

PATHWAYS INTO THE DISCIPLINE: SIMILARITIES AND DIFFERENCES
BETWEEN FEMALE AND MALE UNDERGRADUATE
GEOGRAPHY MAJORS

THESIS

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By

Vanessa Hudson Eckert, B.A.

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CHAPTER 1

INTRODUCTION TO THE STUDY

Sex differentiation in career choice, status, and wages earned permeates all societies throughout the world, and most often female workers are the ones with limited career choice, status, and wages. Women continue striving to end sexual discrimination in employment patterns and the workplace in many countries. Sex differentiation in career choice is related to unequal opportunities in education that result from social constructions of gender. Although laws are designed to protect people from sexual discrimination in education and in employment, sexual discrimination continues to affect many professions.

In some countries, stereotyping of jobs and school subjects as the proper domain of one sex feeds into a cycle of behavior in which females and males are segregated in classrooms and on the job. For example, nursing and teaching are stereotyped as the proper domain of women, where engineering is stereotyped as the proper domain of men. Some argue that this stereotyping results from individual decisions, but the argument that this phenomenon results from individual selection of course work and career fails to recognize that forces of socialization such as parental influences on the gender orientation of their children support

as parental influences on the gender orientation of their children support such self-selection. Unfortunately, low wages and low prestige often accompany the careers and occupations that have been designated by society as “women’s work”, and many occupations have historically worked to exclude females from their ranks.

Whether intentionally or unintentionally, geography is one field that has positioned itself historically as an inappropriate domain for females. Although there have been women geographers throughout the 20th century (Pittser 1999), the discipline virtually ignored the status of females in geography until the 1970s (Lee 1990). Monk (2000) notes that even today, the history of women in the discipline has been neglected, and preference has been to report only the patriarchal male figures in geography and their “big ideas.”

Since the women’s movement of the 1970s, there have been increasingly more women in male-dominated fields including geography. However, there is still underrepresentation of women on the faculties of college geography departments as well as in undergraduate and graduate geography classrooms. In 1990, Lee noted that “Geography suffers from an inability to recruit, train, and retain females in the profession to the same degree as males” (207). Although the number of women in geography increased during the 1990s, they remain underrepresented in the discipline. In the *Guide to Programs in Geography in the United States and Canada 1999-2000* (Association of American Geographers

1998), evidence of the continued underrepresentation of females is seen in the number of geography degrees conferred in the United States from January 1 to December 31, 1998. Females earned 34% of Bachelor's degrees, 37% of Master's degrees, and 35% of Doctoral degrees awarded during the period reported.

The importance of the inclusion of females into geography has been expressed by several researchers (Henrie 1997; Monk 1987; Sanders 1990). Sanders (1990) challenged the discipline to make more of an effort to attract women and minorities, and the need for a diverse population in geography in order to "act on social, political, economic, and environmental problems" was expressed by Monk (1987, 143). *Finding a Way*, a project initiated by the National Council for Geographic Education and funded by the National Science Foundation, worked to develop strategies for encouraging more female participation in geography by increasing gender equity in the geography classroom (Sanders et al. 1999). In order to further the gains made by the *Finding a Way* project, more research is needed to better our understanding of how females' interest in geography can be increased.

Since many studies and commentary pieces have attempted to explain why women are *not* interested in geography or why they underperform on tests of geographic knowledge and skills, this study takes a different route in addressing the problem of underrepresentation in geography. Why have some women chosen to enter a profession that

is historically male-dominated? The purpose of this study is to explore the pathways that have led female geographers to the discipline. To accomplish this goal, this study focuses on the backgrounds of female and male geography majors in order to identify similarities or differences in the development of their interest in geography and their selection of geography as a major and a career. The results indicate that the processes that influence females and males to select geography as a major are similar; however, differences exist in the motivations that they report initially drew them to the discipline.

CHAPTER 2

LITERATURE REVIEW

This chapter summarizes existing literature on three themes related to this study. They are: (1) sex differences in spatial ability and geographic literacy, (2) nontraditional career choice, and (3) developing interest in geography. Many researchers have attempted to explain why geography is a male-dominated discipline by looking at sex differences in spatial ability (spatial visualization and spatial orientation) or geographic literacy (acquired knowledge of geographic themes and concepts). Nontraditional career choice studies look at ability and socialization as explanations for female participation in male-dominated fields. Finally, geographers have looked at geographic variables such as travel and contact with the physical environment among other factors to explain development of interest in geography.

Sex Differences in Spatial Ability and Geographic Literacy

In 1994, Downs proclaimed, “we - professional geographers- do not know very much about being and becoming geographically competent” (Downs 1994, 176). Although there has been work to establish an understanding of the origins of spatial ability in young children by both

psychologists and geographers (Downs 1997; Stea et al. 1996), there is still controversy about the exact nature of spatial ability and when it emerges in childhood. The imbalance in the ratio of males to females in professional geography in both the faculty and student populations at colleges and universities in the United States is suggested to be the result of differing proficiency in spatial ability and geographic literacy by the sexes as reviewed by Zelinsky et al. (1982). Sex differences in spatial ability are also cited as an explanation for female underrepresentation at higher levels of the National Geographic Society's *National Geography Bee* (Downs and Liben 1996). However, there is also considerable disagreement among researchers as to whether there are sex-related differences in spatial ability and geographic literacy, and what the causes are for such differences if indeed they do exist.

Theories of Difference

Three theories concerning sex-related differences in spatial ability are presented in a review of literature by Self et al. (1992). *Deficiency theory* informs the work of researchers looking for biological explanations for sex-related differences in spatial ability and knowledge. The proponents of this theory are divided into two causal camps. One group seeks to use a biological explanation regarding differences in male and female brain structures and use, with the other group explaining sex-related differences in spatial ability as a function of hormones- androgen and estrogen.

Difference theory focuses on explanatory sociocultural factors that lead to differences in the experiences of males and females, thus leading to differences in the background characteristics that inform geographic competence and skills. The third theory described by Self et al. (1992) is *inefficiency theory* which is similar to difference theory in that it implies a socially constructed difference. Inefficiency theorists propose that differences found from tests of spatial ability and geographic literacy are a result of bias in the testing procedures that generally favor one sex (usually males) over the other.

Sex Differences in Spatial Ability and Geographic Literacy: Natural or Structural?

Considering that there are substantial distinctions among the theories that address sex-related differences in spatial abilities, it is not surprising that there is also a considerable amount of disagreement among researchers as to whether these differences actually exist. In fact, the findings that males outperform females on spatial tasks and tests of geographic literacy have proven to be inconsistent (Henrie et al. 1997). Caplan et al. (1985) noted that the sex-related differences found in many studies were minimal, thus the conclusions of male superiority in spatial abilities are often overestimated and unwarranted. Other studies (Montello et al. 1999; Self and Golledge 1994) found that there are sex-related differences in spatial ability, but that the differences are dependent on the type of spatial test used in the study. Females and males typically scored better on different tasks, and some tasks showed

no differences in abilities. However, while it is disputed whether there is sufficient evidence to support the supposition that one sex is superior with regard to spatial abilities and geographic literacy, there are persistent findings of sex differences on certain tasks. Determining the causes should be the focus of future research, rather than continuing the attempt to establish a sex-related superiority of spatial ability (Voyer and Voyer 1995).

An argument against the validity of many studies that find sex-related differences in spatial abilities questions the relationship of psychological tests of spatial abilities to the skills and knowledge that geographers deem germane to their work. To many researchers, findings of sex-related differences in spatial abilities are related to the sociocultural phenomena associated with either *difference theory* or *inefficiency theory* (Hart 1979; Henrie et al. 1997; Kitchin 1996; Matthews 1987).

Regarding geographic literacy, Henrie et al. (1997) interpreted the results of their study using the two socialization-related theories (biases in testing factors and differences in background knowledge due to gender-role expectations) while expressing that these explanations are not mutually exclusive. Matthews' (1992) review of literature on children's direct experience of place revealed considerable differences in the outdoor behavior and environmental experiences of boys and girls. According to Hart (1979), the girls observed in his study were encouraged

to limit their spatial range by participating in domestic activities (chores, baby sitting jobs, etc.) by their parents and other adults, as opposed to their male peers who had more opportunities for independent exploration and expanded home range (Wridt 1999). Kitchin (1996, 275) stated, “the territorial movements of females are often more controlled than males with strictly defined ranges,” which “is particularly pronounced at younger ages, the time of most learning potential.” The findings in his study suggested that given comparable geographic training and similar patterns in spatial behavior males and females possess “equivalent geographic knowledge and spatial skills” (Kitchin 1996, 285).

Although researchers make the case for sex-differences in spatial ability related to sociocultural factors as an underlying cause of female underrepresentation in geography, the lack of clarity on the exact nature of such differences make it essential for scholars to explore other avenues of research. I am not rejecting the idea that ability in geographic skills could influence the selection of geography as a college major and subsequent career as a geographer. Rather, I am suggesting that ability must be combined with interest in the discipline in order to understand why some women are attracted to the discipline.

