for others in a multicultural environment following an international medical mission; this hypothesis linked to questions 5 h-k; 6 i; and 8 e-j. Correlations were weighted toward the high end of the scale, supporting the acceptance of this hypothesis with strong confidence in this distribution of the evidence (see Figure 4-8).

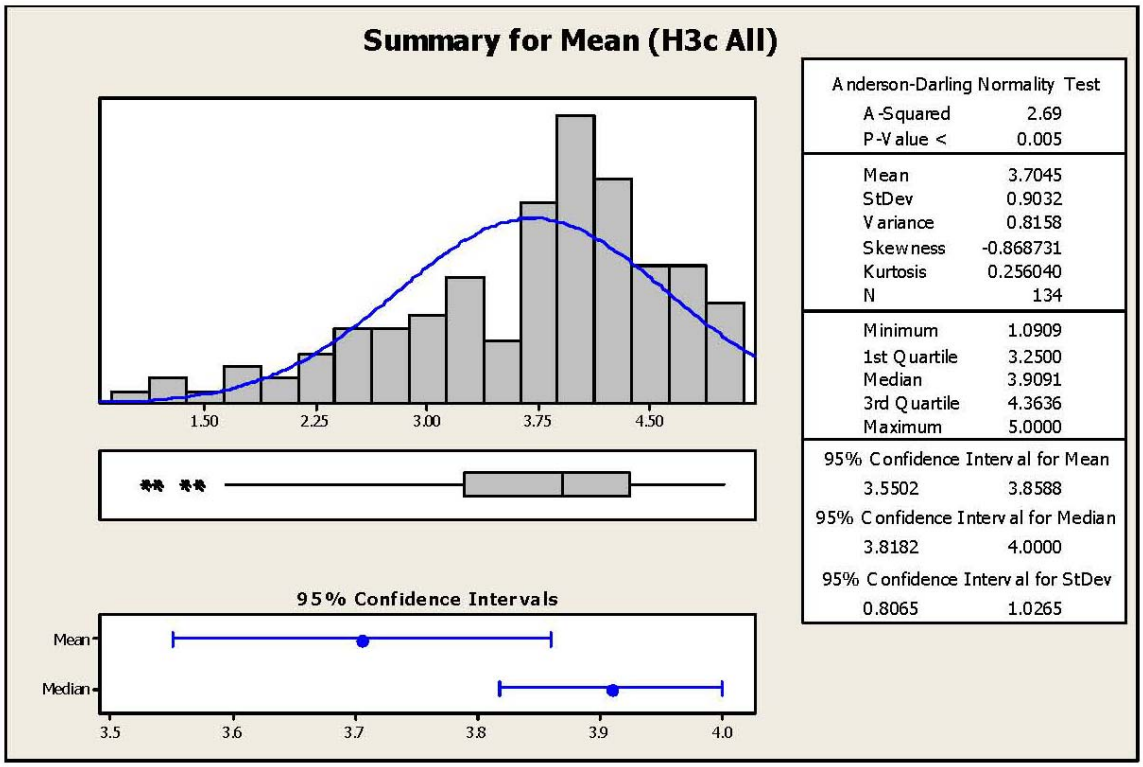

Figure 4-8. Results for hypothesis 3c.

Hypothesis 4

Results for hypothesis 4—that students report the same H1a through H3c effects 3 to 6 months following an international medical mission—remain incomplete, as the evidence to test this hypothesis will be collected over a period of months to years and will include retesting with the PIHMQ along with an interview to probe the sustainability of the changes already in evidence at the time of the completion of the international medical mission. A smaller sample was tested, and this hypothesis was supported when a correction factor for a small sample size was employed.

In anecdotal evidence, several of the students' responses in the qualitative component of the questionnaire and in later interviews gave testimony that their earlier opinions about the changes they had experienced after the mission had deepened and that they were eager to retest this hypothesis on their own by making plans to go back to the same mission site or a similar one. It is through the qualitative analysis presented later in the chapter that this hypothesis has accrued more nuanced evidence.

Summary

The hypotheses set out were uniformly supported by the results from the PIHMQ (see Table 4-12).

Table 4-12
Summary of Hypothesis Support by the PIHMQ Results

Hypothesis	Result
H1a: Students increase their substantive knowledge following an international medical mission.	Supported
H1b: Students increase their sympathetic appreciation of patients and the magnitude of their problems following an international medical mission.	Supported
H2a: Students express a greater self-efficacy following an international medical mission.	Supported
H2b: Students express a change in their professional behavior following an international medical mission.	Supported
H2c: Students express a change in their personal growth in the context of health care following an international medical mission.	Supported
H3a: Students express a change in how they view U.S. health care and resource allocation following an international medical mission.	Supported
H3b: Students express a change in confidence as a health care professional following an international medical mission.	Supported
H3c: Students express a change in their ability to work with and gain respect for others in a multicultural environment following an international medical mission.	Supported
H4: Students report the same H1a through H3c effects 3 to 6 months following an international medical mission.	Data incomplete

Analyses Beyond the Research Questions

To investigate whether some features of the respondents might have influenced their Likert-scale distribution of responses, bivariate analyses were conducted. Several interesting possibilities were examined:

- Whether the mission's leadership affected students' responses
- Whether levels of confidence or self-efficacy depended on the health care sophistication that the participant brought to the mission—something that might be based on their branch of the healing arts (e.g., nursing, medicine, or other) and how far along were they in the development of their professional identity and competence

- Whether religion played a role in students' reaction to the differences encountered in other cultures or in their motivation for service

Other questions, such as whether African Americans returning to Africa would have different responses than other students, could not be addressed because of limited numbers.

Effect of Leadership

One question that has often been debated concerns the role of leadership. One side of the debate focuses on the role of a charismatic leader, who teaches effectively and whose students follow him or her, Pied Piper-like, regardless of the setting. This view believes that the only way to reproduce the near-ecstatic responses of the transformed students is to clone this leader; since each is unique, the experience cannot be generalizable. On the other side of this argument is the position that, while the learner must have a facilitator, the *real* leader in this transformation is the impoverished patient; the *encounter* is the most powerful agent in bringing about transformational learning within the participants.

To test the effect of leadership, hypothesis 2a (a positive change in students' self-efficacy after an international medical mission) was correlated with the previously blind category of leadership of the mission. There was a broad variability in this variable: many students named a fellow student, and several were not even aware who the leader of their mission was!

Table 4-13 provides the results of a one-way ANOVA based on the named leader of the mission. Results showed a pattern of self-efficacy improvement variability that

scattered when compared with the nominal category of mission leader, with the higher correlations actually matched with a student participant misidentified as mission leader, and the most experienced mission leader faring no better than the others. The null hypothesis was accepted in this pattern of associations ($P = 0.116$), suggesting that the second approach in the debate (focused on the patient) may be true.

Table 4-13
Bivariate Analysis: Role of Leader and Results for Hypothesis 2a

Leader code	N	Mean	Standard deviation
BS	11	4.2051	0.5801
GG	51	3.5846	0.8344
GWU	8	3.6773	0.2284
Other	6	3.2254	1.0304
RP	23	3.6718	0.5625
SU	9	3.7158	0.4562
WS	25	3.8336	0.6886

These data and their analysis make possible the setting up of new hypotheses to test for the actual locus of the leadership in the transformational learning phenomenon, and it is quite likely that it may be multifactorial, but it is also likely that the professor is no more likely than the compelling patient to be the agent that brings about this change.

Effect of Type of Health Care Professional

Several notable statistically significant factors were uncovered in the bivariate analysis. The kind of health care professional the respondent was or was becoming and especially the length of experience in that professional role and medical expertise (i.e., graduate or undergraduate) correlated strongly with the change in self-efficacy (see Table 4-14). For these data, the *P* value was 0.010.

Table 4-14
Bivariate Analysis: Type of Health Care Professional and Results for Hypothesis 2a

Type of health care professional	N	Mean	Standard deviation
Medical, graduate	43	3.6977	0.7975
Medical, undergraduate	21	3.7166	0.5932
Nursing	27	4.0250	0.6028
Other	32	3.3693	0.7361
Paramedical	11	3.8637	0.3612

Other Effects

Similarly, plots were developed to review the changes in self-efficacy against ethnicity, religion, and country served, and these showed weaker correlations (see Table 4-15 for the example of religion).

Table 4-15
Bivariate Analysis: Religion and Results for Hypothesis 2a*

Religion	N	Mean	Standard deviation
Catholic	32	3.9049	0.6647
Muslim	11	3.7612	0.8992
None	17	3.6125	0.6208
Other	26	3.6102	0.6246
Protestant	48	3.6070	0.7903

**P* value = 0.397.

When additional plots examined these same factors in relation to hypothesis 3c (students expressing a change in their ability to work with and gain respect for others in a multicultural environment following an international medical mission), the characteristics showed a more striking correlation. Further multivariate analyses were scanned for outliers or aberrancy, and no unusual patterns emerged. Some of these additional analyses appear in Appendix D.

Qualitative Analyses

This dissertation has focused predominantly on quantitative methodology. In addition, qualitative data were collected through open-ended essay responses in the PIHMQ. The essays were not examined until the quantitative analysis was complete, so as to avoid any tainting of those results by an understanding of why certain respondents may have answered the way they did. The goal was to obtain a clean and inclusive analysis, covering all completed PIHMQs—even those that came in with unsolicited prejudicial statements. There may have been outliers on the positive side as well that may have been unblinded by individual letters or grateful testimonials that were directed to mission leaders.

Following its other components, the PIHMQ had four open-ended questions for the student respondents:

21. Could you describe how the experiences on the IHM may have changed you?
22. Please list the factor(s) that influenced your decision to participate in the IHM.
23. What issues or ambiguities about this trip may have made you anxious, and what did you expect to encounter that might have been unpleasant or uncomfortable, which were realized, and which were least, which most surprising? What fears did you have about the travel, the mission venue or the peoples served or the companions you would be working with or health care workers you would be guided by?
24. In what way do you think this medical mission has changed you with respect to: a) what you know about medicine; b) how you will feel about patients who need

care; c) the variety of different people and their lifestyles you will have encountered; d) and how do you think it has changed you personally?

Even the students who skipped the quantitative questions seemed to want to write down how they felt about the experience.

Superlatives abounded. Nearly all used language of a transformational experience —such as "I will never be the same"; "never again would I take for granted . . ."; and "the most broadening experience of my life stretching me beyond all previous limits." Many reverted to words usually reserved for the sacred in describing the experience as a calling, and most of those who did so reverted to religious terminology, some of them calling it a "conversion" experience. None appeared to be nonchalant about the encounters, and many used the mission experience as an occasion to reflect upon the meaning of their lives and what they would do with the privileged position they now realized they might have with respect to far needier peoples in the same world.

Many respondents expressed nonmedical deficits in their education that they felt inhibited their effectiveness. The single most frequently cited deficit was stated by one of the participants: "I feel I must enhance my foreign language skills to be able to relate to many patients I can not communicate with now."

Although many expressed fears they had about the unknown they would be entering and the harm that might come to them in such environments, almost all reflected that those fears had been exaggerated and had been unrealized. A few even admitted to being sheepish in bringing up those antecedent fears retrospectively, since they had been worried about mere inconvenience before the trip, with their concerns obliterated after dealing with people who had daily questions of survival. Several of the students

confessed to being ashamed of the self-centered concerns they had before the trip in light of their new appreciation of the patients who faced much larger risks with much longer odds.

Many of the respondents personalized their newer glimpse of reality by seeing it through the eyes of a memorable patient they had encountered. Such strong recollections reinforce the belief that the patient is the active agent in leading the student through a transformational learning event in the international mission. Many respondents were almost awestruck at their own reactions to this new environment and were remarkably introspective, a phenomenon a few suggested would not have been likely before the mission experience.

To detail the responses to the open-ended questions or to the questions from the follow-up interview would be to fill the text with poignant quotations, which was not the principal intent in carrying out the study, but it does "raise the temperature" of the statistical positive results in analysis to also hear that this was a very moving experience for almost all participants.

A decision was made to hold the qualitative evaluations until months or years after the mission (and, quite possibly, after several serial missions), to further characterize the transformational learning process and its durability. This effort is in progress.

Summary

The results of the study showed a statistically significant and personally meaningful change in the participants through the international medical mission

experience. The changes included a cognitive as well as an emotional enhancement of their health care knowledge, but also a greater appreciation of the diversity and intensity of patient encounters in quite different settings than they may have been used to before. Most expressed these changes quantitatively in the upper two quintiles of ranked responses and also expressed their experience verbally in describing transformational learning events.

CHAPTER 5:

INTERPRETATIONS, CONCLUSIONS, AND RECOMMENDATIONS

The interpretation of the results of this study applies to the transformational learning clearly in evidence in most all of the participants, as displayed in the quantitative analysis of their responses, with important implications for how health care educators go about the process of medical education. These implications suggest further aspects for continued study and better analysis of the process of transformational learning within health care education, which lead to recommendations for health care education reform.

