Geographic Literacy Among LDS Returned Missionaries

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GEOGRAPHIC LITERACY AMONG LDS RETURNED MISSIONARIES

by

Paul Cook Stahmann

A thesis submitted to the faculty of

Brigham Young University

in partial fulfillment of the requirements for the degree of

Master of Science

Department of Geography

Brigham Young University

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GRADUATE COMMITTEE APPROVAL

of a thesis submitted by

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ABSTRACT

GEOGRAPHIC LITERACY AMONG LDS RETURNED MISSIONARIES

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Department of Geography

Master of Science

The majority of male Ricks College students, while serving as missionaries for the Church of Jesus Christ of Latter-day Saints, spend two years living in geographically unfamiliar environments. This thesis compares the geographic literacy of those Ricks College males who have served LDS Church missions with those who have not. A test of geographic literacy was administered to 306 male Ricks College students. Returned missionaries demonstrated significantly higher knowledge of general cultural and physical geography than pre-missionaries. In contrast, returned missionaries demonstrated no greater ability to identify global places such as countries and cities. As expected, the returned missionaries possessed a superior knowledge of the regions in which they served.
ACKNOWLEDGMENTS

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CHAPTER 1

Introduction

What is Geography?

Geography is the knowledge and understanding of phenomena spatially distributed on the Earth’s surface. It is also the study of human landscapes and natural landscapes or the interrelationships and processes between these landscapes. A widely accepted professional definition of geography as stated by the Association of American Geographers is:

Geography is the science of place and space. Geographers ask where things are located on the surface of the earth, why they are located where they are, how places differ from one another, and how people interact with the environment. There are two main branches of geography: human geography and physical geography (AAG 1999).

Geography gives us the ability to understand “why” as well as “where” and “what.”

Practical knowledge of geography is important. As discussed in the literature, a knowledge of geography is important to understand our foreign trading partners, allies, and enemies and their customs and issues. As Gilbert Grosvenor stated, “Indeed, our economic future depends on geographic literacy (Pan Newsletter 1988).”

More than 300 male Ricks College students were asked to provide their own definition of what geography is. See Ricks College Geography Survey, question 35. The following are samples of their responses:

“The study of maps, people, and their ways of life.” Age 22, returned missionary from Sugar City, Idaho.

“Map reading and the locating of states, countries, continents, lakes, mountain ranges, etc.” Age 22, returned missionary from Mesa, Arizona.
"Study of land, location, and culture." Age 18, pre-missionary from Portland, Oregon.

"Where countries are on the map." Age 21, returned missionary from Duluth, Minnesota.

"The study of society - physical and human." Age 21, returned missionary from Sparwood, British Columbia, Canada.

"The study of the earth and things on it." Age 21, returned missionary from West Valley City, Utah

"The study of where things are in the world and their characteristics - topography, climates, people, cultures, etc." Age 21, returned missionary from Aurora, Colorado.

"Geography is all kinds of relationships and interactions within the space of the earth." Age 17, pre-missionary from Hong Kong, China.

"The study of all the countries in the world." Age 18, pre-missionary from Pretoria, South Africa.

These responses indicate that many Ricks College students have a partial but limited understanding of what geography is. One of the great challenges in the discipline of geography is overcoming a public misconception that geography is no more than place name trivia.

Geographic Knowledge and Literacy

General geographic knowledge is 1) information about and 2) understanding of the world we live in (i.e. cultural/human geography) and about the world we live on (i.e. physical geography). Geographic literacy is defined as 1) knowing where a location is in a spatial context (i.e., a map) and 2) having a sense of "whereness" (Manson 1977). Geographic knowledge and literacy of both students and non-students has been studied in the United States for the past few decades. The results of these studies typically indicate poor geographic knowledge and literacy among these populations. For example:
• One American in seven (14 percent) cannot identify the United States on a world map. One-fourth cannot identify the Pacific Ocean on a world map (Gallup Organization 1988).

• Thirty-nine percent of high school seniors tested in Boston, Massachusetts, could not name the six New England states. Forty percent of high school seniors tested in Kansas City, Missouri, could not name three countries in South America (Elliott 1988).

• Thirty-five percent of the college students surveyed at the University of Miami could not locate France on a world map. Thirty-nine percent could not locate Chile, 80 percent could not locate Kenya, 42 percent could not locate Los Angeles or London, and 54 percent could not locate Iceland (Helgren 1983).

• Nineteen percent of the college students tested at a university in Texas placed New Zealand in Scandinavia while 9 percent placed China in the Mediterranean Sea. Only 46 percent knew that Portuguese is the primary language of Brazil (Eve 1994).

These studies have shown a lack of geographic knowledge and literacy within both the general public and college student populations. In comparison, one would expect a higher degree of geographic knowledge and literacy among a population with more diverse geographic experience. A significant number of male Ricks College students, while serving as missionaries for the Church of Jesus Christ of Latter-day Saints (LDS), have spent two years living in culturally and geographically unfamiliar environments. Ricks College is a private junior college sponsored by the Church of Jesus Christ of
Latter-day Saints. Ricks College enrolled 3,729 male students during winter semester 2000, of which 2,521 (64%) spent two years as full-time church missionaries. These missionaries are seen by the church as ambassadors for the church. During that two-year period these young men lived in a different culture, region or country from the one in which they were raised.

**Worldwide Missionaries of the LDS Church**

In 1999, the Church of Jesus Christ of Latter-day Saints had nearly 60,000 missionaries and more than 330 missions worldwide. Each mission encompasses a specific geographic area in which male missionaries live for at least twenty-two months. LDS missions can be found in all parts of North America and Western Europe, most parts of Eastern Europe, South America, Central America, East Asia, and the South Pacific. A limited number of missions are also found in the areas of Sub-Saharan Africa, South Asia, and Southeast Asia.

Young men who are members of the LDS Church are encouraged to volunteer to serve a two-year full-time church mission when they reach the age of nineteen. Young women may volunteer at the age of twenty-one. While missionaries volunteer to serve, they do not make the decision where they will serve. The location of their missionary service is “random” in that the church assigns the missionaries to where the church has a need. Thus, while missionaries may express a preference where they would like to serve, they have no influence as to where they will ultimately be placed. Similarly, even if a
prospective missionary has substantial language skills related to a geographic region, that is only one factor taken into account in assigning the actual location of his mission service.

Justifications and Hypotheses

The purpose of this thesis is to investigate the differences in geographic knowledge and literacy between male Ricks College students who have served as LDS Church missionaries (returned missionaries) and those who have not served as church missionaries (pre-missionaries). When this research began, it was hypothesized that:

1. There is a difference in **general geographic knowledge** between returned missionaries and pre-missionaries.
2. There is a difference in **global geographic literacy** between returned missionaries and pre-missionaries
3. There is a difference in **regional geographic literacy** between returned missionaries and pre-missionaries

Importance of the Study

This thesis will demonstrate that the LDS missionary experience is an influential, but not highly significant variable in enhancing general geographic knowledge as well as regional geographic literacy. It extends the literature focusing on the impact of foreign travel and expatriate living on geographic literacy.

Limitations of the Study

There were two primary limitations to this research. First, the study population did no include all male LDS pre-missionaries and returned missionaries, but only 3,729 males attending Ricks College during winter semester, 2000. It is doubtful that the males
attending Ricks College are entirely representative of the complete LDS pre-missionary and returned missionary population. The Ricks College LDS students are probably younger than those at other universities. The Ricks College population is also less diverse ethnographically and geographically - the students are dominantly Caucasian United States citizens from the Intermountain West.

Limiting the study to male students was required as a practical matter. Of the 8,840 full-time students enrolled at Ricks College in winter semester 2000, only 53 (<1%) were female returned missionaries. While largely a sampling problem, the exclusion of females also had the important benefit of eliminating gender as a factor to be accounted for in the literacy tests. It has been clearly established that gender is an important variable in explaining general levels of geographic knowledge and literacy (Beatty 1987, 1989; Eve 1994).

Structure of Thesis

Chapter two details the framework which was used as a basis for this research. It includes a review of variables which were found to influence or not influence geographic knowledge and literacy. Chapter three sets forth the data and methods of analysis. Chapter four details the research results and includes a discussion on the findings. Conclusions will be found in chapter five.
CHAPTER 2

Variables Influencing Geographic Literacy

Introduction

Literature on geographic education is impressive in its extent. However, because of its narrow focus and limited readership, literature discussing the question of geographic knowledge and literacy of returned missionaries and pre-missionaries does not exist. What does exist is a moderate body of literature about geographic literacy among college students, high school students, and non-students in general.

In this chapter, the three major factors influencing geographic knowledge and literacy will be presented. The first factor includes the following demographic variables: gender, race, age and parental history. The second major factor to consider is education. These included academic major, pre-college curriculum, level of education and college GPA. The third factor in determining geographic literacy is experience. These variables included exposure to media, travel history, past places lived, and reading habits. This forms a conceptual framework for both the methodology presented in chapter 3 as well as the results. These variables will also be discussed as they related to this thesis and the subjects being studied.