Nontraditional Career Choice

The sociocultural influences, other than direct experience of place that could be associated with some females’ desire for and propensity to

do well in the male-dominated field of geography, are explored in the literature that examines female nontraditional career choice.

The phrase nontraditional career choice refers to the selection of an occupation for which one's sex is a contradiction because that occupation has been traditionally stereotyped as the proper and exclusive domain of only one sex. (Auster and Auster 1981, 253)

If segregating a certain sex in a profession is the manifestation of the idea that only one sex is suited to that particular profession, then geography is an appropriate example of a nontraditional career (Lee 1990; Zelinsky 1973a; Zelinsky 1973b; Zelinsky et al. 1982).

Auster and Auster's (1981) review of literature related to selection of nontraditional careers and the influence of role models in the decision making process helps to outline the methods and findings of these studies. Role-model influences on selection of a nontraditional career by females are grouped in the following manner: family influence (mother's influence, father's influence, parental support, socioeconomic status, sibling position and number), peer group influence, and teachers' influences (Auster and Auster 1981). Other factors added to the equation for nontraditional careers include academic achievement and gender role behavior (Sandberg et al. 1987), influence of sex-role self-concept (Strange and Rea 1983) and family and career commitment (McWhirter et al. 1998).

Family Influences

The family is the primary agent of socialization for a child. Family influence occurs on both the passive and active levels. Passive influences are socioeconomic status, birth order, and number and sex of siblings. The variables that exert an active effect on career choice are “parental attitudes and values, and behavior concerning the occupational socialization of children” (Auster and Auster 1981, 254).

The role of the mother in the career socialization of daughters has been studied repeatedly. In Auster and Auster’s (1981) review of literature, they report that a mother’s education level has a stronger relationship to a daughter’s educational expectations than a father’s education level. Having a working mother improves the chances that a daughter will choose a male-dominated career (Auster and Auster 1981; Sandberg et al. 1987). Mothers’ working did tend to be associated with daughters’ choosing nontraditional careers, although many of the mothers were not in nontraditional professions (Haber 1980; Sandberg 1987). Haber’s (1980) study suggested that even though the mothers of women in nontraditional careers were not themselves in these types of fields, they provided cognitive models and conveyed the belief that more options and alternatives exist for their daughters than had existed for themselves.

The role fathers play in the career expectations and aspirations of female children seems to have some relationship to the choice of

nontraditional careers by daughters. Women working in nontraditional careers report having a close relationship with their fathers, and they also indicate that it was their fathers that most prized their intellectual abilities (Auster and Auster 1981). Hackett et al. (1989) also found that fathers exert a strong and significant influence on the consideration of a nontraditional career.

Lunneborg (1982) viewed emotional support from both parents, rather than identification with just one, as more important to career choice. This assumption is supported in studies that found parents' expectations for their daughters' sex-role behavior to be a major predictor for the selection of a traditional or nontraditional career (Haber 1980; Sandberg et al. 1987). However, while parents of higher socioeconomic status encourage their daughters' general academic performance, they tend to discourage the pursuit of quantitative fields of study in college (Ethington and Wolfe 1988). Perhaps this is why Auster and Auster (1981) report inconsistent findings for parental emotional support data.

Family socioeconomic status is said to influence the choice of a nontraditional career in three ways: providing financial support for extended education, having a value system that places emphasis on educational attainment, and providing contact with a cultural milieu that models nontraditional careers (Auster and Auster 1981). Lunneborg (1982) found that over half the nontraditional subjects in her study came from families where the average income was over \$30,000.

Birth order is another factor that shows up as significant to nontraditional career choice by females. At least half of nontraditional females in studies reviewed by Auster and Auster (1981) were the oldest or only child, or were born first among the female siblings.

Socioeconomic status is linked to this factor, because in a family of limited income, the male children are viewed as needing family resources for education more so than female children. Lunneborg (1982) also reports nontraditional females as being the first born among female siblings, and adds that sisters consistently give low ratings to their brothers for being supportive of their nontraditional career choices.

Teachers' Influence

The influence of teachers on females' choices of nontraditional careers appears in several studies. Female students seem to value the advice of teachers and counselors more than male students do (Ware 1988). Houser and Garvey (1983) found that 48 percent of nontraditional female students said they were told, or got the impression from teachers, that they would do well in male-dominated courses, as opposed to only 14 percent of traditional female students. Mexican American girls perceived fewer barriers to their educational and occupational futures with higher levels of perceived teacher support (McWhirter et al. 1998). Although not a strong tendency, male teachers did exert a negative influence on women's selection of science-related college majors. However, this study did find that female professors are

positive role models for nontraditional career aspirations by female students (Hackett 1989).

Academic Achievement and Family and Career Commitment

Several studies point to a link between academic ability and higher level career aspirations by females (Ethington and Wolfle 1988; McWhirter et al. 1998; Nauta et al. 1998; Sandberg et al. 1987). For example, if a person is adept at mathematics she is more likely to aspire to be an engineer than a person with lower abilities in math.

Another pertinent factor for females' career aspirations is future plans for family. The expectations for marriage and family or commitment to career achievement are predictors of selection of traditional or nontraditional career paths, respectively. When females put marriage and family before career commitment, they tend to choose traditional rather than nontraditional occupations (Haber 1980; McWhirter et al. 1998; Nauta et al. 1998; Ware and Lee 1988).

Sex Role Self-Concept and Gender Role Behavior

Females who perceive themselves as having more stereotypically masculine characteristics are more likely to choose nontraditional occupations than females who perceive themselves as more stereotypically feminine (Baker 1984, 1987; Kenkel and Gage 1983; Lee 1998). Sandberg et al. (1987) found that adolescent girls who aspired to have nontraditional careers in adolescence reported being "tomboys" in their childhood. This finding might be linked with Kitchin's (1996)

conclusion that given similar experiences with the environment in childhood, females perform as well as or better than males in geography.

Developing Interest in Geography

Just as early experiences with place are suggested as possible explanations for both spatial ability and geographic competence, these experiences are also linked to career choice (Milley and Bee 1982). Professional geographers have also speculated on the nature of childhood experiences on the selection of geography as a career choice. Indeed, in one of the few studies that actually looked at how professional geographers developed interest in their field, Buttner (1993) notes that childhood milieu are most often recalled by her colleagues when they are asked about their reasons for choosing geography as their career.

Carl Sauer (1956) observed in his presidential address to the Association of American Geographers that geographers are partly born and partly shaped by their early environment. Based on autobiographical descriptions of the paths that have led some professional geographers into the discipline, Downs (1994, 187) adds that “we should look to formative, early childhood experiences and perhaps even epiphanies to understand the origins of geographic expertise.” Sauer (1956) also emphasized the idea that geographers as a collective group are individuals of varying backgrounds having some denominator in common.

Among the common denominators underlying the formation of the geographer, as illuminated in the presidential address by Sauer (1956), is an interest in maps. He proposed that one of the characteristics inherent to a geographer is “liking maps and thinking by means of them” (Sauer 1956, 391). Peirce Lewis (1985, 467) revisited Sauer’s ideas about the nature of the geographer, and describes the geographers’ fetish for the tools of the trade as “cartophilia, the visceral love of maps.” A second spatial predilection elucidated by Lewis (1985, 467) is “topophilia, an equally visceral passion for the earth.”

Similar to Lewis’ idea of the geographer’s “passion for the earth” is the desire and interest in travel. Sauer (1956, 392) stated that geographers are “...travelers, vicarious when they must be, actual when they may.” Buttner (1993, 29) found that most geographers associated childhood “contact with the terrain itself” to be among the reasons for selecting geography as a career. Reference to place by professional geographers when asked the influences that led them to geography is also noted by Haggett (1990).

Although geographers have reflected on influences that seem apparently related to development of geographic expertise, the variables cited by geographers (e.g., travel, outdoor experiences, etc.) did not correlate with better performance in some studies that examined spatial ability and geographic literacy (Beatty and Troster 1987; Eve et al. 1994; Henrie et al. 1997). However, Bein (1990a; 1990b) found that students

in an introductory college geography class scored higher on the National Council for Geographic Education (NCGE) Competency-Based Geography Test if they had traveled more than twelve times. He also noted that adult relocation, living in more than one U.S. state after age 17, correlated with higher scores on the NCGE test. Since the findings of the intuitive variables of travel and relocation vary by study of geographic ability, these variables will be considered in my research as possible common denominators for the formation of interest in geography.

In her research on the career paths of women with graduate degrees and professional positions in geography, Monk (forthcoming) expresses the need for research into career choice in geography to move beyond childhood in examining the pathways into geography. She also points out that differences in the career paths of male and female geographers through career decisions related to the attitudes of a spouse or parents, the climate for women in geography departments (both currently and historically), and the intersections of the personal and the professional must be included in order to understand the gender dynamics associated with the ratio of men to women in the discipline (Monk 2000).