Interpretation and Conclusions

Conclusion 1: Increased Substantive Knowledge

The study showed that students increase their substantive knowledge following an international medical mission. Beyond statistical doubt ($P < 0.005$), the medical mission experience was an intense learning experience. Many students compared the volume of new information that they had learned with a more standardized part of their curriculum—biochemistry, for example—and to quote one, "The number of things I had to learn that were brand new in my experience was an order of magnitude greater." This kind of experience is not the "junket" type of soft core medical learning in transactional terms but is an academically rigorous component of the curriculum, at least on a par with much of the prescribed elements of the traditional medical curriculum often thought to be difficult and intensive principally because of a very large volume of new information coming at the learner in a fast-paced continuous stream. Not one of the students

expressed the belief that the mission experience was a soft "gut" course that could be satisfactorily performed with anything less than their full attention and energies.

Moreover, there was an emotive as well as cognitive overlay to this intensive learning, since, unlike the sometimes elusive significance of much of the other factual information on which they are tested regularly, there were few questions as to the relevance of the knowledge they needed to master in the mission context since it came to them principally embodied in patients' lives.

Those who were medical are grouped in three stages: undergraduate (i.e., medical students), graduate (i.e., residents), and continuing (i.e., licensed practitioners). Those who are nonmedical, e.g., premedical college students, have not yet entered any formal medical education. There was a much higher yield of changes in learning in medical issues inversely related to the experience level of those medically trained already (e.g., the medical students learned much more than the premedical students and those who were already in medical practice or residencies were already familiar with the medical issues that came as new information to most of the medical and premedical students). As for the questions dealing with nonmedical issues, there was an even distribution of responses across these experience levels, the medical expertise giving no advantage over or isolation from the common cultural exposure.

Conclusion 2: Increased Sympathetic Appreciation of Patients

The results showed that students increased their sympathetic appreciation of patients and the magnitude of the patients' problems following an international medical mission. Unequivocally ($P < 0.005$), participants recognized that the kind and extent of

patient suffering they saw in the mission setting had a significant impact on them. Although there are no readily available data on the comparable impact of other curriculum courses, it would seem highly probable that few, if any, first-hand clinical experiences measure up to this impact in changing students' perspective on suffering.

Such exposure might be intimidating at least and perhaps terrifying at worst. Based on that, some critics might consider this immersion to be a "shock therapy" that may result in participants' loss of control over their own feelings and recognition of impotence to rescue any sufferer. To the contrary, to quote one freshman medical student:

> Never have I been so sure that I wanted to be a doctor, and although I know that I am almost worthless in confronting the magnitude of the health problems I was presented in Mozambique with you on our mission, it makes me more determined than ever to get to know how to manage these diseases, and I have new incentive to stay alert in the coming courses to learn all I can about illness that I might otherwise have considered irrelevant ailments confined to exotic places and simply "blown off" any investment of energy in learning more or remembering it beyond passing the tests.

This leads to the role of the mission experience on self-efficacy.

Conclusion 3: Greater Self-Efficacy

Students expressed a greater self-efficacy following an international medical mission. For all subquestions of this perception of self-efficacy enhancement, students showed a significant ($P < 0.005$) increase in their feeling of confidence in addressing problems confronting themselves and third-world patients after the health care mission experience. Self-efficacy increased across a wide variety of aspects (ranging from $P < 0.005$ to the least secure $P < 0.015$), and *no* participant felt less secure after the experience.

As expressed by one student, perhaps well aware of her delicate position since I had not yet graded her performance:

> It will take many decades for me to know only a fraction as much as you know and do in teaching me about these people and their diseases, but I am almost as smart as you are, and as I work very hard at it, I will at least be able to manage many of the problems, even if I never catch up!

Similar comments were made in the answers to open-ended questions by participants of missions led by other team leaders.

Conclusion 4: Improved Professional Behavior

Students expressed a change in their professional behavior following an international medical mission. Even though the mission occurred early in many participants' health care careers, most of them ($P < 0.054$) already expressed a behavioral change that was in transition toward professionalism. The distribution suggested bimodality (minimized by dot plot) in some ways following the stages in development of participants' nascent careers, but even the earliest trended toward adopting the "health helper mindset"—i.e., being alarmed by the patients' problems and sensitive to the suffering caused by them but not incapacitated by the sympathetic concern as much as motivated to do something about it. The fundamental act of health care is assumption of responsibility for the well-being of another, rather than the first and lasting impulse to seek refuge for protection of oneself.

One premedical student stated:

> I could not believe I was seeing the very same disease you had described and had shown to me in a repugnant picture during our "packing party" ["gnoma," or "cancrum oris," a synergistic gangrene that eats away the tissues of the face in an infection of susceptible malnourished peoples]. At first I wanted to run away and

> hide, but it did not seem to frighten you, and after I could barely get used to looking at it, I was fascinated to hear that there was something that could actually be done about it. Can I see now what this patient looks like after surgical treatment? I will not feel so queasy anymore since I saw it when it had been much worse.

This is a transition to professionalism—no longer voyeurism on the disasters that can befall mankind, like slowing down to stare at the scene of a wreck out of morbid curiosity, but motivation to learn how this disaster might be treated and possibly prevented.

Conclusion 5: Personal Growth

Results showed that students expressed a change in their personal growth in the context of health care following an international medical mission. This "personal growth" conclusion was "off the charts" in nearly all participants' responses ($P < 0.005$ for each question). This finding reflects a transformational experience and not just an abundance of transactional learning through higher amounts of data input. Nearly all participants reflected on how they had changed in the mission experience and how they had received more than they could ever give—a theme stated repeatedly.

The statement "I know that I will never be the same" was reiterated—almost as if it had been a discussed and agreed upon group response, even though the data were collected from participants independently. Changes were not necessarily "vectored"; i.e., it was not necessarily true that any personal change in themselves would have to be for the better, but no one reported being made worse by the experience. No one claimed to be converted to misanthropy, or more likely in the context of perpetual frustration, into cynicism. Many if not all of those predisposed (by identifying a religion in their

nominative data) expressed this experience in religious terms: 20, for example, reported a divine "calling" to such service, giving an indication that they would be repeating this kind of service because they felt spiritually compelled to do so. Some said that the mission was the first time they had clearly known the way they would pattern the rest of their life and spoke of the health care mission in terms of a religious "conversion." Two identified patients as the agents of their change in life plans.

Conclusion 6: Changed Views of U.S. Health Care and Resource Allocation

Students expressed a change in how they viewed U.S. health care and resource allocation following an international medical mission. Nearly all students experienced a change ($P < 0.005$), but the nuanced responses reflected several directions for that change.

Most expressed being extremely grateful for being the beneficiaries of first-world health care systems and facilities, which most said they had taken for granted before encountering a society which somehow had to get along without them. Others revolted against the profligate waste and redundancy in boutique care in the U.S., especially the large portion of health care expended in end-of-life futility in intensive care unit support. Most had definite reactions to the disparity and agreed that the U.S. and other first-world health care systems could learn some things about the rationing of extremely precious and scarce health care resources. The developing world has had to confront even bigger health problems that are often solvable with the right skills and preventive practices. One example was the application of simple physical examination clinical skills (granted, often applied to a later stage in the development of the disease process in "late presentation")

as compared to the default reliance on expensive even if precise high technology for screening patient problems.

With the stark confrontation of impoverished health care systems fresh in their minds, few seemed neutral on reentry into the world of health care redundancy as providers, even if they were happy to be its beneficiaries as recipients. One commented:

> Until I went on this trip I frankly believed that the propaganda line that two billion of the world's people have to get by on less than two dollars a day was hyperbole designed for "poster children" to solicit support. Now I have seen whole villages that live on less than I spend in Starbucks each week.

He did not then indicate whether he intended to change his behavior based on this insight. One other student in interview opined similarly but then shrugged and added: "But I have got to live . . . and *this* is my lifestyle here!"

Conclusion 7: Improved Confidence as a Health Care Professional

Students expressed a change in confidence as a health care professional following an international medical mission. Confidence change ($P < 0.005$) is slightly distinct from self-efficacy and is expressed in verbal terms as the diminishing of misgivings about whether the participant is up to the challenge of the continuing learning process inherent in transformational learning. Many of the participants expressed an exhilaration in their professional choices and began to see the challenge of mastering knowledge not as discouraging but as affirming:

> There is so much more to learn than I had ever imagined, but I find it intellectually stimulating and personally compelling, and I cannot wait to measure myself against the 'Dark Continent' again after I have had my clinical rotations.

Confidence was often as buoyant as the last patient successfully encountered. It lasted until the next patient stumped the novice clinician and went into a nosedive after successive failures. This is an epi-phenomenon above that of self-efficacy. As even the lay public knows, even the most skilled health care workers are ultimately engaged in a damage-limitation profession with an outcome that is inevitable for each of us. The confidence I had seen deflated in many participants when they first witnessed a child dying of a preventable disease was the subject of a prolonged and emotional tutorial discussion after the event. Confidence seemed to mature in the course of the missions, not from scoring right an increasing number of times (which was more reflected in self-efficacy improvement) but from a deeper appreciation of the limits and capacities of health care as one among many factors in human well-being, and one with better professional means of control than many other social factors such as global poverty.

Conclusion 8: Improved Ability to Work in a Multicultural Environment

Results showed that students change in their ability to work with and gain respect for others in a multicultural environment following an international medical mission. This may be one of the most salient features of "take-home skills" expressed by nearly all participants ($P < 0.005$). For some participants, the mission may have been the first time that they were plunged into a population in which they were instantly a minority. The importance of respect for differences is exaggerated on the minority end of any spectrum.

Seven of the missions during the study period were held within a single but bisected country, Sudan; three were in the Islamic-dominated Arabic-speaking North, and four were in the Christian/Bantu villages along the Upper Nile in the South. Participants

from each culture were mixed in the health care team in ministering in refugee camps on each side. There was a close working relationship among the health care students, many of whom wrote about how much they had learned from each other. Their interpersonal understanding was closer than that with the patient populations on either side, which may have shared a religious or cultural bond with half the team. An exception related to the facilitation of language: whatever understanding there may have been was expressed in the essays in English, since even the Arabic speakers expressed their opinions in this study in their second language, which biased the responses.

The ability to translate health care abilities across diverse boundaries is critical—although less apparent in the nearly homogeneous culture of first-world health care (except for the patient population served), where all are welcomed so long as they come much more than halfway to accommodate us, speak our language, mimic our work habits, observe our holidays, enjoy our cuisine, and "take off that headscarf or turban." It is not so easy if the "odd man out" is the first-world dominant, which inevitably he or she is during international missions. In much of the experience of international missions in quite different African, Oriental, and, to a lesser extent, Latin cultures, the theme has been "modernization without Westernization." It is easy to appreciate improvements in the mutual professional pursuit of health care among persons of radically different mindsets on other issues, and health care is a very useful bridge across many differences among peoples, but by no means makes those differences go away or become less cumbersome.

Several of the responders expressed this in "Yes, but . . ." qualifications, several of them from among devout "true believers" evenly divided between actively

proselytizing Christian missionaries and fundamental Muslims, with some of the groups reflecting medical missions as a means of converting (the former) and adamantly refusing to allow such subjects to even be discussed (the latter). Among the most tolerant, but below a number to give statistical significance, Jewish and "other" self-designations expressed intriguing interest with a new culture with which they had made contact in the mission. Much of this interest was expressed in an anthropologic approach to "make a study" of the peoples encountered and not limiting their investigation to illnesses, health care, or its delivery.

One particular subgroup of interest comprised descendants of a country of origin, returning as "hyphenated Americans" to a nation of ancestral origin. There were too few African-American or Asian-American "returning pilgrims" in this series to draw meaningful conclusions, but as a rule, each acted distinctively more American than African or Asian in the mission—even when they used the language or had family members in the home country visit them during the mission. The mission experience was even more profoundly moving for such "returnees." One haunting thought was expressed by two of the participants: "That could be me if only my grandparents had not immigrated to the New World and all the advantages that conferred." Another said, more in jest than seriously, "Do you realize that if I had not been born back there and become a poor struggling medical student, I would have been royalty over here?"

Culture consciousness—if not frank culture shock—was a feature that nearly all participants in a first-time mission experience remarked on. Some first experienced a "tourist appreciation" of the difference and later began to see diversity as a mixed blessing. Without such differences, for example, they might have worked much more

efficiently. Despite this discomfort, one of the participants shrugged it off, stating: "If they were any more like us, why leave home—except to escape for an Equatorial winter!"

A contrary opinion was expressed by one participant in Somaliland as we struggled in the public hospital, overcrowded, ill-equipped, and understaffed. After we had been working for a week in such conditions, the students had become aware that a new up-market hospital had been built in Hargeisa by expatriate Somalis for those elite enough to afford to pay for care. In this system, a surgical patient is written a "prescription" for an overstock of suture, gauze, instruments, and all other medical and surgical supplies alleged to be necessary for the operation, and the patient must return with these in a large shopping bag to cover the supply needs for the prescribed operation (and several others, it is obvious). Once this disguised bribe has been paid, the care approaches what is seen in Western facilities. "Well, what, then, are we doing over here, struggling with a lack of everything needed, when we might have worked over there where you knew that a really good facility was available?" was the student's complaint.