Gender

Beatty and Troester (1987) found the gender of university students to be the most significant variable in determining geographic literacy. These researchers conducted a number of studies involving more than 1,800 undergraduate students which demonstrated a significant gender difference in geographic literacy. It was demonstrated that “gender
alone accounted for a higher proportion of variance than any other variable in predicting accuracy in locating features of U.S. geography and U.S. cities.” The overall findings demonstrated that males consistently outperformed females in geographic literacy. After controlling for such variables as education level, travel history, desire to travel or the amount of exposure to the media, gender differences were still significant in the undergraduate students’ geographic literacy.

A different study conducted one year later by Beatty (1988) also revealed gender differences on regional map scores completed by university students. A test was administered to 64 students at the University of California at San Diego (UCSD), 114 students at North Dakota State University (NDSU), 41 older San Diego residents and 59 older North Dakota-Minnesota residents. All 278 subjects were asked to locate cities, mountains and rivers on a series of 18 regional outline maps by writing the code number that identified each item. Each map contained 12 to 16 items. Beatty found that on average, the male students at UCSD could label 84 percent of the locations correctly whereas the females could label 78 percent correctly. The male students at NDSU could label 87 percent correctly while the females could label 78 percent correctly. The older male residents of San Diego and North Dakota-Minnesota labeled 92 percent and 98 percent of the locations correctly, respectively. The older female residents of San Diego and North Dakota-Minnesota labeled 90 percent and 93 percent of the locations correctly, respectively. Beatty concluded that there was a significant difference (.05) in which males performed more accurately than females in locating large geographic features of the United States and United States cities.
Again, in another study, Beatty (1989) administered a test to 263 males and 304 females who were residents of either North Dakota or Minnesota. The test required the subjects to locate 30 U.S. cites and 10 large features of U.S. geography on an outline map of the U.S., and 18 cities on an outline map of the tristate region that included North Dakota, South Dakota, and Minnesota. Beatty found that even after controlling for variables such as age, on an average, males could identify geographic locations more accurately. In a two-sample t-test, it was concluded that geographic literacy among males was significantly (.05) higher than females throughout the age ranges studied (20's-70+ years old).

Cross (1987) also found the gender of university students to be a significant variable in explaining overall place location knowledge. A test was administered to 879 students at the University of Wisconsin-Oshkosh from a variety of major fields of study. The test asked the students to locate eleven countries on a blank map of the world that showed political boundaries, major rivers, and lines of latitude and longitude. These countries had all figured prominently in recent world affairs. Students were asked to indicate the countries' locations by placing an X within the country's boundaries and labeling the country. In conclusion, Cross found that the median score for males was 5.1 and for females it was 2.7. For every country whose location was requested, a statistically significant (at .05) higher proportion of the males were able to correctly place the country. Thus, males demonstrated greater geographic literacy than females.

Eve (1994) also found gender to be a significant variable in explaining geographic literacy. A survey was administered to 313 students taking general-level English and
sociology courses at a major southwestern U.S. public university. The survey contained four question areas. First, 50 multiple choice questions were given to assess geographic knowledge. Second, there was a blank political map of the world with 10 countries labeled “A” through “J.” Students were asked to match the letters with a list of names (e.g., B with Sweden). Third, 10 cultural literacy questions were included. These dealt with characteristics of society and environment associated with various geographic locations. Fourth, 10 photocopied images of constructed landmarks (icons) were included. Students were to match the correct country with the correct icon (e.g., France with Eiffel Tower). A result similar to other research was found in which males demonstrated higher geographic knowledge and literacy than females. Males composed of 96 percent of the highest quartile while females composed of only 5 percent of the same quartile. Gender proved to be the single strongest predictor of geographic literacy in this study of university students.

The demographic variable of gender influences geographic literacy. Studies have shown that males have a higher geographic knowledge and literacy than females. Because of this only male Ricks College students were surveyed for this thesis. A future study might include returned female missionaries in comparison to returned male missionaries.

Race

Only one study was found in which race was a variable in geographic knowledge and literacy. The study by Eve (1994) has already been discussed in relation to gender and will be discussed in relation to influencing variables of age, parents, academic major, previous geography course, grade point average (GPA) and reading habits. Eve found
that race was one of the strongest indicators of geographic knowledge and literacy. Eve concluded that for his sample of university students, Caucasians showed higher geographic literacy than other races.

The survey of male Ricks College students used in this thesis asked respondents to indicate their race. Though race was found to be a variable influencing geographic literacy by Eve, it was assumed that race may not be a discriminating variable for the male Ricks College respondents because of the high percentage of Caucasians at Ricks College.

**Age**

A study by Beatty (1988) found that older persons performed better than college students on tests of geographic literacy. Beatty attributed this finding to age, education, and that the older subjects generally had experienced a larger extent of living places. In another study by Beatty (1989) it was also shown that peak geographic knowledge was found in those who were middle aged. In the previously cited study by Eve (1994), age was noted as one of the strongest predictors of geographic knowledge and literacy. Eve concluded that older students outperformed younger university students on geographic tests.

Therefore, age was found to be a variable influencing geographic literacy in the three studies cited. In this study, the male Ricks College students were asked to indicate their age on the survey. Even though most male students at Ricks College are between the ages of 18 and 22 and therefore of a restricted age range, it was deemed important to examine this variable in this study.

**Parental History**
In Eve’s (1994) study it was found that the education level of the survey respondents’ mothers was not correlated with geographic performance. The fathers’ education level showed only a very slight relationship, with higher scores being associated with more educated fathers. Eve also found that having parents who traveled regularly outside the United States or having parents or grandparents born outside of the United States was not related to geographic test performance. Eve concluded that parental education level, travel history, and birth country of parents and grandparents had little effect on student geographic literacy.

In this thesis study, the parent’s education level, place where parents’ were raised and if (and where) parents served LDS Church missions was asked of the male Ricks College students. Although the Eve finding was weak this study included the variable of parental influence because of the potential effect of parents’ mission experience.

Academic Major

Eve’s (1994) study found that social science majors performed the worst of all the respective majors surveyed. In general, social science majors are those that are typically expected to be able to excel in areas such as geography. Eve also found that education majors did equally as poor as the social science majors on the geographic survey. This variable was related to other findings - that many teachers were teaching material [geography] to elementary and high school students when they did not know the material themselves.

In Cross’ (1987) study, it was noted that a university student’s academic major was a variable influencing greater geographic literacy. Students in the Letters and Science
majors performed the best on geographic literacy, while Education majors performed the worst. This study did not list specific majors and therefore it was hard to determine how much a student's academic major actually impacted their geographic knowledge.

In two studies found in the literature review and cited above, the variable of social science academic major was generally found not to influence geographic literacy. In the present study the academic major was asked of the male Ricks College students. This was done to determine if academic major was related to student's geographic literacy in the sample of male junior college students surveyed. No previous study of junior college students was found in the literature reviewed.

**Pre-College Curriculum**

Curriculum was found to be a variable influencing geographic literacy of university students. Williams' (1952) study discovered two variables in curriculum that were related to geographically unprepared college freshmen. First, he cited declining numbers of geography courses offered in elementary and secondary schools as a major variable. Second, he pointed to the inadequate use of maps, globes, and atlases in the classroom as another variable impacting the geographic knowledge and literacy of university students.

Geographic education has been affected by changes in the nature of social science education. One of the variables which contributed to higher geographic literacy of college students outside of the United States included geography courses being required in elementary and secondary school curriculums (Gallup 1989). A variable related to poor geographic literacy in the United States was the lack of geography courses. One way that
geographic literacy has been improved is through the promotion of geographic education and research for the purpose of educating students and adults about the world.

Wise (1975) wrote, “there is a widespread and quite unnecessary lack of basic world knowledge among many who are genuinely interested in becoming effective teachers, whether in geography, social studies, or other areas . . . there is no reason for any person to be allowed to pass through 16 or 17 years of ‘the system’ and be so unaware of the world.” Those that do pass through ‘the system’ as a geography major typically perform better on geographic literacy tests because of the materials and maps studied as part of the curriculum.

In Cross’ previously cited 1987 study, slightly more than a third of the university students had taken a high school geography course. It was found that there were no statistical differences between university students who had or did not have a high school geography course. Eve (1994) also found that having had a previous geography course had no effect on geographic literacy. In some cases the opposite of what was expected was found. Many of those that had taken their last geography class in elementary school did better than those who had taken geography more recently in high school. This indicated that having had a previous geography course was not a variable in a person’s geographic knowledge.