Concluding Remarks

Researchers have sought explanations for female underrepresentation and underperformance in geography by looking for evidence of male superiority in spatial ability and geographic literacy.

Although conclusions of sex differences have been reached in some studies, they do not collectively show superiority by either sex on all spatial and geographic tests. Furthermore, the conclusions that sex differences in spatial ability and geographic literacy exist often fail to address causality. Unlike many of the tests of spatial ability that sometimes focus too heavily on aggregate data, this present study considers developmental processes, life experiences, and life goals as determinants for the selection of geography as a college major and career.

CHAPTER 3

RESEARCH METHODS

Since this study constitutes an exploratory process looking for patterns in the backgrounds of geography majors, I use a set of broad questions to outline the research problem and define the most appropriate methods for this study. The central question guiding this study is, "If females are generally underrepresented and underperforming in geography, by most indicators, why are *certain* females attracted to the discipline of geography, and why do they do well in it?" The following list of sub-questions are designed to outline and facilitate the data collection and analysis in order to answer the central research question.

1. Are there differences in the reasons that females and males decide to major in geography?
2. Do patterns exist with regard to the travel and migration backgrounds of male versus female geography majors?

Pilot Study

I conducted a pilot study using variables from nontraditional career choice literature in the spring semester of 1999 at Southwest Texas State University. A questionnaire was used to gather data on

socializing influences of both male and female geography majors. Some of the most interesting data revealed through the pilot study were collected in a qualitative short answer to the question, "What significant events or experiences from your childhood/adolescence do you believe had a strong influence on your decision to major in Geography?"

Fifty-eight geography majors, including 15 females and 43 males, answered this question on the pilot questionnaire (Table 1). The fifteen

Table 1. Reasons for Interest in Geography from Pilot Study, by Sex

	Female <i>N</i>	Male <i>N</i>
Love of Outdoors/Outdoor Experiences	9	13
Travel Experiences	2	9
Interest in Maps	0	7
Residential Relocation	2	5
School Experiences	1	4
Influence of Person	1	3
Geographic Media	1	2
Camping	3	1
Landscape Toys	0	1
Exploring	0	1
Boy Scouts	0	1

Source: Pilot Survey Data.

Note: Since some students who completed the question listed more than one of these reasons for their interest in geography, the total number (*N*) of responses is greater than the actual number of respondents.

female geography majors who answered this question responded from most to least frequent love of outdoors or outdoor experiences, camping, travel and relocation, school experiences, influence of a person, and geographic media. The male majors who completed the pilot

questionnaire had some overlapping answers with the female majors who responded; however, there were some differences. The male geography majors gave the following answers to this question from most to least frequent: love of outdoors and outdoor experiences, travel, interest in maps, relocation, school experience, influence of a person, geographic media, exploring, landscape toys, camping, and Boy Scouts.

Since outdoor experiences or the love of the outdoors, travel, and relocation were among the most commonly cited childhood and adolescence events and experiences influencing males and females to major in geography, these variables dictated the design of the present study.

Research Design

The exploratory nature of the research problem in this study supports the use of multiple methods of data collection and analysis. *Triangulation* is the term used to describe a research methodology that uses mixed methods including both qualitative and quantitative techniques. Triangulation argues for the combination of methodologies to minimize or neutralize biases inherent in data sources, researchers and methods (Creswell 1994). Creswell pointed out that while there are debates on the use of multiple methods by purist in both the qualitative and quantitative camps, “pragmatists argued that a false dichotomy existed between qualitative and quantitative approaches and that

researchers should make the most efficient use of both paradigms in understanding social phenomena” (Creswell 1994, 176).

Monk (1998) emphasized the need for more in-depth, explanatory methods that go beyond simple descriptive counting when exploring the influences that lead women into the discipline of geography. She focused on the need to understand not only the numbers of women in geography, but also who they are, how they might differ from the men in the discipline, and the circumstances that played a role in developing their interest in a career as a geographer. With this in mind, and given the nature of this research project, the use of qualitative methods was selected as the essential and dominant strategy of the study.

Grounded Theory

Grounded theory is particularly well suited to this research project, because I plan to develop a hypothetical model for students’ attraction to the discipline of geography by examining the pathways that lead them to major in geography and develop a career in a geographically related field. Grounded theory uses working hypotheses rather than *a priori* hypothesis testing. While the procedures in grounded theory are very structured, the process allows some flexibility for the researcher to gather data, use the new information to revise the evolving hypotheses, and update the data collection process throughout the data collection phase of the study (Creswell 1998). The quantitative data collected for

this study are used to supplement the more in-depth information gathered through personal interviews and open-ended survey questions.

In her work, Monk (forthcoming) raised the important issues of reflexivity and positionality that must be considered in social research. England defined and described the importance of reflexivity in research:

Reflexivity is self-critical sympathetic introspection and the self-conscious *analytical* scrutiny of the self as researcher... reflexivity is critical to the conduct of fieldwork; it induces self-discovery and can lead to insights and new hypotheses about the research questions. (England 1994, 82)

Nast (1994) re-emphasized the need to practice reflexivity throughout the research process, specifically as it relates to the positioning of the researcher and the researched in relation to the audience the research project is intended to address. The ideas inherent in the concept of positionality are based on the theory of “situated knowledge” (Haraway 1996). Haraway’s “situated knowledge” rejects the idea that absolute truth is found through “objective” knowledge or that “objective” research even exists, and focuses on the subject, especially in social research, as an active agent rather than a passive data source. This theory argues that, “Accounts of a ‘real’ world are not...dependent on a logic of ‘discovery’, but on a power-charged social relation of ‘conversation’” (Haraway 1996, 125).

The issues of reflexivity, positionality, and situated knowledge are important considerations for the methodology and methods selected for this study. Another important consideration for this research are the

gendered relations embedded in the qualitative method of personal interviewing that I use to gather data (Herod 1993). The selection of interviewing as a data collection method is considered more useful in an exploratory study than simply administering a structured survey, because the survey usually does not provide an underlying rationale for subject actions.

Three important points related to sex in the gathering and interpretation of interview data are: (1) portraying the researcher's own gender more favorably than the other sex, (2) the realization that females and males often use language in different ways, and (3) gender differences in non-verbal communication (Herod 1993). The pitfalls of gender relations in interviewing were kept in mind while doing the research for this project as well as the other considerations of reflexivity and positionality.

Study Population

One hundred eighty-seven undergraduate geography majors, who were enrolled in upper-division geography courses at Southwest Texas State University in San Marcos, Texas, participated in the questionnaire portion of this project. I administered the background questionnaire in the first 15 minutes of class or in the last 15 minutes of class in several geography classes. One hundred and nine male geography majors completed the survey as well as 78 female geography majors. The

classes in which the questionnaire was given included four geographic techniques classes, two physical geography classes, three environmental management classes, one planning class, a section of political geography, and a regional geography class.

In addition to the data collected with the questionnaire, I also gathered data using personal interviews. Twelve geography majors, including seven female majors and five male majors, participated in the interview phase of the study. Only majors with at least a 3.0 grade point average in geography and a 2.75 overall grade point average were selected to interview. The reason for these criteria in the selection interviewees is related to the primary research question of why certain females do well in geography. In order to have an equivalent comparison group of male majors, the selected male interviewees also met these criteria. The interviews lasted from approximately 45 minutes to one hour and 30 minutes. I conducted both the questionnaire and interview phases of the project during the spring semester of 2000.

Data Collection Instruments

Background Questionnaire: The background questionnaire (see Appendix A) consisted of questions that asked participants' age, sex, ethnicity, class level, major, minor, credit hours completed in major, grade point average in major, overall grade point average, and the number of subjects that the participant majored in before deciding on his

or her current major. A qualitative, open-ended question was included with the other questions on the background questionnaire. This question specifically asked majors what prior experiences influenced them to choose their college major. The questionnaire also asked about the number of U.S. states visited by the participants as well as the number of places visited outside the U.S.

Residential Setting and Relocation Data Matrix: The residential setting and relocation data matrix, included on the background questionnaire, asked participants to list each place they lived, their age range at each residence (length of time lived at each residence), and whether their residences were urban, suburban, or rural.

Bem Sex Role Inventory: The Bem Sex Role Inventory (Bem 1978) was also included in the questionnaire packet in hopes of determining if gender characteristics are related to the selection of geography as a major. The Bem survey asks participants to rate themselves in relation to a number of descriptive adjectives. Some of the adjectives included on the survey are supposedly masculine, feminine, and neutral. A “masculinity score” and a “femininity score” is assigned to the participant depending on how she or he responds to each item. A gender identity can then be assigned based on these scores. However, the Bem scores for female and male majors were not significantly different, and this avenue of analysis was therefore carried no further and the results are not reported here.

Interviews: I conducted personal interviews asking probing questions as a basis for the development of the grounded theory model. The data obtained during the interviews was coded into categories using standard grounded theory coding techniques. As data were collected, the questions for future interviews were revised to explore patterns in the data set. Hypotheses evolved until patterns emerged, and interviewees began repeating each other with regard to the information they divulged. The interview questions (see Appendix B) addressed how students became interested in geography, what prior experiences from childhood, adolescence, and the recent past might have influenced their interest in geography including travel, teachers, support from family and significant others, and expectations for careers and further education.