Conclusion 9: The Durability of Changes

Students reported that the changes they experienced on a medical mission persisted from months to years. The durability of the transformational learning remains an open question, but over a period of months the change was holding. A few study participants had been back for a year. Although the findings for their follow-up contact and interview could not achieve statistical significance because of the smaller numbers, their findings were similar to those with the shorter-term follow-up.

The study will continue for the purpose of analyzing the longer-term durability of the perspective change noted upon return from the mission, but this aspect may face additional confounding variables. Many of the longer-term "graduates" of the medical mission are making plans to go back, either to the same field that hosted their original mission or to a similar field. Within the practical limits imposed by residency requirements and life changes that may include family and dependents, many expressed an interest in making plans as soon as practical in view of the very positive learning experience they had.

Several nursing students (perhaps self-selected among a group that went to an Ethiopian venue for their first venture abroad) expressed a change in career determinations based on their experience and have signaled their intentions to become career missionaries. This decision may have determined their motivation for the mission in the first place, but the mission confirmed their prior leanings in that direction.

Interpretations of the Role of Transformational Learning in Intersection with the International Medical Mission Experience

Both the approach to the study of international medical missions and the educational experiences themselves might be transformed by the concept of transformational learning. Through such learning, we might get beyond the apparent conflicts of healing arts in circumstances of power imbalance and constrained resources attempting to address the enormity of unmet need. The ambiguities experienced by both health care across such boundaries and education bridging these issues of learning in such settings virtually require a transformational learning experience, since linear patterns of

transactional learning break down when facing "strange," unfamiliar patterns. Medical and allied health education programs are filled with a high volume of life science data input. Although no part of the information may be extremely difficult, transactional learning involving such a large quantity of information has challenges of its own. Mastery of this biomedical learning process requires high-speed data processing, but not necessarily a whole new way of thinking.

In a medical mission, this newly minted mastery of learned behavior comes up against the "other world" reality of massive unsolved problems among impoverished people—people who are burdened with illness but somehow cope against great odds. The students face a new paradigm in the struggles of the human condition, and a first encounter with this new glimpse of reality is likely to lead to a "disorienting dilemma." A successful transition through this conceptual dissonance virtually requires a transformational learning process if one does not opt out altogether, retreating into one or the other of the incongruous antithetical worlds.

Close observation of this transition, perhaps first recognized in self but repeated often in other precepted health care students, had prompted the researcher to search for the "active ingredient" that made this transformation so compelling. The data from this study indicate that the active ingredient does not appear to be the leader, a charismatic teacher guiding the learner into these higher levels of understanding, although many other "breakthrough insights" in education have been attributed to such leadership. The agency for transformation in these observed international health education experiences appears to be the mission experience itself, an experientially rich encounter with a new environment requiring a whole new way of thinking to reorient rational thought on the new and larger

scale. Mezirow had located this transformation in a revolution in rational thought processes from his orientation in psychoanalysis but later appreciated the strong emotive component that is involved as well.

The emotive component may be the lead-off in the usually shocking first encounters in the developing world. Perhaps because of the preselection of medical and allied health applicants who presumably have a bias toward compassion, amplified by the higher degree of misery accompanying third-world patients, the experience evokes a powerful emotional response. At the end of the PIHMQ, when participants were asked about their most memorable experience, most responded that it was an encounter with a given patient. Most likely, the third-world sufferer serves as the active agent to help the student confront his or her inadequate life model, which had been comfortably in use up to the point. And, this encounter with an "other" is an *experience*—a requirement in the Mezirow scheme—and no amount of passive lecture attendance or reading in books or role playing achieves the same kind of intensity.

Interestingly, nonmedical participants were significantly less likely than their medical counterparts in the same or similar setting to be sensitive to and respectful of diversity. This unexpected finding may indicate a special kind of transformational learning across ethnic and cultural differences, either faster or more thorough than for less health care–oriented participants—perhaps because health care personnel are instinctively drawn to the commonality of the human condition, quickly distinguishing what unites people from the superficially apparent differences. This finding might indicate that health care may be useful in modeling ways to be sensitive to humanitarian

ends and to reach across other gaps that might separate varied members of the same species.

This study was set in the context of international health care service in developing world missions. As described in the definitions of terms, the developing or "third world" setting is the environment whether in or outside political boundaries. There are populations of citizens in every developing world nation that are affluent beyond the measures of higher-income earners in the USA, for example, and there are adjacent fellow citizens who have more in common with the deprived populations anywhere on earth than they do with those who might be entitled, if they could ever be so lucky, to hold the same passport. In prior visits to Pakistan, for example, in Karachi there are affluent industrialists who have more in common with their Park Avenue contemporaries in Manhattan than they do with those in the next door "katchie abadies" (Urdu for "slums") across the tracks where the hard scrabble for daily survival is much more like that of the "bottom billion" anywhere else on the planet, irrespective of language or "nationality."

This means that a "developing world" experience can be had much closer and cheaper inside the big city slums typically nearby any inner-city urban medical school, or only slightly further removed in, for example, Appalachia or the South among rural poor. It is for that reason that applicants to travel with this researcher are asked what evidence exists that their motivation to do so is based in an interest in serving the poor rather than the adventure component when the opportunity for service is also found much closer. Those who have already served in such examples as the local "Clinica del Pueblo" or have done stints in the Peace Corps, VISTA, or other volunteering for crises such as that

seen with Hurricanes Katrina or Rita or the victims of the 2008 Midwest flooding are immediately accepted on the basis of this evidence, and others are encouraged to do so. They are likewise encouraged in participation in these closer venues as a follow-up opportunity for such continuing service after an international health mission is completed.

The international mission was selected as the venue since it was a discrete block of time for intense service, without the opportunity to withdraw into a first-world setting of more accustomed relative luxury, enabling a focus on the conditions shared with the patient population. It was more homogeneous to study the international missions than a first-world setting with incursions into pockets of third-world venues that could not be controlled for, with the patients inevitably being residents of one world and the caregivers retreating into the other.

Recommendations for Practice

1. Make the Benefits of an International Medical Mission Experience More Widely Available to Students Who Want to Participate

An international medical mission is a transformational learning experience for a health care student the way few other required parts of the health care curriculum are. Most of the core curriculum aims toward assimilation of a required fund of knowledge as a platform from which judgments can be made. An intensive testing methodology determines how effective these transactional learning processes are for each student. Although the final goal of medical education is a compassionate, humane, and competent clinician who can respond to human needs with effective interventions for all kinds of illness in a wide variety of people, the psychometrics for this humane application of the

healing art are not as well developed. Because of that, the current medical education model cannot "get us there from here" using current methods alone.

There are really only two "windows" in the medical curriculum for this opportunity, except by special arrangements involving substituting required courses. From the freshman to the sophomore year, the medical students have a summer vacation, the last they will experience. At this point all their coursework has been in the basic sciences, with a few demonstrations of clinical encounters; they have had no exposure to pathology or pharmacology, the fundamental building blocks of disease and treatment. In their senior year, the first elective parts of the curriculum are available for this experience. By that time, students have had all their basic science and a full year of clinical rotations. This has a great deal to do with their knowledge base and their self-efficacy.

The missions, similarly, are biphasic. They consist of screening clinics and an "office outpatient-type" general medical clinic (the great majority of the international medical missions in this series) or are more specialized, as in surgical missions, either for general surgical problems or specialized cases for training indigenous practitioners, with skills and equipment to be left behind to "indigenize" the skills brought by the mission. Such missions often target a fixable problem such as cleft lip, club foot, goiter, or acquired blindness. Senior medical students may elect to participate in these latter missions, and they may even serve as an accreditable tuition-requiring elective course in which students are tested and evaluated.

The international health mission may not be for everyone, and it is not suggested that it be a mandatory requirement for graduation or licensure. Although a highly

valuable medical educational experience, it is impractical for some who may have impediments from a family and dependents obligation or some handicap in carrying out the rigors of such an experience. It may be appropriate for such students to explore the domestic alternative of the "third world next door" in inner-city or rural poverty clinics. The recommendation that this opportunity be made more widely available to all health care students who might be able to fulfill the requirements means rather that such a choice be facilitated, obstacles removed, and be evaluated and updated as with any other entry in the medical curriculum.

A chief inhibition to the performance of a medical mission is the expense of getting to the site. A number of scholarship sources that will offset these expenses are being made available so that money will not be the reason that the student cannot go. The expenses entailed in this international medical mission appear to be a surcharge on the already heavy burden of indebtedness taken on by students, but the costs are dwarfed by those entailed in other required parts of the medical curriculum, which may be sine qua non for the medical education but have less data associated with them as to their transformational learning potential.

In addition to the cost issue, a number of administrative roadblocks have been imposed that should be resolved. A student applying for an "away elective" in, say, radiology, at, say, a West Coast teaching program may often select the site at which the living expenses are surely going to be higher, the educational yield little different than that which he or she has already experienced in his or her home institution, and without likelihood of transformational learning and an outcome. Such a waste of an elective choice is often encouraged but is most often simply a job-seeking interview, as the

student is going to a site where he or she might propose to match in a residency of choice. This dilutes the value of this tuition-paying educational time in which one may learn something new, perverting it into an early start on a protracted residency, a job for which one will be on salary support. The lifelong learning that is the continuing educational plan of all medical practitioners should optimize the use of the precious few elective periods in the medical curriculum for their maximum yield. The choices made in residency selection by health care students are already being heavily slanted by lifestyle preferences, and the collateral learning in the international health mission can offer service alternatives to such a focus. This may be responsive to the challenge that the medical education process "vanquishes virtue" (Coulehan & Williams, 2001).

2. Incorporate the International Medical Mission Experience into the Core Curriculum

Incorporating the mission experience into the core curriculum of academic offerings entails applying regular credit and evaluation structures, supporting it with the same resources any other "laboratory" or rotation would receive, employing a registry of international service sites available and leaders who are willing to mentor, and offering preparatory counseling and follow-up for this health care course.

This study has assessed educational goals at a higher level of abstraction in a transformational learning model and shown that the international medical mission experience is an effective way of bringing about such learning for participants. These data may be usefully applied in recommending that such opportunities be made more widely available through institutionalizing them for all health care students and seeking funding resources to make such experiences the rule rather than the exception.

Transformational learning within individual students might be prescriptive for transforming health care education experiences generally. Further research might then be established to determine whether institutions that establish an early international medical mission program as a part of their core curriculum produce more compassionate clinicians with enhanced capacities for dealing with diversity in practice. This study has provided evidence that such transformations take place in individual students; the next level would be to test similar output changes for an entire institution. Such emphases have already been assessed in institutions that claim a special center of excellence in producing the biomedical research leaders of the future (e.g., the University of Chicago) and an emphasis on the production of primary care clinicians (e.g., George Washington University.)

Especially in Washington, DC—an urban enclave that may consider itself a "world capital" by housing each of the world's embassies, the United Nations, the World Bank, the International Monetary Fund, faith-based organizations, nongovernmental organizations, and multilateral foreign aid programs and by having residents that represent the world's biologic, cultural, and ethnic palette—this "center of excellence" could be offered as a testable and provable model to address world health globalization with a proactive program to produce the leaders of the new paradigm in "world health."

An international medical mission curriculum would also fit in well with the even better funded but less well studied antiterrorism emphasis of multiple programs already extant in the U.S. capital. Bioterrorism is best prevented with a deeper understanding of all parts of the global citizenry, and no other profession than the healing arts has such intimate local knowledge at the grassroots level of surveillance. The institution with the

special feature of an international medical mission curriculum can achieve a public health eminence from a higher-level platform in human affairs, with multipliers in all fields already available for collaboration in the university and in the "world capital."

3. Use the Transformational Learning of International Medical Missions as a Model for Health Care System Reform

In worldwide-ranging international health care missions, students are exposed to health care under a wide variety of public and private health care systems. They encounter multiple examples of systems that clearly do and do not work. This researcher has carried out medical missions in a variety of environments: in health care systems based in communism, socialism, capitalism, private enterprise, and charities; in the chaos of failed states; in places with some pretense of governance and some with highly organized—if not rigid—structures of health care, public and/or private. In each environment, some healing art practitioner must take responsibility for the health of another in delivery of care, and there remains some pattern of health-seeking and care-giving.

During this study's missions in Somaliland, Congo, South Sudan, Eritrea, Haiti, and among groups breaking away from nation-state status, many of the systems actually worked, despite the severe constraints of failed states and social disruption, up to and including civil war. The health care students often expressed awe at the capacity to cope with the burden of health care problems on the part of those "positive deviants" who responded with whatever resources their limited economy had available. In lauding these individuals for the innovations that seemed to work and criticizing harshly the corruption

of official sinecures in titular charge of health care, students frequently reflected back on the U.S. system from which they had come, and not always favorably.