The male Ricks College students were asked to indicate on the survey whether they had taken a high school or college level geography course on the survey. In this study male Ricks College respondents were asked if and when they had taken previous geography course(s).
Level of Education

A study by Beatty (1989) found higher geographic literacy in those with higher education levels over those people with lower levels of education. The variable of education level was often associated with a person’s age. There was no significant difference between students separated by one college grade level (i.e., freshmen-sophomore).

College Grade Point Average

The study by Eve (1994) indicated that the variable of a university student’s grade point average (GPA) was not a strong indicator in determining a person’s geographic literacy. University students with low a GPA scored equally as well as those with a high GPA. Therefore, GPA of the male Ricks College students was asked on the survey.

Exposure to Media

Cross (1987) found that geographic literacy was significantly related to the students’ exposure to mass media. Geographic literacy scores generally rose with greater newspaper readership as well as for those who regularly watched the national news on television. An earlier study by Williams (1952) found that those who were exposed to various forms of the news media were likely to have higher geographic literacy. A survey was administered to 2,084 students in beginning geography courses at 13 universities throughout the United States. The students were asked to identify the individual U.S states by placing the names within their proper boundaries. Williams found that places which had recently appeared in the printed media were more familiar to people and were more easily identified on geographic tests.
The variable of media exposure influences geographic literacy. For this thesis, students were asked to indicate their readership of local and national newspapers as well as how often they watch television news.

**Travel History**

Another strong variable found to be related to geographic literacy was the extent to which a person had traveled. Beatty and Troester's (1987) results indicated that accuracy on tests of geographic literacy was positively correlated with how much university students had traveled. Beatty and Troester stated, "It seems intuitively obvious why travel would facilitate performance on tests of geographical knowledge. People who have traveled extensively would be directly exposed to salient geographical features (e.g., San Francisco Bay) and memory for these experiences should aid localization of specific places on map tests (Beatty and Troester 1987, pg. 587)." It was also noted that travelers were more likely to study maps of unfamiliar places prior to visitation. Beatty (1989), in his study of adults, found that the variable of greater travel history positively correlated with geographic knowledge and literacy.

Travel history was a contributing variable in the higher levels of geographic literacy of students surveyed in 1989 by the Gallup Organization (Grosvenor 1989). College students in 10 separate countries were asked to identify 16 countries on a world map. It was found that on an average, college aged students in Sweden (11.9 out of 16), Germany (11.2 out of 16), and Japan (9.5 out of 16) performed better when locating counties on a world map than did their counterparts in the United States (6.9 out of 16). It was concluded that this finding was associated with more extensive and frequent travel experiences by college students who lived outside of the United States.
One study concluded that travel history did not influence geographic literacy. In Cross’s (1987) study of university students cited previously, while those students with greater travel history could locate a larger proportion of countries, the differences were not statistically significant. Cross qualified the conclusion by indicating that only 23 percent of the students in the University of Wisconsin-Oshkosh sample had traveled outside the U.S. and Canada. With that qualification, Cross concluded that travel history does not influence geographic literacy.

Travel history was found to influence geographic literacy in three of the four studies cited. For this thesis, students were asked to indicate their travel history. Travel history of the male Ricks College students was an important variable because the experience of serving a full-time church mission provided a unique travel experience. A male Ricks College student who had this missionary travel experience, along with other travel experiences would perhaps to have higher geographic literacy than those who had not.

**Past Places Lived**

The study of university students by Beatty and Troester (1987) found that accuracy on tests of geographic literacy was positively correlated with the extent to which they had lived in various regions of the world. Despite the positive correlation between geographic literacy and places past lived, their study of university students concluded, “it is important to note that traveling to a place or even residing in a region does not guarantee accurate memory for its geography.”

A study by Beatty (1988) reported that the accuracy of geographical literacy was highest on the map of each subject’s home region, next highest on the adjacent region,
with accuracy becoming increasingly lower as the distances increased from their home region. Older residents performed better than college students which Beatty attributed to variables such as age, education, and the fact that the older subjects generally had experienced a larger extent of living places.

Beatty and Spangenberger (1988) observed from previous research (Bahrick 1983; Beatty 1985) that a person’s knowledge about geographical features of the region in which they were born and raised was as accurate as their knowledge of the region in which they currently lived. A test was administered to 13 permanent retired Florida residents who had moved away form regions in the Northeast or North Central U.S. and 14 Florida winter residents who returned to the North every summer. Beatty and Spangenberger found that the variable of revisiting a geographic region was not required to maintain general geographic literacy of a place previously lived. Specific information about geographical features was more vulnerable to loss unless refreshed by visits or incidental exposure to media sources.

Therefore, for this study it was postulated that general geographic literacy of a region learned by those who had served LDS missions in that region, should be retained after these missionaries return home. The variable “place previously lived” is also an important consideration for this thesis. Male Ricks College students who had served a mission in a particular place or region, and thus lived in that region, should have higher geographic literacy and knowledge of that region than those who had not served (lived) in that same particular region.

Reading Habits

The study by Eve (1994) has already been discussed a number of times. Eve
indicated a variable associated with higher geographic knowledge was increased reading by the subjects. Those who read many books, of any topic, showed a significantly higher geographic knowledge than those who did not. Eve found no correlation between reading magazines and high geographic knowledge. Therefore, the reading habits of the male Ricks College students were surveyed.

Summary

Literature relevant to this study has been reviewed and this chapter has discussed variables which have been shown to be related a person’s geographic knowledge and literacy. This information is summarized in Table 1.

A significant variable was that of gender-based differences in geographic literacy with males generally showing greater geographic knowledge and literacy than females (Rand 1976; Beatty 1987; Cross 1987; Eve 1994). This gender-based difference was often attributed to variables such as travel experience, individual interest in geography and attention given to world affairs. Almost no research has surveyed geographic knowledge and literacy within groups of males. No studies of junior college students were found. Therefore, this thesis contributes to the general knowledge of geographic knowledge and literacy of male junior college students.

The survey of the literature also revealed that there has been no published research completed concerning students who have lived for extended periods of time in places different from their home area. Many college-aged students experience extended foreign living through internships, study abroad programs, foreign military service and business travel. Young men and women of The Church of Jesus Christ of Latter-day Saints (LDS) who serve for 18-24 months as missionaries have an experience in which they can live in
and experience a different culture, region or even country from the one in which they were raised. There is a need for research concerning the differences in geographic knowledge and geographic literacy between male LDS college students who have served missions and male LDS college students who have not served missions. This thesis furthers the understanding of the differences in geographic knowledge and literacy between young men who have served LDS Church missions and those who have not.
**Table 1. Literature-based Variables and their Impact on Geographic Knowledge and Literacy.**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Strength of Impact</th>
<th>Reference(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Strong</td>
<td>Beatty 1987; Beatty 1988; Beatty 1989; Cross 1987; Eve 1994</td>
</tr>
<tr>
<td>Race</td>
<td>Weak</td>
<td>Eve 1994</td>
</tr>
<tr>
<td>Age</td>
<td>Strong</td>
<td>Beatty 1988; Beatty 1989; Eve 1994</td>
</tr>
<tr>
<td>Parental History</td>
<td>Weak to None</td>
<td>Eve 1994</td>
</tr>
<tr>
<td><strong>Education Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Major</td>
<td>Weak</td>
<td>Cross 1987; Eve 1994</td>
</tr>
<tr>
<td>Pre-College Curriculum</td>
<td>Moderate to none</td>
<td>Cross 1987; Eve 1994; Gallup 1989; Williams 1952; Wise 1975</td>
</tr>
<tr>
<td>Level of Education</td>
<td>Moderate</td>
<td>Beatty 1989</td>
</tr>
<tr>
<td>College Grade Point Avg.</td>
<td>None</td>
<td>Eve 1994</td>
</tr>
<tr>
<td><strong>Experience Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure to Media</td>
<td>Strong</td>
<td>Cross 1987; Williams 1952</td>
</tr>
<tr>
<td>Travel History</td>
<td>Strong</td>
<td>Beatty 1987; Beatty 1989; Cross 1987; Grosvenor 1989</td>
</tr>
<tr>
<td>Past Places Lived</td>
<td>Strong</td>
<td>Bahrick 1983; Beatty 1985; Beatty 1987; Beatty 1988;</td>
</tr>
<tr>
<td>Reading Habits</td>
<td>Moderate</td>
<td>Eve 1994</td>
</tr>
</tbody>
</table>
CHAPTER 3

Data and Methodology

This chapter describes the development of the survey used in this thesis, the subjects, the selection of the subjects, and the treatment of data. The primary purpose of this thesis was to investigate the differences in geographic knowledge and literacy between male Ricks College students who had served LDS Church missions and those who had not served church missions.

A thorough review of the literature was conducted and no existing instrument adequate to the needs of this thesis research was found. This is because of the unique nature of the groups studied. Therefore, it was necessary for the author of this thesis to develop such a survey.

This thesis discusses one type of knowledge and two types of literacy. These are defined as:

- General geographic knowledge is 1) information about and 2) understanding of the world we live in (i.e. cultural/human geography) and about the world we live on (i.e. physical geography).