Data Analysis

As I acquired data collected from the personal interviews the coding process for the grounded theory model unfolded. The first step in the analysis of data was open coding. At this phase, the data were sorted into categories. Within each category there were subcategories, termed properties. Axial coding was the next data-sorting filter. A central phenomenon in the data was identified at this level along with causal conditions, strategies, context, intervening conditions, and the outcome. These concepts were then organized and displayed in a logic diagram. At the selective coding phase, the categories identified in the axial coding

process were integrated to form hypotheses (Creswell 1998). The quantitative data collected from the background questionnaire, the travel matrix, the residential setting and relocation matrix, and the Bem Sex Role Inventory were used to compare male and female geography majors. I analyzed the quantitative data using descriptive statistics and a comparison of means test, the two-tailed t-test. I analyzed the qualitative question from the background questionnaire concerning influences on the decision to major in geography using content analysis.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

This chapter highlights the results from the quantitative analyses of data for all geography majors and the data obtained during the in-class questionnaire as well as the qualitative analysis of the interview data.

Profile of Population and Sample

Data obtained for the population of geography majors at Southwest Texas State University (SWT) indicates that 560 students were declared majors as of the 1999 fall semester. The ethnic distribution within the population of majors consists of mostly Caucasian (82%), with Hispanic (11%) being the second most represented group. These numbers indicate that within geography Caucasians are slightly overrepresented with all other ethnic groups slightly underrepresented when compared to the overall undergraduate population. The sample of geography majors gathered from the in-class questionnaire proves to be fairly representative of the total population of geography majors (Table 2).

Table 2. Comparison of Populations and Sample, by Ethnicity

	Total Undergraduates (%)	All Geography Majors (%)	Sample (%)
Caucasian	72	82	79
Hispanic	19	11	12
African Am.	5	1	1
Asian Am.	2	1	2
Native Am.	1	2	3
Other/ No Response	2	2	5

Source: Office of Institutional Research, Southwest Texas State University and Survey Data.

The overall population of undergraduates at SWT by sex includes 55% females and 45% males. The ratio of females to males changes drastically in geography when compared to the overall population, because the percentage of females is very much less. There is a large gap between the percentage of female and male geography majors, and the sample approximates this pattern with only 5% higher representation of females and 5% lower of males (Table 3).

Table 3. Comparison of Percentages of Females and Males

	Total Undergraduates (%)	All Geography Majors (%)	Sample (%)
Female	55	37	42
Male	45	63	58

Source: Office of Institutional Research, Southwest Texas State University and Survey Data.

The fact that there is a higher percentage of female majors in the sample data is welcomed in this study since the purpose of the research is to ascertain why females choose to major in geography since they are underrepresented in the discipline.

Other comparisons made to determine if the sample of geography majors taken from the in-class questionnaire is representative of the population of geography majors include class level and concentration within the major (Tables 4 and 5). The sample consists of a total of 187 geography majors.

Table 4. Comparison of Population with Sample, by Class Level

	Geography Population (%)	Sample (%)
Senior	54	52
Junior	29	41
Sophomore	13	5
Freshman	4	0.5

Source: Office of Institutional Research, Southwest Texas State University and Survey Data.

The overrepresentation of Juniors and underrepresentation of Sophomores and Freshman in the sample is due to the in-class questionnaire being administered in upper-division geography classes. The purpose of sampling upper-division classes only was to ensure that the majors in the sample were students likely to stay in geography; therefore, avoiding a possible methodological error by basing the data on

Table 5. Comparison of Population with Sample, by Concentration

	Geography Population (%)	Sample (%)
Resource/Environmental Management	53	58
GIS/Cartography	17	13
Urban/Regional Planning	11	8
General	9	6
Geographic Education	5	6
Physical	5	9

Source: Office of Institutional Research, Southwest Texas State University and Survey Data.

students who have a higher chance of changing their major before graduating.

With regard to the data on concentration within geography, the categories Resource/Environmental Management, Geographic Education and Physical are slightly overrepresented in the sample, while the categories GIS (Geographic Information Systems)/Cartography, Urban/Regional Planning, and General are slightly underrepresented in the sample.

Similarities and Differences of Female and Male Majors

Using both the data on all majors and the data collected from the in-class questionnaire, I made comparisons between the female and male geography majors. All of the similarities found between the two groups

are not highlighted in this section, but several interesting similarities are reported and all of the sex differences are reported.

Among the similarities between females and male geography majors is the selected minor. At SWT, students are required to declare a minor in addition to their major to fulfill the Bachelor's degree requirements. The following is a list of the most frequently listed minors for both groups in the sample: Biology (21%), Geology (11%), Anthropology (8%), Nature and Heritage Tourism (7%), Business (7%), and Agriculture (7%). Within some minors, however, there are sex differences. While the minors Biology, Anthropology, and Agriculture contain virtually equal percentages of females and males, Geology and Business have nearly twice as many males as females, and Nature and Heritage Tourism has twice the percentage of females to males.

These findings show typical relationships for selected subjects and female and male participation. Biology, a life science, generally attracts more females than do physical sciences (e.g., Geology), and females share equal representation with males in most of the social science with the exception of geography (Lee 1990). It is important to note here that the category Agriculture contains the sub-categories of General Agriculture as well as Horticulture. This could explain the nearly equal percentage of females to males in this minor.

The sample data also show similarities between female and male geography majors with regard to the number of majors they had prior to

declaring geography as their major and year of their selection of geography as their major (Tables 6 and 7). The results of these measures

Table 6. Number of Previous Majors, by Sex

	<i>N</i>	Female (%)	Male (%)
One (1)	79	44	41
Two (2)	27	17	13
Three (3) or more	12	8	6
Total	118		

Source: Survey Data.

Table 7. Year of Major Selection, by Sex

	<i>N</i>	Female (%)	Male (%)
Prior to First Year	12	6	12
Freshman Year	14	15	9
Sophomore Year	43	40	32
Junior Year	44	32	38
Senior Year	7	4	7
Total	120		

Source: Survey Data.

Notes: Since this item was included on the second draft of the questionnaire there is a discrepancy between the total for this item and the 187 count for persons who completed the questionnaire.

seem to indicate that both female and male majors tend to decide upon majoring in geography in either their Sophomore or Junior year, and more than half of both female and male geography majors declare a major in at least one other subject before deciding to major in geography.

The number of residential moves is another point on which female and male geography majors share similar experiences (Table 8). For this

Table 8. Number of Residential Moves, by Sex

Residential Moves	N	Female (%)	Male (%)
Two (2)	38	22	20
Three (3)	38	27	16
Four (4)	27	13	16
Five (5) or More	34	19	18
Total	137		

Source: Survey Data.

comparison the variables *no moves* and *one move* are not included, because most of the students who completed the questionnaire moved at least once when they left home to go to college. There were only 12 exceptions to this assumption, three females and nine males. Three students did not complete this section of the questionnaire.

Although there are slight variations between female and male majors in some of the variables presented thus far (e.g., selected minor), the similarities between the two groups with respect to those variable are evident. However, some variables on the in-class questionnaire and the data for all geography majors illustrate pronounced differences between female and male geography majors. These variables include concentration in geography, highest education plans, grade point average

overall and in major, being born in Texas and the number of states resided in, and influences on the selection of geography as a major.

In Table 5 the percentages of all geography majors and of the geography majors in the sample are listed for each of the undergraduate concentrations offered by the Department of Geography at Southwest Texas State University. When each concentration is analyzed for sex differences the results show a strong differentiation in concentration by sex (Figure 1). The concentration with the highest percentage of female majors (69%) is geographic education. The high percentage of females in this concentration is not surprising since elementary and secondary education is a traditionally female-dominated profession. It is also important to note that, historically, geography as a profession, kept female geographers in the role of pre-collegiate educators (Monk 1998).

Regarding the ratios of female to male geography majors in the other concentrations, females typically seem to be attracted to the specializations that relate to issues of social concern (Goodchild and Janelle 1988). Goodchild and Janelle (1988, 11) state, "Differentiation in the patterns of specialization ... according to gender are considered as possible evidence of social influences on the structure of the discipline."