In some parts of the developing world, several systems may be in place simultaneously: an official public institution, sometimes better supplied with resources and personnel but often inept in delivery, and the "go-to alternative," a system that had sprung up to attempt to address the unmet needs of the population. These are "natural laboratories" that exist side by side in an environment nearly ideally adjacent to a control group of patients drawn from the same circumstances. Some of these systems actually *do* work, requiring a minute fraction of the profligate resources obligated in a U.S. setting. The students often asked such questions as this paraphrased composite of four student responses:

> Why can't we use our resources as efficiently as the small clinic run by Dr. [X]—who sees ten times the patients daily with one thousandth the budget of our own redundant U.S. outpatient department, which wastes more on the excesses for a single patient than Dr. [X] uses all week in curing over half the patients that come to him for help?

Nearly all students returned from the mission with strong opinions about U.S. health care. The students could appreciate a lesson the developing world had for the developed world—how to deal with a much larger number of far more serious health issues with the use of far fewer resources, more efficiently and resourcefully. It is, after all, the developing world that is teaching us how to deal with a pandemic HIV/AIDS plague. It is the developing world that can boast far higher vaccination rates. It is the developing world that can study interrelationships such as the role of nutrition in communicable disease.

Most of these resolutions may come about not from some global revelation programmed by the developed world, as might be suggested by such vast programs as the Millennium Health Goals, but by innovation and improvisations of local clinicians who are burdened with the task of doing it right with very little resource support. I have often used this aphorism in the developing world when discussing case management when students puzzle over a seemingly insurmountable problem: "We have no money; therefore, we must think." We cannot employ technology as a substitute for judgment. The immediacy of the problem calls for rapid and effective response. Rapidly, options are proven, or disproven, in a very real-time exercise in problem-solving, a common well-exercised characteristic of the developing world clinician.

Any policy maker who conjures up a global health care scheme to impose upon the real world mosaic is, *a priori,* wrong. The small-scale experiments in real-time problem-solving in individual patient care or in health care systems quickly show what works and what does not, in practice. A collection of these "management methods that work" practiced by the "positive deviants" in the developing world who may have innovated them makes for a "bottom-up" health care reform. Their advantage is that they have the single feature absent in prospective official policy in the absence of appreciation of the untoward consequences of assumptions to be imposed upon a large diversity of patients and settings—outcome measures that are evidence based. The measure of outcomes, one at a time in clinical practice, grouped for disease and patient characteristics and collectively for public health measures, allows comparable "staging," and such iterative "best practices" can be scaled up cautiously toward an amalgam that may constitute policy.

Such an approach incorporates efficiency as well, since no single patient problem is going to be addressed in a cost-plus gamble mortgaging care for all against the even-desperate care for an isolated individual. To use a word often employed in the developing world that seems anathema in the developed world, care is *rationed* in these settings. All but one student who considered this rationing found it agreeable to use this most-good-for-the-most-number appropriate in such settings. "Those settings" now include ours, and evidence-based best-practice health care monitoring through ingenious improvisation is a model for accretion of health policy reform—another gift from developing to developed world, which may allow us to learn from them to transform health care efficacy and efficiency.

The issue of satisfaction with health care was raised in this study's introduction. Such satisfaction has not been achieved through extravagant resource expenditure but is more likely to result from rationalization of health care to address human needs to the ultimately limited extent to which it is usable. Despite severe resource constraint—or, more probably, because of it—developing world health care policy has of necessity been minimalist, innovative, rapid-impact oriented, and sharply focused on outcome—both in clinical care and in health care systems. Health care students might bring back from an international medical mission more than just astonishment about the kinds of tropical diseases that those patients have that we don't typically share; they have also considered the pragmatic health care policies they have observed and wondered why such policies have not been applied in first-world health care reform.

Recommendations for Research

Methodologic Issues Related to the PIHMQ

The PIHMQ was modified for application to medical missions from a prior instrument on international encounters (Wilson, 1993). Further research or use of it might consider the following.

First, administering the PIHMQ both before and after the mission may more accurately reflect the anticipations, expectations, and anxieties of the students as they approach the mission trip, rather than having the experienced mission color the recall of how they had felt in the premission period. Such a use could also see if outcomes were somewhat predetermined at the outset. In a study of first-time marathoners, Carson (2005) tested individuals before and after they ran their first marathon using the self-efficacy instruments of Sherer and Button (Sherer, 1982; Sherer & Adams, 1983; Button et al., 1996). The determination reflected through the decision to perform at marathon level predetermined the outcome even before it was experienced (Carson, 2005). Permission to use the PIHMQ as a premission and postmission evaluation was declined for this study.

Second, determining the best intervals to assign the postmission PIHMQ—upon returning for each participant and again months to years after returning—would allow bracketing of the impact of this experience as the students incorporate it into their lives and plans.

In addition, further modifications of the PIHMQ might be appropriate for the specialized study of certain participant characterizations, such as personal or parental ethnicity identification as it relates to the international mission. Further studies could be

done among demographic subgroups as well. Eagly et al. (2003) showed that there may be a difference in the way men and women experience transformational and transactional learning, and there may be a difference contributed by the setting in which these different forms of learning take place.

Finally, repeated testings of mission participants would be helpful to determine when "saturation" is achieved and whether there might be the same rate of learning over repeated missions.

Study of the Durability of Transformational Learning

One area for future research concerns the durability of the transformational learning experienced through the international medical missions. Within the short time frame of this study, there did not appear to be any decay in the enthusiasm reflected in participants' evaluation of the mission experience immediately after returning from it. Most expressed an interest in preparing for a repeat mission, some of which were planned, and at least one had already gone several times more to not only the same site but to other sites as well.

One of the hallmarks of transformational learning is its durability in affecting behavior change over a protracted period of time and in new and different circumstances. Each of the participants who are or were students undergoes a status change at graduation. When they had applied to, say, medical school, they may each have envisioned what it would be like for them to be a physician, but before they could get to that point they had to go through this all-absorbing process of becoming something quite different—a medical student, a rite of passage toward what they thought they might

become after graduation. In the course of this medical education process, they had encountered this "other world" experience of the international medical mission, which was quite different from either the imagined world of what it might be like to be a physician, and the immediate and quite different experienced world of what it is to be a medical student.

This interim disconnect reminded each of them that they were in a transitory period of emergence and gave opportunity for them to focus on what this metamorphosis might result in, besides sharpening the image of the end-product of this transition with a great deal more of the reality now refining the projected picture of their earlier ideals. Reality of practice in a developing world gives both the glory and self-fulfillment of the attainment of some parts of their imagined futures and the harsh realities of the limits and discomforts of putting this into practice. "It is hard," several of them reported, and half of those added, "and I am ready to do it all over again."

How long does this enthusiasm last or does it, too, go through modification with another set of realities upon their return from an international health mission? One of the harsh realities is the "prolonged latency" of a protracted period of hard work in attaining full efficacy in licensure of their own independent judgments and actions. Postgraduate residency is even longer and may be more grueling than the undergraduate experience. Many of those interviewed in follow-up are in the middle of that next level of all-consuming preoccupation and have still not got to whatever modified view of their end-product might have been. How the international health experience and its transformational learning has affected this next level of "reality learning" may be assessed in the continuing follow-up and interviews of those who had completed the

earlier phase of this investigation as undergraduate health care students. Future investigations will continue these follow-up contacts out to a decade to assess how it may be still active in their ultimate practice careers after completing both the undergraduate and graduate transitions.

Study of the Differences of Medical Versus Surgical Missions

Different types of missions—medical versus surgical—have distinguishing qualities. In surgical missions, the immediacy and often dramatic impact of the surgical intervention and its demonstrable outcome are quite affecting for both the patients (and family and community) and the participating health care student as well. It is harder to see the impact of a course of antibiotics to cure a disease, since it may or may not work and if it does, it would likely not be under the immediate observation of the health care student involved with the course of treatment. But the student can see before his or her eyes the cleft lip repaired, the goiter removed, the limb straightened, the cataract removed. This immediacy in the change in the patient's life (for good or ill) often makes for a more rapid impact on the student as well, and the transformation often becomes epiphanal rather than gradual, as it might more often in a medical mission of screening clinics. A course of future study will involve the difference in the missions and the students' level at participation and the rate of transformation to see when it is that the trend in the numbers indicating these significant differences becomes "hard."

Study of the Role of the Leader in the Transformation Experience

Future studies may extend the investigation attempted in this series on the role of the leader in affecting the transformation of the health care students participating in the

mission. With a longer time course for evaluation, the same leader can follow students for a considerable period to ascertain the durability of this transformation presently carried out for a 2-year period and with the plan to follow at regular intervals for a decade to see the effect on practice behavior.

Study of the Long-Term Impact on In-Country Medical Practitioners

All the missions involved local health care personnel, with the intent of raising the capacity of indigenous health care; equipment was also left for this purpose, along with instructions in its use. This has established quite strong bonding of the on-site practitioners who are always available for consultation with the use of some technologies such as solar-paneled e-mail questions, patient clinical photographs, and even x-ray and specimen image transmission. Over time we will have the ability to track this association's further development. It was unlikely that the immersion into the environment in which they worked was nearly so "disorienting" to the personnel who were already "on the scene," fluent in the local languages, familiar with the resources and community in which they worked. They were very happy with the incremental improvements in the new techniques and equipment they were instructed in and mentored as they took over not just the doing, but also the teaching of the techniques they had just learned.

As an example, a number of missions were conducted in the South Sudan environment in which the "Lost Boys of Sudan" were being returned to take over as community leaders, having been educated as immigrants into first-world settings, now hoping to translate this help in the rebuilding of the devastated South Sudan after the

prolonged civil wars. Multiple agencies are interested in following each of these returned "Lost Boys," and our data are shared with them, just as the development agencies that had sponsored them granted us feedback. Recently graduated Philippine doctors were instructed in special techniques that they had not yet learned and are continuing to practice those techniques. The same has been true of a number of the recently graduated physicians and surgeons in Afghanistan who have been visited in their assigned outposts in the Hindu Kush for follow-up and further training. Further research can study the long-term impact of such efforts.

Study of the Impact on the Patients

An outcome health study would also seek to find how the transformational learning demonstrated in this study affected patient care. The follow-up of patients requires a more sophisticated approach than self-report surveys of the practitioner. It also raises issues on either side of the development barriers. In the developing world, follow-up is often impossible, since the patients only seek out help in the extremes of their disability and do not return since "they see no need to" if they are doing well. Record-keeping is often very difficult, especially in nomadic populations of illiterates. If the lessons learned are transported back home to the practice in patients in the developed world, many more records are accumulated, but there now is a barrier to access of such records with HIPAA regulations (in the U.S., "Health Information Privacy Act"), for which special permits would be required.

It is highly unlikely that patients treated by someone not undergoing a similar transformational international medical learning experience would consent to be followed

as a control group. Regarding the control group, there is a similar issue as with the before-and-after medical mission administration of the PIHMQ: one could not reasonably expect a group to complete the PIHMQ about an experience they have not only *not* experienced, but have no interest in or wish to experience.

Further Phenomenological Study

The quantitative analysis of this study confirms the hypotheses beyond a statistical doubt: the phenomenon of transformational learning is real and reproducible, with little chance that the association is random. Further phenomenological studies could better address why and how people become transformed through the mission eexperiences.

If the philosophical substrates consist of "meaning, mattering, truth, and consequences," the analysis of the data given shows the truth of these findings, and we might now ask the meaning of these consistent patterns. For that value added, the qualitative studies have been indicating the character of these responses and are being followed for their durability. In the "consequences," recommendations have been made and will be similarly analyzed when enacted for their results, and this will help evaluate the "mattering" for individual patients, practitioners, institutions, and health care policy and reform.

Concluding Remarks

With a single exception, participants in the medical missions involved in this study reported that the experience was of great personal and professional value in their lives and that the dramatic encounter with third-world patients brought about a new way

of thinking about human health and healing. The study has attempted to quantify some of these transformational learning responses in order to suggest a more generalized use of such medical mission experiences.

Enhancement of this effective means of medical education may warrant institutionalizing the process for greater participation in the benefits of the proven process for the students, the curriculum, the patients that the students encounter on the missions, and those to whom they will carry forward the lessons learned.

It had also become apparent to the researcher in the course of these studies that not only were medical missions valuable in transformational learning in his own life and the observed health care students' lives, but the study of the process has also refined and added value to the mission experience for those still to come.

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APPENDIX A:

INFORMED CONSENT FORM

Transformational Learning in Health Care Students
Through International Service
In Developing World Environments

School of Education and Human Development, IRB # 060639

Principal Investigator: Dr. Michael Marquardt
Researcher: Dr. Glenn Geelhoed

Informed Consent Form

I. INTRODUCTION: You are invited to take part in a research study. Before you decide to be a part of this study, you need to understand the risks and benefits. This consent form provides information about the research study. The researcher of this study will be available to answer your questions and provide further explanations. If you agree to take part in the research study, you will be asked to sign this consent form. This process is known as informed consent. Your decision to take part in the study is voluntary. You are free to choose whether or not you will take part in the study. Your participation or nonparticipation will not affect your grades or your academic records in the program.