- Global and regional geographic literacy are 1) knowing where a location is in a spatial context (i.e., a map) and 2) having a sense of “whereness” (Manson 1977).

Development of the Survey Instrument

Based on the conceptual framework in chapter 2 a survey testing geographic knowledge and literacy and the variables influencing them was developed. Many survey questions and ideas were obtained from surveys previously developed and used by Eve

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(1994), Beatty (1988, 1989), Cross (1987), Helgren (1983), Hill (1981), McTeer (1979) and Hubbard (1979). Other questions were formulated by the author of the thesis based on readings from books, texts, magazines, and discussions with geography faculty at Brigham Young University and Ricks College, students, and others. Other independent variables measured included the following: (For the entire survey, see Appendix A, Ricks College Geography Survey).

**Independent Variables**

The first questions were designed to measure basic demographic and travel history characteristics of the subjects. These included the normal demographic questions such as age, race and religious affiliation. Questions regarding academic class standing and G.P.A. were added. Since parental influence was found to be important in the literature, questions about parental travel and education were considered critical. Demographic questions specifically related to geography included the following:

- Where is your hometown?
- Where were your parents raised?
- Where have you traveled domestically and internationally?
- From which foreign countries do you have friends?
- How many times have you traveled outside of the United States?
- In which past places have you lived (excluding mission)?
- Have you taken a college level geography course?

Exposure to various forms of media was found to be important in the reviewed literature. Questions about the subject’s media use were considered important. Questions
were designed to measure media use of the subjects by asking how many days per week they were exposed to printed newsmedia, television news, and books.

Mission Related Questions

Since this thesis was assessing the geographic knowledge and literacy of returned missionaries and pre-missionaries, questions regarding LDS Church missionary service were obviously required. Mission service questions specifically related to hypothesis testing included the following:

- Have you served a mission?
- In which mission and region did you serve?
- If you have not served a mission, do you plan to serve a mission?
- Did either of your parents serve a mission?

Multiple Choice - General Knowledge Questions

Twenty-three questions were designed to assess the subject’s general geographic knowledge. Questions 55 through 77 on the Ricks College Geography Survey (RCGS) were multiple choice questions based on subject knowledge that would likely be taught in an introductory level geography course at the college/university level. These 23 questions could be divided into the following six categories: General geography and population, physical geography, economic geography, religious geography, and political geography. The questions were as follows (For complete question and answer refer to Appendix A, RCGS):

55. What is the official language of Brazil?
56. What is the predominant ethnic group of the United States in terms of population?
57. What is the approximate population of the World in 1999-2000?
58. Which is the World's Largest City?
59. How many times zones are there around the world?
60. What is the approximate population of the United States in 1999-2000?
61. What percent of the Earth's surface is land?
62. On which continent is the Gobi Desert located?
63. On which continent are the Andes Mountain range located?
64. Which continent has coasts on both the Indian and Pacific Oceans?
65. What is the predominant climate of Australia?
66. Which country is the United States largest trade partner?
67. Which country is NOT part of the European Union?
68. Which country does NOT have a dedicated or announced LDS temple?
69. In which country is the Roman Catholic headquarters the Vatican City located?
70. In which country are LDS missionaries NOT currently proselytizing?
71. Which country is NOT predominantly Islamic?
72. Prayer, fasting, scripture study and giving to the poor are basic characteristics of which religion?
73. Which country is NOT a communist country in its form of government?
74. In which country is the United Nations Headquarters located?
75. Who is the current Prime Minister of the United Kingdom?
76. Which is NOT a country?
77. What river forms a border between the United States and Mexico?

World Map - Global Literacy Questions

The next section was a blank political map of the world with twenty-five countries and seas labeled 1 through 36. All respondents were asked to match the number that corresponds with the listed location (e.g., 27 = Egypt). The respondents were asked to
locate the following places: China, Mexico, Indonesia, South Africa, Iraq, Russia, Brazil, Germany, Egypt, United States, Colombia, Saudi Arabia, Serbia, North Korea, Ukraine, Belgium, Chile, Nigeria, Argentina, Ireland, North Sea, Caribbean Sea, Indian Ocean, Persian Gulf and the Yellow Sea. These countries were chosen randomly based on factors such as their frequency in the media, location, and use in previous research surveys.

Regional Maps - Regional Literacy Questions

The final section of the survey included eight regional maps in which respondents identified 12 locations on at least two of the regional maps. The respondents were asked to determine whether they had served a church mission and then complete specific maps. They were to write in the corresponding number that locates each place on the given map. Pre-missionaries were to complete the Asia map (#2), the South America map (#3) and the Western Europe map (#7a). Returned Missionaries were asked to complete two regional maps. The first, included their region of mission service (Served in Czech Republic = Eastern Europe map). The second map included another randomly assigned geographic region.

Pretesting

In order to establish the validity, the survey was initially tested on 15 Ricks College students for accuracy, length of time taken to complete it and clarity. The initial survey was modified based on the feedback obtained. Final approval of the survey came from Dr. Perry Hardin, BYU Geography Professor and thesis committee chair, Dr. Peter Valora, Ricks College Geography Department Chair; and Dr. Scott Bergstrom, Ricks College Institutional Research Director. The survey was granted the appropriate
administrative approval to be administered to Ricks College students on the Ricks College campus in Rexburg, Idaho.

Subjects

The study population was limited to 3,729 male students (8,840 full-time total students) attending Ricks College during winter semester 2000. Of this population, 306 male students completed the survey and were the sample subjects. The subjects included 198 (64.7%) returned-missionaries and 108 (35.2%) pre-missionaries. The average age of the returned missionaries was 21.89 and the average age of the pre-missionaries was 18.25. All 306 (100%) subjects responded having religious affiliation with the Church of Jesus Christ of Latter-day Saints, which is the sponsoring organization of Ricks College and the missionary program which was studied. Other demographic information about the subjects will be discussed in chapter 4.

Procedure and Treatment of Data

To acquire a pseudorandom sample of the male population at Ricks College, the survey was completed by male students enrolled in four sections of Geography and World Affairs (120) and one section of Introduction to Physical Geography (101) during the first week of winter semester 2000. All male and female students enrolled in Geography and World Affairs (120) were assigned to administer the survey to three male students outside of class who had not already completed the survey. The subjects were asked to complete the survey alone, not to use atlases, and not to ask for help on answers. Subjects were asked to complete the survey only once even if asked multiple times and to give accurate and thoughtful responses. There may have been sampling biases through the selection of
the subjects by the thesis author and/or the students who were assigned to administer the survey to male Ricks College students. Male students who were registered for Geography and World Affairs may be those with either little geographic knowledge (thus wanting to know more) or those with a lot of interest in geography. Another bias might have been not including returned missionary and pre-missionary subjects from colleges and universities other than Ricks College.

After the surveys were collected the multiple choice section, the world map section and the regional map sections were graded. The answers from each survey question were entered into SPSS (Statistical Program for the Social Sciences) for analysis.

**Hypothesis Testing**

The purpose of this thesis was to investigate whether or not there are differences in geographic knowledge and literacy between male Ricks College students who had served an LDS Church mission and those who had not served a mission. In order to study this general question, three null hypotheses were formulated. Each null hypothesis was tested by running an independent two-samples t-test between group means on predetermined variables (responses to RCGS survey questions). The following were the variables and the statistical analyses which were used to determine the results to be found in chapter 4. The three null hypotheses established were as follows:

1. There will be no difference in **general geographic knowledge** between returned missionaries and pre-missionaries.
   - An independent two-samples t-test was run between returned missionaries and pre-missionaries and the respective mean score sum (multiple choice
score) of responses to questions 55 through 77. A significance level of .05 was used to detect differences between the means. The differences between returned missionary and pre-missionary group multiple choice mean scores established whether there was a statistically significant difference in general geographic knowledge between the two groups.

2. There will be no difference in **global geographic literacy** between returned missionaries and pre-missionaries.

   - An independent two-samples t-test was run between returned missionaries and pre-missionaries and the respective mean score sums (total score) of responses to the subject’s world maps. A significance level of .05 was used to detect differences between the means. The differences between returned missionary and pre-missionary world map scores established if there was a difference in global geographic literacy.

3. There will be no difference in **regional geographic literacy** between returned missionaries and pre-missionaries.

   - An independent two-samples t-test was run between returned missionaries and pre-missionaries and the respective mean regional geographic literacy scores from the subject’s regional maps. Returned missionaries who served church missions to a specific region were compared with pre-missionaries who were asked to complete the same regional map. A significance level of .05 was used to detect differences between the means.
Summary

In this chapter, the development of the survey instrument and the validity of that survey were discussed. The survey questions were described. The procedures taken to analyze the data to test each hypothesis were outlined. The statistical techniques used to test the three null hypotheses and arrive at the results found in Chapter 4 were also described.
CHAPTER 4
Results and Discussion

This chapter presents the results found after completing the analysis procedures outlined in chapter 3. Results and discussions are presented for the research hypotheses stated in chapter 1.