Because females are underrepresented in geography, especially at higher levels in academe (Lee 1990), it is interesting that one of the sex differences associated with the sample data is in the variable *highest education plans*. Half of the males who completed this question noted

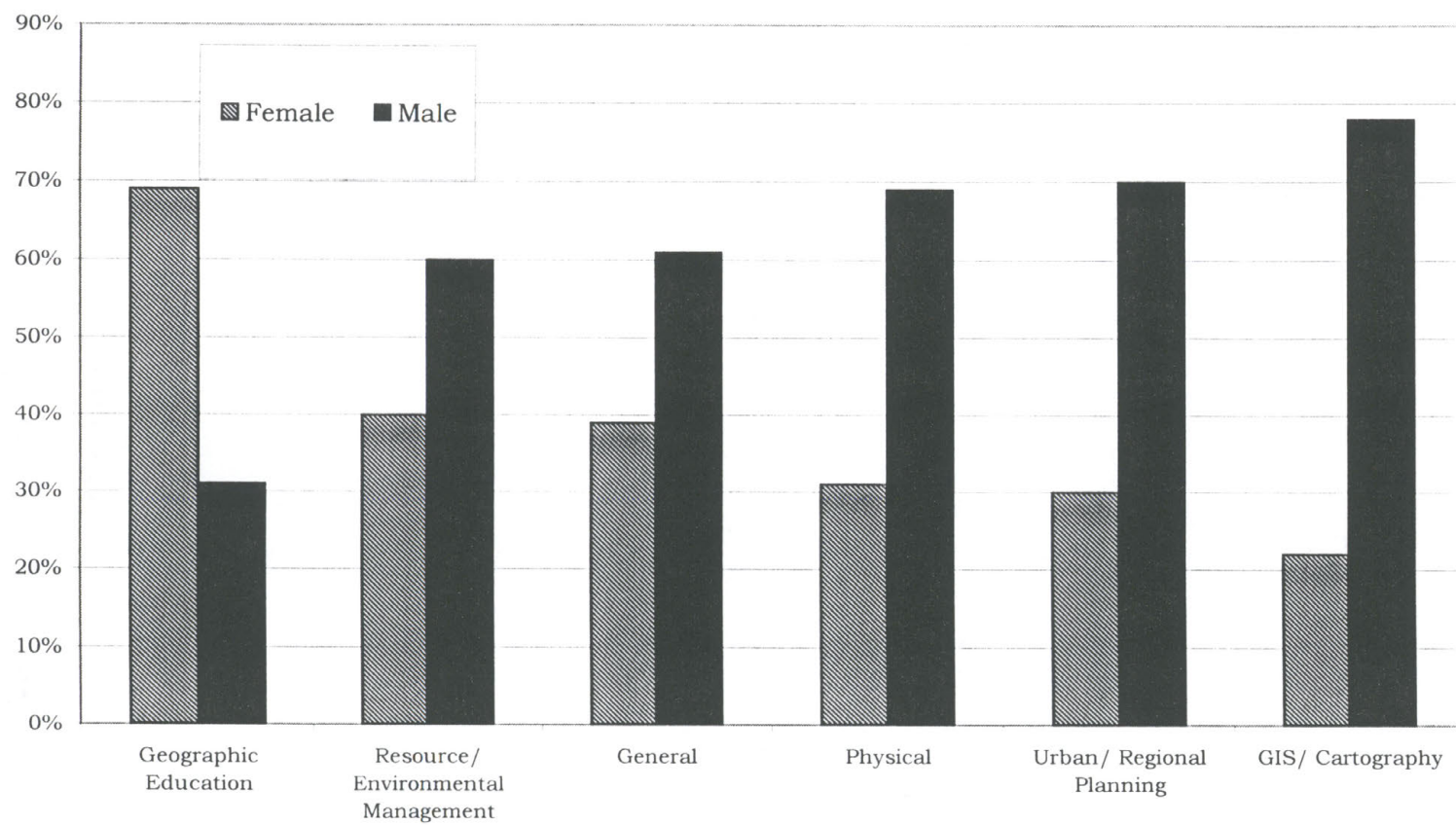


Figure 1. Percentage of Female and Male Majors by Concentration

that they plan to stop their formal education after attaining a Bachelor's degree while almost 70% of females completing this question indicated they plan to attain a graduate degree. This finding is probably related to the two other variables included on the questionnaire, *grade point average in major* and *overall grade point average*. The data on all geography majors included *overall grade point average* as a variable, but did not include grade point average in major. Again, there is a noticeable sex difference for this variable (Figure 2). Nearly twice as many female as male majors are represented in the two highest grade point ranges, 3.5 to 4.0 and 3.0 to 3.4. On the same measure, there is a higher percentage of male majors in the two lowest grade ranges, 2.0 to 2.4 and below 2.0. There is only a slight difference in the percentage of females and males in the 2.5 to 2.9 grade range.

Two other variables from the questionnaire, *born in Texas* and *number of state resided in*, show sex differences when analyzed. The males overwhelmingly (73%) tended to be native Texans, but just over half the females indicated that they were born in the state (Table 9).

Table 9. Born in Texas, by Sex

	<i>N</i>	Female (%)	Male (%)
YES	122	53	73
NO	65	46	27
Total	187		

Source: Survey Data.

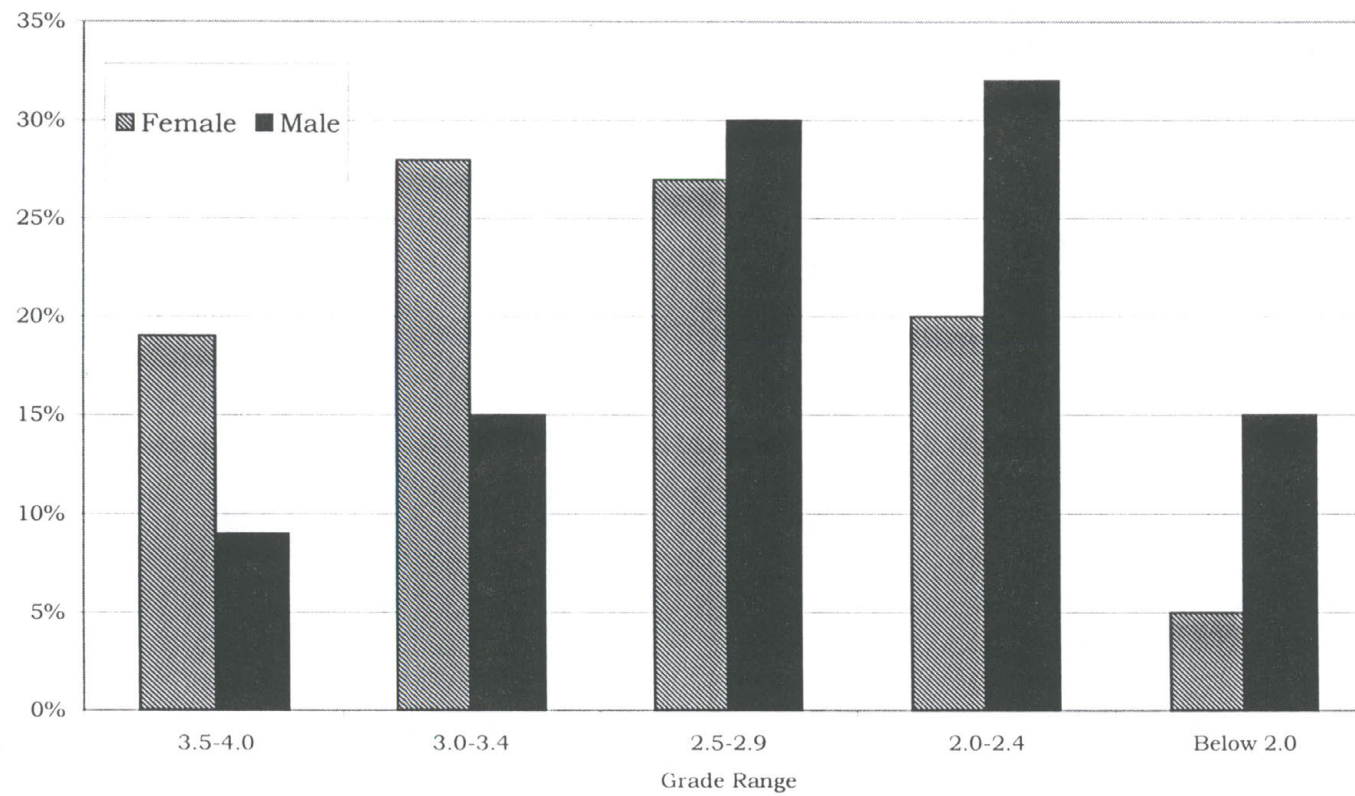


Figure 2. Grade Range of Geography Majors by Sex

Since only a little over half the females participating in the questionnaire stated that they were born in Texas, it is not surprising that more female than male geography majors in the sample had lived in more than one state. What is interesting is that the percentage of female majors who have lived in three or more state (29%) is double the percentage of male majors who have lived in three or more states (14%). This finding could mean that female majors have had more opportunities for travel, if, perhaps, they visit their home state to see relatives or old friends.

Two Tailed T-Test

A two tailed t-test for statistical significance was performed on the quantitatively measured variables that indicated sex difference in the crosstabular descriptive analysis. Table 10 displays the results of the statistical analysis.

Table 10. T-Test for Equality of Means, by Sex

Variables in Equation	T	Sig T
GPA in Major	3.37	.001***
Overall GPA	6.53	.000***
Born in Texas	-2.75	.007**
Number of States Resided In	1.96	.056

Source: Survey Data.