II. PURPOSE: The purpose of this research study is to measure, describe, and compare the actual and perceived benefits of an international medical mission experience among medical students at The George Washington University School of Medicine and Health Sciences.

III. PROCEDURES: The research will be conducted at the George Washington University. Your participation would entail the following: Phase I: Filling out and sending the consent form to the researcher and answering a survey called the Perceptions of an International Health Mission Questionnaire (PIHMQ). The first phase is a questionnaire that elicits information about demographics as well as your perception, experience, and reflection on the international experience. Phase II: A follow-up questionnaire, which is a shortened version of the first one, administered 3 to 6 months after the first one to determine the long-term effects, if any, of this international experience.

IV. POSSIBLE RISKS: To the best of my knowledge, the things you will be doing have no more risk of harm than you would experience in everyday life. There can be some uncomfortable feelings during the process, because some questions on the questionnaire relate to your personal experience, reflection, and perception. The

researcher will try to make the questions as interesting and tactful as possible to reduce or eliminate these feelings. Other than that, no risks to the participants are involved.

V. POSSIBLE BENEFITS: You will not get any financial benefit from taking part in this study. The study will possibly benefit you by enriching you academically and personally, since it will provide an opportunity to reflect on your experiences and to understand cultural differences better. In addition, your participation may provide you with the satisfaction of helping advance knowledge in the area on intercultural learning in medical education.

VI. COSTS: There are no costs associated with taking part in this study.

VII. COMPENSATION: You will not receive compensation for participating in this study.

VIII. RIGHT TO WITHDRAW FROM THE STUDY: Your participation in this research study is voluntary. You may decide not to begin or to stop this study at any time. Your records will be used for research purposes only.

IX. CONFIDENTIALITY AND PRIVACY OF RESEARCH RECORDS: The nature of the study suggests that some of the participants may be aware of other participants. However, participants' names and records will be private. Your records will be used for research purposes only.

X. QUESTIONS: If you have questions about the procedures of this research study, please contact Dr. Glenn Geelhoed by calling (202) 994-4428 during workdays. If you have questions about the informed consent process or your rights as a research subject, please contact the Assistant Vice President for Health Research, Compliance and Technology Transfer at (202) 994-2995.

THIS IS TO CONFIRM THAT I HAVE READ THIS INFORMED CONSENT, THAT THIS STUDY HAS BEEN EXPLAINED TO ME, THAT MY QUESTIONS HAVE BEEN ANSWERED, AND THAT I AGREE TO PARTICIPATE AND TAKE PART IN THIS STUDY.

□ **NO** □ **YES**

_____ _____

Signature **Date**

APPENDIX B:

PERCEPTIONS OF AN INTERNATIONAL HEALTHCARE MISSION

QUESTIONNAIRE

Directions: Please circle the number that best corresponds to your reply to each question. There is no right or wrong answer. The question response reflects your **thoughts and feelings** about your experiences as a health care professional student on your International Healthcare Mission (IHM).

l. From participating on the IHM, how much new knowledge did you learn about:

	None **1**	**Minimal** **2**	**Moderate** **3**	**Significant** **4**	**Tremendous** **5**
a. A different country	1	2	3	4	5
b. Health care in another country	1	2	3	4	5
c. A different culture	1	2	3	4	5
d. Health beliefs in another culture	1	2	3	4	5
e. Health care professionals in another country	1	2	3	4	5

Directions: For the next series of questions, please rate the degree of change in your thinking/cognitive skills that you can attribute to your participation on the IHM.

2. From participating on an IHM, how much did your thinking/cognitive skills *improve* in the areas listed below?

	No change 1	**Minimal 2**	**Moderate 3**	**Significant 4**	**Tremendous change 5**
a. Gathering patient health history information	1	2	3	4	5
b. Collecting pertinent information about the patient's environment	1	2	3	4	5
c. Considering information about a patient's economic status	1	2	3	4	5
d. Gathering information about the patient's support system	1	2	3	4	5
e. Considering other resources available to the patient	1	2	3	4	5
f. Ease of using previously learned physical assessment skills	1	2	3	4	5
g. "New" uses for learned physical assessment skills	1	2	3	4	5
h. Learning about the strengths of other health care disciplines	1	2	3	4	5
i. Learning your health discipline's role on the health care team	1	2	3	4	5
j. Learning about diseases not typically found in the U.S.	1	2	3	4	5
k. Learning about treatments not typically considered in the U.S.	1	2	3	4	5
l. Considering alternatives to traditional "Western" medical care	1	2	3	4	5

Directions: For the next series of questions, please rate how ***much*** you may have changed your ideas about the United States health care system after participating on an IHM.

3. After participating in an IHM . . .

	Strongly disagree 1	**Disagree 2**	**Not sure 3**	**Agree 4**	**Strongly agree 5**
a. My view of the U.S. health care resources became more positive	1	2	3	4	5
b. My view of U.S. health care quality became more negative	1	2	3	4	5
c. My opinion of U.S. health care availability became more positive	1	2	3	4	5
d. My beliefs on health care availability for the indigent in the U.S. became more negative	1	2	3	4	5
e. My opinion of U.S. health care services for persons from another country in the U.S. became more positive	1	2	3	4	5
f. I believe people from another culture or country receive quality health care in the U.S.	1	2	3	4	5

Directions: For the next series of questions, please rate how your self-confidence may have changed after participating on an IHM.

4. The IHM experience changed my *confidence* . . .

	Decreased 0	No change 1	Improvement			
			Minimal 2	Mod-erate 3	Signifi-cant 4	Tremen-dous 5
a. Working with patients	0	1	2	3	4	5
b. Working on a multi-*disciplinary* health team	0	1	2	3	4	5
c. Working on a multi-*cultural* health care team	0	1	2	3	4	5
d. Working with families from cultures other than mine	0	1	2	3	4	5
e. Working as a health care professional	0	1	2	3	4	5
f. Helping others work with people from other cultures	0	1	2	3	4	5

Directions: For the next series of questions, please rate your beliefs about any changes in your abilities to perform various professional tasks after participating on an IHM.

5. The IHM experiences changed my ability to . . .

	Decreased 0	No change 1	Improvement			
			Minimal 2	Mod-erate 3	Signifi-cant 4	Tremen-dous 5
a. Assess patient health problems	0	1	2	3	4	5
b. Assess patient needs	0	1	2	3	4	5
c. Plan patient treatment(s)	0	1	2	3	4	5
d. Provide patient education	0	1	2	3	4	5
e. Provide patient treatment(s)	0	1	2	3	4	5
f. Evaluate plan of patient care/treatment(s)	0	1	2	3	4	5
g. Evaluate results of patient education	0	1	2	3	4	5
h. Effectively work on a multidisciplinary team	0	1	2	3	4	5
i. Effectively work on a multicultural team	0	1	2	3	4	5
j. Work with patients/families from cultures other than my own	0	1	2	3	4	5
k. Help coworkers understand the needs of patients or people from another cultures	0	1	2	3	4	5

Directions: The next series of questions asks you about how the IHM may have changed your attitudes. Please rate how much the IHM changed your attitudes in each of the areas listed below:

6. To what degree did participating on an IHM increase my awareness of . . .

	No change 1	**Minimal 2**	**Moderate 3**	**Signifi-cant 4**	**Tremen-dous 5**
a. The culture of a different country	1	2	3	4	5
b. A different type of health care	1	2	3	4	5
c. The influence of culture on health	1	2	3	4	5
d. The influence of environment on health	1	2	3	4	5
e. The influence of individual beliefs on health					
f. The influence of economic status on health	1	2	3	4	5
g. The influence of support systems on health	1	2	3	4	5
h. My preconceptions of individuals from another country	1	2	3	4	5
i. The need to mediate for individuals of another culture in the U.S.	1	2	3	4	5

Directions: The next series of questions asks about how the IHM may have changed your feelings. Please rate how much the IHM changed your feelings in each of the areas listed below:

7. To what degree did participation in an IHM change my . . .

			Improvement			
	Decreased 0	**No Change 1**	**Mini-mal 2**	**Mod-erate 3**	**Signifi-cant 4**	**Tremen-dous 5**
a. Empathy towards others on return from the IHM	0	1	2	3	4	5
b. Ability to be sensitive to the needs of those from a different culture	0	1	2	3	4	5
c. Ability to be sensitive to the needs of those from a different country	0	1	2	3	4	5
d. Ability to be patient with non-U.S. citizens	0	1	2	3	4	5
e. Tolerance towards beliefs other than my own	0	1	2	3	4	5
f. Adaptability in different situations	0	1	2	3	4	5

Directions: The next series of questions asks you about how the IHM may have been a "life-changing" experience for you. Please rate how much you may have changed in each of the areas listed below.

8. To what degree did participating in the IHM help me . . .

	No change 1	**Minimal 2**	**Mod-erate 3**	**Signifi-cant 4**	**Tremen-dous 5**
a. Learn about myself	1	2	3	4	5
b. Reflect on my beliefs	1	2	3	4	5
c. Connect with the emotions of caring for and comforting individuals, or nontechnological aspects of care	1	2	3	4	5
d. Recognize patients as unique individuals	1	2	3	4	5
e. Gain respect for other health care team members	1	2	3	4	5
f. Gain respect for my peers	1	2	3	4	5
g. Gain respect for patients	1	2	3	4	5
h. Gain respect for people from other cultures	1	2	3	4	5
i. Gain respect for people from other religions	1	2	3	4	5
j. Gain respect for people from other economic classes	1	2	3	4	5

Participant Demographics

9. What is your gender?
    ____ Male
    ____ Female

10. Which age range are you in?
    ____ 20–24
    ____ 25–29
    ____ 30–34
    ____ Over 35

11. In which health care discipline are you a student?
    ____ Nursing graduate
    ____ Nursing undergraduate
    ____ Medicine graduate
    ____ Medicine undergraduate
    ____ Physician assistant
    ____ Pharmacy
    ____ Public health
    ____ Other (please specify)_____

12. In which group do you consider yourself a member?
    ____ American Indian or Alaska Native
    ____ Asian
    ____ African or African American
    ____ Hispanic
    ____ Native Hawaiian or other Pacific Islander
    ____ Caucasian

13. Do you affiliate with a religious denomination? If so, which one?
    ____ Buddhist
    ____ Catholic
    ____ Hindu
    ____ Jewish
    ____ Muslim
    ____ Protestant
    ____ Other (please specify)_____
    ____ No religious affiliation

14. What language(s) besides English do you speak? (Circle as many as apply)
    ____ Arabic (including Farsi and Urdu)
    ____ Spanish
    ____ French
    ____ Chinese (any dialect)
    ____ Indian (any dialect)
    ____ Other (please specify)_____

15. At the time of your **first mission experience**, how far along were you into your health care professional program?

____ First year
____ Second year
____ Third year
____ Fourth year
____ Other (please specify)_____

16. How many international medical missions (IHM) have you participated in?

____ One
____ Two
____ Three
____ Four or more

17. At the time of your **most recent mission experience** how far along were you into your health care professional program?

____ First year
____ Second year
____ Third year
____ Fourth year
____ Other (please specify)_____

18. How long ago did you participate on your last IHM?

____ Within the last month
____ One to three months ago
____ Four to six months ago
____ Seven to nine months ago
____ Ten to twelve months ago
____ Over a year ago

19. Have you had any travel to an impoverished population (in, or outside, the USA) prior to your first IHM?

____ Yes
i) Where?_____ ii) Purpose?_____
____ No

20. Which country hosted your most recent medical mission?

____ Haiti
____ Dominican Republic
____ Rwanda
____ Malawi
____ Somaliland
____ Eritrea
____ Philippines
____ Other (please specify) _____

Directions: For each of the following questions, feel free to extend your response to the backside of this page or add extra sheets if you would care to expand on your answers.

21. Could you describe how the experiences on the IHM may have changed you?

22. Please list the factor(s) that influenced your decision to participate in the IHM.

23. What issues or ambiguities about this trip may have made you anxious, and what did you expect to encounter that might have been unpleasant or uncomfortable, which were realized, and which were least, which most surprising? What fears did you have about the travel, the mission venue or the peoples served or the companions you would be working with or health care workers you would be guided by?

24. In what way do you think this medical mission has changed you with respect to: a) what you know about medicine; b) how you will feel about patients who need care; c) the variety of different people and their lifestyles you will have encountered; d) and how do you think it has changed you personally?