Demographic Question Results

A total of 306 subjects (male students) completed the Ricks College Geography Survey (RCGS). All responding subjects had a religious affiliation with the Church of Jesus Christ of Latter-day Saints. As seen on Table 2, of the 306 subjects, 198 were returned missionaries and 108 were pre-missionaries. Average age of the returned missionaries was 21.89 and the average age for pre-missionaries was 18.25. For the returned missionaries, 54 identified themselves as freshmen and 144 identified themselves as sophomores. For the pre-missionaries, 95 were freshmen and 13 sophomores. Of the 198 returned missionaries 189 (95.4%) responded as being Caucasian as well as 102 (92.6%) of the 108 pre-missionaries. The subjects were essentially Caucasian, with 95 percent of the returned missionaries and 93 percent of the pre-missionaries reporting so. When the pre-missionaries were asked if they planned on serving church missions, 99 of the 108 (92%) plan on serving LDS Church missions.
Table 2. Subjects’ Demographic Information

<table>
<thead>
<tr>
<th></th>
<th>Returned Missionaries</th>
<th>Pre-Missionaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>198</td>
<td>108</td>
</tr>
<tr>
<td>Mean Age</td>
<td>21.89</td>
<td>18.25</td>
</tr>
<tr>
<td>Freshmen</td>
<td>54</td>
<td>95</td>
</tr>
<tr>
<td>Sophomore</td>
<td>144</td>
<td>13</td>
</tr>
</tbody>
</table>

Table 3 shows the number of returned missionaries who served in each geographic region. During his two years of missionary service the average returned missionary served (lived) in just over six different locations in their mission boundary. He had an average of 13 different companions. Seventy-eight percent of the missionaries reported having companions from a country other than the United States. The returned missionaries in the sample had been home from their mission for an average of 13 months.

Table 3. Returned Missionaries Regions of Service

<table>
<thead>
<tr>
<th>Mission Service Region by Continent</th>
<th>N of Returned Missionaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>90</td>
</tr>
<tr>
<td>South America</td>
<td>42</td>
</tr>
<tr>
<td>Western Europe</td>
<td>19</td>
</tr>
<tr>
<td>Asia</td>
<td>17</td>
</tr>
<tr>
<td>Central America/Carribean</td>
<td>15</td>
</tr>
<tr>
<td>Australia and New Zealand</td>
<td>7</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>6</td>
</tr>
<tr>
<td>Africa</td>
<td>2</td>
</tr>
</tbody>
</table>

In examining the home state or county of the samples, it was found that the two groups are similar in their diversity. Returned missionaries represented 26 different states,
plus three Canadian provinces and one other country. Pre-missionaries represented 24 different states, plus one Canadian province and two other countries. The samples strongly represented the western states of California, Idaho, Utah, and Washington with some 68 percent of the returned missionaries and 60 percent of the pre-missionaries coming from these states.

Hypotheses Results and Discussion

As stated in chapter 3, three null hypotheses were formulated for this thesis. In this section, the results of each hypothesis are presented followed by a discussion. The discussion will focus on the differences between returned missionaries and pre-missionaries and their respective geographic knowledge and literacy.

Hypothesis 1

There will be no difference in general geographic knowledge between returned missionaries and pre-missionaries.

The differences between the two groups on the Ricks College Geography Survey (RCGS) general geographic knowledge scores were significant at the .023 level. Therefore, the null hypothesis was rejected. The returned missionaries scored statistically significantly higher than the pre-missionaries on general geographic knowledge as shown by the data in Table 4.
Table 4. Differences between General Geographic Knowledge Scores for Returned Missionaries and Pre-Missionaries

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean (out of 23)</th>
<th>Standard Deviation</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Returned Missionaries</td>
<td>198</td>
<td>14.42</td>
<td>2.91</td>
<td>304</td>
<td>2.28*</td>
</tr>
<tr>
<td>Pre-Missionaries</td>
<td>108</td>
<td>13.57</td>
<td>3.43</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p = <.023

It is of interest to note that the two group mean scores are numerically close. Returned missionaries scored a mean of 14.4 (63% correct) and pre-missionaries scored a mean of 13.57 (59% correct) out of 23 possible. Even though this is a statistically significant difference, the question of practical or substantive significance must be raised. Neither group’s score was very high. In looking at the scores, as a group, the returned missionary’s scores showed less variability (lower standard deviation) than pre-missionaries. More returned missionaries scored closer to their group average geographic knowledge score than did the pre-missionaries. Also, as shown in the box plot (Table 12, Appendix B), the returned missionary score distribution was skewed above the mean, meaning that more returned missionaries scored above their group average than did the pre-missionaries. On the other hand, the pre-missionaries tended to score in a broader range (higher standard deviation) and more of them scored below their group mean.

Table 10 (Appendix B) shows the multiple choice questions, the number and percent of returned missionaries and pre-missionaries that correctly or incorrectly answered general geographic knowledge questions. Looking at individual multiple choice questions reveals insight into the differences in general geographic knowledge of the two
groups. The following are examples of the percent of correctly answered multiple choice questions:

- 55 percent of the returned missionaries and 36 percent of the pre-missionaries knew which country out of Sweden, Honduras, South Africa and China does not have a dedicated or announced LDS Temple.
- 70 percent of the returned missionaries and 63 percent of the pre-missionaries knew the approximate population of the world in 1999-2000 was 6 billion.
- 71 percent of the returned missionaries and 65 percent of the pre-missionaries knew which country out of North Korea, China, Vietnam and Russia is not a communist country in its form of government.
- 97 percent of the returned missionaries and 88 percent of the pre-missionaries knew that Portuguese is the official language of Brazil.
- 82 percent of the returned missionaries and 70 percent of the pre-missionaries knew that Australia’s predominant climate is a desert.

Hypothesis 2

There will be no difference in global geographic literacy between returned missionaries and pre-missionaries.

The differences between the two groups on the global geographic literacy score were not significant ($p = .488$) and thus the null hypothesis was accepted. Although the returned missionaries scored a higher over all mean on the world map, this was not significantly higher than the pre-missionaries as shown by the data in Table 5. As found in hypothesis 1, it is of interest to note that the two group mean scores are numerically close.
Returned missionaries scored a mean of 19.4 (78% correct) and pre-missionaries scored a mean of 18.97 (76% correct) out of 25.

Table 5. Differences between Global Geographic Literacy Scores for Returned Missionaries and Pre-Missionaries - World Map

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean Score (out of 25)</th>
<th>Standard Deviation</th>
<th>df</th>
<th>t*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Returned Missionaries</td>
<td>198</td>
<td>19.40</td>
<td>5.17</td>
<td>304</td>
<td>-.69*</td>
</tr>
<tr>
<td>Pre-Missionaries</td>
<td>108</td>
<td>18.97</td>
<td>5.40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p = .488 not significant

Since it was hypothesized that there will be no difference in global geographic literacy between returned missionaries and pre-missionaries and the null hypothesis was accepted, it could be concluded that serving an LDS Church mission does not necessarily increase a young man’s ability to locate countries or large geographic features on a world map. Both returned missionaries and pre-missionaries were better able to locate countries and large geographic features on a world map than many of their peers as referred to in Chapter 1 (Helgren 1983). It was noted that on this measure of global geographic literacy (Table 5) the returned missionaries scored some 15 percent higher than they did on general geographic knowledge (Table 4) and the pre-missionaries scored 17 percent higher on global geographic literacy than on general geographic knowledge. Comparatively, both groups of young men were better able to locate countries on a world map than demonstrate general geographic knowledge of those places.

Table 11 (Appendix B) shows the locations the subjects were asked to identify on the world map. The number and percent of returned missionaries and pre-missionaries that
correctly or incorrectly identified each location are also shown in Table 13. Looking at individual locations reveals insight into the similarity of the two groups on global geographic literacy. The following are examples of the percent of correctly identified locations:

- 95 percent of the returned missionaries and 94 percent of the pre-missionaries could correctly locate Chile.
- 42 percent of the returned missionaries and 42 percent of the pre-missionaries could correctly locate Ukraine.
- 84 percent of the returned missionaries and 84 percent of the pre-missionaries could correctly locate the North Sea.
- 32 percent of the returned missionaries and 28 percent of the pre-missionaries could correctly locate Serbia.
- 50 percent of the returned missionaries and 52 percent of the pre-missionaries could correctly locate Nigeria.

Regarding hypothesis 1 and 2, it could be asked why returned missionary scores for general geographic knowledge and global geographic literacy were not in practical terms higher than pre-missionaries? Factors explaining why returned missionaries do not have significantly higher scores could include: 1) missionaries do not read newspapers or watch television while serving their two year missions, and 2) missionaries are religion focused as they are teaching others about the LDS Church. Therefore, they are unaware of global or regional political, economic and social developments. While returned
missionaries are viewed as ambassadors to the world, they serve in very small geographic areas, most often only living in a small region of one country.