** p < .01 *** p < .001

As indicated by the crosstabular descriptive statistics, and as shown in Table 9, female majors in this sample have significantly higher grade point averages overall ($p < .001$) and in their major ($p < .001$) than do their male counterparts. Also, male majors are statistically more likely to be born in Texas than are female majors ($p < .01$).

Influences on the Decision to Major in Geography

Lastly, a comparison of the responses female and male majors listed for the qualitative question on the in-class questionnaire, "What factors (from your recent past, adolescence, childhood, etc.) do you feel influenced your choice of college major?" yielded very interesting results (Figure 3).

Environmental Concern

The most obvious contrast observed from this data is in the percentage of majors who indicated their decision to major in geography as a result of their interest in the environment or environmental issues and/or their desire to protect or conserve nature and natural resources. Here the female majors predominate, evidence that females are drawn to current social issues (Goodchild and Janelle 1988). This finding is also substantiated by Seager's report that:

With few exceptions, women constitute approximately 60 to 80 percent of the membership of most environmental organizations- averaging 60 percent of the membership of general-interest environmental groups, 80 percent or more of grassroots groups and animal-rights groups. (Seager 1993, 264)

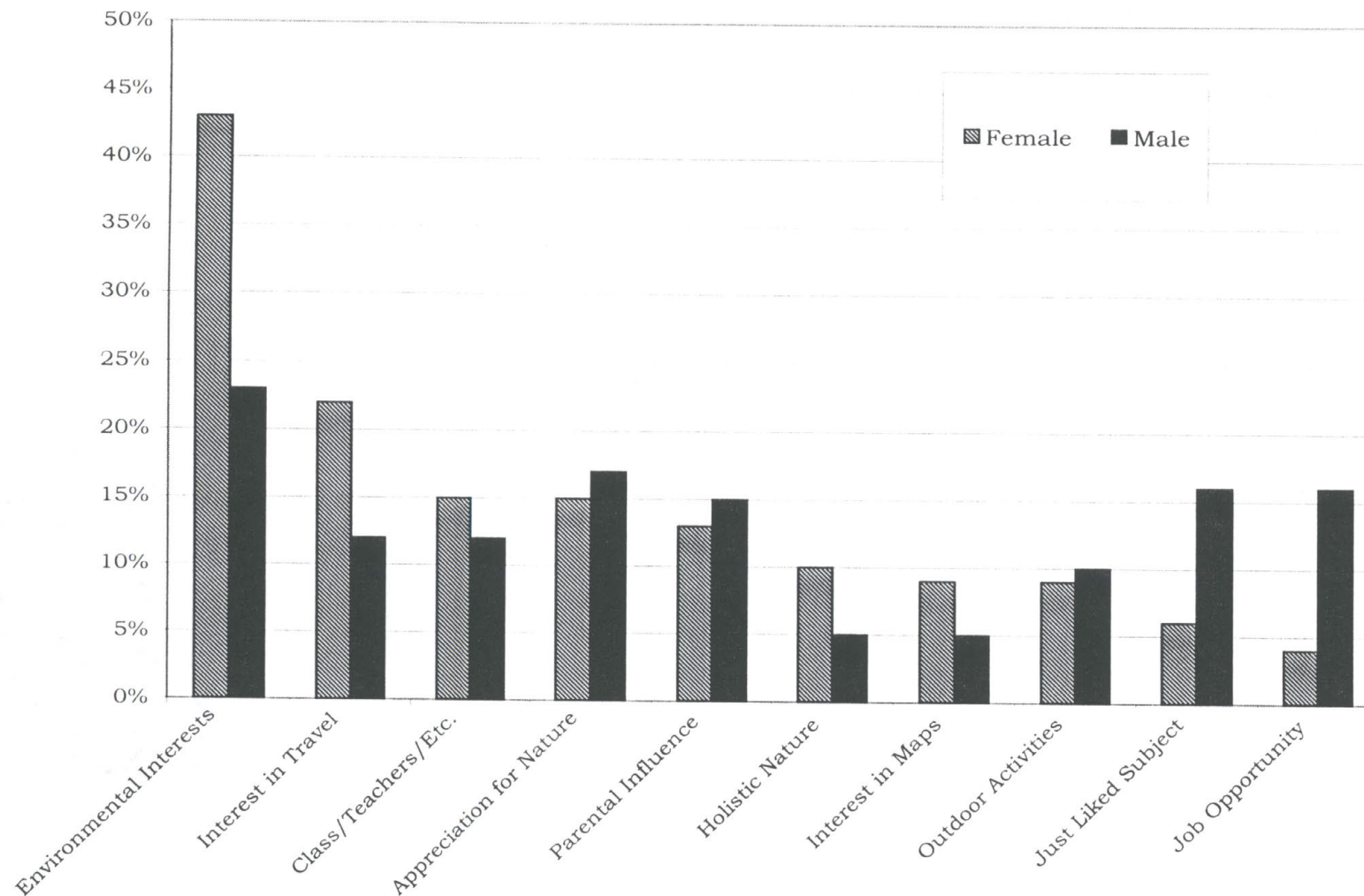


Figure 3. Female and Male Reasons for Selecting Geography as Major

Note: The percentages in Figure 3 were calculated from the number of females and males who answered this question. A total of 10 females did not respond to this question, and a total of 22 males also gave no answer.

Although there are indicators that link females with concern for the environment, I want to avoid the implication that environmental issues are female issues in order to guard against essentialism and naturalism.

As defined by Kobayashi, essentialism is:

Ascribing essential and immutable qualities to a category of persons on the grounds of "race" or "sex." (Kobayashi 1994, 11)

And naturalism is:

Maintaining that such qualities are "naturally" rather than socially produced, and therefore part of a natural order that cannot or should not be changed. (Kobayashi 1994, 11)

Since 23% of male majors also mentioned environmental interests or concerns as a factor in their selection of geography as their major, and since this was the highest percentage response among male majors who answered the question, I am inclined to feel this interest among majors has more to do with socialization. For example, the male majors tended to equate environmental interests with conservation of resources for future use, and the female majors most often indicated a desire to protect resources from human use. Given that females are traditionally socialized to be nurturing care-givers (Momsen 2000), environmental issues might be a way to draw females into geography, at least to environmental geography.

Seager (1993) points out a valid link between females and the environment without caving in to essentialist or naturalist ideologies:

The emergence of a women's voice on the environment does not imply the workings of biological destiny...Rather, a "women's

voice” on the environment derives from materially-grounded facts about women’s social location. Women’s environmental activism occurs within the context of, and as a result of, their particular socially assigned roles- roles that in many key ways do transcend boundaries of race, ethnicity, and class. (Seager 1993, 269)

Other Influences on Female and Male Majors

Among the other factors, shown in Figure 3, reported by a higher percentage of female majors as influencing their selection of a geography major, include an *Interest in Travel*, a *Class/Teachers/Etc.*, the *Holistic Nature* of geography and an *Interest in Maps*. Two of these reported influences correspond with Carl Sauer’s (1956) predilections for geographers: travel and maps.

Three factors represent nearly equal percentages for female and male majors: an *Appreciation for Nature*, *Parental Influence*, and *Outdoor Activities*. An *Appreciation for Nature* and *Outdoor Activities* echo Sauer (1956) and Buttimer’s (1993) words regarding what is at the core of the geographer. Sauer (1956, 392) notes that, “The geographic bent rests on seeing and thinking about what is in the landscape....” Buttimer (1993, 14) adds to this description with, “The aesthetic appeal of landscape exploration and the emotional sense of belonging to place have ranked high among the sirens that have called people to the practice of geography.”

Twenty percent of male majors ($N=22$) who completed the in-class questionnaire chose not to answer or gave a vague answer to the question about influences on their selection of a geography major.

Although 13% of female majors ($N=10$) also fall into this category, they were more likely to give a vague answer such as “I’m not sure” than to simply skip the question. Socialization is a possible explanation for this phenomenon, because females research participants have been shown to feel more of an obligation to answer to a researcher’s question than male research participants (Kerkman 1999).

Finally, male majors were more likely than female majors to emphasize the influence of being able to find employment with their degree in geography. After conducting interviews with female majors (the results of the interviews will be addressed in the next section), I am convinced that female majors are also interested in finding employment in a geography-related field, but they tend to emphasize other aspects related to their interests.

Developing a Hypothetical Model

In order to better understand the process of deciding to major in geography, I developed a grounded theory model which evolved from the interviews I conducted with female and male geography majors, with added clarification from the qualitative question on the in-class questionnaire. I used the framework and examples for the development of a grounded theory in Creswell (1998) and Stauss and Corbin (1998) to produce a visual diagram for the decision to major in geography (Figure 4).