Please return your completed survey to your mission leader or to

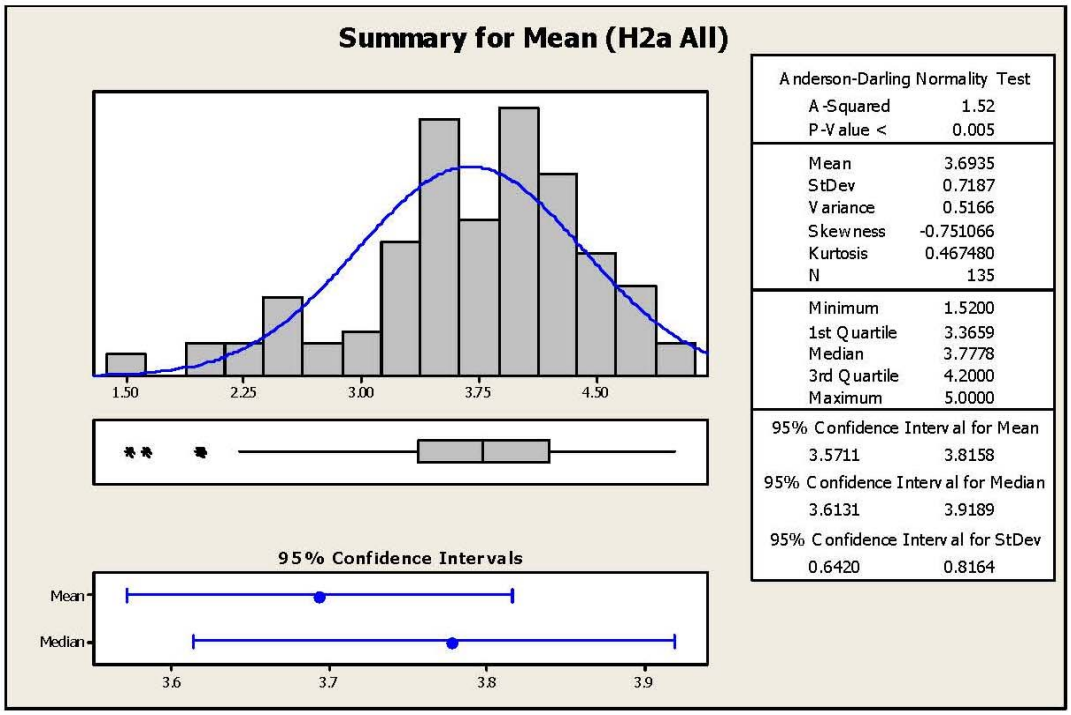
Dr. Glenn W. Geelhoed
Ross Hall 741, Office of the Dean
George Washington University Medical Center
2300 I Street NW
Washington, DC 20037.

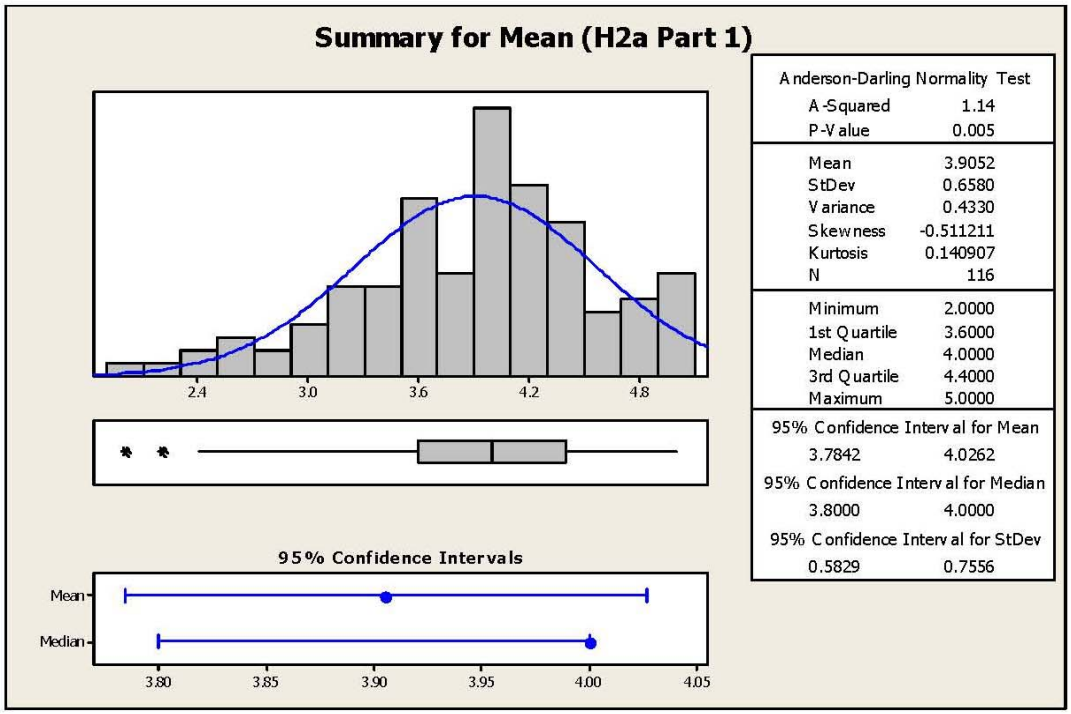
Thank you very much for your participation in this research and evaluation of international medical mission experience. All your responses will be carefully protected to assure anonymity.

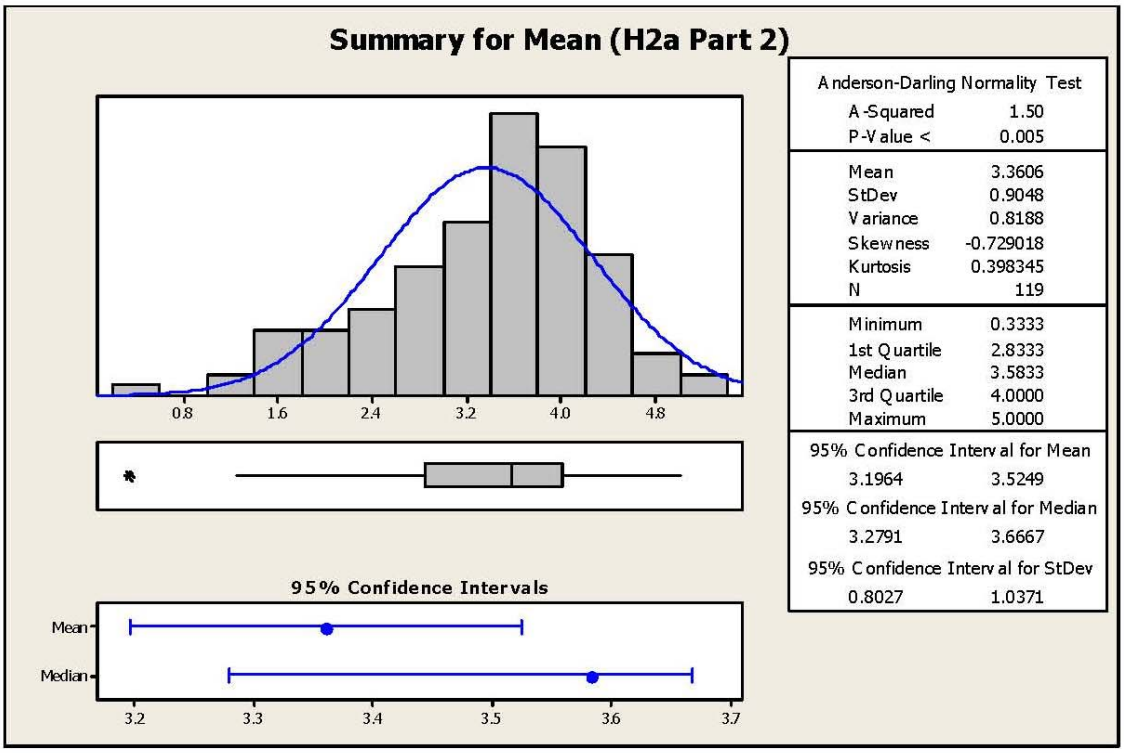
For any questions, you may call Dr. Glenn W. Geelhoed, George Washington University Medical Center, at 202/994-4428 (office) or 240/401-0247 (cell) or msdgwg@gwumc.edu (email).

APPENDIX C:

ADDITIONAL ANALYSES FOR HYPOTHESIS 2A



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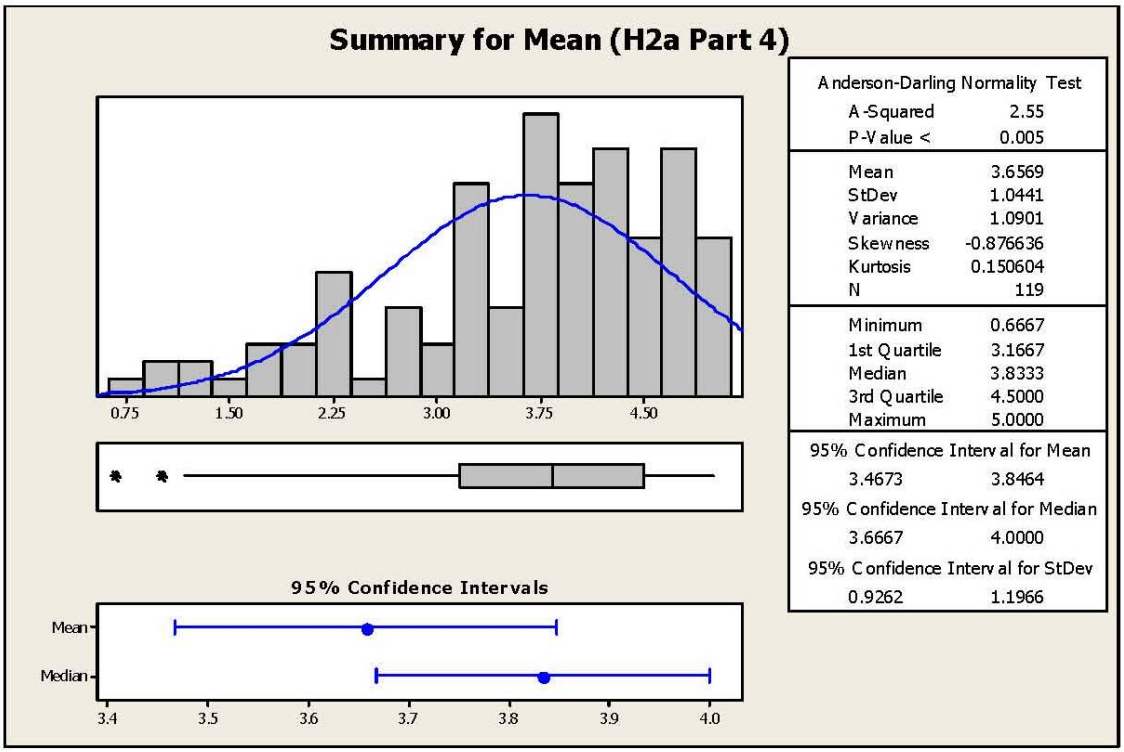
1.6
2.4
3.2
4.0
4.8
95% Confidence Intervals
Mean
Median
3.2
3.3
3.4
3.5
3.6
3.7
Anderson-Darling Normality Test
A-Squared 1.50
P-Value < 0.005
Mean 3.3606
StDev 0.9048
Variance 0.8188
Skewness -0.729018
Kurtosis 0.398345
N 119
Minimum 0.3333
1st Quartile 2.8333
Median 3.5833
3rd Quartile 4.0000
Maximum 5.0000
95% Confidence Interval for Mean
3.1964 3.5249
95% Confidence Interval for Median
3.2791 3.6667
95% Confidence Interval for StDev
0.8027 1.0371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3.75
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95% Confidence Intervals
Mean
Median
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3.5
3.6
3.7
3.8
3.9
4.0
Anderson-Darling Normality Test
A-Squared 2.55
P-Value < 0.005
Mean 3.6569
StDev 1.0441
Variance 1.0901
Skewness -0.876636
Kurtosis 0.150604
N 119
Minimum 0.6667
1st Quartile 3.1667
Median 3.8333
3rd Quartile 4.5000
Maximum 5.0000
95% Confidence Interval for Mean
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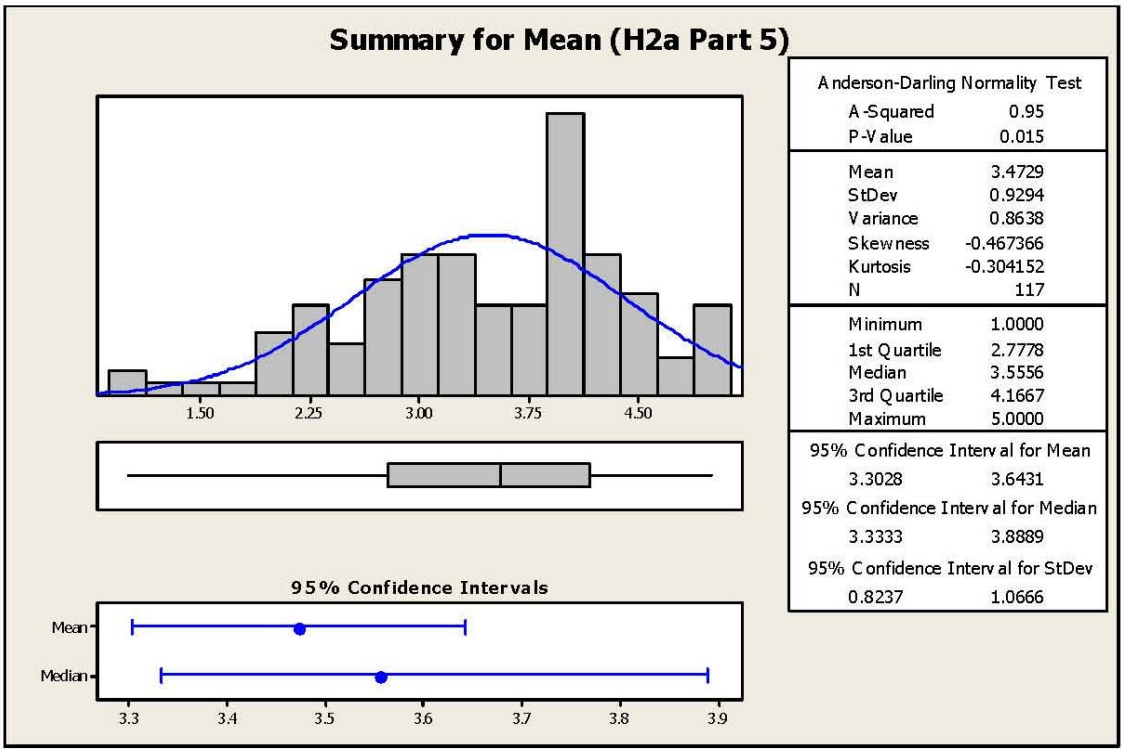
95% Confidence Interval for Median
3.6667 4.0000
95% Confidence Interval for StDev
0.9262 1.1966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95% Confidence Intervals
Mean
Median
3.3
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3.5
3.6
3.7
3.8
3.9
Anderson-Darling Normality Test
A-Squared 0.95
P-Value 0.015
Mean 3.4729
StDev 0.9294
Variance 0.8638
Skewness -0.467366
Kurtosis -0.304152
N 117
Minimum 1.0000
1st Quartile 2.7778
Median 3.5556
3rd Quartile 4.1667
Maximum 5.0000
95% Confidence Interval for Mean
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95% Confidence Interval for Median
3.3333 3.8889
95% Confidence Interval for StDev
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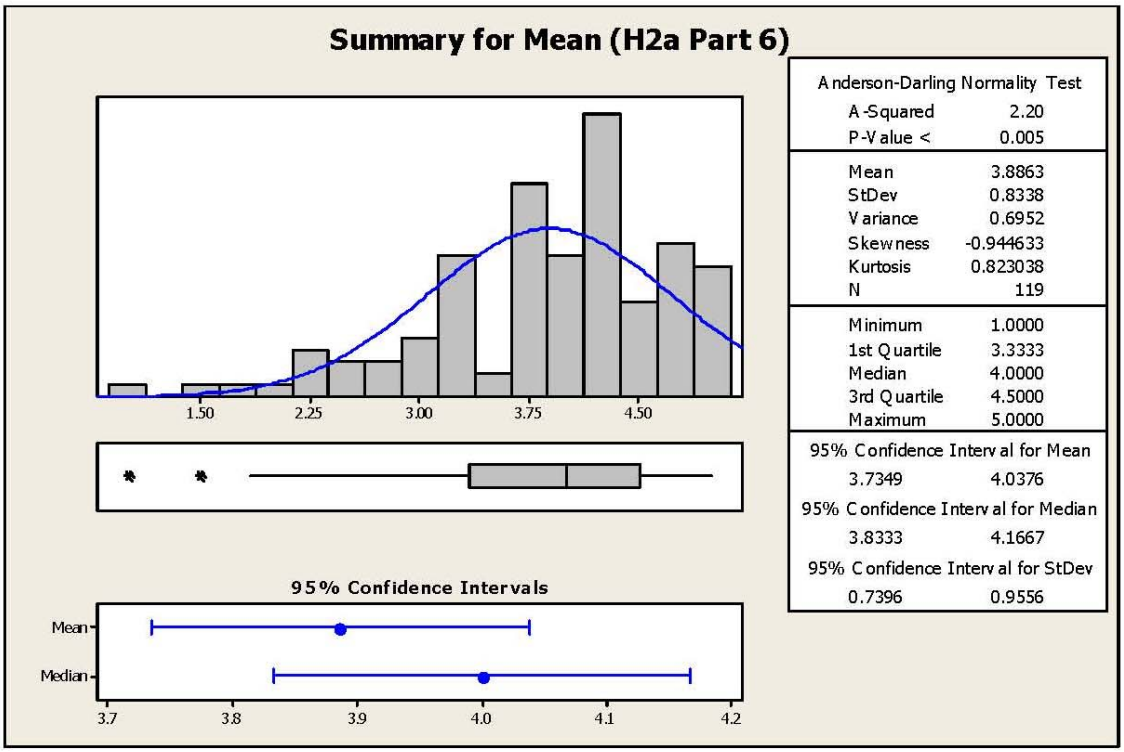
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Median
3.7
3.8
3.9
4.0
4.1
4.2
Anderson-Darling Normality Test
A-Squared 2.20
P-Value < 0.005
Mean 3.8863
StDev 0.8338
Variance 0.6952
Skewness -0.944633
Kurtosis 0.823038
N 119
Minimum 1.0000
1st Quartile 3.3333
Median 4.0000
3rd Quartile 4.5000
Maximum 5.0000
95% Confidence Interval for Mean
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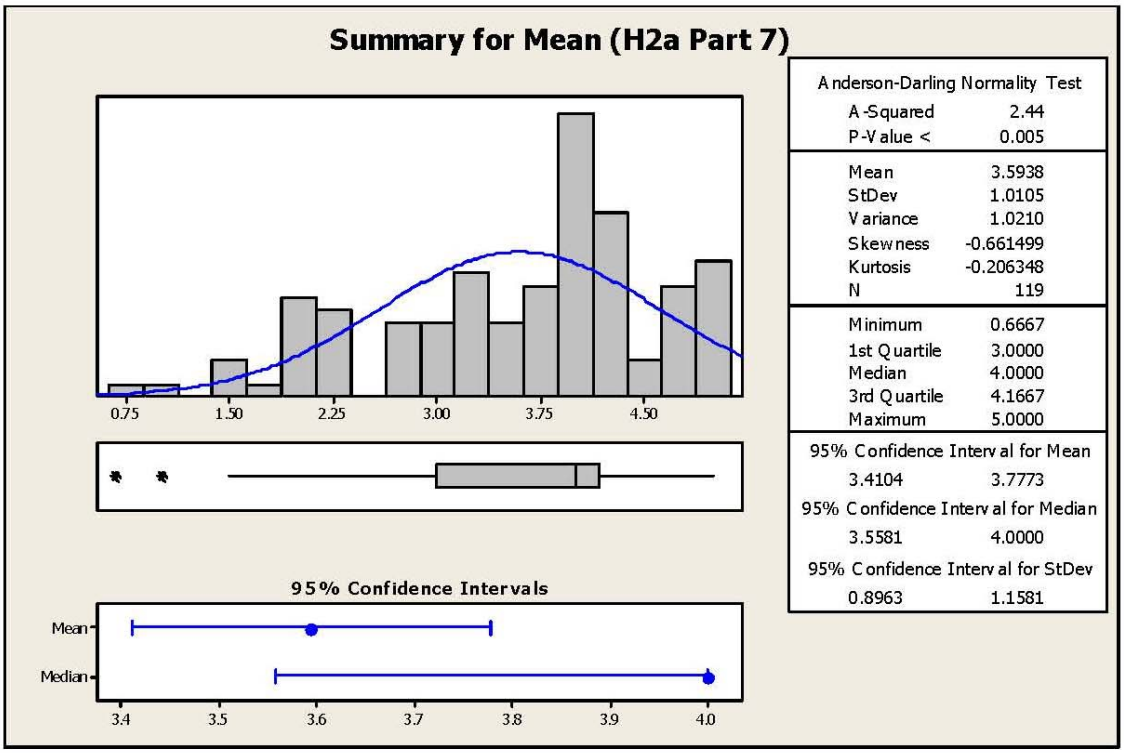
95% Confidence Interval for Median
3.8333 4.1667
95% Confidence Interval for StDev
0.7396 0.9556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95% Confidence Intervals
Mean
Median
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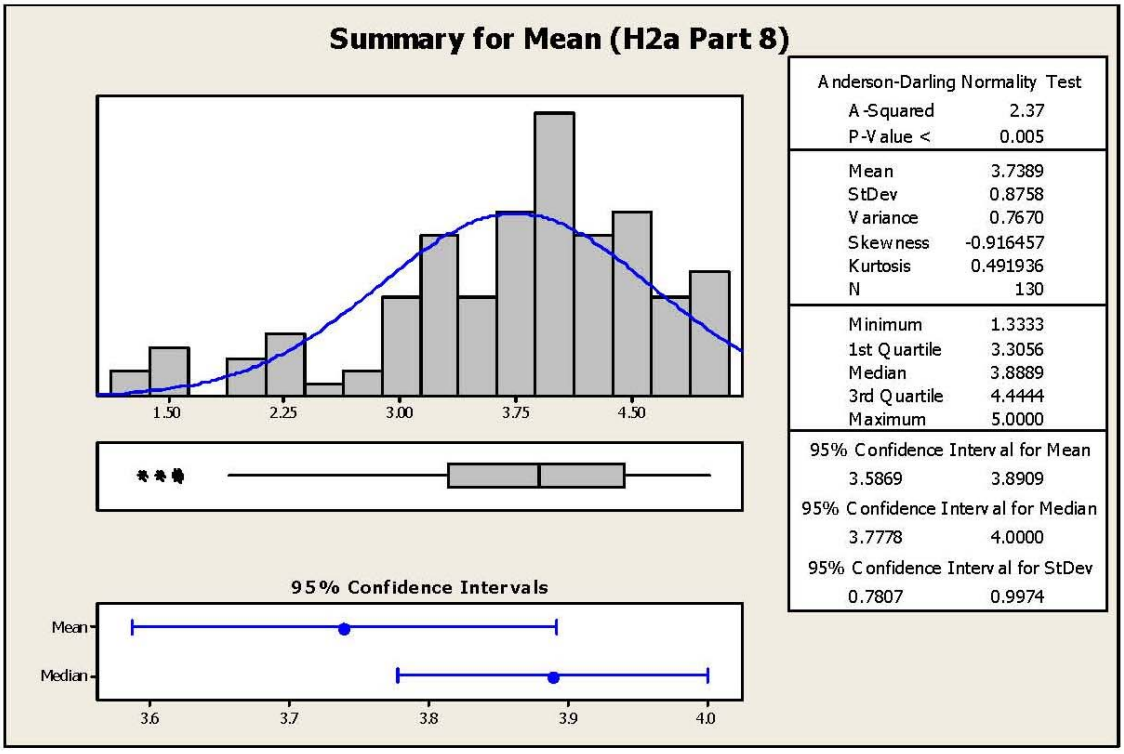
3.5
3.6
3.7
3.8
3.9
4.0
Anderson-Darling Normality Test
A-Squared 2.44
P-Value < 0.005
Mean 3.5938
StDev 1.0105
Variance 1.0210
Skewness -0.661499
Kurtosis -0.206348
N 119
Minimum 0.6667
1st Quartile 3.0000
Median 4.0000
3rd Quartile 4.1667
Maximum 5.0000
95% Confidence Interval for Mean
3.4104 3.7773
95% Confidence Interval for Median
3.5581 4.0000
95% Confidence Interval for StDev
0.8963 1.1581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Mean
Median
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3.7
3.8
3.9
4.0
Anderson-Darling Normality Test
A-Squared 2.37
P-Value < 0.005
Mean 3.7389
StDev 0.8758
Variance 0.7670
Skewness -0.916457
Kurtosis 0.491936
N 130
Minimum 1.3333
1st Quartile 3.3056
Median 3.8889
3rd Quartile 4.4444
Maximum 5.0000
95% Confidence Interval for Mean
3.5869 3.8909
95% Confidence Interval for Median
3.7778 4.0000
95% Confidence Interval for StDev
0.7807 0.9974

APPENDIX D:

ANALYSES OF EFFECT OF ADDITIONAL FACTORS

One-way ANOVA: MeanH3cAll versus Leader

Source	DF	SS	MS	F	P
Leader	6	5.233	0.872	1.09	0.373
Error	125	100.091	0.801		
Total	131	105.325			

S = 0.8948 R-Sq = 4.97% R-Sq(adj) = 0.41%

Level	N	Mean	StDev	Individual 95% CIs For Mean Based on Pooled StDev
Bill Schnackel	11	4.2493	0.6886	(--------*--------)
GG	51	3.5975	1.0809	(---*---)
GWU	8	3.5795	0.7141	(----------*----------)
Other	6	3.3356	1.2219	(-----------*-----------)
Richard Pat	22	3.7802	0.7819	(-----*-----)
Sarah Underwood	9	3.8098	0.4787	(---------*---------)
Will Schmitt	25	3.8073	0.6840	(----*-----)
				3.00 3.60 4.20 4.80