Hypothesis 3

There will be no difference in **regional geographic literacy** between returned missionaries and pre-missionaries.

An independent samples t-test was used to determine if the male college students who served a mission to a specific region scored higher on regional geographic literacy than those who have not served church missions. A significance level of .05 was used to detect differences between the means.

Returned missionaries were asked on the survey (see final section on Ricks College Geography Survey) to determine where they served an LDS church mission and to complete the corresponding regional map. Pre-missionaries were asked to complete three regional maps, one each for Asia, South America and Western Europe. For example, a male Ricks College student who had served a mission to Germany would have completed the Western Europe regional map (#7a). His geographic literacy of Western Europe was compared to those who had not served church missions.

Hypothesis 3 stated that there will be no difference in regional geographic literacy between male Ricks College students who have served LDS Church missions and male Ricks College students who have not served missions. Tables 6 through 8 show the results of the analyses for hypothesis 3. Returned missionaries who served in the Asia, South America, and Western Europe regions were compared with all pre-missionaries. The differences between the two groups on the regional geographic literacy scores were
statistically significant in all three comparisons. The returned missionaries scored significantly higher than the pre-missionaries.

Table 6. Differences between Regional Geographic Literacy Scores for Returned Missionaries and Pre-Missionaries - Asia Region Map

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean Score (out of 12)</th>
<th>Standard Deviation</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia Region Returned Missionaries</td>
<td>18</td>
<td>7.94</td>
<td>3.63</td>
<td>125</td>
<td>2.16*</td>
</tr>
<tr>
<td>Pre-Missionaries</td>
<td>109</td>
<td>6.01</td>
<td>3.47</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p = .032

As shown in Table 6, the differences between the two groups on the Asia region map scores were significant at the .032 level and thus the null hypothesis was rejected. Returned missionaries who served church missions (lived for almost two years) in the Asia region scored significantly higher than pre-missionaries who had not served (lived) there. Returned missionaries had a mean score of 7.94 (66% correct) and the pre-missionaries had a mean score of 6.01 (50% correct) out of 12.
As shown in Table 7, the differences between the two groups on the South America region map scores were significant at the <.0001 level. Thus the null hypothesis was rejected. Returned missionaries who served church missions (lived for almost two years) in the South America region had a mean score of 6.88 (57% correct) and the pre-missionaries had a mean score of 3.04 (25% correct) out of 12. The large difference in the scores and the corresponding low p value could indicate that serving a mission does impact regional geographic literacy.
Table 8. Differences between Regional Geographic Literacy Scores for Returned Missionaries and Pre-Missionaries - Western Europe Region Map

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean Score (out of 12)</th>
<th>Standard Deviation</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Europe Region Returned Missionaries</td>
<td>17</td>
<td>7.29</td>
<td>3.36</td>
<td>123</td>
<td>2.29*</td>
</tr>
<tr>
<td>Pre-Missionaries</td>
<td>108</td>
<td>5.46</td>
<td>3.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p = .024

The differences between the two groups on the Western Europe region map scores were significant at the .024 level and thus the null hypothesis was rejected. Returned missionaries who served church missions (lived for almost two years) in the Western Europe region had a mean score of 7.29 (61% correct) and the pre-missionaries had a mean score of 5.46 (46% correct) out of 12.

It was hypothesized that there will be no difference in regional geographic literacy between returned missionaries and pre-missionaries and the null hypothesis was rejected. A conclusion from these results is that serving an LDS Church mission and living in a specific region for almost two years, increases a young man's geographic literacy for that region. The results reported here show clearly higher regional literacy scores for those who served LDS Church missions in Asia, South America and Western Europe over those who did not.

Summary

The purpose of this chapter was to present the results of the Ricks College
Geography Survey and the thesis hypotheses. Comparing and discussing the results between the returned missionaries and pre-missionaries accomplished this purpose.

Further discussion of the results in the concluding chapter will discuss the implications of this thesis.
CHAPTER 5

Conclusion

This thesis proposed to determine the differences in geographic knowledge and literacy between returned missionaries and pre-missionaries. The Ricks College Geography Survey (RCGS) was developed and administered to the two groups. Statistical analyses were applied to the data collected from the RCGS. This thesis furthers the understanding of the differences between returned missionaries and pre-missionaries on measures of general geographic knowledge, global geographic literacy, and regional geographic literacy.

The three hypotheses formulated for this thesis have been tested. As discussed in chapter 4, male Ricks College students who have served church missions scored significantly higher (but not substantively) on general geographic knowledge and regional geographic literacy tests. The difference between the two groups on global geographic literacy were not statistically significant. The hypothesis results are summarized in Table 9.

Table 9. Summary of Hypotheses and Results.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>SUMMARY OF FINDING(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 1 - Geographic Knowledge</td>
<td>Returned missionaries scored statistically significantly higher than pre-missionaries. Mean score difference between the groups was not large.</td>
</tr>
<tr>
<td>Hypothesis 2 - Global Literacy (World Map Ability)</td>
<td>No statistically significant difference between returned missionaries and pre-missionaries.</td>
</tr>
<tr>
<td>Hypothesis 3 - Regional Literacy</td>
<td>Returned missionaries who lived in Asia, South America or Western Europe scored</td>
</tr>
</tbody>
</table>
This thesis found that returned missionaries scored significantly higher than pre-missionaries on a 23 item measure of general geographic knowledge (hypothesis 1). The scholarly literature contained no studies similar to the thesis looking at differences between two similar groups on general geographic knowledge.

This thesis also found that returned missionaries who served (lived) in Asia, South America, and Western Europe scored significantly higher on map tests of regional geographic literacy, for those regions, than pre-missionaries who had not lived there (hypothesis 3). This finding is related to (and extends) previous research which demonstrated that greater university student travel history is associated with higher geographic literacy (Beatty & Troester 1987, Beatty 1989; Grosvenor 1988). Travel history was found to be an influencing variable on geographic literacy in this thesis as well as in previous research. Those male Ricks College students who had the missionary travel experience were found to have higher general geographic knowledge and regional geographic literacy.

The results of the group differences between returned missionaries and pre-missionaries also supports previous research findings that past places lived is related to higher regional geographic literacy (Beatty 1987, 1988). One conclusion of this thesis is similar to that stated by Beatty and Troester (1987). Both were studies of college/university students which found that accuracy on tests of regional geographic literacy were positively correlated with the extent to which people had lived in various regions of the world. The returned missionaries are a group which have spent two years living in culturally and geographically unfamiliar places. Therefore, those who had served
as missionaries would be expected, and were found, to have higher geographic knowledge and regional geographic literacy of the area in which they served.

There were no differences between the groups on global geographic literacy scores (hypothesis 2). The differing results for hypothesis 1 and 2 point to the possibility and need for additional research into geographic literacy and knowledge to further understand such differences.

It is noted that no previous studies in the literature studied students enrolled in the junior college setting which was the sample for this thesis. This is another contribution of this thesis to the knowledge of students in this educational context.

**Future Research**

There are variables within the RCGS which should be part of future research to determine what influenced returned missionaries to have higher geographic knowledge and regional literacy than pre-missionaries. Since differences were found between returned missionaries and pre-missionaries, a step-wise regression test should be run. Multiple variables from the RCGS could be applied to determine at what significance level specific variables influence the differences in geographic knowledge and literacy.

Future research should also include surveying female pre-missionaries and female returned missionaries and comparing their geographic knowledge and literacy score means with male pre-missionaries and returned missionaries. The groups studied should be expanded to include LDS returned missionaries and pre-missionaries attending other colleges or universities. Other future research should be to follow a group of pre-
missionaries using a pre/post survey design to longitudinally study their geographic knowledge and literacy before and after their mission experiences.

Other variables may be influencing the regional geographic literacy of the male Ricks College students such as media and Geography and History curriculum. For example, the pre-missionaries scored a mean of 3.04 on the South America map verses 5.46 on the Western Europe map and 6.01 on the Asia map, respectively. In the everyday media (television and newspapers), is there more coverage of Asia and Western Europe more than about South America? If so, the results of this study would support the previous finding (Williams 1952) that places which had recently appeared in media were more familiar to people and more easily identified on geographic tests. Thus, pre-missionaries, by default, would learn and recognize more about Asia and Western Europe than South America.

In regard to Geography and History curriculum, is it possible that in many high school and junior high school Geography and History courses, students learn more about Western Europe and Asia than South America? Such courses may directly and indirectly influence a persons regional geographic literacy. These variables should lend themselves to future research in geographic knowledge and literacy.