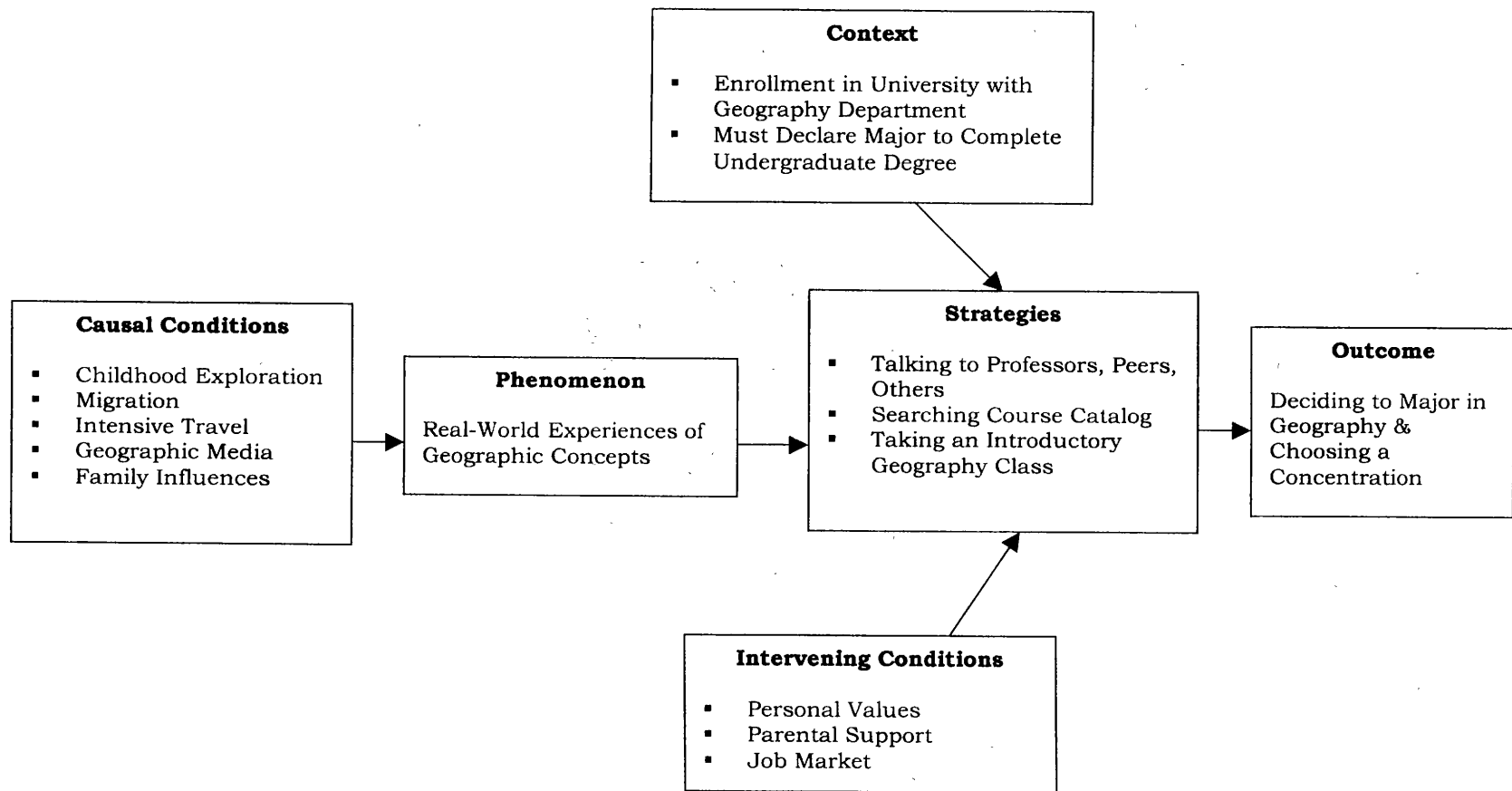


Figure 4. Hypothetical Model for Selecting Geography as Major

Causal Conditions for Interest in Geography

Several causal conditions for having an interest in geography were identified from the interview data, including: childhood exploration, migration, intensive travel, geographic media, and family influences. Although not every geography major experiences every causal condition, these conditions are the most frequently cited reasons for original interest in the subject, and many majors have more than one of these experiences in their backgrounds. Childhood exploration and play was a common theme among the interviewees. When asked what actions from their past might have influenced their decision to major in geography, more often than not they replied that playing outdoors as a child was a major influence on them. Freida (all names are pseudonyms) remembers, "I always played outside as a kid. We had woods behind my house and across the street from my house, and I would always go explore in them. Also, my friend, who lived nearby, had a lot of acreage, pasture land, with a creek bed. We'd explore out there for hours" (Freida 2000). Janie's (2000) grandparents had a farm in Minnesota, near Canada, with "a huge radius to explore in any direction." Childhood exploration, however, was not limited to rural areas. Drey recalls riding his bike all over his suburban neighborhood with a friend, and going much farther than his parents had given him permission to go (Drey 2000).

A second causal condition in the lives of geography majors is migration. Kate, whose dad was a pilot in the United States Air Force, moved every four years during her childhood and adolescence. She says, "Every four years I had a new geography. It made me adventurous" (Kate 2000). Sloan (2000) also moved around to different places with her family. She moved from San Antonio, Texas, to Denver, Colorado, to Houston, Texas, then to California, and finally to Oregon before moving back to San Antonio. Before the age of 12, Lilith moved from Florida to Georgia to Tennessee to Texas. She says of her migration experience:

We moved around to a lot of different places...even though those are all states in the South, they are real different, real different kinds of people...I met people who had never been anywhere, and I thought, 'Oh, how terrible.' Even when I came to Texas, there were people who had never been outside of Texas, and even at age 12 I was really grateful that I'd gone to different places, you know, because I knew about things that they didn't know about. (Lilith 2000)

Similar to the experiences involved in migration are the experiences associated with the causal condition, intensive travel. The definition I use to describe intensive "travel is travel that goes beyond a superficial experience with a place and its inhabitants." Intensive travel is more like a mini-migration, because you experience what life is like in a place. Bailey (2000) experienced intensive travel while in high school. She was selected by her teacher to participate in a student exchange program to Australia and New Zealand. During her two months "Down Under," she studied the coral reefs of Northeastern Australia with two

marine biologists, where she learned the different kinds of marine life that depend on the reef. While in New Zealand, Bailey stayed with a Maaori tribe and visited their school. She was impressed by the school, because there the Maaori children learned about their traditions, including traditional arts, as a means of preserving their culture. She also noted that, “the weather was awful when we first got to New Zealand, because Mount Ruapehu had just erupted” (Bailey 2000).

Cho (2000) also had an intensive travel experience at a young age. When he was 15 years old, his parents financed a backpacking trip through Western Europe. He traveled around Western Europe alone for six weeks.

Freida's (2000) intensive travel experiences resulted from road trips she took with her cousin. She decided to take a break from college after her sophomore year. She went on a road trip with a cousin who had taken many road trips before, including several to Rainbow Gatherings, so her cousin had friends in different parts of the United States. On her initial road trip, Freida and her cousin went to see friends in Colorado, then drove to see friends in California. They left California to visit friends in Seattle, and then went back to California and camped for a few weeks while her cousin looked for a job because she planned to stay there. Since that initial trip, she has gone on several extended road trips, especially trips to Rainbow Gatherings, spending up to a month in Oregon, a month in Pennsylvania, and three weeks in Missouri.

The last two causal conditions, geographic media and family influences, are sometimes related. Bailey's father had had a subscription to *National Geographic* since the 1950s and she loved to look through all the old issues. She even began a map collection with the supplemental maps that accompanied the issues. When he let his subscription lapse, she had her mom order it for her. Bailey's parents also only let her watch public television when she was young. She said she always wanted to travel, because she loved the travel and nature shows she saw on public television.

Sloan's (2000) father also had "lots of *National Geographics*, maps and globes around the house." Her father was also an amateur photographer, and she loved to look at all the photos he took of different places. Beyond the geographic media that influenced Sloan, her parents also liked to hike and explore the natural world. She remembers them taking her hiking in state parks, or even on her grandparents' Texas ranch. They would point out different rock formations and plant species on these treks.

Kate's (2000) dad had his own small plane, and would take her for rides around their Northern California home. He would let her pretend to be navigator, and put her in charge of the maps. She loved it when she could recognize places from the air she had explored on the ground. Kate credits the experience of being "flight navigator" for her dad with giving her the incentive to start collecting maps at age ten.