Pooled StDev = 0.8948

One-way ANOVA: MeanH3cAll versus Experience

```
Source   DF      SS     MS     F      P
I11       1   1.773  1.773  2.13  0.147
Error   112  93.238  0.832
Total   113  95.011

S = 0.9124   R-Sq = 1.87%   R-Sq(adj) = 0.99%


                          Individual 95% CIs For Mean Based on
                          Pooled StDev
Level   N    Mean   StDev  ----+---------+---------+---------+-----
No     40  3.7895  0.7771           (--------------*--------------)
Yes    74  3.5282  0.9770  (----------*----------)
                          ----+---------+---------+---------+-----
                            3.40      3.60      3.80      4.00

Pooled StDev = 0.9124
```

One-way ANOVA: MeanH3cAll versus Medical Expertise

```
Source    DF       SS     MS     F      P
Medical Expertise    4    6.655  1.664  2.09  0.085
Error    128  101.754  0.795
Total    132  108.409

S = 0.8916   R-Sq = 6.14%   R-Sq(adj) = 3.21%


                                  Individual 95% CIs For Mean Based on
                                  Pooled StDev
Level          N    Mean   StDev   -+---------+---------+---------+--------
Med G         43  3.6049  0.9871         (-------*-------)
Med U         21  3.7293  0.5892          (-----------*-----------)
Nursing       27  4.0623  0.7442                    (---------*---------)
other         31  3.4322  1.0833   (--------*--------)
Paramedical   11  3.9091  0.6543          (---------------*--------------)
                                   -+---------+---------+---------+--------
                                  3.15      3.50      3.85      4.20

Pooled StDev = 0.8916
```

One-way ANOVA: MeanH3cAll versus Religion

```
Source    DF       SS     MS     F      P
Religion   4    2.267  0.567  0.69  0.603
Error    128  105.663  0.825
Total    132  107.930

S = 0.9086   R-Sq = 2.10%   R-Sq(adj) = 0.00%


Level        N    Mean   StDev
Catholic    31  3.7898  0.8964
Muslim      11  3.9911  0.8419
None        17  3.5711  0.8928
Other       26  3.7682  0.7693
Protestant  48  3.5809  0.9991

            Individual 95% CIs For Mean Based on Pooled StDev
Level         +---------+---------+---------+---------
Catholic               (--------*---------)
Muslim                 (----------------*----------------)
None          (-----------*-----------)
Other                (---------*---------)
Protestant         (------*-------)
              +---------+---------+---------+---------
            3.15      3.50      3.85      4.20

Pooled StDev = 0.9086
```

One-way ANOVA: MeanH3cAll versus Country

```
Source    DF       SS     MS     F      P
Country    7    5.739  0.820  1.02  0.420
Error    124   99.585  0.803
Total    131  105.325

S = 0.8962   R-Sq = 5.45%   R-Sq(adj) = 0.11%


                                  Individual 95% CIs For Mean Based on
                                  Pooled StDev
Level            N    Mean   StDev  --+---------+---------+---------+-------
Duk Payuel       9  3.5152  1.1373  (-----------*-----------)
Haiti            8  3.5795  0.7141   (------------*-----------)
Honduras        12  4.2047  0.6744                (---------*---------)
Nicaragua       25  3.8073  0.6840             (------*------)
Other           11  3.4570  1.2526  (----------*----------)
Philippines     40  3.5769  1.0243         (-----*----)
Soddo Ethiopia  10  3.8955  0.5264          (----------*----------)
Sudan           17  3.8545  0.8038           (--------*--------)
                                  --+---------+---------+---------+-------
                                  3.00      3.50      4.00      4.50

Pooled StDev = 0.8962
```

One-way ANOVA: MeanH3cAll versus Ethnicity

```
Source     DF       SS     MS     F      P
Ethnicity   3   15.797  5.266  7.46  0.000
Error     129   91.008  0.705
Total     132  106.806

S = 0.8399   R-Sq = 14.79%   R-Sq(adj) = 12.81%


                                Individual 95% CIs For Mean Based on
                                Pooled StDev
Level       N    Mean   StDev  --------+---------+---------+---------+-
African    10  4.2255  0.5787                      (------*-------)
Asian      18  3.9246  0.4179                   (-----*-----)
Caucasian  93  3.7220  0.8880                    (-*--)
Other      12  2.6964  1.0650  (------*-----)
                                --------+---------+---------+---------+-
                                      2.80      3.50      4.20      4.90

Pooled StDev = 0.8399
```

One-way ANOVA: Mean Q1 versus Ethnicity

```
Source     DF      SS     MS     F      P
Ethnicity   3   5.879  1.960  5.00  0.003
Error     112  43.918  0.392
Total     115  49.797

S = 0.6262   R-Sq = 11.81%   R-Sq(adj) = 9.44%


                                Individual 95% CIs For Mean Based on
                                Pooled StDev
Level       N    Mean   StDev  -------+---------+---------+---------+--
African    10  3.8400  0.7106                 (----------*----------)
Asian      15  3.6933  0.5175              (---------*--------)
Caucasian  81  4.0296  0.6341                             (---*---)
Other      10  3.2800  0.6197  (----------*----------)
                                -------+---------+---------+---------+--
                                     3.15      3.50      3.85      4.20

Pooled StDev = 0.6262
```

One-way ANOVA: Mean Q2 versus Ethnicity

```
Source     DF      SS     MS     F      P
Ethnicity   3  11.722  3.907  5.29  0.002
Error     115  84.891  0.738
Total     118  96.613

S = 0.8592   R-Sq = 12.13%   R-Sq(adj) = 9.84%


                                Individual 95% CIs For Mean Based on
                                Pooled StDev
Level       N    Mean   StDev  -------+---------+---------+---------+--
African    10  3.8250  0.6180                       (--------*--------)
Asian      15  3.3167  0.9265                 (------*-------)
Caucasian  82  3.4390  0.8561                      (--*--)
Other      12  2.4931  0.9571  (--------*-------)
                                -------+---------+---------+---------+--
                                     2.40      3.00      3.60      4.20

Pooled StDev = 0.8592
```

One-way ANOVA: Mean Q3 versus Ethnicity

```
Source     DF      SS     MS     F      P
Ethnicity   3  11.192  3.731  8.39  0.000
Error     109  48.473  0.445
Total     112  59.665

S = 0.6669   R-Sq = 18.76%   R-Sq(adj) = 16.52%


                                Individual 95% CIs For Mean Based on
                                Pooled StDev
Level       N    Mean   StDev  ---+---------+---------+---------+------
African    10  3.3000  0.4289                      (------*------)
Asian      12  3.3056  0.5405                       (-----*-----)
Caucasian  81  2.7798  0.7041                  (-*--)
Other      10  2.0500  0.6623  (------*------)
                                ---+---------+---------+---------+------
                                 1.80      2.40      3.00      3.60

Pooled StDev = 0.6669
```

One-way ANOVA: Mean Q4 versus Ethnicity

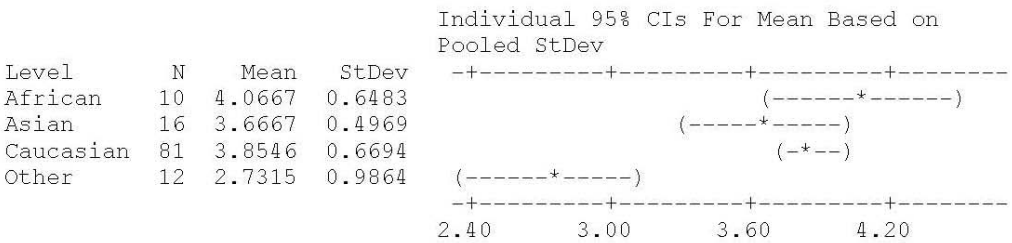
```
Source    DF       SS     MS     F      P
Ethnicity    3   21.813  7.271  7.83  0.000
Error      115  106.814  0.929
Total      118  128.627

S = 0.9638   R-Sq = 16.96%   R-Sq(adj) = 14.79%


                                Individual 95% CIs For Mean Based on
                                Pooled StDev
Level       N    Mean   StDev  ----+---------+---------+---------+-----
African    10  4.5167  0.4743                          (------*-------)
Asian      16  4.0313  0.4915                    (-----*-----)
Caucasian  81  3.6255  1.0719                   (-*--)
Other      12  2.6528  0.9169  (------*------)
                                ----+---------+---------+---------+-----
                                  2.40      3.20      4.00      4.80

Pooled StDev = 0.9638
```

One-way ANOVA: Mean Q5 versus Ethnicity

```
Source    DF       SS     MS     F      P
Ethnicity    3   12.562  4.187  4.26  0.007
Error      113  111.030  0.983
Total      116  123.591

S = 0.9912   R-Sq = 10.16%   R-Sq(adj) = 7.78%


                                Individual 95% CIs For Mean Based on
                                Pooled StDev
Level       N    Mean   StDev  ----+---------+---------+---------+-----
African    10  3.8000  0.7747                     (--------*--------)
Asian      15  3.4242  0.8649                  (------*------)
Caucasian  80  3.2920  1.0588                    (--*--)
Other      12  2.3864  0.7744  (-------*-------)
                                ----+---------+---------+---------+-----
                                  2.10      2.80      3.50      4.20

Pooled StDev = 0.9912
```

One-way ANOVA: Mean Q6 versus Ethnicity

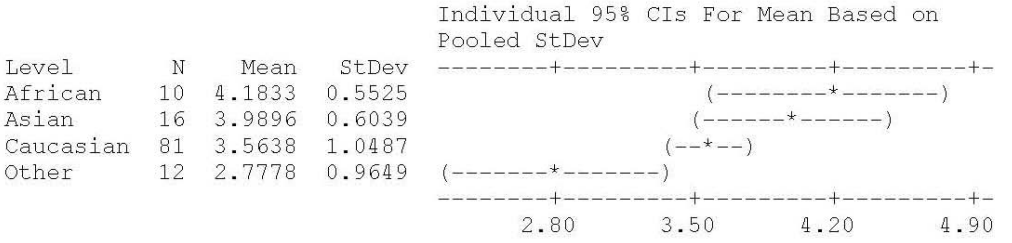
```
Source     DF      SS     MS      F      P
Ethnicity   3  14.418  4.806  10.23  0.000
Error     115  54.032  0.470
Total     118  68.450

S = 0.6855   R-Sq = 21.06%   R-Sq(adj) = 19.00%
```




```
Pooled StDev = 0.6855
```

One-way ANOVA: Mean Q7 versus Ethnicity

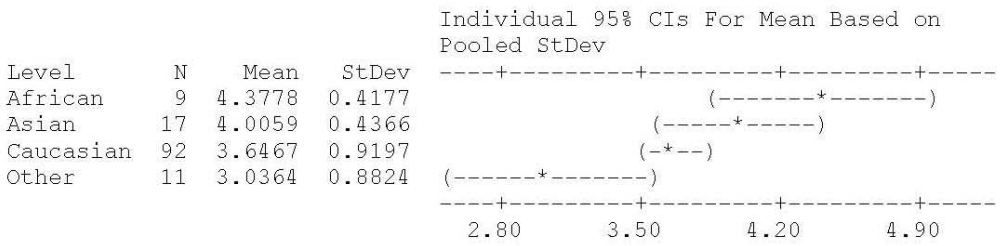
```
Source     DF       SS     MS     F      P
Ethnicity   3   14.045  4.682  5.06  0.003
Error     115  106.434  0.926
Total     118  120.480

S = 0.9620   R-Sq = 11.66%   R-Sq(adj) = 9.35%
```




```
Pooled StDev = 0.9620
```

One-way ANOVA: Mean Q8 versus Ethnicity

```
Source     DF       SS     MS     F      P
Ethnicity   3   10.824  3.608  5.06  0.002
Error     125   89.199  0.714
Total     128  100.024

S = 0.8447   R-Sq = 10.82%   R-Sq(adj) = 8.68%
```




```
Pooled StDev = 0.8447
```

Correlations: MeanHAll, Mean 7, MeanH2aAll, MeanH2bQ5, MeanH2cAll, Mean Q3, ...

	MeanHAll	Mean 7	MeanH2aAll	MeanH2bQ5	MeanH2cAll
Mean 7	0.568				
	0.000				
MeanH2aAll	0.826	0.835			
	0.000	0.000			
MeanH2bQ5	0.703	0.595	0.825		
	0.000	0.000	0.000		
MeanH2cAll	0.657	0.887	0.935	0.737	
	0.000	0.000	0.000	0.000	
Mean Q3	0.323	0.461	0.466	0.301	0.472
	0.000	0.000	0.000	0.001	0.000
Mean Q4	0.625	0.674	0.855	0.787	0.888
	0.000	0.000	0.000	0.000	0.000
MeanH3cAll	0.557	0.730	0.879	0.694	0.862
	0.000	0.000	0.000	0.000	0.000

	Mean Q3	Mean Q4
Mean Q4	0.388	
	0.000	
MeanH3cAll	0.484	0.750
	0.000	0.000

```
Cell Contents: Pearson correlation
               P-Value
```