As shown in Tables 6 through 8 and previously discussed, returned missionaries had a significantly higher regional geographic literacy than pre-missionaries. It was assumed that serving an LDS Church mission influences regional geographic literacy. This assumption alone introduces the question whether it is the mission itself that raised the regional geographic literacy or other unstudied variables. Variables might be:
• When a pre-missionary received his mission “call” or assignment, how much did he study a regional map of the region to which he was called?

• How much did he learn about his mission region in the Missionary Training Center (MTC)?

• On his mission, how often did the missionary have contact with people outside of his mission country but within his mission region?

Future research could help us better understand how such variables may or may not influence regional geographic literacy as they pertain to pre-missionaries and returned missionaries of the LDS Church.

Educational Implications

There are several implications of the thesis findings for geographic education. An unstated educational objective of this thesis was to provide information to help improve the geographic education of all college students. Also, to increase the awareness of the geographic educators (at Ricks College, Brigham Young University and other colleges and universities) about the geographic knowledge and literacy of returned missionaries and pre-missionaries.

This thesis provides another educational benefit for the Church of Jesus Christ of Latter-day Saints. It suggests continuing or increasing efforts to teach missionaries in the MTC about their respective mission areas, peoples, cultures, and customs. Doing so would benefit the missionaries (and their work) by helping them be more aware of the geographical and cultural differences around them. Missionaries of the Church of Jesus Christ of Latter-day Saints teach the restored gospel of Jesus Christ and follow the
admonition of Jesus Christ himself, "Go ye into all the world, and preach the gospel to every creature (St. Mark 16:15)" If missionaries are to go into all the world, it is important that they are geographically knowledgeable and literate. Through increased geographic knowledge and literacy it will be easier for missionaries to understand other cultures, ideas, and have a love of all people.
REFERENCES


Grosvenor, Gilbert M. 1984. Geography has been losing ground in our schools. National Geographic Magazine. 166: 126.


Maps used with permission of Brigham Young University Geography Department: World map, North America map, South and East Asia map, South America map and Africa map.
APPENDIX A

Ricks College Geography Survey

Instructions: Please complete alone, do not use atlases or maps and do not ask for help on answers. Please take only once even if asked multiple times. Give accurate and thoughtful responses. I appreciate your time and effort in completing this very important survey. This takes approximately 20-30 minutes. Paul Stahmann 356-1423, Smith 214C.

Fill in or circle the most appropriate answer.

1. Age_____  2. Class:_____ 1 = Freshman  2 = Sophomore  3 = Other

3. How many total semesters have you attended college?_____

4. Race:______ 1 = Caucasian  2 = African American  3 = American Indian  4 = Asian/Pacific Islander  5 = Hispanic  6 = Other

5. Major____________________________________

6. College G.P.A _______ 1 = 3.7-4.0  2 = 3.3-3.6  3 = 3.0-3.2  4 = 2.7-2.9  5 = 2.4-2.6  6 = 2.0-2.3  7 = <1.9

7. Religious Affiliation:_______ 1 = LDS  2 = Other: Please specify_____________________

8. Hometown (City, State, Country)___________________________________________

9. Past places lived (excluding mission)________________________________________

10. Have you taken a college level geography course? Yes - No  What course______

11. Before college, in which grade level(s) did you have a geography course?
   12 11 10 9 8 7 6 5 4 3 Never
12. Did/do you have brothers and/or sisters serve(serving) missions? Yes____ No____
Where?
12a. Brother(s): ________________________________________________________________

12b. Sister(s): ________________________________________________________________

13. How many days per week do you read local (Scroll, Post Register, etc.) newspapers?
   None  1  2  3  4  5  6  7

14. How many days per week do you read national (USA Today, NY Times, Wall Street
    Journal, Internet newspapers/news, etc.) newspapers? None  1  2  3  4  5  6  7

15. How many days per week do you watch television news such as local news, national
    news, CNN headline news? None  1  2  3  4  5  6  7

16. How would you rate your map reading and comprehension skills______
   1 = excellent  2 = good  3 = fair  4 = poor

17. How many books(excluding texts) do you read per year?
   None  2  4  6  8  10  12  14 <16

Answer questions #18-22 using the list found on question #34.

18. Where were your parents raised? Father______ Mother______

19. Did either parent serve a mission - where? Father:______ Mother:______

20. Where have you traveled? Domestic (in the U.S.)______________________________

21. Where have you traveled? Internationally____________________________________

22. From which foreign countries do you have current or close contact friends?_______
23. What are your parents' highest education levels? Father_____ Mother_____

1= High School
2= Technology or vocational school
3= Some College no degree
4= Associates degree
5= Bachelor degree
6= Graduate degree (MBA, CPA, M.S., M.A.)
7= Doctorate degree (Ph.D., Ed.D., M.D., D.D.S., J.D., etc.)

24. How many different times have you traveled outside of the United States (excluding mission)? Never 1 2 3 4 5 6 7 8 9 10 11 >12

25. Have you served a mission?______ 1= Yes 2= No If No, continue at question #33.

26. In which mission did you serve?_________________________________________________________

27. How many months have you been home from your mission?________________________

28. How many companions did you have (including MTC companions)?

5 6 7 8 9 10 11 12 13 14 15 >16

29. Were companions from countries other than your native country? Where?____________

30. How many mission areas/cities did you serve in?

1 2 3 4 5 6 7 8 9 10 11 <12

31. What were the predominant races/nationalities of people taught on your mission?________

32. Did parents, friends, relatives, others pick you up from your mission?_______

1= Yes 2= No

If yes, what countries or areas did you visit other than your mission area?________

33. If you have not served a mission, do you plan to serve a mission? 1= Yes 2= No
34. If you have not yet served a mission, where would you prefer to go? Please make your choices from the following list. Choice #1________ #2________

1= Western U.S. (HI, AK, WA, OR, CA, AZ, UT, ID, MT, NV, NM, CO, WY)
2= Eastern U.S. (ME, VT, NH, NY, CT, NJ, RI, MA, PA, DE, MD, DC, WV, VA)
3= Southern U.S. (FL, GA, SC, NC, KY, TN, AL, MS, LA, TX, AR, OK)
4= Midwest U.S. (ND, SD, NE, KS, MO, MN, IA, MI, OH, IL, IN, WI)
5= Canada
6= East Asia (Japan, Taiwan, Korea, China, etc.)
7= Southeast Asia (Vietnam, Philippines, Indonesia, etc.)
8= South Asia (India, Sri Lanka, Bangladesh, etc.)
9= Central America/Caribbean (Mexico, Costa Rica, Guatemala, Jamaica, etc.)
10= South America (Brazil, Chile, Argentina, Venezuela, etc.)
11= Western Europe (Germany, France, Spain, Britain, etc.)
12= Eastern Europe (Russia, Romania, Ukraine, etc.)
13= Africa (South Africa, Kenya, Nigeria, etc.)
14= Australia/New Zealand
15= South Pacific Islands (Samoa, Fiji, Tonga, etc.)
16= Middle East (No current proselyting missions, but in the future)
17= Other

35. In your own words, what is “Geography?” ________________________________

____________________________________

Based on personal opinion, please react to the following statements:
On a scale of 1 to 4, with 1 = strongly disagree,
1= Western U.S. (HI, AK, WA, OR, CA, AZ, UT, ID, MT, NV, NM, CO, WY)
2= Eastern U.S. (ME, VT, NH, NY, CT, NJ, RI, MA, PA, DE, MD, DC, WV, VA)
3= Southern U.S. (FL, GA, SC, NC, KY, TN, AL, MS, LA, TX, AR, OK)
4= Midwest U.S. (ND, SD, NE, KS, MO, MN, IA, MI, OH, IL, IN, WI)
5= Canada
6= East Asia (Japan, Taiwan, Korea, China, etc.)
7= Southeast Asia (Vietnam, Philippines, Indonesia, etc.)
8= South Asia (India, Sri Lanka, Bangladesh, etc.)
9= Central America/Caribbean (Mexico, Costa Rica, Guatemala, Jamaica, etc.)
10= South America (Brazil, Chile, Argentina, Venezuela, etc.)
11= Western Europe (Germany, France, Spain, Britain, etc.)
12= Eastern Europe (Russia, Romania, Ukraine, etc.)
13= Africa (South Africa, Kenya, Nigeria, etc.)
14= Australia/New Zealand
15= South Pacific Islands (Samoa, Fiji, Tonga, etc.)
16= Middle East (No current proselyting missions, but in the future)
17= Other

35. In your own words, what is “Geography?” ________________________________

____________________________________

Based on personal opinion, please react to the following statements:
On a scale of 1 to 4, with 1 = strongly disagree,
2 = somewhat disagree
3 = somewhat agree
4 = strongly agree