Central Phenomenon in the Lives of Geography Majors

The causal conditions experienced by both female and male geography majors focused in on a central phenomenon – real-world experiences of geographic concepts. Buttimer (1993) elucidates this concept when describing the “vocational meaning” in the careers of academic geographers. She terms this concept “*poesis*,” which:

Denotes the evoking of geographic awareness, critical reflection, discovery, and creativity. It elicits curiosity and insight about relationships between humanity and the physical earth.... (Buttimer 1993, 15)

Although Sauer (1956, 391) stated that the “most primitive and persistent trait” among geographers is “liking maps and thinking by means of them,” and although proficiency with the tools of the trade is certainly a necessary quality for a geographer, I would argue that the most basic trait that draws people into geography is having profound and impressive real-world experiences with geographic concepts. Evidence to support this claim is found in the causal conditions experienced by the geography majors interviewed for this study. Lilith described how those fundamental experiences helped her focus in on geography:

I think something that helped me was being Latin and coming from a different culture and growing up in a different culture... having to live in a different culture and trying to balance the two -- always seeing where the similarities were and how my friends, maybe, acted different around their parents or things like that helped me to understand the concept of regions and within those regions are different people.... So coming into those first geography classes, that material was easier for me to take and make a part of me. (Lilith 2000)

To his credit, a similar message resonates in another description of the geographer by Sauer (1956, 392), “An innate aptitude to register differences and similarities is joined to a ready curiosity and reflection on the meaning of likeness and unlikeness.”

Context for Majoring in Geography

The context that facilitates links between the causal conditions and central phenomenon with the strategic actions that lead to the decision to major in geography include being enrolled in a four-year university that has an undergraduate geography program and having to declare a major to progress towards the attainment of an undergraduate degree. Since, generally, the goal associated with enrollment in a four-year university is obtaining a college degree, all students at some point in their college career are faced with making the decision to pursue advanced study in one field of inquiry to the exclusion of others. Being at a university that has a geography program that actively recruits undergraduate majors exacerbates this contextual condition.

Many of the interviewees, as well as, in the responses by geography majors responding to the in-class questionnaire, reported hearing that the geography department was one of the largest in the country. Others picked up a copy of a publication by the geography department that includes business cards showing types of jobs that are available to people with a geography degree.

Intervening Conditions Influencing Strategies

Intervening conditions, in addition to context, also play a part in linking the causal conditions, phenomenon and strategies that lead to the selection of geography as a college major. These intervening conditions include personal values, parental support, and the job market. Personal values intervened in this situation in that many of the majors interviewed expressed the relationship between their personal values and the contribution they hoped to make with a geography degree. Lilith (2000) emphasized that although she is concerned with environmental issues, her main interest lies in the betterment of the lives of people, and that is why she chose Urban/Regional Planning as her concentration. Alma (2000), on the other hand, feels that the environment needs to be protected from people, rather than conserved for people. She hopes to eventually be in a position where she can do something to protect natural resources.

The support for the decision to major in geography is also an intervening condition. Most often, at the undergraduate level, this support, whether financial, emotional or both, comes from parents. When asked if their parents supported their decision to major in geography, the most common response was, "Yes, as long as I am doing what I like, sticking with it and getting a degree, they support what I do."

The job market is also an important consideration as an intervening condition. Almost all the majors said they believed that they

would be able to find jobs using their geography degree when they graduate, and a couple already had jobs waiting for them at graduation.

Strategies for Deciding to Major in Geography

Both the context and intervening conditions intersect with strategies to facilitate the process of becoming a geography major. Having experienced the central phenomenon, real-world experience of geographic concepts, both the context and intervening conditions link this experience with the strategies of talking to professors, peers, and others about geography, searching through the course catalog for requirements and courses in the geography department, and enrolling in an introductory geography class.

These strategies were applied alone and in combination. Freida used the course catalog alone to decide that she wanted to major in geography. “I decided on geography because I was looking in the course catalog and I liked the diversity of classes” (Freida 2000). Kate (2000) looked in the course catalog as a first step, and then she made an appointment with the undergraduate coordinator in the geography department to discuss her options before declaring her major in geography. Lilith (2000) talked to a friend who was already majoring in geography in order to make the decision to switch to geography from political science. Drey enrolled in an introductory cultural geography class to fulfill an elective requirement, and decided to change his major

from sociology, because “the geographic perspective seemed like a more thorough way of explaining a situation” (Drey 2000).

Outcomes

The outcomes influenced by the causal conditions, central phenomenon, contextual and intervening conditions, and strategies as described in this narrative and visual grounded theory model is the selection of geography as a major by college undergraduates. The elements of this model vary by case among the female and male geography majors participating in this study, but their common denominators begin to illuminate the process of becoming a geographer.

CHAPTER 5

CONCLUSIONS

The results of this study are a beginning, and not an end unto themselves. The theoretical model developed in these pages needs to be substantiated by further study of how interest in geography develops and how a person becomes a geographer.

In attempting to answer the question, "Why do certain females major in geography and do well in it?" I took a different approach to the problem by looking at what first made females majors interested in the discipline. Most of the other studies that have looked at sex-related differences in geography attempted to explain female underrepresentation by examining differences in spatial abilities. The results of this study are intriguing, because they seem to indicate that females are actually outperforming males in college geography classrooms, as evident by their significantly higher grade point averages in geography. This finding contradicts the opinion of many researchers who feel that males scoring higher on such psychological tasks as mental rotation, etc. is the answer to why, for example, more boys compete successfully at the National Geography Bee each year.

Although the results of this study cannot refute any such claims to male superiority on tasks of spatial ability, it does show that the processes involved in becoming a geographer are similar between males and females, but that what varies is individual motivation. The theoretical model developed during this study shows that when females and males are both privy to the causal conditions associated with real-world experiences of geographic concepts, they have equal propensity to be interested in geography and to do well in geography.

The motivational variation among geography majors, such as female interest in environmental issues, is related, in the literature, to structures of socialization rather than evidence of biological difference. From this analysis, it appears that geography attracts males with high and low academic ability, while the females that find their way to geography are either more serious students or have a higher capacity for learning than their male counterparts.

Another explanation could be that more males than females have had experiences with geographic concepts before deciding on a major. While yet another explanation might indicate that males, regardless of ability, are more highly recruited than females by geography programs. However, these possible explanations are not substantiated with the present data, so these conclusions are mere speculation at this point.

Further research is needed that takes different approaches to the question of why there are not more females in geography. Future studies

could compare the backgrounds of female geography majors with non-geography majors to determine if the dearth of females in geography is a problem of lack of prior geographic experience. Also, interviews with low achieving male majors might provide answers as to why they choose to major in a field in which they have a low grade point average. Other ideas for future research could include looking at female interest in geography by concentration, since the results of this study show that the ratio of males to females depends on the geographic concentration. Questions about female participation in the discipline of geography are endless.

It is about as difficult to describe a geographer as it is to define geography, and in both cases I am content and hopeful. (Sauer 1956, 396)

APPENDIX A

Background Information Questionnaire

Please answer the following background questions

Age: _____

Sex: Male Female

Ethnicity (circle one): African-American Asian-American European-American
Hispanic-American Native American Pacific Islander Other Ethnicity (specify): _____

Class Level (circle one): Freshman Sophomore Junior Senior Other(specify): _____

Major: _____ Number of Credit hours in major: _____

Concentration in Major: _____

Minor: _____ Number of Credit hours in minor: _____

GPA in Major: _____ Overall GPA: _____

What factors (from your recent past, adolescence, childhood, etc.) do you feel influenced your choice of college major?

What stage in your education did you decide upon your present major? (circle one) Prior to 1st Year Freshman Year
Sophomore Year Junior Year Senior Year Other: _____

What other areas of study have you majored in prior to declaring your present major? _____

List any classes that you have taken which influenced your choice of major. _____

What is the highest level of education you plan to attain? (circle one). BA/BS
MA/MS Ph.D. Other (specify): _____

What type of job do you expect to get with your degree? _____

Parents Professions or Occupations:

Mother's: _____

Father's: _____

Were there any role models (i e , brothers or sisters, parents, other adults) that influenced your selection of major/ career choice? (specify): _____

Place of Birth (city/ state or province/ country): _____

QUESTIONS CONTINUED ON THE BACK OF THIS PAGE.

APPENDIX B

Interview Questions:

1. How did you decide to major in geography? What led you to this subject?
2. What factors from your personal or professional life do you feel influenced your decision to major in geography? Adulthood? Adolescence? Childhood?
3. What's your concentration and what do you plan/think you can do with your degree in geography?
4. Describe your travel experiences. Adulthood. Adolescence. Childhood
5. Do your family, friends, significant others, etc. support your decision to major in geography?
6. Is there anything else you'd like to add? What other questions do you think I should have asked? How do you think this interview could be improved?

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VITA

Vanessa Hudson Eckert was born in Troy, Alabama, on April 14, 1970, the daughter of Fran S. Hudson and John F. Hudson. After completing her work at Oliver Wendell Holmes High School, San Antonio, Texas in 1988, she entered Texas Tech University in Lubbock, Texas. She transferred to Southwest Texas State University in San Marcos, Texas in 1995. She completed the requirements for a secondary level certification in geography in the fall of 1997 while student teaching abroad in Cuernavaca, Morelos, Mexico. She received a Bachelor of Arts degree from Southwest Texas State University in December 1997. In June 1998, she entered the Graduate School of Southwest Texas State University, San Marcos, Texas.

Permanent Address: 8706 Birmingham Drive
Austin, Texas 78748

This thesis was typed by Vanessa Hudson Eckert.