36. Geography is an important part of a general high school education______
37. Geography is an important part of a general college education______
38. Geography should be a required course in high school______
39. Geography should be a required course in college general education______
40. Knowledge of other countries is important in today’s world______
41. Understanding other cultures is important in today’s world______
42. Knowledge of other countries is important in today’s LDS church______
43. Understanding other cultures is important in today’s LDS church______
44. Geographic knowledge is just as important as math skills______
45. Geographic knowledge is just as important as computer skills______
46. Geographic knowledge is just as important as knowledge of national history______
47. Geographic knowledge is just as important as learning a foreign language______
48. Geographic knowledge is important for national political leaders to have______
49. Geographic knowledge is important for business people to have______
50. Geographic knowledge is important for Missionaries to have______
51. It is important to know the location of countries in the news_____
52. Rank in order what you think are the most important optional courses for a college general education:

- Health/Fitness
- History
- English
- Fine Arts
- Biology
- Computer Basics
- Geography
- Math

53. I have a current interest in traveling internationally.

54. Rank in order your top five choices for current travel destinations

Choice#1     #2     #3     #4     #5

1= Western U.S. (WA, OR, CA, AZ, UT, ID, MT, NV, NM, CO, WY)
2= Eastern U.S. (ME, VT, NH, NY, CT, NJ, RI, MA, PA, DE, MD, D.C., WV, VA)
3= Southern U.S. (FL, GA, SC, NC, KY, TN, AL, MS, LA, TX, AR, OK)
4= Midwest U.S. (ND, SD, NE, KS, MO, MN, IA, MI, OH, IL, IN, WI)
5= U.S. National Parks
6= LDS church sites
7= Hawaii
8= Alaska
9= East Asia (Japan, Korea, etc.)
10= Southeast Asia (Vietnam, Philippines, etc.)
11= Central America (Mexico, Costa Rica, etc.)
12= South America (Brazil, Chile, etc.)
13= Western Europe (Germany, France, etc.)
14= Eastern Europe (Russia, Romania, etc.)
15= Caribbean
16= Australia/New Zealand
17= South Pacific Islands (Samoa, Tonga, etc.)
18= Middle East (Jerusalem, Egypt, etc.)
19= Africa

For each of the following multiple choice questions, circle the correct answer:

55. What is the official language of Brazil?
A. Portuguese  B. Spanish  C. Brazilian  D. English

56. What is the predominant ethnic group of the United States in terms of population?
A. Caucasian  B. African American  C. Asian  D. Hispanic

57. What is the approximate population of the World in 1999-2000?
A. 3 billion  B. 5 billion  C. 6 billion  D. 8 billion

58. Which is the World’s Largest City?
A. New York City  B. Tokyo  C. Mexico City  D. Sao Paulo

59. How many times zones are there around the world?
A. 8  B. 14  C. 19  D. 24
60. What is the approximate population of the United States in 1999-2000?
   A. 70 million B. 180 million C. 275 million D. 1 billion

61. What percent of the Earth's surface is land?
   A. 30 B. 40 C. 50 D. 60

62. On which continent is the Gobi Desert located?
   A. South America B. Africa C. Asia D. North America

63. On which continent is the Andes Mountain range located?
   A. Africa B. North America C. South America D. Europe

64. Which continent has coasts on both the Indian and Pacific Oceans?
   A. Africa B. South America C. Australia D. Europe

65. What is the predominant climate of Australia?
   A. tundra B. desert C. deciduous forest D. tropical rainforest

66. Which country is the United States largest trade partner?
   A. China B. Canada C. Japan D. Germany

67. Which country is NOT part of the European Union?
   A. Germany B. Denmark C. Great Britain D. Norway

68. Which country does NOT have a dedicated or announced LDS temple?
   A. Sweden B. Honduras C. South Africa D. China (including Hong Kong)

69. In which country is the Roman Catholic headquarters the Vatican City located?
   A. Israel B. Italy C. Spain D. Egypt

70. In which country are LDS missionaries NOT currently proselytizing?
   A. Greece B. India C. Kenya D. Vietnam

71. Which country is NOT predominantly Islamic?
   A. Iran B. Indonesia C. India D. Pakistan

72. Prayer, fasting, scripture study and giving to the poor are basic characteristics of which religion?
   A. Islam B. Judaism C. Mormonism D. all of the above

73. Which country is NOT a communist country in its form of government?
   A. North Korea B. China C. Vietnam D. Russia

74. In which country is the United Nations Headquarters located?
   A. United States B. Great Britain C. South Africa D. Australia
75. Who is the current Prime Minister of the United Kingdom?
   A. Prince Charles  B. Tony Blair  C. Margaret Thatcher  D. Gerhard Schroeder

76. Which is NOT a country?
   A. Tibet             B. Netherlands  C. Singapore  D. San Marino

77. What river forms a border between the United States and Mexico
   A. Colorado   B. Rio Orinoco  C. Rio Grande  D. Mississippi River

Write in the corresponding number that locates each place from the given world map. Not all numbers found on the map will be used.

_____ China  _____ Mexico  _____ Iraq  _____ South Africa
_____ Indonesia  _____ Russia  _____ Brazil  _____ Germany
_____ Egypt  _____ United States  _____ Chile  _____ Saudi Arabia
_____ North Korea  _____ Serbia  _____ Ukraine  _____ Belgium
_____ Colombia  _____ Nigeria  _____ Argentina  _____ Ireland
_____ Yellow Sea  _____ Caribbean Sea  _____ Indian Ocean  _____ Persian Gulf
_____ North Sea
Please read the following to determine which maps you should now complete. Write in the corresponding number that locates each place on the given map. **Not all numbers found on the maps will be used.**

-If you *have NOT served* a mission please complete map #2, map #3 and map #7a.

-If you *HAVE served* a mission to:

  - United States/Canada - please complete map #1 and map #7b.
  
  - East Asia Or Southeast Asia (Japan, S. Korea, Vietnam, Philippines, etc.) - please complete map #1 and map #2.
  
  - Central America/Caribbean (Mexico, Costa Rica, Jamaica, etc.) - please complete map #4 and map #7a.
  
  - South America (Brazil, Chile, Equador, Argentina, etc.) - please complete map #3 and the map #5.
  
  - Western Europe (Germany, France, Sweden, Spain, Austria, etc.) - please complete map #2 and map #7a.
  
  - Eastern Europe (Russia, Romania, Poland, Ukraine, Greece, etc.) - please complete map #6 and map #7b.
  
  - Australia, New Zealand Or South Pacific Islands (Samoa, Tonga, etc.) - please complete map #3 and map #6.
  
  - Africa (Kenya, South Africa, Nigeria, etc.) - please complete map #4 and map #5.
Map #3 - South America
Map #6 - Australia and New Zealand

1. New Caledonia
2. Queensland
3. Great Barrier Reef
4. Tasmania
5. Great Sandy Desert
6. Southern Alps
7. Melbourne
8. Perth
9. Darwin
10. Adelaide
11. Brisbane
12. Perth
13. Darwin
14. Adelaide
15. Brisbane
16. New Caledonia
17. Queensland
18. Great Barrier Reef
19. Tasmania
20. Great Sandy Desert
21. Southern Alps
22. Melbourne
23. Perth
24. Darwin
25. Adelaide
26. Brisbane
Map # 7A - Western Europe
### APPENDIX B

Table 10. Scoring of Multiple Choice Questions.
RM = Returned Missionary with N of 198  
PM = Pre-Missionary with N of 108  
* = Correct answer

<table>
<thead>
<tr>
<th>Multiple Choice Question</th>
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<th>A - PM</th>
<th>B - RM</th>
<th>B - PM</th>
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Table 11. Scoring of World Map Locations.
RM = Returned Missionary with N of 191-194
PM = Pre-Missionary with N of 108

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<th>World Map Locations</th>
<th>Correctly Identified-RM</th>
<th>Incorrectly Identified-RM</th>
<th>Correctly Identified-PM</th>
<th>Incorrectly Identified-PM</th>
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<tr>
<td>Chile</td>
<td>184 95.3%</td>
<td>9</td>
<td>101 94.3%</td>
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<tr>
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<td>116 60.1%</td>
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<td>Mexico</td>
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<td>182 94.3%</td>
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<td>Saudi Arabia</td>
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<td>82 78%</td>
<td>23</td>
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<tr>
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<td>147 76.5%</td>
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<td>79 75.2%</td>
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<tr>
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<td>23</td>
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Table 11. Continued.

<table>
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<th>Correctly Identified-PM</th>
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<tr>
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<td>19</td>
<td>97 92.3%</td>
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<tr>
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<td>157 81.7%</td>
<td>35</td>
<td>90 85.7%</td>
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<td>Egypt</td>
<td>156 81.2%</td>
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<td>86 81.9%</td>
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<tr>
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<td>81 77.1%</td>
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<td>87 82.8%</td>
<td>18</td>
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<td>69 65.7%</td>
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<td>160 83.7%</td>
<td>31</td>
<td>88 83.8%</td>
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</table>
Table 12. Box Plot showing variability of scores on General Geographic Knowledge for the Returned Missionaries and Pre-Missionaries.